EAST BAY MUNICIPAL UTILITY DISTRICT

Final
Responses to Comments

Environmental Impact Report
Main Wastewater Treatment Plant
Land Use Master Plan

SCH# 2009112073

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Chapter 8 Introduction to Final Environmental Impact Report

The regulations for implementing the California Environmental Quality Act (CEQA) direct the lead agency to respond to substantive public comments on the Draft Environmental Impact Report (EIR). The lead agency for this project is the East Bay Municipal Utility District (EBMUD). Comments received by EBMUD during the comment period for the Draft EIR are addressed in this document.

8.1 Organization of the Document

The Final EIR consists of the Draft EIR and appendices, including the Mitigation Monitoring and Reporting Program (Volume I) and Comment Letters and Responses to Comments (Volume II).

This document is Volume II of the Environmental Impact Report for the EBMUD Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan. This volume contains three chapters, which present the responses to comments on the Draft EIR. The three sections are:

Chapter 8: Introduction. This chapter describes the organization of the document and summarizes the public review process for the Draft EIR.

Chapter 9: Responses to Comments on Draft EIR. This chapter includes individual responses to each comment on the Draft EIR. Revisions to text of the Draft EIR based on comments are included in these responses. Text revisions are formatted in revision fashion: ~~strikeouts~~ indicate removed text and <u>underlines</u> indicate new text.

Chapter 10: Comment Letters. This chapter includes all comment letters received on the Draft EIR by EBMUD during the Draft EIR review period.

The Mitigation Monitoring and Reporting Program for the project is contained in Appendix E of the Draft EIR. There were no changes in the mitigation measures or the monitoring program as a result of the comments received on the Draft EIR.

8.2 Public Review Process for EIR

The public comment period for the Draft EIR began on February 7, 2011 with announcement of the availability of the Draft EIR. A public meeting was held on March 9, 2011 to present information about the project and to receive comments. Because the meeting was held in an open-house format, it was requested that all comments be submitted in writing. The formal public comment period was closed on March 28, 2011.

A Notice of Availability (NOA) of the Draft EIR was provided to all responsible agencies, all owners and occupants of property contiguous to the project site, and those requesting such notification. The Notice of Completion was also filed with the Office and Planning and Research. The Draft EIR was distributed to those requesting copies. The Draft EIR was also made available to the public on EBMUD's website and hard copies were available for review at the EBMUD offices at 375 Eleventh Street, Oakland, CA as well as at the West Oakland Branch Library and Main Oakland Library.

EBMUD will consider certification of the Final EIR at the regularly scheduled Board of Directors Meeting on June 28, 2011 at the EBMUD offices at 375 Eleventh Street, Oakland, CA. In order to certify the Final EIR, EBMUD must find that:

- the Final EIR has been completed in compliance with CEQA;
- the Final EIR was presented to the decision-making body of the lead agency and that the decision-making body reviewed and considered the information contained in the Final EIR prior to selection of a Project; and
- The final EIR reflects the lead agency's independent judgment and analysis (CEQA Guidelines 15090).

If EBMUD certifies the Final EIR, a decision will be made regarding whether to approve the Master Plan, and the Notice of Determination will be filed. At the time of considering approval of the project, EBMUD must consider the information presented in the Final EIR. Because the project has significant, unavoidable environmental impacts, EBMUD must find that the benefits of the project outweigh the environmental effects before it may approve the project. Accordingly, EBMUD will prepare a Statement of Overriding Considerations to be included in the record of project approval (CEQA Guidelines 15093).

8.3 Minor Revision to Project Description

Since publication of the Draft EIR there has been a slight change in the configuration of the facilities required for digester expansion. As noted on page 2-21 of the Draft EIR, in the last sentence under the heading of Digester Expansion: "With or without expansion of digester capacity, piping modifications may be undertaken in order to separate the digestion of food wastes and other high strength wastes from wastewater solids." Dedicated digestion of food waste would enable additional beneficial uses of the digested solids that are not possible if the solids are mixed with municipal wastewater solids. Since the publication of the Draft EIR, EBMUD has determined that it may not be feasible to use one of the existing centrifuges to separately dewater solids from the dedicated digester(s) and therefore a separate dedicated dewatering facility may be required. The description of the Master Plan has been revised to include a dedicated dewatering facility to be constructed adjacent to the existing digesters. Changes to the project description are shown in Section 9.5 of this Final EIR, Staff Initiated Text Changes.

8.4 Consideration of Recirculation

If significant new information is added to an EIR after public review, the lead agency is required to recirculate the revised document (CEQA Guidelines Section 15088.5). Significant new information includes, for example, a new significant environmental impact or a substantial increase in the severity of an impact. New information is not considered significant unless the document is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or comment on a feasible mitigation measure that the proponent has declined to implement. As noted above, there have been minor changes in facilities to include the possibility of a separate dedicated dewatering facility. The impacts of the revision to the project have been evaluated and no impacts described as less than significant in the Draft EIR have been found to be significant as a result of this change.

No new impacts or substantial increase in the severity of impacts has been identified as a result of information brought forward in the comments. Recirculation of the Draft EIR was thus not deemed to be necessary.

8.5 Use of Comment Summaries

The full text of all written comments is included in Chapter 10. Each letter is identified by a number and each comment is identified by a comment number in the margin; responses use the same number system. For example, Comment 1 in Letter 1 is designated Comment 1-1. In addition, to facilitate reading the Response to Comments, a summary of each comment is inserted in *italics* just prior to each response. This summary does not substitute for the actual comment; the reader is urged to read the full original text of all comments. The responses are prepared in answer to the full text of the original comment, and not to the abbreviated summary.

8.6 List of Letters Commenting on Draft EIR

EBMUD received three comment letters on the Draft EIR. EBMUD also received correspondence from the State Clearinghouse documenting the completion of the public review period for the Draft EIR. Each communication is identified below by number, comment author and date.

Letter	Comment Author	Comment Date
1	David Otsubo, Permitting and Compliance Division, California Department of Resources Recycling and Recovery (CalRecycle)	315/11
2	Wing Suen, Senior REHS, Office of Solid/Medical Waste Management, Alameda County, Department of Environmental Health	3/26/11
3	Scott Morgan, Director, State of California, Governor's Office of Planning and Research, State Clearinghouse	3/24/11
4	West Oakland Environmental Indicators Project	3/24/11

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Chapter 9 Responses to Comments

9.1 Comment Letter 1 – California Department of Resources Recycling and Recovery (CalRecycle)

9.1.1 Response to Comment 1-1

Comment Summary: The comment summarizes the project description for the biodiesel production facility and points out that if their summary differs from the project as proposed by EBMUD, any significant differences should be addressed in the Final EIR.

EBMUD confirms the accuracy of the summary of the project provided in the comment.

9.1.2 Response to Comment 1-2

Comment Summary: The comment points out that there is a discrepancy between the construction timing presented in the Executive Summary and in Section 2.3.5.

The timing presented in Section 2.3.5 is more accurate, though the actual timing of the project is subject to change. Section ES.1.4 of the Draft EIR is revised as follows:

Page ES-4, the first bullet is revised as follows:

- Biodiesel Production Facility: construction expected to begin in the fall of 2011 and be complete by the ~~fall~~ spring of 2012; and

9.1.3 Response to Comment 1-3

Comment Summary: The comment states that Table 2-4 should not use fractional vehicle trips because they reflect maximum vehicle trips.

Many deliveries would occur infrequently, so rounding numbers up to the nearest whole number would inaccurately reflect the level of traffic. For example, calcium bentonite deliveries would require about two trucks per month. Table 2-4 shows daily numbers for calcium bentonite delivery as <0.1 trucks. Rounding the daily truck numbers up to one truck trip per day would imply that there were 30 deliveries per month, which is incorrect. The fractional numbers were used in preparing the EIR because they provide a more accurate depiction of truck deliveries; the fractional numbers are explained in footnotes to the table.

9.1.4 Response to Comment 1-4

Comment Summary: The comment states that sources, incoming amounts, method(s) of receipt, and processing methods for animal fats are not described in the Draft EIR.

Because EBMUD does not have a land-lease agreement in place with a private company for the biodiesel facility, no additional details beyond what was described in the Draft EIR on feedstock sources are available. Animal fat may be included in the feedstock, as discussed on page 2-10 of the Draft EIR. The total amount of animal fat would not exceed the maximum daily feedstock use as presented in Table 2-2 on page 2-11 of the Draft EIR. The method for receipt of animal fat is expected to be the same as described under "Materials Transport" on page 2-12 of the Draft EIR, with incoming feedstock arriving by truck or rail. Processing methods for all feedstock are assumed to be similar, and are described on page 2-11 of the Draft EIR, under the heading "Biodiesel Production Steps." As described there, "Waste Oil Pretreatment is required to remove moisture and other impurities if waste oil is used as a feedstock. Processes may include filtration, heating, centrifugation, and decanting."

9.1.5 Response to Comment 1-5

Comment Summary: The comment states that if the biodiesel facility uses solid waste as a feedstock the activities would be considered as solid waste handling and thus the operator of the biodiesel facility should contact the Alameda County Department of Environmental Health (LEA) regarding the applicability of solid waste facility regulations.

EBMUD does not expect the biodiesel facility to handle solid waste. EBMUD will require the private company that leases land from EBMUD for the facility to comply with all applicable regulatory requirements, including any applicable solid waste facility regulations and to coordinate with the Local Enforcement Agency (LEA), as needed.

9.1.6 Response to Comment 1-6

Comment Summary: The comment states that if the LEA determines that the biodiesel facility is a solid waste facility, a solid waste facilities permit would be required. If the facility is defined as a solid waste operation, a permit would not be required, but design and operational requirements would be applicable.

As noted in Response to Comment 1-5, EBMUD does not expect the biodiesel facility to handle solid waste. EBMUD will require the private company that leases land from EBMUD for the facility to comply with all regulatory requirements.

9.1.7 Response to Comment 1-7

Comment Summary: The comment summarizes the project description for the food waste preprocessing facility and points out that if their summary differs from the project as proposed by EBMUD, any significant differences should be addressed in the Final EIR.

EBMUD confirms the accuracy of the summary of the project provided in the comment.

9.1.8 Response to Comment 1-8

Comment Summary: The comment states that operation of the food waste preprocessing facility would likely require a full solid waste facilities permit from Alameda County Department of Environmental Health, the LEA.

EBMUD confirms the information provided in the comment, as described on page 3.15-12 of the Draft EIR.

9.1.9 Response to Comment 1-9

Comment Summary: The comment asks how the food waste preprocessing facility would comply with the requirement to clean the facility and equipment once each 24 hours.

Each area of the food waste preprocessing facility would be cleaned at the end of the day after use to provide vector control and to reduce opportunities for vermin harborage. The facility would follow a regular LEA-approved cleaning schedule, and additional cleaning would take place as needed for vector control purposes. A record of these procedures and their completion times and dates would be maintained by appropriate personnel and filed on site.

The tipping floor and push walls would be cleaned of loose materials and litter regularly to remove any material that accumulates in accordance with State of California standards as described in 14CCR, §17407.2(a). These materials would be collected for appropriate management (disposal or recycling). All roads, entrances and exits, fences, and material handling areas would be monitored daily and collected as needed to minimize the tracking or off-site migration of waste materials.

Equipment would also be cleaned on a regular basis. This cleaning would typically be performed manually using minimal wash water (recycled wastewater, if possible). All material and water collected as part of the cleaning operations would be handled and disposed of according to all applicable regulatory requirements.

9.1.10 Response to Comment 1-10

Comment Summary: The comment asks for further definition on the housekeeping procedures that are proposed to control odors.

Odor control provisions would be implemented at the food waste preprocessing facility in accordance with State of California standards including General Design requirements as described in 14 CCR, §17406.2. An enclosed building would mitigate potential odors outside the facility, while natural ventilation designed into the structure would minimize odors inside. Odors would be controlled by the timely removal of the organic-rich materials and regular cleaning of the preprocessing facility's tipping floor. An Odor Management Plan for the food waste preprocessing facility would be included in the Transfer/Processing Report that would be submitted with the Solid Waste Facility Permit application. Please refer to Response to Comment 1-9 for additional information regarding housekeeping procedures. EBMUD has also included mitigation in the Draft EIR to address the possibility that proposed procedures would not adequately control odors. Please refer to Mitigation Measure AIR-6a on page 3.3-37 of the Draft EIR, which requires that roof vents on the proposed building be designed to accommodate odor controls in the event that odor problems occur in the future and controls are ultimately needed.

9.1.11 Response to Comment 1-11

Comment Summary: The comment asks how the food waste preprocessing facility would comply with the requirement to implement a hazardous waste exclusion program that contains random load checks and a storage area of hazardous wastes.

Due to the composition of the material (i.e., organic-rich materials including food scraps), it is not anticipated that any hazardous wastes would be received; however, a Load-checker would be designated to implement the Load-checking Program for the food waste preprocessing facility to prevent the delivery and acceptance of hazardous or prohibited wastes at the facility. The scope of the Load-checking Program includes inspection and surveillance procedures for delivered waste loads, providing training to company employees on hazardous waste identification and exclusion procedures, managing abandoned hazardous wastes, responding to hazardous waste emergencies, and public outreach and education activities. A copy of the Load-checking Program would be included in the Transfer/Processing Report that would be submitted with the Solid Waste Facility Permit application. Records of wastes collected, returned, and disposed of as part of the Load-checking Program would be maintained on site. Hazardous or prohibited materials identified by the Load-checking Program at the time of delivery would not be accepted. If hazardous materials are identified during processing, they would be promptly removed and collected in a hazardous materials bin for proper disposal.

9.1.12 Response to Comment 1-12

Comment Summary: The comment states that regulations require solid wastes to be removed from facilities within 48 hours unless otherwise authorized by the LEA.

In accordance with 14CCR, §17410.1(a)(2), materials would be processed and removed within 48 hours of receipt, though the standard operating procedure would be to process and remove material within a 24-hour period as described on page 3.3-35 of the Draft EIR.

9.1.13 Response to Comment 1-13

Comment Summary: The comment states that the preliminary site plan in Figure 2-6 does not show the option to use a mechanical conveyor or pipeline to transport preprocessed food waste from the processing building to the processing facility.

No conveyor or pipeline is shown in Figure 2-6 because it has not been determined if this form of conveyance would be practical. The EIR analyzes conveyance by truck as the worst-case option for transporting preprocessed food waste, as it would require additional truck trips. The conveyor or pipeline would be located entirely within the boundaries of the MWWTP, so neither facility would be expected to have significant impacts. Potential visual impacts of the conveyor or pipeline are discussed on page 3.2-6 of the Draft EIR, "The mechanical conveyor that may be used would be fully-covered and leak proof and elevated high enough above ground to allow trucks to pass underneath. The enclosed pipeline, if used, would likely be below ground. The conveyor would be a new outdoor structure and therefore would be visible from some areas outside the site. However, since the two food waste facilities are adjacent to each other (as shown in **Figures 2-2** and **2-4** in *Chapter 2, Project Description*), the length required for either structure would be relatively short, limiting the impact on the visual character of the facility. In addition, either type of structure would be consistent in character with existing piping, tubing and other auxiliary structures currently used at the MWWTP site." The conveyor or pipeline would be less than 500 feet long.

9.1.14 Response to Comment 1-14

Comment Summary: The comment requests a description of how incoming material is removed from trucks and what storage would be provided for material to minimize liquid discharge, odors, vector issue, and any other nuisances.

Please refer to Response to Comment 1-10 for a discussion of odor control. General information regarding these processes is presented on pages 2-14, 2-15 and 2-17 of the Draft EIR. More specific information will be contained in the Transfer/Processing Report that would be submitted with the Solid Waste Facility Permit application. In general, organic-rich material loads delivered to the food waste preprocessing facility would be unloaded inside the building directly onto the tipping floor. There would be an area within the facility designated for all incoming feedstock and storage of materials. Upon the placement of loads onto the tipping floor, the materials would be handled using a front-end loader. The front-end loader would be used to collect the materials and to load the preprocessing feeders. A "first-in/first-out" procedure would be used to ensure that all organic-rich materials are removed from the site in a timely manner. As required by 14CCR, §17410.1(a)(2), organic-rich materials would not be stored at the food waste preprocessing facility for more than 48 hours. The standard operating procedure would be to process and remove material within a 24-hour period as described on page 3.3-35 of the Draft EIR. Specific procedures for liquid management, vector control and general nuisance control are discussed below.

Liquid Management: Liquid waste acceptance at the food waste preprocessing facility would be limited to the liquid contained within the organic-rich material loads. Standard operating procedures employed at the facility would be designed to prevent generation and leakage of any liquids. These procedures would include performing all unloading, processing, and loading of materials inside the food waste preprocessing facility. This provision, coupled with positive drainage away from the building, would ensure that drainage associated with precipitation events would not mingle or come in contact with organic-rich materials. Similarly, any water added to the waste (i.e., for dust control or floor washing) would be limited to the amount that can be absorbed by the waste, thereby eliminating the need for special liquid containment or

management provisions. Whenever possible, "dry cleaning" would be performed (i.e., sweeping and scraping) in lieu of the use of water.

Vector Control: The food waste preprocessing facility would be operated to control the propagation, harborage, and attraction of vectors such as flies, rodents, birds, and other animals. Putrescible materials and green waste materials would not remain on site for more than 48 hours from the time of receipt, and would typically be processed and removed on a daily basis as described on page 3.3-35 of the Draft EIR. All materials would be contained within the food waste preprocessing facility, thus limiting attraction of birds. Areas between and around push walls would be regularly maintained and cleaned as appropriate to prevent vermin harborage. In addition, vector control specialists would be used as necessary to control any vector problems that may arise.

General Nuisance Control: Consistent with 14CCR, §17408.5, the food waste preprocessing facility would be operated to avoid creating a nuisance to the public. Wastes would be removed on a frequent basis and in accordance with all state and local regulations. All processing operations would be conducted within the enclosed building, thereby minimizing the potential for any nuisance issues.

Traffic areas would be paved with all-weather surfaces, thus limiting vehicular-generated dust. All unloading, handling, processing, and loading operations would be conducted inside the confines of the food waste preprocessing facility. This mode of operation would adequately control any dust generated by these activities from leaving the site vicinity. In some cases, dust created within the material unloading and/or handling areas may be controlled with sprayed water; however, due to the generally moist nature of the material that would be received, water application is not typically anticipated. Regular inspection and cleaning performed as part of the maintenance program at the food waste preprocessing facility would serve to reduce and control routine dust generated.

9.1.15 Response to Comment 1-15

Comment Summary: The comment asks if the 76 trucks per day for delivery of materials include truck traffic necessary to move preprocessed material to the food processing facility.

As shown in Table 2-6 on page 2-18 of the Draft EIR, the 76 trucks per day include 10 trucks per day that would convey processed material from the preprocessing facility to the EBMUD Food Waste Facility. Those trips would occur within the MWWTP property. The text of the first full paragraph on page 2-18 has been revised as follows for clarification:

> A total of approximately 76 trucks per day delivering organics-rich material<u>, transferring preprocessed food waste within the MWWTP,</u> and taking away non-digestible material would be required at peak capacity (see **Table 2-6**).

9.1.16 Response to Comment 1-16

Comment Summary: The comment points out that the LEA has not been notified of EBMUD's proposal to increase capacity of the existing food waste facility from 100 tons per day to 250 tons per day.

In 2009, EBMUD prepared an Initial Study/Negative Declaration (IS/ND) for the Food Waste Facility Phase 2 Project. That CEQA document, which has been adopted by EBMUD, evaluated expansion of the facility from 100 tons per day to 250 tons per day, and determined that the expansion, as described, would not result in significant impacts. In accordance with the comments from the Integrated Waste Management Board on this IS/ND, EBMUD submitted an updated notification to the LEA regarding the expansion of the existing food waste facility from 100 tons per day to 250 tons per day on March 15, 2011.

9.1.17 Response to Comment 1-17

Comment Summary: The comment requests copies of the Statement of Overriding Considerations and Findings along with hard copies of any subsequent environmental documents, and points out the requirement for filing a Notice of Determination with the State Clearinghouse. The comment also requests that a copy of the responses to comments on the Draft EIR be provided at least ten days before certification of the Final EIR, along with notification of the date of the certification hearing.

EBMUD will provide information as requested in the comment and will file the Notice of Determination with the State Clearinghouse.

9.2 Comment Letter 2 – Alameda County Department of Environmental Health

9.2.1 Response to Comment 2-1

Comment Summary: The comment asks for clarification regarding how feedstock is delivered to the biodiesel facility for processing, and requests additional information on sources, incoming amount, storage and pre-treatment for animal fats.

Because EBMUD does not have a land-lease agreement in place with a private company for the biodiesel facility, no additional details beyond what was described in the Draft EIR on feedstock sources are available. Animal fat may be included in the feedstock, as discussed on page 2-10 of the Draft EIR. The total amount of animal fat would not exceed the maximum daily feedstock use as presented in Table 2-2 on page 2-11 of the Draft EIR. The method for receipt of animal fat is expected to be the same as described under "Materials Transport" on page 2-12 of the Draft EIR, with incoming feedstock arriving by truck or rail. Processing methods for all feedstock are assumed to be similar, and are described on page 2-11 of the Draft EIR, under the heading "Biodiesel Production Steps." As described there, "Waste Oil Pretreatment is required to remove moisture and other impurities if waste oil is used as a feedstock. Processes may include filtration, heating, centrifugation, and decanting."

9.2.2 Response to Comment 2-2

Comment Summary: The comment asks for information on the pretreatment process for incoming feedstock and notes that a Solid Waste Facility Permit may be required if pretreatment involves solid waste handling or preprocessing on site.

As noted above in Response to Comment 2-1, pretreatment is described on page 2-11 of the Draft EIR. EBMUD does not expect the biodiesel facility to handle solid waste. EBMUD will require the private company that leases land from EBMUD for the biodiesel facility to comply with all applicable regulatory requirements, including any applicable solid waste facility permit requirements.

9.2.3 Response to Comment 2-3

Comment Summary: The comment states that Table 2-4 should not use fractional vehicle trips because numbers reflect maximum vehicle trips.

Many deliveries would occur infrequently, so rounding numbers up to the nearest whole number would inaccurately reflect the level of traffic. For example, calcium bentonite deliveries would require about two trucks per month. Table 2-4 shows daily numbers for calcium bentonite delivery as <0.1 trucks. Rounding the daily truck numbers up to one truck trip per day would imply that there were 30 deliveries per month, which is incorrect. The fractional numbers were

used in preparing the EIR because they provide a more accurate depiction of truck deliveries; the fractional numbers are explained in footnotes to the table.

9.2.4 Response to Comment 2-4

Comment Summary: The comment requests a description of how the odor control building would control odor at the Biodiesel Production Facility.

As described on page 3.3-35 of the Draft EIR, "The biodiesel production facility's process would be a completely closed loop system and all process vent gases would be accumulated and condensed. Exhaust air from within the building would be processed through an activated carbon filtration system to capture VOCs, odors, and other gas phase contaminants. Process vapor emissions would be sent to chillers and accumulators to recover all methanol in the gaseous phase, which would be recycled back to the process. Such recovery of methanol would help to reduce the potential for nuisance odors from methanol. Pressure relief valves would have activated carbon filters to capture odors."

9.2.5 Response to Comment 2-5

Comment Summary: The comment notes that EBMUD currently has an Enforcement Agency (EA) Notification for the food waste processing facility to handle 100 tons per day of food waste. A new EA Notification is required to handle up to 250 tons per day.

In 2009, EBMUD prepared an Initial Study/Negative Declaration (IS/ND) for the Food Waste Facility Phase 2 Project. That CEQA document, which has been adopted by EBMUD, evaluated expansion of the facility from 100 tons per day to 250 tons per day, and determined that the expansion, as described, would not result in significant impacts. In accordance with the comments from the Integrated Waste Management Board on this IS/ND, EBMUD submitted an updated notification to the LEA regarding the expansion of the existing food waste facility from 100 tons per day to 250 tons per day on March 15, 2011.

9.2.6 Response to Comment 2-6

Comment Summary: The comment requests a description of changes in design and operations of the existing food waste processing facility to accommodate expansion from 100 to 250 tons per day.

Changes in design and operation of the existing food waste facility were described in detail in the Food Waste Facility Phase 2 Project IS/ND in 2009. A hard copy of this CEQA document was provided by EBMUD in our notification letter to the LEA on March 15, 2011.

9.2.7 Response to Comment 2-7

Comment Summary: The comment requests a specific site plan or operational plan that details how feedstock is transferred from haul trucks to the preprocessing system, and asks how and for how long the feedstock is stored before it is fed into the preprocessing system.

General information regarding these processes is presented in the Draft EIR on pages 2-14, 2-15, and 2-17. A detailed site plan including a circulation plan as well as a Transfer/Processing Report would be submitted with the Solid Waste Facility Permit application. In general, organic-rich material loads delivered to the food waste preprocessing facility would be unloaded inside the structure directly onto the tipping floor. There would be an area within the facility designated for all incoming feedstock and storage of materials. Upon the placement of loads onto the tipping floor, the materials would be handled using a front-end loader. The front-end loader would be used to collect the materials and to load the preprocessing feeders. A "first-in/first-out" procedure would be utilized to ensure that all organic-rich materials are removed from the site in a timely manner. As required by 14CCR, §17410.1(a)(2), organic-rich materials would not be stored at the

food waste preprocessing facility for more than 48 hours, though the standard operating procedure would be to process and remove material within a 24-hour period as described on page 3.3-35 of the Draft EIR.

9.2.8 Response to Comment 2-8

Comment Summary: The comment asks for a description of how odors and vector issues would be controlled through proper material management and meticulous housekeeping practices.

Each area of the food waste preprocessing facility would be cleaned at the end of the day after use to provide vector control and to reduce opportunities for vermin harborage. The facility would follow a regular LEA-approved cleaning schedule, and additional cleaning would take place as needed for vector control purposes. A record of these procedures and their completion times and dates would be maintained by appropriate personnel and filed on site.

The tipping floor and push walls would be cleaned of loose materials and litter regularly to remove any material that accumulates in accordance with State of California standards as described in 14 CCR, §17407.2(a). These materials would be collected for appropriate management (disposal or recycling). All roads, entrances and exits, fences, and material handling areas would be monitored daily and collected as needed to minimize the tracking or off-site migration of waste materials.

Equipment would also be cleaned on a regular basis. This cleaning would typically be performed manually using minimal wash water (recycled wastewater, if possible). All material and water collected as part of the cleaning operations would be handled and disposed of according to all applicable regulatory requirements.

9.2.9 Response to Comment 2-9

Comment Summary: The comment requests a description of specific steps to control odor inside and outside the food waste preprocessing building.

Odor control provisions would be implemented at the food waste preprocessing facility in accordance with all applicable State of California standards including General Design requirements as described in 14 CCR, §17406.2. An enclosed building would mitigate potential odors outside the facility, while natural ventilation designed into the structure would minimize odors inside. Odors would be controlled by the timely removal of the organic-rich materials and regular cleaning of the preprocessing facility's tipping floor. An Odor Management Plan for the food waste preprocessing facility would be included in the Transfer/Processing Report that would be submitted with the Solid Waste Facility Permit application. EBMUD has also included mitigation in the Draft EIR to address the possibility that proposed procedures would not adequately control odors. Please refer to Mitigation Measure AIR-6a on page 3.3-37 of the Draft EIR, which requires that roof vents on the proposed building be designed to accommodate odor controls in the event that odor problems occur in the future and controls are ultimately needed.

9.2.10 Response to Comment 2-10

Comment Summary: The comment asks how long non-digestible material is stored on site before being shipped off site for composting.

Non-digestible materials would be removed and transported to a compost facility or landfill within 48 hours.

9.2.11 Response to Comment 2-11

Comment Summary: The comment asks how the food waste preprocessing facility would screen hazardous waste exclusion from incoming loads and requests a description of hazardous waste storage and disposal.

Due to the composition of the material (i.e., organic-rich materials including food scraps), it is not anticipated that any hazardous wastes would be received; however, a Load-checker would be designated to implement the Load-checking Program for the food waste preprocessing facility to prevent the delivery and acceptance of hazardous or prohibited wastes at the facility. The scope of the Load-checking Program includes inspection and surveillance procedures for delivered waste loads, providing training to company employees on hazardous waste identification and exclusion procedures, managing abandoned hazardous wastes, responding to hazardous waste emergencies, and public outreach and education activities. A copy of the Load-checking Program would be included in the Transfer/Processing Report that would be submitted with the Solid Waste Facility Permit application. Records of wastes collected, returned, and disposed of as part of the Load-checking Program would be maintained on site. Hazardous or prohibited materials identified by the Load-checking Program at the time of delivery would not be accepted. If hazardous materials are identified during processing, they would be promptly removed and collected in a hazardous materials bin for proper disposal.

9.2.12 Response to Comment 2-12

Comment Summary: The comment asks for details regarding procedures to handle and capture liquid process wastes and wash down water.

Floor drains and appropriate sloping would be incorporated into building design so that all washdown water would be captured. As noted on page 2-15 of the Draft EIR, washdown water may be either routed directly to the sanitary sewer system for treatment at EBMUD's MWWTP or may be captured and then routed underground, or transported by tanker truck to the Resource Recovery (R2) Receiving Station at the MWWTP for treatment in the anaerobic digesters.

9.2.13 Response to Comment 2-13

Comment Summary: The comment states that design or operational changes are not sanctioned until incorporated in a Solid Waste Facility Permit that has been concurred with by CalRecycle and issued by the LEA.

EBMUD will inform and require the companies that lease land from EBMUD for the biodiesel and food waste facilities to obtain all appropriate permits. EBMUD operations will comply with all appropriate regulations.

9.3 Comment Letter 3 – State Clearinghouse

9.3.1 Response to Comment 3-1

Comment Summary: The comment transmits a comment letter from the California Department of Resources Recycling and Recovery, and confirms that EBMUD has complied with the State Clearinghouse review requirements for draft environmental documents pursuant to the CEQA.

EBMUD appreciates the assistance of the State Clearinghouse in complying with CEQA requirements for environmental review.

9.4 Comment Letter 4 – West Oakland Environmental Indicators Project

9.4.1 Response to Comment 4-1

Comment Summary: The comment provides background information about the West Oakland Environmental Indicators Project and the West Oakland neighborhood, pointing out that the neighborhood is already subject to high levels of diesel emissions and asking how the project will benefit West Oakland residents.

EBMUD acknowledges the high levels of existing diesel emissions in the project area due to existing freeways, port operations and industry and the associated health effects. Table 4-3 in the cumulative air quality analysis presents information on existing stationary sources and roadways in the vicinity. As noted on page 4-16 of the Draft EIR, "The BAAQMD Community Air Risk Evaluation (CARE) program identified West Oakland as an Impacted Community, due to the combination of high levels of diesel particulate matter (DPM) (due to on-road heavy duty trucks, as well as ships, harbor craft, locomotives, and cargo handling equipment) and proximity of sensitive populations." The biodiesel produced may be used in heavy-duty trucks that access the Port of Oakland and travel through the West Oakland community, which would reduce particulate matter emissions.

While the Draft EIR does not address unemployment rates, as employment statistics do not directly relate to environmental impacts, and the CEQA Guidelines (Section 15131) specifically state that "Economic or social effects of a project shall not be treated as significant effects on the environment," the document identifies the potential to create jobs as a benefit of the project. The Draft EIR considers the existing environment in West Oakland and evaluates environmental impacts in the project area, but is not required to address unemployment in the impacts analysis.

The Draft EIR considers whether the Master Plan would accommodate increases in population in the project area. As noted on page 4-1 of the Draft EIR, "None of the projects included in the Land Use Master Plan would increase the wastewater treatment capacity of the MWWTP, so the new facilities would not accommodate growth in the EBMUD wastewater service area," which includes West Oakland.

The project benefits are discussed on page ES-1 of the Draft EIR. Potential benefits to the West Oakland community include:

- Improved odor control through implementation of the odor control upgrades that are part of the Master Plan;
- Maintenance of reasonable (wastewater user) rates through revenue generation at the MWWTP;
- Potential for creation of local jobs;
- Production of renewable energy, including biodiesel, which may be used in heavy-duty trucks that access the Port of Oakland; and
- Increased solid waste diversion.

9.4.2 Response to Comment 4-2

Comment Summary: The comment summarizes information about the biodiesel production facility.

EBMUD confirms the information provided in the comment.

9.4.3 Response to Comment 4-3

Comment Summary: The comment asks about the source of oil for biodiesel feedstock, how it would be collected and transported, and if there is a partnership with companies to supply used oil.

Procurement of feedstock, will be the responsibility of the private company that would lease land from EBMUD for the biodiesel facility. Transportation of waste oil is discussed under "Materials Transport" on page 2-12 of the Draft EIR; incoming feedstock would arrive by truck and/or rail. As noted in the footnote to Table 3.3-8 on page 3.3-21 of the Draft EIR, for purposes of analysis "approximately half of the feedstock is assumed to be collected from waste oil collection centers

within a 100-mile radius…and half is assumed to come from soybean oil shipped from the Midwest via rail to the Port of Oakland, then transferred by truck to a supplier within 10 miles of the MWWTP or directly to the MWWTP." As described, it is expected that half of the waste oil would be collected from within a 100-mile radius of the MWWTP.

9.4.4 Response to Comment 4-4

Comment Summary: The comment asks about the expected market for biodiesel and whether EBMUD has a market for local fuel sales.

Sales of the biodiesel produced at the MWWTP would be the responsibility of the private company that would lease land from EBMUD for the biodiesel facility. Due to the large number of diesel users in the project area and the economic benefits of selling the biodiesel product locally, it is expected that biodiesel would be available to local users. As noted in the footnote to Table 3.3-8 on page 3.3-21 of the Draft EIR "Biodiesel product is assumed to be delivered to vendors/distributors within a 20-mile radius of the MWWTP."

9.4.5 Response to Comment 4-5

Comment Summary: The comment asks about the health effects of using glycerin.

Glycerin is a byproduct of biodiesel production and would be contained and conveyed to the anaerobic digesters at the MWWTP for digester gas and renewable energy production. Digestion of glycerin would occur within the enclosed digesters and would not have any health effects.

9.4.6 Response to Comment 4-6

Comment Summary: The comment asks if EBMUD would use up all of the biodiesel that is produced at the facility, and if sold how it would be transported.

Please refer to Response to Comment 4-4 regarding sales and transport of biodiesel. As noted on page 3.14-13 of the Draft EIR, trucks, including those transporting biodiesel, "would not be expected to use local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue." Truck trips associated with the biodiesel facility are shown in Table 3.14-6 on page 3.14-12 of the Draft EIR. At its initial capacity of 5 million gallons per year (mgy), the delivery of biodiesel product would require an average of 4 truck trips per day; the 20 mgy facility would require an average of 13 trips per day. However, these trips would not be expected to occur on local streets and would thus not disturb the West Oakland community and its transportation system. If the biodiesel facility were able to construct a rail spur, truck trips for transport of the biodiesel could be significantly reduced or eliminated.

9.4.7 Response to Comment 4-7

Comment Summary: The comment asks about the potential impact of rail transportation on the local neighborhood.

If rail transport were used, the project would only require construction of a small rail spur connecting the biodiesel facility with existing railroad tracks. Figure 2-4 on page 2-9 of the Draft EIR shows the proposed rail spur, and the existing rail line, which lies just south of Engineers Road. Construction of the rail spur would take place almost entirely within the existing MWWTP property, and would not be expected to have adverse effects on the neighborhood. Rail transport would reduce traffic congestion in the project area. Because rail transport would use existing rail lines it is not expected to affect neighborhood safety. As noted on page 2-12 of the Draft EIR, a maximum of "five railcars per day would deliver feedstock and reagents to the site and transport biodiesel from the site."

9.4.8 Response to Comment 4-8

Comment Summary: The comment asks if EBMUD will require local West Oakland hiring by their contractors.

Please refer to Response to Comment 4-1, which describes benefits to the local community, including the potential for creation of local jobs. In accordance with the CEQA Requirements, EBMUD hiring practices are not addressed as part of the analysis prepared to comply with CEQA. As noted on page 3.14-10 of the Draft EIR operation of the food waste preprocessing facility would require 5 workers for the initial operation and 15 workers at build-out capacity. Operation of the biodiesel production facility would require 20 workers for the initial operation and 45 workers at build-out. Job opportunities would be created by the project.

It is EBMUD policy to encourage contractors to hire locally. EBMUD construction projects are advertised in local papers such as the Oakland Tribune. One key component of the EBMUD's Contract Equity Program is to encourage Local Business participation in all contracts. In evaluating contracts for professional services, decision makers are required to add a minimum 5% weighting for contracts that include a Local Business Enterprise. Furthermore, as noted in the EBMUD Standard Specifications, Division I General Requirements, "The District encourages Contractors (and their subcontractors), who have active District contracts, to provide job training and employ local residents with little work experience and/or residents who are returning to work from welfare."

9.4.9 Response to Comment 4-9

Comment Summary: The comment asks if EBMUD will sell biodiesel and use the revenue for the West Oakland community.

The biodiesel company will sell the biodiesel produced at the facility. As noted on page ES-1 of the Draft EIR, the intent is that land lease revenues will help EBMUD maintain reasonable wastewater rates for communities in the East Bay, which includes West Oakland.

9.4.10 Response to Comment 4-10

Comment Summary: The comment asks how methane will be transported, and if EBMUD use working with companies who produce or need methane.

Transportation of all materials used in biodiesel production is discussed on page 2-12 of the Draft EIR in the section titled "Materials Transport." The biodiesel process does not use methane to react with oil, so no methane would be transported. The glycerin byproduct produced by the biodiesel facility would undergo anaerobic decomposition in completely enclosed digesters at the MWWTP and biogas (which is approximately 60 percent methane and 40 percent carbon dioxide) generated by this process is utilized in EBMUD's Power Generation Station at the MWWTP. All of the methane generated by the digesters would be used to generate power for EBMUD, so no excess methane is expected to be available for sale. EBMUD does not plan to purchase methane from outside sources.

9.4.11 Response to Comment 4-11

Comment Summary: The comment states that methane will increase air pollution.

The methane produced by the digesters is currently and would continue to be captured and used to generate power at the EBMUD Power Generation Station at the MWWTP. The Master Plan is thus not expected to increase methane emissions in West Oakland.

9.4.12 Response to Comment 4-12

Comment Summary: The comment asks about measures to ensure safety regarding use and transportation of sodium methoxide.

Safety measures for use of hazardous materials, including sodium methoxide, are discussed on page 3.9-25 of the Draft EIR. As noted, "use and storage of these materials would comply with California Fire Code Articles 79 and 80 (discussed in *State Policies and Regulations*). Article 80 includes specific design requirements for the safe storage and handling of hazardous materials." The Draft EIR specifies that "transport of hazardous materials would comply with local, state, and federal requirements and trucks would not be expected to utilize local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue."

9.4.13 Response to Comment 4-13

Comment Summary: The comment asks how West Oakland residents would be compensated for having hazardous materials transported in the community.

As noted in Response to Comment 4-6, transport of materials for the biodiesel facility would not use local streets.

9.4.14 Response to Comment 4-14

Comment Summary: The comment asks if residents will be exposed to odor from methane or sodium methoxide, and how EBMUD would respond to odor complaints.

It should be noted that methane alone is an odorless gas. The Master Plan includes odor control upgrades for a number of existing facilities at the MWWTP. Methane produced by anaerobic digestion would continue to be contained and captured for use as fuel for the Power Generation Station at the MWWTP. The Draft EIR also includes mitigation measures to ensure that odor controls are implemented as needed for all Land Use Master Plan elements. Details are presented in Mitigation Measures Air-6b: Odor Controls on Other Land Use Master Plan Elements, on page 3.3-37 of the Draft EIR. With implementation of mitigation, the project would not be expected to increase odor from biogas.

Sodium methoxide would be used in the biodiesel production process, which occurs within a sealed system. As noted on page 2-12 of the Draft EIR, "All tank vents would be connected to an exhaust air system to allow vent gases to be accumulated and condensed for methanol recovery and reuse. Exhaust air from within the building would be passed through a pre-filter to remove particulates, followed by activated carbon to capture VOCs and odors. All tanks would be double walled or have secondary containment. Pressure relief valves would have activated carbon filters to capture any trace VOCs and odors." Odors from sodium methoxide are thus not expected to affect the nearby community. As described on page 3.3-5 of the Draft EIR, "EBMUD operates a 24-hour Odor Hotline to respond to community concerns regarding odors from the MWWTP. Staff collects detailed information regarding the complaint, conducts site investigations, and takes action when possible to reduce off-site odors."

9.4.15 Response to Comment 4-15

Comment Summary: The comment asks if EBMUD will create and implement an emergency evacuation plan for local residents.

EBMUD would require that the biodiesel facility operator develop and implement a Hazardous Materials Business Plan (HMBP) and comply with Oakland Fire Department (OFD) requirements to ensure safety of surrounding areas. As noted on page 3.9-25 of the Draft EIR, "the owner/operator for the biodiesel facility would file an HMBP with the OFD, Office of Emergency

Services detailing hazardous materials uses at the facility and specifying emergency response procedures for chemical emergencies in accordance with City of Oakland requirements."

9.4.16 Response to Comment 4-16

Comment Summary: The comment summarizes information about the food waste preprocessing facility.

EBMUD confirms the information provided in the comment.

9.4.17 Response to Comment 4-17

Comment Summary: The comment asks how the food waste preprocessing facility would benefit the residents of West Oakland.

Please refer to Response to Comment 4-1 for a discussion of project benefits to the West Oakland community.

9.4.18 Response to Comment 4-18

Comment Summary: The comment asks for information on transportation routes for the food waste preprocessing facility.

Transportation of food waste and byproducts is discussed under "Materials Transport" on page 2-17 of the Draft EIR. Food waste would be delivered by truck and would use the same route as for truck trips associated with the biodiesel facility. Trucks would not be expected to utilize local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue. No rail transport is proposed for the food waste preprocessing facility.

9.4.19 Response to Comment 4-19

Comment Summary: The comment expresses concern about odor impacts associated with food waste preprocessing.

Odor impacts from the food waste preprocessing facility are evaluated on page 3.3-35 and 3.3-36 of the Draft EIR. Mitigation Measure AIR6a: Odor Controls in Food Waste Preprocessing Facility, would be implemented to minimize odors associated with food waste. The measure includes the requirement that roof vents on the proposed building be designed to accommodate odor controls in the event that odor problems occur in the future and controls are ultimately needed. The Master Plan also includes odor control upgrades for the Influent Pump Station, primary sedimentation tanks, Solids Dewatering Building, and Resource Recovery Receiving Station. In addition, EBMUD will continue to respond to community concerns regarding odors from the MWWTP.

9.4.20 Response to Comment 4-20

Comment Summary: The comment asks how EBMUD will involve the community in planning odor reduction.

EBMUD has been working with the West Oakland community on an ongoing basis regarding issues associated with operation of the MWWTP. For more than a decade, EBMUD has met with the West Oakland Liaison Group (WOLG) periodically to discuss issues related to operation of the MWWTP, future projects, and community concerns including odors. EBMUD also meets with various neighbors to address concerns on an as-needed basis. As part of the development of the Draft EIR, EBMUD conducted a scoping meeting for the project on December 14, 2009, and held a public workshop to provide information on the Draft EIR on March 9, 2011.

9.4.21 Response to Comment 4-21

Comment Summary: The comment asks where organics-rich food waste would come from and if there is a collection relationship with local companies to process their raw material.

Table 3.3-10 on page 3.3-23 of the Draft EIR provides a description of the source of food waste. Food waste is expected to be delivered from a number of existing solid waste collection facilities including transfer facilities in San Francisco, Alameda, Contra Costa and San Mateo counties. Some direct haul of food waste to the MWWTP is also expected. Sources of food waste would be developed by the private company that would lease land from EBMUD for the food waste preprocessing facility.

9.4.22 Response to Comment 4-22

Comment Summary: The comment asks if the food waste project would offer local residents job opportunities.

In accordance with CEQA, hiring practices and employment are not addressed as part of the analysis of potential impacts in a CEQA document. As noted on page 3.14-10 of the Draft EIR operation of the food waste facility would require 5 workers for the initial operation and 15 workers at build-out capacity. Operation of the biodiesel production facility would require 20 workers for the initial operation and 45 workers at build-out. Job opportunities would be created by the project.

9.4.23 Response to Comment 4-23

Comment Summary: The comment asks how EBMUD will supply renewable energy directly to the West Oakland community.

Renewable energy produced by the food waste preprocessing facility would be used by EBMUD to produce power to operate the MWWTP. Excess electricity produced would be put back into the grid and sold. Operating the MWWTP with power produced on site and selling excess power reduces electrical costs and helps minimize rate increases associated with wastewater treatment, which in turn benefits ratepayers in West Oakland. The biodiesel company would sell the biodiesel produced at the facility. Although specifics regarding the sales approach have not been determined, it is expected that the biodiesel would be sold locally, so as to minimize transportation costs.

9.4.24 Response to Comment 4-24

Comment Summary: The comment asks how the project would generate value, affect rates for West Oakland citizens, and benefit the West Oakland Community in general.

Please refer to Response to Comment 4-1 for a discussion of project benefits. Both the biodiesel production facility and food waste preprocessing facility would generate revenue from land-leases and increased renewable energy production. The projects are expected to be self-sustaining and would provide additional material for the digesters, which would increase power generation for operations at the MWWTP, reducing the purchase of power from the grid.

9.4.25 Response to Comment 4-25

Comment Summary: The comment asks what jobs are being offered to the community.

Please refer to Response to Comment 4-22 regarding potential employment at the food waste preprocessing and biodiesel facilities. A total of 60 new jobs are expected to be available, many of which may be filled by the local community. Most of the jobs would be made available by the private companies that would lease land from EBMUD for their respective facilities. EBMUD

does not expect that other Land Use Master Plan elements would require a significant number of new employees.

9.4.26 Response to Comment 4-26

Comment Summary: The comment asks how rate payers in West Oakland would be compensated for noise, odor and aesthetic impacts.

The Draft EIR includes mitigation measures for impacts from noise and odor, as well as aesthetic impacts, and concludes that all potential impacts in the areas of noise, odor and aesthetics can be reduced to less than significant with implementation of mitigation measures. In addition, the odor control improvements that are proposed as part of the Master Plan would reduce odors from existing facilities. Please refer to Response to Comment 4-1 for a discussion of benefits to the local community.

9.4.27 Response to Comment 4-27

Comment Summary: The comment asks if it is possible to reduce odor impacts, requests an evaluation of how much odor reduction can be achieved, and enquires as to the timing for odor reduction.

Short-term odor impacts during construction are not expected to be significant and this issue is discussed beginning on page 3.3-17 of the Draft EIR. The Master Plan includes odor control upgrades for the Influent Pump Station, primary sedimentation tanks, Solids Dewatering Building, and Resource Recovery Receiving Station, as described on page 2-19 of the Draft EIR. Mitigation for operational odor impacts associated with the Master Plan is presented on page 3.3-37 of the Draft EIR. It is not possible to quantify odors in the same manner as criteria pollutants, so evaluation of odor reduction is, of necessity, subjective. Although odors cannot be completely eliminated, EBMUD continuously looks for ways to reduce odors coming from the MWWTP. The MWWTP Odor Control Master Plan has identified odor control projects that, taken together, will reduce odors and their impacts at the MWWTP and for its neighbors. All of the projects described are currently scheduled to be implemented within the next ten years, with the highest priority projects to be implemented within the next three to five years.

9.4.28 Response to Comment 4-28

Comment Summary: The comment asks how EBMUD projects maximize conservation in relation to reservoirs and dams.

The project evaluated in the Draft EIR addresses improvements to the MWWTP. Water conservation and water recycling are critical components of EBMUD's water supply plans. EBMUD’s Water Smart Center provides water conservation tips, rebates and services. EBMUD operates all of its facilities to ensure the most efficient use of water resources. Further, increased on-site power production results in a reduced need to purchase power, including purchased hydroelectric power associated with dams and reservoirs.

9.4.29 Response to Comment 4-29

Comment Summary: The comment asks how the project would maximize the sale of energy and asks if it is possible to sell products such as methane to outside companies.

As noted in previous responses (see Responses to Comments 4-10 and 4-23) renewable energy produced by the Power Generation Station at the MWWTP would be used to operate the treatment plant with any excess electricity fed back to the grid. Sales of excess power to local companies may be considered. The biodiesel company will sell the biodiesel produced at the facility. All of the methane generated by the digesters would to be used to generate power on-site at the MWWTP, so no excess methane is expected to be available for sale.

9.4.30 Response to Comment 4-30

Comment Summary: The comment asks for a definition of "reasonable" in relation to rates for the West Oakland community.

EBMUD endeavors to maintain reasonable rates for all customers. Water and wastewater rates support the work EBMUD does to provide high-quality, reliable water and wastewater service. Rates are developed, in accordance with law, with the goal of ensuring that all ratepayers pay a fair share of the total cost of operating the wastewater system. The USEPA defines "reasonable or affordable" as water and wastewater rates at levels at or below 2% of the median income for the service area. The estimated 2009 median income for the EBMUD wastewater service area is $60,191/year. The service area includes 650,000 residents from seven East Bay communities, including Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and Stege Sanitary District (El Cerrito, Kensington and part of Richmond). The current average EBMUD water and wastewater charges (including the City of Oakland sewer charges) for typical consumption is $1,022 per year or 1.7% of the median household income within the service area. For residents with lower household income, the Customer Assistance Program (CAP) is available to assist low-income customers by paying a portion of the customer's water bill. For example, for a five-member household that earns less than $39,800, the CAP program would pay half of the standard service charge and water usage charge up to 5,250 gallons per month. This program, which currently applies to a customer's water bill only, is expected to be extended to apply to a customer's wastewater bills starting in 2012.

9.4.31 Response to Comment 4-31

Comment Summary: The comment asks how the project would reduce gas emissions.

As noted on page ES-1 of the Draft EIR, the Master Plan objectives include protection of water, air and soil quality, providing flexibility to meet air quality regulations, increasing renewable energy production, and reducing the potential for odor impacts. The two projects proposed for immediate implementation, the biodiesel production and food waste preprocessing facilities, would produce "green" energy, create local jobs and feed renewable energy directly into the local power grid in West Oakland. The biodiesel produced may be used in heavy-duty trucks that access the Port of Oakland and travel through the West Oakland community, which would reduce particulate matter emissions.

The Draft EIR acknowledges that the BAAQMD Community Air Risk Evaluation program has identified West Oakland as an Impacted Community, due to the higher levels of diesel particulate matter (DPM) from area freeways, port operations and industry (see discussion of cumulative air quality impacts beginning on page 4-14 of the Draft EIR). The project's contribution to cumulative impacts is evaluated on page 4-17 of the Draft EIR. While EBMUD's contribution to air quality community risks and hazards would be reduced to less than significant with mitigation, the risk would contribute incrementally to the already impacted condition in the MWWTP vicinity. While EBMUD has existing programs to reduce on-site DPM emissions, and implementation of the biodiesel project would contribute to reduction of DPM emission in the region, this impact is considered significant because mitigation cannot eliminate all DPM emissions.

EBMUD is currently capturing methane produced by the digesters. By diverting food waste from landfills, the project would reduce uncontrolled methane emissions at landfills and possibly reduce methane emissions generated during transport by shortening the transport time between source, preprocessing, processing, and decomposition.

9.4.32 Response to Comment 4-32

Comment Summary: The comment enquires about impacts on population, public services, recreation and transportation

Impacts on population are addressed on page 4-1 of the Draft EIR in the section on growth-inducing impacts. Because the project would not increase the capacity of the MWWTP it is not expected to induce population growth. Impacts on public services are discussed starting on page 3.13-3 of the Draft EIR. The Draft EIR does not identify any significant impacts on public services. Impacts on recreation are addressed beginning on page 3.11-7 of the Draft EIR. The Draft EIR does not identify any significant impacts on recreation. Impacts on transportation are addressed starting on page 3.14-14 of the Draft EIR. Mitigation measures are proposed to ensure that construction and operation would not result in significant impacts to transportation systems.

9.4.33 Response to Comment 4-33

Comment Summary: The comment asks if transportation of products would contribute to impacts associated with noise, hazardous conditions or aesthetics.

Noise impacts from truck and rail transportation are addressed beginning on page 3.12-21 of the Draft EIR. Truck noise is expected to increase less than 1 A-weighted decibel (dBA), which is considered imperceptible by the human ear. If rail transport is used for the biodiesel facility it is expected that railroad-related noise levels would remain below the City of Oakland Noise Ordinance limit. Potential safety hazards due to conflicts with rail transport are addressed starting on page 3.14-19 of the Draft EIR, and mitigation is included to ensure safety of rail crossings. Page 3.9-25 of the Draft EIR specifies that "transport of hazardous materials would comply with local, state, and federal requirements and trucks would not be expected to utilize local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue." Because of the transient nature of both truck and rail transportation, and the high level of existing transportation use in the vicinity of the MWWTP, trucks and rail cars are not expected to alter the existing visual environment.

9.5 Staff-Initiated Text Changes

The following changes in the text of the Draft EIR were made by EBMUD staff to correct minor typographical errors in the Draft EIR. These changes do not alter conclusions about significance of impacts, but are included here in the interest of accuracy and completeness. The Draft EIR is revised as follows:

The sixth sentence on the second paragraph on page 3.2-6 is revised follows:

> The food waste preprocessing facility would be similar to the existing facilities at the MWWTP, and **Mitigation Measure AES-2b** would require that its design, exterior finishes, and color would blend with the surrounding facilities.

The entry for San Mateo County in the top half of Table 3.3-10 on page 3.3-23 is revised follows:

> Sent to Ox Mountain Landfill for disposal – ~~10~~60 tpd

The footnote on the bottom of page 3.3-24 is revised follows:

> Under the previously approved 250 tpd scenario, the practices for disposing food waste would be similar to those described on the top of Table 3.3-10~~9~~ (current practice)…

The reference to Table 3.3-9 at the bottom of page 3.8-8 is corrected follows:

> Again, the primary reduction in GHGs associated with the project would be the reduction in current GHG emissions resulting from the proposed diversion of approximately 335 tpd of food waste currently disposed at landfills (refer to Table 3.3-10 ~~9~~).

The following change in the text of the Draft EIR was made by EBMUD staff to reflect minor modifications to the project. The Draft EIR is revised as follows:

The paragraph under Digester Expansion on page 2-21 is modified with the addition of the following sentence:

> A dedicated dewatering facility may be required in the area designated for the Food Waste Processing Facility.

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Chapter 10 Comment Letters

The comment letters received on the Draft EIR are included in this section.

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Natural Resources Agency

Edmund G. Brown, Jr., Governor

CalRecycle

DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY

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March 15, 2011

Vince De Lange
EBMUD
375 Eleventh Street, MS 702
Oakland, CA 94607

Subject: SCH No. 2009112073: Draft Environmental Impact Report (DEIR) for the Main Wastewater Treatment Plant Land Use Master Plan, East Bay Municipal Utility District (EBMUD), no SWIS number assigned, Alameda County

Dear Mr. De Lange:

Thank you for allowing the Department of Resources Recycling and Recovery (CalRecycle) staff to provide comments for this proposed project and for your agency's consideration of these comments as part of the California Environmental Quality Act (CEQA) process.

CalRecycle staff has reviewed the environmental document cited above and offers the following project description, analysis and our recommendations for the proposed project based on our understanding of the project. If CalRecycle's project description varies substantially from the project as understood by the Lead Agency, CalRecycle staff requests incorporation of any significant differences in the Final Environmental Impact Report. Significant differences in the project description could qualify as "significant new information" about the project that would require recirculation of the document before certification pursuant to CEQA Section 15088.5.

EBMUD currently operates a biosolids composting operation. The operation is a biosolids digester that utilizes processed food waste as an additive to the digestion process. (SWIS No. 01-AA-0299). The operation currently accepts up to 100 tons per day of preprocessed food waste. 1-1

Project Description

The DEIR analyzes many program level issues regarding the long term operation of the EBMUD facility, as well as project level analysis for two specific projects, the Biodiesel Production Facility and the Food Waste Preprocessing Facility. It is the two specific projects' analyses on which our comments will focus.

Biodiesel Production Facility

EBMUD is considering the addition of a biodiesel production facility, to be completed in 2012, which would be owned and operated by a private company on land leased to that company by EBMUD. This approximately three acre facility would be designed to eventually produce up to 20 million gallons per year (55,600 gallons per day) of biodiesel. Feedstock usage at full output

would be 68,000 gallons per day. In addition, up to 14,400 gallons per day of crude glycerin byproduct would result from processing, and this material would be sent to EBMUD digesters.

1-1 cont'd The biodiesel would be produced from the processing of virgin oil from plants (such as soy), used cooking oil, and animal fats. Receipt of feedstocks may occur at any time, but would mostly occur between 5:00 a.m. and 6:00 p.m.. At full production, up to 32.5 truck trips total incoming and outgoing materials would be required, or if a rail spur is utilized, 11.8 truck trips and 5 rail cars would be required.

Staff Comments on Biodiesel Production Facility

For clarity and convenience, our comments and questions are *italicized*. CalRecycle staff will also make statements, which we believe are factual. If these are incorrect or unclear, please notify CalRecycle. The proponent or operator of a proposed project is not given tacit approval of an action or activity by that action or activity not being specifically prohibited in the environmental document.

1-2

In section ES 1.4, it is stated that the biodiesel facility will be completed by the fall of 2012, while in section 2.3.5, it is stated that this facility will be completed by the spring of 2012. *Please clarify this apparent discrepancy.*

1-3 Table 2.4 shows the "Max Daily Trucks," both with and without a rail option. Fractional vehicle trips are used in this table. *Since these are maximum vehicle trips, whole numbers should be utilized.*

1-4 Section 2.3.3 discusses the processing of incoming feedstock oils (waste and virgin). Section 2.3.4 discusses the transport of these materials to the site. As shown elsewhere in the document, animal fats are a potential feedstock for the biodiesel facility. *The sources, incoming amounts, method(s) of receipt, and processing methods for animal fats are not described in the document.*

1-5 As stated (page 2-12), the biodiesel production process occurs within a sealed system. Included in this process (depending on the feedstock) are the steps of filtration, drying, acid esterfication, trans-esterfication, and separation/purification. *If these activities utilize solid waste as a feedstock they would be defined as solid waste handling as defined in Section 40195 of the Public Resources Code (PRC) and could be also defined as a solid waste facility. As such, the operator of the facility should contact the Alameda County Department of Environmental Health (LEA) regarding the applicability of solid waste facility regulation.*

1-6 On page 3.15-12, there is a statement, "The biodiesel production facility is not expected to require a solid waste permit, but is still expected to maintain minimum operating standards as established in CCR, Title 14, Section 18100-18105.11." . *If it is determined by the LEA that the handling of solid waste at the biodiesel facility is required to be regulated as a solid waste facility, a solid waste facilities permit will be required as well as design and operational requirements. If the LEA determines that the solid waste handling at the biodiesel facility is defined as solid waste operation, then a permit would not be required but design and operational requirements will be applicable.*

Food Waste Preprocessing Facility

EBMUD is considering the siting of a food waste preprocessing facility, to be completed in 2013, which would also be owned and operated by one or more private company(ies) on land leased to that company by EBMUD. This approximately 1.4 acre facility would be located adjacent to the existing food waste processing facility. Initially, 200 to 300 tons of incoming raw material would be processed in a new 29,000 square foot building to produce up approximately 125 tons per day of preprocessed food waste for treatment in the food waste processing facility. Eventually, the building size would be increase to 58,000 square feet and up to 600 tons of incoming material would be accepted to produce up to 250 tons per day of preprocessed food waste. The preprocessed food waste would be transported from the preprocessing building to the food waste processing facility by truck, mechanical conveyor, or made into a slurry form and pumped to that facility by an enclosed pipeline. The balance of the material would be sent to off-site composting facilities. Any contaminants (such as plates, silverware and plastic) would be removed at the off-site composting facilities. 1-7

Deliveries and preprocessing would occur up to 24 hours per day, seven days per week. Removal will occur between 5 a.m. and 4 p.m. At peak capacity, 76 trucks per day would bring in raw materials and to remove the balance to off-site compost facilities.

The fully enclosed building would contain a feed hopper, trommel, grinders, a system of conveyor belts, and an optional shredder. All incoming material will be run through the trommel, and the material that passes through the screen will be ground for delivery to the food waste processing facility. The larger material that does not go through the screen will continue on a conveyor belt and will be sent off-site to composting facilities. A magnet will remove metallic contaminants. The shredder may be used before the trommel screen to break up material. Any process liquids and wash down water will be collected and sent to the food waste processing facility or sent to the sanitary sewer. The system will be able to process up to 45 tons per hour per process line. The initial 29,000 square foot building will house one process line, and the 58,000 square foot building, two process lines.

Staff Comments on Food Waste Preprocessing Facility

On page 3.5-12, the DEIR contains information regarding possible solid waste facilities permit ramifications of the food waste preprocessing facility. *It appears that operation of this facility will require a full solid waste facilities permit as a large volume transfer/processing facility, issued by the Alameda County Department of Environmental Health, the LEA. The permitting process is described in Title 27 of the California Code of Regulations (27 CCR). As mentioned in the DEIR, the siting element of the Alameda County Integrated Waste Management Plan will have to be amended to identify the site. The facility will be required to operate under the State Minimum Standards set forth in 14 CCR, Division 7, Chapter 3.* 1-8

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14 CCR 17407.2 Cleaning- requires a facility and its equipment to be cleaned at least once per 24 hour period. How will the requirement be met? 1-9 *The DEIR mentions the use of "meticulous housekeeping requirements" to control odors. What do these requirements consist of?* 1-10

1-11 *14 CCR 17409.5 Loadchecking – requires a facility to implement a hazardous waste exclusion program that, in part, must contain random loadchecks and a storage area for any hazardous wastes that are discovered. How will this requirement be met?*

1-12 It is stated that material will be processed and removed within 48-72 hours. *14 CCR 17410.1 Solid Waste Removal requires wastes to be removed from facilities within 48 hours unless otherwise authorized by the LEA.*

1-13 The DEIR indicates that the preprocessed food waste would be transported from the preprocessing building to the food waste processing building by truck, mechanical conveyor, or made into a slurry form and pumped to that building by an enclosed pipeline. *The preliminary site plan Figure 2-6 only shows the truck transport option.*

1-14 The DEIR states that the material will be delivered to the site in covered leak proof trucks. Figure 2-6 shows an area where the incoming feedstock will be stored. *The document should include a description of how the incoming material is removed from the incoming trucks and what storage will be provided for this material to minimize liquid discharge, odors, vector issues, and any other nuisances.*

1-15 The DEIR states that 76 trucks per day would bring in raw materials and to remove the balance to off-site compost facilities. *Does this include any truck traffic necessary to move any preprocessed material to the food processing facility?*

1-16 In the DEIR (ES.1.3), it is stated that the existing food processing facility was "approved in July 2009" to receive up to 250 tons per day of preprocessed food waste. *The existing notification on file at CalRecycle, received by the LEA on June 3, 2009, states that this operation will receive up to 100 tons per day of said material. The LEA has confirmed that this is the only notification that they have received and that quarterly inspections through the end of 2010 show that the facility has never exceeded 80 tons per day of incoming preprocessed material. If the operator desires to receive up to 250 tons per day, and no other aspects of the operation have changed, a new notification should be submitted to the LEA in accordance with 14 CCR 18103.1. Should other changes be proposed, including, but not limited to, changes in feedstock or the dedicated digestion of organic materials at the treatment plant, the operator should contact the LEA regarding the applicability of additional solid waste facility regulation.*

The CalRecycle staff thanks the Lead Agency for the opportunity to review and comment on this Draft Environmental Impact Report and hopes that this comment letter will be useful to the Lead Agency in carrying out their responsibilities in the CEQA process.

1-17 Since there will be significant impacts resulting from the proposed project, CalRecycle staff requests that a copy of the Statement of Overriding Considerations and Findings be forwarded as required by CEQA Section 15091 along with any related resolutions adopted by the decision making body.

CalRecycle staff requests *hard copies* (paper not electronic) of any subsequent environmental documents including, the Final Environmental Impact Report, the Report of Facility Information, Statement of Overriding Considerations, copies of public notices and any Notices of Determination for this project.

Staff further requests that if the Lead Agency is to circulate the Final Environmental Impact Report electronically or in an abbreviated form, that a *hard copy* of the complete document including all appendices be forwarded to CalRecycle at time of circulation.

The CalRecycle staff requests *hard copies* of any subsequent environmental documents including the Final Environmental Impact Report, the Report of Facility Information/Transfer Processing Report, copies of public notices and any Notices of Determination for this project.

Please refer to 14 CCR, § 15094(d) that states: "If the project requires discretionary approval from any state agency, the local lead agency shall also, within five working days of this approval, file a copy of the notice of determination with the Office of Planning and Research [State Clearinghouse]." **1-17 cont'd**

The CalRecycle staff requests that the Lead Agency provide a copy of its responses to comments at least ten days before certifying the Final Environmental Impact Report. Refer to Public Resource Code, Section 21092.5(a).

If the document is certified during a public hearing, CalRecycle staff requests ten days advance notice of this hearing. If the document is certified without a public hearing, CalRecycle staff requests ten days advance notification of the date of the certification and project approval by the decision-making body.

If you have any questions regarding these comments, please contact me at 916.341.6330 or e-mail me at david.otsubo@calrecycle.ca.gov.

Note: *Please note that correspondence related to this letter and for staff of the Waste Compliance and Mitigation Program should continue to be sent to 1001 I Street, Sacramento, CA 95814. Correspondence specifically for the attention of the Director of CalRecycle should be sent to the address in the letterhead.*

Sincerely,

David Otsubo
Permitting & Compliance Division

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
Alex Briscoe, Agency Director

DEPARTMENT of ENVIRONMENTAL HEALTH
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502
(510) 567-6790
Fax (510) 337-9234

Letter 2

March 26, 2011

Vince De Lange
EBMUD
375 Eleventh Street, MS 702
Oakland, CA 94607

Subject: Draft Environment Impact Report (DEIR) for the Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan – Local Enforcement Agency (LEA) Comments

Dear Mr. De Lange:

The Alameda County Department of Environmental Health, Solid and Medical Waste Program (Local Enforcement Agency – LEA) have reviewed the document listed above. There are two specific projects described in the DEIR. They are the Biodiesel Production Facility and the Food Waste Preprocessing Facility. As described in the DEIR, both projects involve EBMUD contracting with private companies under a land-lease agreement to construct and operate a facility at the MWWTP.

The LEA has reviewed the two specific projects described in the DEIR and provided comments in the followings:

A) <u>Biodiesel Production Facility</u>

1) Section 2.3.3 **Clarify** how the feedstock (include virgin oil from plants such as soy), yellow grease (from waste cooking oil), or animal fats is delivered to the facility for processing. What are the sources and incoming amounts of animal fats? **Does this involve** temporary storage before processing? If any, **describe the pre-treatment process for animal fats**? **2-1**

2) (Page 2-5), **what is the pre-treatment process** of the incoming feedstock for the Biodiesel production? If the pre-treatment process involves solid waste handling or preprocessing onsite, a Solid Waste Facility Permit (SWFP) **maybe required**. **2-2**

3) (Page 2-13), Table 2-4: Anticipated Truck and Rail numbers for Biodiesel Production. **Provide whole numbers** instead of fractioned numbers in counting maximum daily truck trips. **2-3**

4) **Describe** how the odor control building will control odor at the Biodiesel Production Facility. **2-4**

B) <u>Food Waste Preprocessing Facility</u>

2-5 1) Currently, the EBMUD has the Enforcement Agency (EA) Notification for the Biosolid Composting Operation to handle maximum of 100 tons per day (tpd). A **new EA Notification** is required to handle maximum of 250 tpd of the operation.

2-6 2) **Describe** the potential changes of design or operations of the existing facility in order to accommodate the expansion of the capacity from handling 100 tpd up to 250 tpd.

2-7 3) (Page 2-16, figure 2-6), **Provide** a specific site plan or an operational plan that details how the delivered feedstock is transferred from hauling vehicles to the pre-processing system. **How is the incoming feedstock stored** temporarily **(and for how long)** before feeding into the pre-processing system?

2-8 4) Section 2.4.4 **Describe** how odor issues, vector issues or any potential nuisances would be controlled through "proper material management" and the "meticulous housekeeping practices". **Describe** the specific steps to control odor inside the enclosed building (i.e. food waste screening, pulping equipment, pumps, mixers and a storage bins area) and the outside of the building if applicable. **What <u>are your necessary steps to reduce odor</u>** produced in the food waste preprocessing area? When the non-digestible material is filtered, **how long is the storage time on-site** before shipping off-site for composting?

2-9

2-10

2-11 5) **What is the screening process to identify hazardous waste** found from incoming loads when feedstock is delivered to the facility? **Describe how to identify hazardous waste, storage and its' proper disposal**.

2-12 6) Section 2.4.3 **Explain** further how the excess liquids and wash down water be captured for transport to the food waste facility or directed to the sanitary sewer for treatment. **What are the necessary procedures** required to handle and capture waste process liquids and wash down water?

2-13 Be advised that any design or operational changes associated with these documents are not sanctioned until incorporated in a Solid Waste Facility Permit that has been concurred by the California Department of Resources Recycling and Recovery (CalRecycle) and issued by the LEA.

Your cooperation is appreciated. If you have any questions about the process, please contact Wing Suen (510) 777-2218.

Very truly yours,

Wing Suen, Senior REHS
Office of Solid/Medical Waste Management
Alameda County, Department of Environmental Health

cc: Ronald Browder – LEA
Jorge Goitia – LEA
Reinhard Hohlwein – CalRecycle

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Letter 3

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

JERRY BROWN
GOVERNOR

March 24, 2011

Vince De Lange
East Bay Municipal Utility District
375 Eleventh Street, MS 702
Oakland, CA 94607-4240

Subject: Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan
SCH#: 2009112073

Dear Vince De Lange:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on March 23, 2011, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that: 3-1

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2009112073
Project Title Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan
Lead Agency East Bay Municipal Utility District

Type EIR Draft EIR

Description EBMUD's MWWTP Land Use Master Plan (Plan) would guide development of the MWWTP and the newly-acquired, adjacent West End property over a 30-year time horizon. The Plan coordinates near-term projects with potential expansion plans to maintain an efficient layout and minimize building demolition and facility relocation. Plan layouts provide sites for plan elements that may be developed in the future, many of which would not be constructed until needed to meet specific future regulations. The EIR evaluates the range of potential LUMP elements. Two near-term renewable energy projects are evaluated at a project level: biodiesel production and food waste preprocessing. Both would help EBMUD increase on-site power generation and maintain reasonable rates, and both involve EBMUD contracting with private companies under a land-lease agreement to construct and operate a facility at the MWWTP.

Lead Agency Contact

Name Vince De Lange
Agency East Bay Municipal Utility District
Phone 510 287-1141 **Fax**
email vdelange@ebmud.com
Address 375 Eleventh Street, MS 702
City Oakland **State** CA **Zip** 94607-4240

Project Location

County Alameda
City
Region
Lat / Long 37° 49' 32" N / 122° 17' 53" W
Cross Streets Wake Avenue/West Grand Avenue
Parcel No. 000-0305-003-03, 000-0305-003-16
Township **Range** **Section** **Base**

Proximity to:

Highways I-80, 580, 880, 24, 13
Airports No
Railways UPRR, BNSF
Waterways SF Bay
Schools
Land Use Zoning: Industrial General; General Plan Designation: General Industrial/Transportation

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Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects

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Reviewing Agencies Resources Agency; Department of Fish and Game, Region 3; Department of Parks and Recreation; San Francisco Bay Conservation and Development Commission; Department of Water Resources; Resources, Recycling and Recovery; California Highway Patrol; Caltrans, District 4; CA Department of Public Health; State Water Resources Control Board, Division of Water Quality; Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; California Energy Commission; Native American Heritage Commission; Public Utilities Commission

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Date Received 02/07/2011 ***Start of Review*** 02/07/2011 ***End of Review*** 03/23/2011

Note: Blanks in data fields result from insufficient information provided by lead agency.

EBMUD Main Waster Water Treatment Plant Land Use Environmental Assessment

To: Whom It May Concern (East Bay Municipal Utility District)

Date: March 24, 2011

About Us:
West Oakland Environmental Indicators Project (WOEIP) is a resident-led organization who takes the initiative to address environmental concerns within the community. WO EIP has joined partnership with the Pacific Institute, an Oakland-based non-profit research organization, and 7th street McClymonds Corridor Neighborhood Improvement Initiative. Over the course of years, the WO EIP Committee has identified 17 indicators of environmental health, support community campaigns, influences policies on redevelopment, help shut down Red Star Yeast, the largest fixed source of toxic air pollution in the neighborhood, and conducted "Clearing the Air: Reducing Diesel Pollution in West Oakland" in 2003. One major focus of WOEIP is to lower diesel emission to zero, so that the residents of West Oakland can have healthier air. Every project and redevelopment in the West Oakland community should and will include resident voices, those who are impacted directly. From research, WO EIP have that "Average diesel emissions in West Oakland are over 90 times higher per square mile than the average for the rest of California," and continues with the effects of diesel exposure, "Asthma is epidemic in West Oakland: children here are 7 times more likely to be hospitalized for asthma than the average child in the state of California" (Clearing 2003). Diesel particulate emission is a serious concern in West Oakland. Residents are directly exposed to diesel and other chronically particulates, such as methane, which has resulted in an increase of asthma, heart disease, and premature death. It is imperative to have public participation with West Oakland residents, who are directly effected. 4-1

This commentary assessment evaluates East Bay Municipal Utility District (EBMUD) project, the Main Waste Water Treatment Plant Land Use (MWWTP). EBMUD is conducting 14 short and long term projects within MWWTP, located on the West End Property (2020 Wake Ave Oakland, Ca), two of which are currently the center focus. The first project, Biodiesel Production Facility will utilize a variety of oils, animal fats, and used cooking oil to produce biodiesel. The second project focuses on the production of Food Waste Processing. The Food Waste Processing Facility would in-take raw materials, organics-rich waste, and other digestible food to be broken down and generated into renewable

4-1 Cont'd

electricity. The Biodiesel and Food Waste Productions have great potential positive outcomes, however, the methods can benefit from alterations. These alterations would include more community involvement and a greater outcome for the residents of West Oakland. The project development of MWWTP has failed to address the issues and concerns of the community, such as population development, unemployment rates, and health statistics. How does West Oakland residents gain benefits from the development of MWWTP projects?

Projects:

4-2

The Biodiesel Production Facility will utilize a variety of oils, animal fats, and used cooking oil to produce biodiesel. This diesel fuel can act as a substitution to be used by local trucking companies, including the Port of Oakland. EBMUD will use Glycerin, a high-energy value byproduct of the biodiesel production process directly to the EBMUD existing anaerobic digesters of the MWWTP for on-site electricity production. For the ultimate facility capacity, glycerin digestion would generate approximately one megawatt, enough renewable electricity to power 1,500 California households.

4-3

WOEIP is concerned about the use of oils, in relations to where would the oil supply come from, and how will it be transported? How will waste cooking oil be collected, and will it be collected from local businesses? Is there a partnership or connections with companies who will supply oil, animal fat, or used cooking oil? Who is the expected market for the biodiesel produced? Does EBMUD have a ready market for local fuel sales? What are the health effects for using glycerin, and what amount is considered unhealthy? Will EBMUD use up the entire diesel produced? If sold, how would it be transported out of the area? Does EBMUD have a system set up that would allow supplies to be delivered without disturbing the West Oakland community and its transportation? How many local truck trips per day will be created by fuel distribution?

4-4

4-5

4-6

4-7

The plan describes the Biodiesel Production Facility would consist of three acres. The project will house an office, a quality control laboratory, processing equipment, waste oil truck parking, and storage tanks. Although the project has planned to use train railing to avoid land availability conflicts with future regulatory-driver projects, to help transport and access products, railing also has a lot of conflicting problems. If railing is a tool used to eliminate traffic problems, how will it account for the build of tracks, noise, traffic congestion, and safety of the neighborhood people? The plan was initially designed to produce five million gallons per year (MGY) of biodiesel, but may expand to process the maximum 20 MGY. WOEIP applauds the project for producing biodiesel,

4-8

however, will EBMUD require local West Oakland hiring by their contractors?

Will EBMUD sell their excessive biodiesel to nearby companies and use revenue towards the West Oakland community? 4-9

The process also uses methane to react with the oils. The uses of methane are a concern in relation to transportation. How will methane be transported from site to site? Is EBMUD working with nearby companies who produce or need methane? Is it possible to sell excessive methane to nearby companies? 4-10 The use of methane will increase air pollutants, how will this help a community that already has sever air problems? 4-11 The process also encounters sodium methoxide, which is a strong acid, and very hazardous. Because this acid is so hazardous, what are EBMUD implementations for transportation and safety response? 4-12 How will the residents of West Oakland be compensated for having a hazardous acid being transported in the community that may encounter problems or an accident? 4-13 Will local residents encounter odor from methane or sodium methoxide, if so, how will EMBUD respond to their complaints, in a short term process? 4-14 Will EBMUD create and implement an emergency evacuation for local residents? 4-15

The second project is the Food Waste Pre-Processing Facility; it will be owned and operated by one or more private companies on a portion of the West End property, under a land-lease agreement. The food waste is pre-processed to remove non-digestible materials. Organic-rich waste pre-processed to improve process efficiency and material consistency. The focus of the Food Waste Pre-processing Facility is to generate electricity. At the ultimate capacity, the food waste associated with this project would generate approximately 2.5 megawatts, enough renewable electricity to power 3,700 California households. 4-16 WOEIP appreciates the attempt to digest food and transform it into energy. However, EBMUD claims that this project would assist local Bay Area Cities and counties to meet waste diversion goals from landfills by turning food waste into electricity rather than sending this material to landfills, where it would be degraded and releases methane. Methane produced through anaerobic digestion is captured and used for electricity products. How will this project directly benefit the residents of West Oakland? 4-17 Transportation of products will be a major concern, how will EBMUD minimize truck and railroad transportation? What are the transportation routes and will these routes travel through residential areas? 4-18 The use of old and digestible food material will cause odor problems for direct residents, how will those affects be compensated? What solution has EBMUD developed to address odor issues? 4-19 It is imperative to have public participation planning in relation to reduce odor, so how will the community be involved? 4-20

Where organic-rich material would come from, is there a collection relationship 4-21

with local companies to process their raw material? Does this project offer local
4-22 residents job opportunities?

Problems and Alternatives:

EBMUD objective states to enhance revenues to maintain reasonable rates through land-lease agreements and continue growth of successful resource recovery program that increases renewable energy production. EBMUD also
4-23 claimed to provide benefits to the community and enhance community relations by reducing the potential for odor and aesthetic impacts. The DEIR also states the benefits to help maintain reasonable waste water rates, as revenue generated from the land-lease agreements and electricity sales would help off set the cost associated with treating waste water from the East Bay communities. The project as a whole claims to produce "green" energy, create local jobs, and feed renewable energy directly to local power in West Oakland. How will EBMUD supply renewable energy directly to the West Oakland community? Biodiesel produced may be used in heavy trucks that access the Port of Oakland and travel in local neighborhoods in the West Oakland community. And lastly, food waste digestion would assist local Bay Area cities and counties in meeting waste diversions goals fro landfills.

4-24

Some concerns with WOEIP are, how will the EBMUD project generate value to initiate the projects and its continual activity? How is rate participation going to affect those in West Oakland, those of poverty? How will the West Oakland community benefit in general from the EBMUD projects? What jobs are being
4-25 offered to the community if the DEIR stated most jobs will be given to inside employees and may not require new hires? How are rate payers in West Oakland
4-26 being compensated for the noise, odor, and aesthetic of these potential projects?
4-27 Is it possible to reduce short term impacts such as odor? How much odor reduction will be achieved and on what time and table? How are the EBMUD
4-28 projects maximizing conservation in relations to reservoirs and dams? How is the project maximizing the sell of energy? Is EBMUD planning on working with nearby companies, businesses, or the City for current or future planning? Is it
4-29 possible for EBMUD to sell products to nearby companies, such as the recycling companies for methane use, to eliminate outside sells and decrease methane pollutants? Please explain your definition of "reasonable" in relation to rates and
4-30 the West Oakland community. Knowing that West Oakland is a highly polluted
4-31 area, how will the development of these projects reduce gas emission? Will these
4-32 projects have any effects towards population, public services, recreation, or transportation? Will the transportation of products, such as railing, contribute to
4-33 the noise, hazardous conditions, or aesthetics?

Sincerely,
WOEIP

Please respond to:
WOEIP
1747 14th St.
Oakland, Ca 94607

EAST BAY MUNICIPAL UTILITY DISTRICT

Draft

Environmental Impact Report
Main Wastewater Treatment Plant
Land Use Master Plan

SCH# 2009112073

Lead Agency:
East Bay Municipal Utility District
375 Eleventh Street, MS702
Oakland, CA 94607-4240
Contact: Vince De Lange, P.E.
510-287-1141

Prepared by:

RMC Water and Environment

In Association with:

Environmental Science Associates

Orion Environmental Associates

February 2011

Table of Contents

List of Tables

List of Figures

Appendices

List of Abbreviations

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ac	acres
AC Transit	Alameda-Contra Costa Transit District
ACCMA	Alameda County Congestion Management Agency
ACDEH	Alameda County Department of Environmental Health
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACWMA	Alameda County Waste Management Authority
ADT	Average Daily Traffic
amp	ampere, amperage
APE	Area of Potential Effect
APS	Alternative Planning Strategy
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BART	Bay Area Rapid Transit
B.C.	Before Christ
BCDC	SF Bay Conservation and Development Commission
bgs	below ground surface
BMPs	Best Management Practices
BNSF	Burlington Northern and Santa Fe Railroad
Btu/h	British Thermal Units per hour
CalARP	California Accidental Release Program
CalEPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAAQS	California Ambient Air Quality Standards
CAP	Clean Air Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CARE	Community Air Risk Evaluation
CBC	California Building Code
CCAR	California Climate Action Registry
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDPH	California Department of Public Health
CEC	California Energy Commission

CEQA	California Environmental Quality Act
cfm	cubic feet per minute
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CHIS	California Health Interview Survey
CIWMB	California Integrated Waste Management Board
CGS	California Geological Survey
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	Carbon dioxide-equivalent
Corps	US Army Corps of Engineers
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CWS	California Waste Solutions
cy	cubic yard
dB	decibel
dBA	A-weighted decibel
DDT	dichlorodiphenyltrichloroethane
dbh	diameter at breast height
DEHP	di(2-ethylhexyl)phthalate
DOE	Department of Energy
DOT	Department of Transportation
DPM	diesel particulate matter
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EMS	Emergency Medical Services
ESA	Endangered Species Act
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency

FISCO	Fleet and Industrial Supply Center, Oakland
FOG	fats, oils, and grease
g	gravity
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
GWh	gigawatt hours
GWP	global warming potential
H_2	Hydrogen
H_2O	water vapor
HAP	Hazardous Air Pollutant
HC	hydrocarbon
HHW	Household Hazardous Waste
HID	high-intensity discharge
HMBP	Hazardous Materials Business Plan
I-80	Interstate 80
I-580	Interstate 580
I-880	Interstate 880
I-980	Interstate 980
IPCC	Intergovernmental Panel on Climate Change
IG	Industrial General
in/sec	inches per second
IPS	Influent Pump Station
IS/MND	Initial Study/Mitigated Negative Declaration
IS/ND	Initial Study/Negative Declaration
JPO	Jepson Prairie Organics
kV	kilovolt
kW	kilowatt
LCFS	Low-Carbon Fuel Standard
LCM	lead containing materials
Ldn	day-night sound level
LEA	Local Enforcement Agency
Leq	equivalent (averaged) sound level
LOS	level of service
LSM	Less than significant with mitigation
LTS	Less than significant
M	Richter magnitude
MCL	maximum contaminant level
mg/kg	milligram per kilogram
µg/kg	microgram per kilogram

μg/L	microgram per liter
mg/L	milligram per liter
mgd	million gallons per day
mgy	million gallons per year
MTC	Metropolitan Transportation Commission
MHI	median household income
$\mu g/m^3$	microgram per cubic meter
mm/yr	millimeters per year
MM	Modified Mercalli
Mmax	Maximum moment magnitude
MMPA	Marine Mammal Protection Act
MMT	million metric tons
CO_2e	carbon dioxide-equivalent
MND	Mitigated Negative Declaration
mph	miles per hour
MT	metric ton
Mw	Moment magnitude
MW	megawatt
MWh	megawatts hour
MWWTP	Main Wastewater Treatment Plant
N_2	nitrogen
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Communities Conservation Program
ND	Negative Declaration
NEPA	National Environmental Policy Act
NEPDG	National Energy Policy Development Group
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NH_3	ammonia
NI	No Impact
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NOAA	National Oceanic and Atmosphere Administration
NOC	Notice of Completion
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSCO	Naval Supply Center, Oakland

NWIC	Northwest Information Center
O_3	ozone
OAB	Oakland Army Base
OAP	Ozone Attainment Plan
OEHHA	California Office of Environmental Health and Assessment
OFD	Oakland Fire Department
OPD	Oakland Police Department
OHW	Ordinary High Water
OHP	Office of Historic Preservation
OPR	Governor's Office of Planning and Research
OPR	Office of Parks and Recreation
OSCAR	Open Space, Conservation, and Recreation
OSHA	Occupational Safety and Health Administration
PAH	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PG&E	Pacific Gas & Electric Company
PGS	Power Generation Station
PM	Particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
POC	precursor organic compounds
PPV	peak particle velocity
ppm	parts per million
PRC	Public Resources Code
PS	Potentially significant
RAS/WAS	return activated sludge/waste activated sludge
R2	Resource Recovery
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
S&U	Significant and Unavoidable
SAAQS	State Ambient Air Quality Standards
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
scfm	standard cubic feet per minute
SCS	Sustainable Communities Strategy
SDC	Seismic Design Category
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan

SO_2	sulfur dioxide
SO_X	sulfur oxides
SPCC	Spill Prevention, Control and Countermeasure
SR 24	State Route 24
SR 61	State Route 61
STLC	Soluble Threshold Limit Concentration
SVOC	semivolatile organic compound
SWIS	Solid Waste Information System
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TBACT	Best Available Control Technoligy for Toxics
TCLP	Toxic Characteristic Leaching Procedure
TMDL	Toal Maximum Daily Loads
tpd	tons per day
TDS	total dissolved solids
TSCA	Toxic Substance Control Act
TTLC	Total Threshold Limit Concentration
UBC	Uniform Building Code
UCMP	University of California, Museum of Paleontology
U.S.	United States
USACE	United States Army Corps of Engineers
USAR	United States Army Reserve
USC	United States Code
USEPA	United States Environmental Protection Agency
U.S. HUD	United States Housing and Urban Development
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground storage tank
UV	ultraviolet
VOC	volatile organic compound
WAPA	Western Area Power Administration
WET	Waste Extraction Test
WMA	Watershed Management Area
WMAC	Waste Management of Alameda County
WRRP	Waste Reduction and Recycling Plan
WTP	Water Treatment Plant
WWF	wet weather treatment facility

Executive Summary

This environmental impact report (EIR) assesses the potential environmental impacts of the East Bay Municipal Utility District (EBMUD) Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan. This document has been prepared in accordance with California Environmental Quality Act (CEQA) statutes and guidelines. EBMUD is the lead agency for the CEQA process. Inquiries regarding this document and project should be directed to:

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ES.1 Project Overview

The EBMUD MWWTP Land Use Master Plan has been prepared to serve as a high-level planning tool to guide development of the existing 48-acre MWWTP site and the newly-acquired, adjacent 15.9-acre West End property (former U.S. Army Reserve Center) over a 30-year time horizon. The Master Plan coordinates near-term land uses with potential plans for future expansion to maintain an efficient plant layout and minimize building demolition and facility relocation requirements. Short- and long-term layouts were developed with recommended locations for identified projects given available land at the MWWTP, which now includes the West End property. Objectives for the Master Plan are to:

- Promote environmental stewardship through the protection of water, air and soil quality;
- Provide flexibility to construct advanced treatment facilities to meet potentially more stringent air, water and/or biosolids regulations in the future;
- Enhance revenues to maintain reasonable rates through land-lease agreements and continued growth of successful resource recovery programs that increase renewable energy production;
- Provide benefits to the community and enhance community relations by reducing the potential for odor or aesthetic impacts; and
- Maintain safety through emergency preparedness and by improving traffic routing to, from and within the MWWTP.

EBMUD has identified short- and long-term actions that may be implemented at the MWWTP in the future. Many of the potential actions would not be undertaken until the facilities are needed to meet a specific future regulatory requirement. The purpose of this EIR is to evaluate the range of potential projects that could be developed as part of the Master Plan. In particular, two renewable energy projects have been identified and are being considered for implementation in the near future – biodiesel production and food waste preprocessing – to help EBMUD meet sustainability goals by increasing on-site power generation. Both projects involve EBMUD contracting with private companies under a land-lease agreement to construct and operate a facility at the MWWTP that meets the Master Plan objectives as outlined above.

The biodiesel production and food waste preprocessing projects would provide a direct benefit to EBMUD customers by helping to maintain reasonable wastewater rates, as revenue generated from the land-lease agreements and associated electricity sales would help offset the costs associated with treating wastewater from the East Bay communities. In addition, these proposed projects would produce “green” energy, create local jobs, and feed renewable energy directly into the local power grid in West Oakland. The biodiesel produced may be used in heavy-duty trucks that access the Port of Oakland and travel in

local neighborhoods in the West Oakland community. Food waste digestion would assist local Bay Area cities and counties in meeting waste diversion goals from landfills.

EBMUD has prepared this combined program/project EIR to address the long-term potential for development of new facilities at the expanded MWWTP site, which includes both the existing plant site and the West End property. The EIR addresses the proposed biodiesel production and food waste preprocessing facilities at a project level and the other Land Use Master Plan elements at a program level.

ES.1.1 Land Use Master Plan Elements

Figure ES-1 shows the elements that are included in the long-term Land Use Master Plan. Proposed Master Plan facilities include:

- Biodiesel Production Facility (short and long term)
- Food Waste Preprocessing Facility (short and long term)
- Temporary Land Lease (short term)
- Employee Parking/Emergency Equipment Storage (short and long term)
- Influent Pump Station (IPS), Dewatering Building and Primary Sedimentation Tank Odor Control (short and long term)
- Food Waste Processing (short and long term)
- Secondary Treatment Upgrades for Nutrient Removal (long term)
- Ultraviolet Disinfection (long term)
- Tertiary Treatment Facility (long term)
- Digester Expansion (long term)
- Household Hazardous Waste (HHW) Collection Facility (long term)
- Public Education Facility (long term)
- Relocation of Resource Recovery (R2) and Septage Receiving Stations (long term)

ES.1.2 Biodiesel Production Facility

EBMUD is considering siting a biodiesel facility that would be owned and operated by a private company. This facility is proposed to be sited on a portion of the West End property under a land-lease agreement (see location in **Figure ES-1**). The facility would utilize a variety of oils, including animal fats and used cooking oil to produce biodiesel. Glycerin, a byproduct of the biodiesel production process would be sent to EBMUD for anaerobic digestion, gas generation and renewable energy production at the MWWTP.

ES.1.3 Food Waste Preprocessing Facility

EBMUD is considering siting a food waste preprocessing facility that would be owned and operated by one or more private companies. This facility is proposed to be sited on a portion of the West End property under a land-lease agreement (see location in **Figure ES-1**).

EBMUD operates an existing food waste processing facility, which was approved in July 2009 for expansion to treat up to 250 tons per day (tpd) of preprocessed food waste. Currently, food waste is preprocessed to remove non-digestible material at a combination of facilities located in the greater San Francisco Bay Area, including but not limited to facilities in Vacaville, San Carlos, and Martinez. With the construction of a food waste preprocessing facility at the MWWTP, organics-rich waste would be delivered directly to the MWWTP to be preprocessed to improve process efficiency and material consistency. This material would then be conveyed to the existing food waste processing facility.

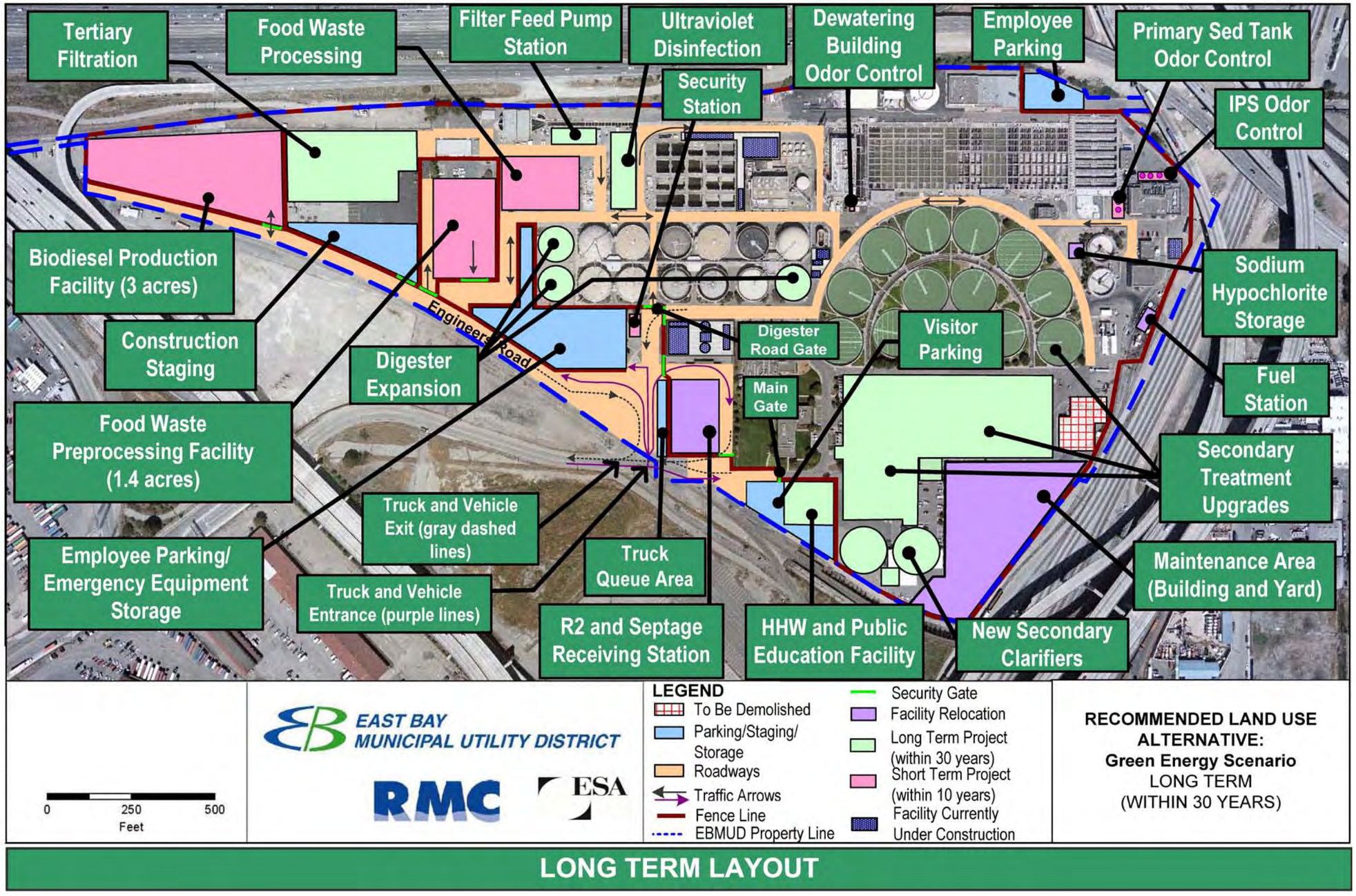


Figure ES-1: MWWTP Recommended Land Use Alternative – Long Term

Material not suitable for anaerobic digestion would be transported off site for further processing at a compost facility.

ES.1.4 Project Schedule

Implementation schedules for most Land Use Master Plan long-term facilities have not been determined, but facilities are expected to be designed and constructed over the next 30 years. Schedules have been developed for the two projects that are evaluated in this EIR at a project level:

- Biodiesel Production Facility: construction expected to begin in the fall of 2011 and be complete by the fall of 2012; and
- Food Waste Preprocessing Facility: construction expected to begin by the spring or summer of 2012 and be complete by the summer or fall of 2013.

ES.2 Summary of Impacts

Table ES-1 provides a summary of potential impacts by topic area. The table does not include impacts or criteria that were deemed not applicable to actions associated with the Land Use Master Plan.

All direct impacts of the project can be mitigated to less than significant. However, cumulative impacts related to community risks and hazards have been determined to be significant and unavoidable because of existing circumstances in the project area. Impacts of proposed EBMUD facilities were determined to be less than significant with mitigation, but emissions of diesel particulate matter from existing sources (primarily freeways adjacent to the MWWTP) are substantial. Thus, even though the impact from the EBMUD facilities is less than significant with mitigation, cumulative community risk and hazard impacts within 1,000 feet of the project site have been determined to be significant because of the exceedence of the Bay Area Air Quality Management District (BAAQMD) thresholds of significance. The impact would be significant with or without development of the biodiesel production facility or other EBMUD projects.

Table ES-1: EBMUD MWWTP Land Use Master Plan EIR Impact Summary

Impact Statement	Level of Significance Before Mitigation			Mitigation Measure	Level of Significance After Mitigation		
	Other Master Plan Elements	Biodiesel Production	Food Waste Preprocessing		Other Master Plan Elements	Biodiesel Production	Food Waste Preprocessing
Aesthetics							
AES-1: Potential to damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
AES-2: Alter existing visual character and views in the study area	PS	PS	PS	AES-2a: Maintenance of construction worksite	LSM	LSM	LSM
				AES-2b: Design to be aesthetically consistent with existing visual character			
AES-3: New source of substantial light or glare	PS	PS	PS	AES-3: Lighting design and low reflective paint	LSM	LSM	LSM
Air Quality							
AIR-1: Construction emissions of criteria pollutants and precursors	PS	PS	PS	AIR-1: Criteria air pollutant and precursor reduction measures	LSM	LSM	LSM
AIR-2: Local community risks and hazards during construction	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
AIR-3: Odors generated during project construction	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
AIR-4: Direct criteria pollutant emissions during project operation	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
AIR-5: Local community risks and hazards during project operation	LTS	LTS	PS	AIR-5: Diesel particulate reduction measures	LTS	LTS	LSM
AIR-6: Odor emissions during project operation	PS	LTS	PS	AIR-6a: Odor controls in food waste preprocessing facility	LSM	LTS	LSM
				AIR-6b: Odor controls on other Land Use Master Plan elements			
AIR-7: Consistency with applicable air quality plans	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Biological Resources							
BIO-1: Potential to interfere with wildlife movement or impede the use of native wildlife nursery sites	PS	PS	PS	BIO-1: Protection of nesting birds	LSM	LSM	LSM
BIO-2: Potential for conflict with local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance	PS	PS	PS	BIO-2: Replacement of protected trees	LSM	LSM	LSM
Cultural Resources							
CUL-1: Potential to cause a substantial adverse change in the significance of a unique archaeological resource	PS	PS	PS	CUL-1: Recovery of buried cultural resources	LSM	LSM	LSM
CUL-2: Potential to cause a substantial adverse change in the significance of a paleontological resource	PS	PS	PS	CUL-2: Recovery of buried paleontological resources	LSM	LSM	LSM
CUL-3: Potential to disturb human remains	PS	PS	PS	CUL-3: Recovery of discovered human remains	LSM	LSM	LSM
Energy							
ENE-1: Inefficient, wasteful or unnecessary use of energy resources	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Geology, Soils, and Seismicity							
GEO-1: Facility damage and exposure of people to hazards from strong seismic groundshaking	PS	PS	PS	GEO-1: Perform design-level geotechnical evaluations for seismic hazards	LSM	LSM	LSM
GEO-2: Facility damage and exposure of people to hazards from liquefaction and lateral spreading	PS	PS	PS	GEO-2: Perform design-level geotechnical evaluations for liquefaction and other geologic hazards	LSM	LSM	LSM
GEO-3: Potential for substantial erosion or loss of top soil	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Greenhouse Gas Emissions							
GHG-1: GHG construction emissions	LTS	LTS	LTS	GHG-1: GHG reduction measures	LTS	LTS	LTS
GHG-2: GHG operational emissions	PS	LTS	LTS	GHG-2a: Energy efficiency measures	LSM	LTS	LTS
				GHG-2b: Water conservation measures for other Land Use Master Plan elements			
GHG-3: Consistency with applicable greenhouse gase reduction plans	PS	LTS	LTS	See GHG-2a and 2b, above	LSM	LTS	LTS

Table ES-1: EBMUD MWWTP Land Use Master Plan EIR Impact Summary (cont'd)

Impact Statement	Level of Significance Before Mitigation			Mitigation Measure	Level of Significance After Mitigation		
	Other Master Plan Elements	Biodiesel Production	Food Waste Preprocessing		Other Master Plan Elements	Biodiesel Production	Food Waste Preprocessing
Hazards and Hazardous Materials							
HAZ-1: Hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
HAZ-2: Hazards to public health and the environment due to a release of hazardous materials present in the soil and groundwater	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
HAZ-3: Hazards to public health and the environment due to a release of hazardous building materials present in buildings that would be demolished	PS	PS	PS	HAZ-3: Hazardous building materials surveys and abatement	LSM	LSM	LSM
HAZ-4: Hazards to public health and the environment due to a release of hazardous materials from construction equipment	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Hydrology and Water Quality							
HYD-1: Violation of water quality standards and/or waste discharge requirements	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
HYD-2: Depletion of groundwater supplies or interference with groundwater recharge	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
HYD-3: Alteration of the existing drainage pattern in a manner which would result in flooding	PS	PS	PS	HYD-3: Prepare and implement a comprehensive drainage plan	LSM	LSM	LSM
HYD-4: Alteration of the existing drainage pattern in a manner which would result in substantial erosion or siltation	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
HYD-5: Inundation due to a catastrophic tsunami or seiche	PS	PS	PS	HYD-5: Prepare and implement a tsunami response plan	LSM	LSM	LSM
Land Use and Recreation							
LUR-1: Physically divide an established community	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
LUR-2: Conflict with any applicable land use plan, policy or regulation	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
LUR-3: Require the construction or expansion of recreational facilities	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
LUR-4: Impede the construction or expansion of planned recreational facilities	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
LUR-5: Impede the achievement of environmental justice	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Noise							
NOI-1: Disturbance from temporary, construction-related noise increases in excess of noise ordinance	PS	PS	PS	NOI-1: Implement noise controls	LSM	LSM	LSM
NOI-2: Temporary disturbance due to construction-related vibration	PS	PS	PS	NOI-2: Implement vibration controls	LSM	LSM	LSM
NOI-3: Increases in ambient noise levels due to operational noise and vibration	PS	LTS	LTS	NOI-3: Employ noise controls for stationary equipment	LSM	LTS	LTS
NOI-4: Traffic-related noise increases along truck and rail routes	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Public Services							
PUB-1: Substantial adverse physical impacts associated with the provision of police or fire protection	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
Transportation							
TRA-1: Temporary construction-related increase in traffic	PS	PS	PS	TRA-1: Construction traffic management plan	LSM	LSM	LSM
TRA-2: Traffic delay on intersection operations	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
TRA-3: Traffic delay on freeway operations	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
TRA-4: Operational increase in local traffic	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
TRA-5: Impacts to emergency access	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
TRA-6: Conflicts with alternative transportation	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
TRA-7: Safety hazards due to conflicts with rail transport	LTS	PS	LTS	TRA-7a: Railroad crossing safety for new rail spur TRA-7b: Coordination with Burlington North Santa Fe (BNSF)	LTS	LSM	LTS

Table ES-1: EBMUD MWWTP Land Use Master Plan EIR Impact Summary (cont'd)

Impact Statement	Level of Significance Before Mitigation			Mitigation Measure	Level of Significance After Mitigation		
	Other Master Plan Elements	Biodiesel Production	Food Waste Preprocessing		Other Master Plan Elements	Biodiesel Production	Food Waste Preprocessing
Utilities							
UTIL-1: Exceed wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board	PS	PS	PS	HYD-3: Prepare and implement a comprehensive drainage plan	LSM	LSM	LSM
UTIL-2: Have sufficient water supplies available to serve the project	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
UTIL-3: Require construction of new stormwater drainage facilities or expansion of existing facilities	PS	PS	PS	HYD-3: Prepare and implement a comprehensive drainage plan	LSM	LSM	LSM
UTIL-4: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
UTIL-5: Compliance with federal, state, and local statutes and regulations related to solid waste	LTS	LTS	LTS	No mitigation necessary	LTS	LTS	LTS
UTIL-6: Temporary disruption of utilties or services due to construction-related activities	PS	PS	PS	UTIL-6: Coordinate relocation and interruptions of service with utility providers during construction	LSM	LSM	LSM
Cumulatively Considerable Impacts							
CUM: Air quality community risks and hazards	PS	PS	PS	Significance is based on existing sources and while **Mitigation Measure AIR-5** is proposed to reduce project emissions it is not possible to completely eliminate project emissions	S&U	S&U	S&U

Notes: NI= No Impact, LTS=Less than Significant, PS=Potentially significant, LSM=Less than Significant with Mitigation, S&U=Significant and Unavoidable

ES.3 Summary of Alternatives

This EIR considers five alternatives to the proposed Land Use Master Plan:

1. The Proposed Project
2. Biodiesel with Rail Spur Alternative
3. Land-lease Energy Projects on New Property Alternative
4. Smaller Scale Biodiesel Facility Alternative
5. No Project Alternative.

The "Proposed Project" (hereinafter referred to as the "proposed project" or "project") is described above.

The "Biodiesel with Rail Spur Alternative" would be similar to the proposed Master Plan in that it would include implementation of all of the short-term and long-term Land Use Master Plan elements that are envisioned as part of the proposed project. The food waste preprocessing facility would be constructed at the West End property on the same schedule as contemplated for the proposed project. Under this alternative, the biodiesel production facility would not be developed at the West End property; it instead, would be located on the eastern portion of the existing MWWTP property, where rail access is already available. This would require relocation of existing maintenance facilities at the MWWTP to the West End property.

The "Land-lease Energy Projects on New Property Alternative" would be similar to the proposed Land Use Master Plan, in that EBMUD would still develop facilities for biodiesel and food waste preprocessing in the short term. However, these facilities would be located on land south of the existing MWWTP site that would be acquired from the City of Oakland.

The "Smaller Scale Biodiesel Facility Alternative" would include all of the same elements as the proposed Land Use Master Plan, but only the first phase of the biodiesel facility would be constructed. Production of biodiesel would be limited to five million gallons per year (mgy), and future expansion to 20 mgy would not be implemented.

The "No Project Alternative" would eliminate both the food waste preprocessing and biodiesel production facilities. In addition, the Land Use Master Plan would not be adopted. However, in the absence of a Master Plan, EBMUD would likely still have to develop most of the proposed facilities over time, as most of them are expected to be required by future regulations. Thus, if the Land Use Master Plan is not implemented, development of regulatory-driven facilities would still occur, but EBMUD would have less ability to plan the utilization of land at the MWWTP and West End property, and would likely have fewer opportunities to implement renewable energy initiatives to generate revenue, and reduce ratepayer costs.

Chapter 5, Alternatives contains a description of each alternative and compares the impacts of each. It also describes the process for consideration and elimination of other alternatives. *Chapter 5* concludes that there is no clearly environmentally superior alternative.

Chapter 1 Introduction

1.1 Overview, Purpose, and Authority

The California Environmental Quality Act (CEQA) requires that all state and local government agencies consider the environmental consequences over which they have discretionary authority before taking an action that has the potential to affect the environment. This combined program/project Draft Environmental Impact Report (EIR) was prepared by the East Bay Municipal Utility District (EBMUD) in accordance with CEQA to evaluate the potential environmental impacts associated with the Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan. This document was prepared in conformance with CEQA (California Public Resources Code, Section 21000 et seq.), CEQA Guidelines (CCR Title 14 Section 15000 et seq.), and EBMUD policies and procedures. This EIR is intended to serve as an informational document for agency decision-makers and the public regarding the MWWTP Land Use Master Plan.

1.1.1 Overview

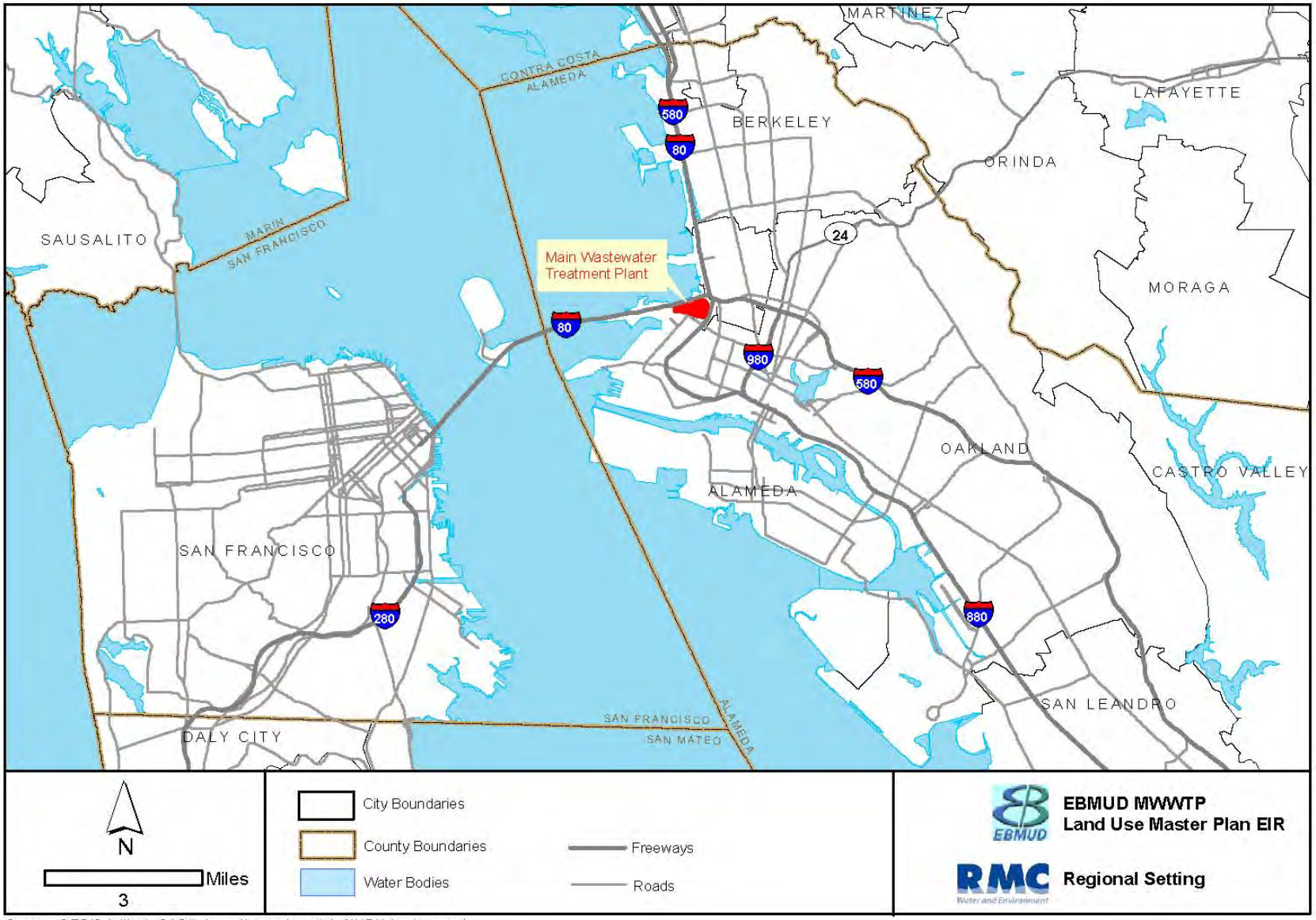
EBMUD owns and operates the 48-acre MWWTP, located in the western portion of the City of Oakland near the convergence of Interstates 80, 580, and 880 (I-80, I-580, and I-880) in Alameda County (see **Figure 1-1**). In order to provide flexibility for future needs, EBMUD acquired the 15.9-acre West End property from the United States Army Reserve (USAR) in 2007. The property is situated directly to the west of EBMUD's existing MWWTP. See **Figure 1-2,** which shows the boundaries of the project site.

A master planning process was initiated to coordinate near-term land uses with potential future treatment improvement projects to determine an appropriate long-term plan for use of available land at the MWWTP (existing site and West End property). Master planning efforts have resulted in the identification of a recommended land use layout, the "Green Energy Scenario," which sites near-term projects appropriately, while reserving land for future projects. This document will serve as a guide as individual projects are implemented by EBMUD. The Draft Land Use Master Plan is summarized here and posted at:

http://www.ebmud.com/about-ebmud/news/project-updates/oakland-wastewater-treatment-plant-land-use-master-plan

1.1.2 Purpose and Authority

This Draft EIR provides a program-level analysis of the potential environmental effects of the Land Use Master Plan and project-level analysis of the potential environmental effects of two specific projects that are included in the Master Plan: biodiesel production and food waste preprocessing. The environmental impacts of the Land Use Master Plan are analyzed to the appropriate degree of specificity, in accordance with Section 15146 of the CEQA Guidelines. This document addresses the potentially significant adverse environmental impacts that may be associated with the planning, construction, and operation of the individual projects described in the Land Use Master Plan. It also identifies appropriate and feasible mitigation measures and alternatives that may be adopted to reduce or avoid significant impacts.



Source: SFGIS (cities), CASIL (counties and roads), NHDH (waterways).

Figure 1-1: Regional Setting

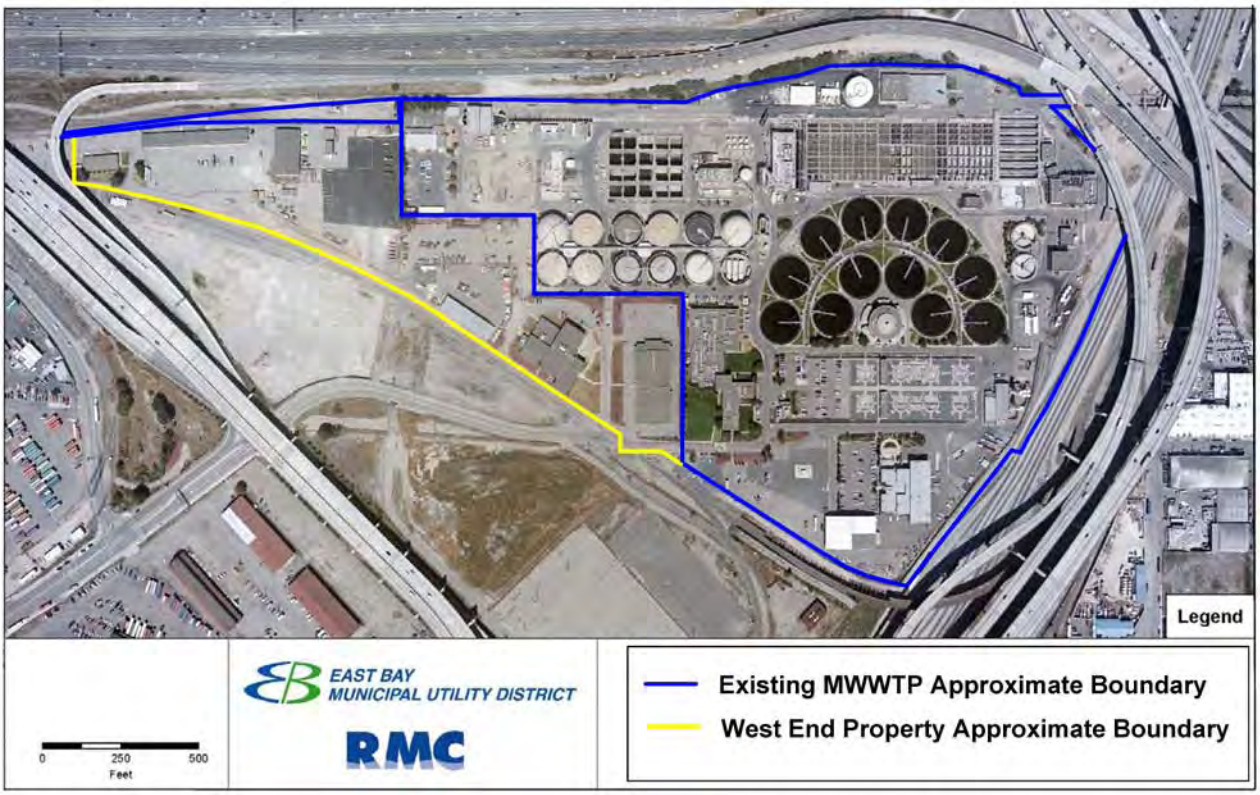


Figure 1-2: MWWTP and West End Property Site Boundaries

1.1.3 Lead Agency Determination

EBMUD is designated as the lead agency for the purposes of this EIR. CEQA Guidelines Section 15367 defines the lead agency as "…the public agency, which has the principal responsibility for carrying out or approving a project." Other public agencies may use this Draft EIR in the decision-making or permitting process and consider the information in this Draft EIR along with other information that may be presented during the CEQA process.

1.2 Objectives and Need for Project

The purpose of the Land Use Master Plan is to coordinate near-term renewable energy and revenue-generating land uses with potential plans for future regulatory-driven process expansion to maintain an efficient plant layout and minimize building demolition and facility relocation. The Master Plan will serve as a high-level planning tool to guide development of the existing MWWTP site and the newly-acquired, adjacent West End property over a 30-year time horizon. Objectives for the Master Plan are to:

- Promote environmental stewardship through the protection of water, air and soil quality;
- Provide flexibility to construct advanced treatment facilities to meet air, water and/or biosolids regulations in the future;
- Enhance revenues to maintain reasonable rates through land-lease agreements and continued growth of successful resource recovery programs that increase renewable energy production;
- Provide benefits to the community and enhance community relations by reducing the potential for odor or aesthetic impacts; and

- Maintain safety through emergency preparedness and by improving traffic routing to, from, and within the MWWTP.

As regulatory-driven projects are required and revenue-generating opportunities are identified, the Master Plan will guide future development of planned and unforeseen projects in a manner that meets these objectives.

EBMUD has identified short- and long-term actions that may be implemented at the MWWTP in the future. Many of the potential actions would not be undertaken until it is necessary to meet a specific future regulatory requirement. The purpose of this EIR is to evaluate the range of potential projects that could be developed as part of the Master Plan. In particular, two renewable energy projects have been identified and are being considered for implementation in the near future: biodiesel production and food waste preprocessing to help EBMUD meet sustainability goals by increasing on-site power generation. Both projects involve EBMUD contracting with private companies under a land-lease agreement to construct and operate facilities at the MWWTP that meet the Master Plan objectives.

The biodiesel and food waste preprocessing projects would provide a direct benefit to customers by helping to maintain reasonable rates, as revenue generated from the land-lease agreements and electricity sales would help offset the costs associated with treating wastewater from East Bay communities. In addition, these proposed projects would produce "green" energy, create local jobs, and feed renewable energy directly into the local power grid in West Oakland. The biodiesel produced may be used in heavy-duty trucks that access the Port of Oakland and travel in local neighborhoods in the West Oakland community. Food waste preprocessing and digestion would assist local San Francisco Bay Area cities and counties in meeting waste diversion goals from landfills.

1.3 Notice of Preparation

In accordance with Sections 15082(a), 15103, and 15375 of the CEQA Guidelines, EBMUD prepared and circulated a Notice of Preparation (NOP) of a Draft EIR for the proposed project for a 30-day comment period between November 18, 2009 and December 21, 2009. EBMUD also conducted one public scoping meeting on December 14, 2009 from 6:00 p.m. to 8:00 p.m. at the EBMUD Adeline Maintenance Center at 1100 21st Street, Oakland, CA, to receive public comments on the scope and content of the Draft EIR. *Appendix A* contains a copy of the NOP, along with the comment letters submitted by agencies and the public in response to the NOP.

1.3.1 Issues to be Evaluated

The scope of this EIR includes the areas of consideration identified in the NOP, as well as issues raised by agencies and the public in response to the NOP, which include:

- Potential impacts on the Bay Trail and Gateway Park;
- Air quality impacts and control measures during construction and facility operation, including potential for odors and emissions from traffic;
- Potential traffic congestion, especially impacts to the Port of Oakland, former Oakland Army Base (OAB), and West Oakland community;
- Project compatibility with surrounding land uses, including Port of Oakland operations;
- Aesthetics of the MWWTP site, particularly from the Bay Bridge approach;
- Cumulative impacts on Caltrans' mitigation for the San Francisco/Oakland Bay Bridge Seismic Retrofit Project and Cypress Freeway Project, future development of Gateway Park, redevelopment of the OAB, and marine terminal improvements at the Port of Oakland; and
- Evaluation of impacts of solid waste components of the project at a sufficient level of detail to support permitting.

1.4 Type of EIR

This Draft EIR includes both the overall MWWTP Land Use Master Plan, which is evaluated at a program level, and two specific projects that are part of the Land Use Master Plan and evaluated at a project level: biodiesel production and food waste preprocessing. All improvements associated with the Land Use Master Plan are analyzed at a program level. CEQA Guidelines (Section 15168) define a program EIR as one which "may be prepared on a series of actions that can be characterized as one large project and are related." A program EIR assesses and documents the broad environmental impacts of a program with the understanding that a more detailed site-specific review may be required to assess future projects implemented under the program. A project EIR is defined (Section 15161) as one which "examines the environmental impacts of a specific development project." A project EIR provides a site-specific review of all phases of the project, including planning, construction, and operation.

This Draft EIR contains both levels of analysis. Project-level analysis is conducted for the two components that are expected to move forward once environmental and regulatory review have been completed (estimated completion in 2011). Program-level analysis is conducted to streamline the review process for the full Land Use Master Plan by allowing for consideration of environmental impacts and mitigation measures on a program-wide scale, thereby addressing cumulative impacts of the Master Plan as a whole. Subsequent facility improvement projects would later be examined in the light of the program EIR to determine whether an additional environmental document must be prepared (Section 15168). A subsequent environmental document may be "tiered" from the program EIR, pursuant to CEQA Guidelines (Sections 15152 and 15168). "Tiering" refers to the use of analysis from a broader EIR, with later EIRs and negative declarations (NDs) and/or mitigated negative declarations (MNDs) prepared for subsequent projects, concentrating on issues specific to the future projects.

For the purposes of CEQA the "project" under consideration in this EIR is the entire Land Use Master Plan, which includes the biodiesel production and food waste preprocessing facilities, plus eleven other elements of the Land Use Master Plan that are contemplated for implementation in the future. Impact discussions in the EIR fall under three headings: 1) biodiesel facility; 2) food waste preprocessing facility; and 3) "other land use master plan elements", which includes the eleven other Land Use Master Plan elements that are evaluated at a program level.

This Draft EIR contains a description of the Land Use Master Plan and provides a discussion of the environmental setting, project impacts, and mitigation measures necessary to reduce impacts found to be significant, as well as an analysis of project alternatives. As required by CEQA, this Draft EIR focuses on significant or potentially significant environmental effects (CEQA Guidelines Section 15143). As discussed above, an NOP was prepared for the Land Use Master Pan to identify issues to be evaluated in this Draft EIR (see *Appendix A*). Comments received on the NOP helped to further refine the list of environmental issues to be evaluated in this EIR.

All of the impacts analyzed in this EIR, including those determined to be less than significant, are summarized in **Table ES-1** in the *Executive Summary* of this document.

1.5 Review and Use of the Draft EIR

Upon completion of the Draft EIR, EBMUD filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the 45-day public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft EIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR and technical appendices are available for review at EBMUD's main office, located at the address provided below. Agencies, organizations, and interested parties, including those not previously

contacted, or who did not respond to the NOP, currently have the opportunity to comment on the Draft EIR during the public review period.

Written comments on this Draft EIR should be addressed to:

East Bay Municipal Utility District
375 Eleventh Street, MS702
Oakland, CA 94607-4240

Attention: Vince De Lange, P.E.
Phone: 510-287-1141
Email: vdelange@ebmud.com

Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review at least 10 days prior to the public hearing before the EBMUD Board of Directors on the Land Use Master Plan, at which certification of the Final EIR will be considered. Comments received and the responses to comments will be included as part of the record for consideration by the Board of Directors.

1.5.1 Responsible Agencies, Permits, and Approvals

Table 1-1 summarizes the potential permits and/or approvals from other agencies that may be required prior to construction of the individual MWWTP Land Use Master Plan projects. In addition to approvals from these agencies, EBMUD would also conduct a project-level review in accordance with CEQA requirements. Construction would take place entirely within the existing MWWTP site and West End property and would not affect waters of the United States (U.S.) under the jurisdiction of the Army Corps of Engineers (USACE), or waters of the State under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB) or California Department of Fish and Game (CDFG). No effects on special-status plants or wildlife are expected. Thus, none of the projects proposed as part of the Land Use Master Plan are expected to require permits from the USACE or CDFG.

Table 1-1: Responsible Agencies and Approvals

Agency	Type of Approval
STATE	
San Francisco RWQCB (Region 2)	National Pollutant Discharge Elimination System (NPDES), Construction General Permit [1]
Department of Toxic Substances Control (DTSC)	Approval for replacement of any soil from the West End property outside of the property boundary. Approval for excavation or disturbance of any soil on the West End property deeper than 5 feet below ground surface
LOCAL	
Bay Area Air Quality Management District (BAAQMD)	Authority to Construct Permit to Operate
City of Oakland	Roadway Encroachment Permit
Burlington Northern Santa Fe Railroad (BNSF)	Railroad Encroachment Permit
Alameda County Department of Environmental Health (ACDEH) (in consultation with CalRecycle, formerly California Integrated Waste Management Board [CIWMB])	Solid Waste Facility Permit for Food Waste Preprocessing Facility[2]

1.6 Other Related Projects at MWWTP

There are a number of projects related to the MWWTP Land Use Master Plan that have undergone environmental review and have already been approved for, or are in construction by EBMUD.

EBMUD's *Food Waste Facility Phase 2 Project Initial Study/Negative Declaration* (2009) addressed expansion of the existing Resource Recovery Program at the MWWTP. The project expands EBMUD's capacity to accept and treat food waste, using existing wastewater treatment plant capacity and reducing the amount of food waste disposed of at area landfills. New facilities include: new food waste screening and pulping equipment, new pumps and mixers, a new storage area for bins, which may include a building, and a new truck loading area for bin removal. This project utilizes existing facilities at the R2 Receiving Station to the maximum extent possible.

The EBMUD *Initial Study/Mitigated Negative Declaration for Power Generation Station Renewable Energy Expansion Project* (2008a) addressed expansion of power and heat generation capabilities of existing cogeneration facilities at the MWWTP. The project increases EBMUD's renewable energy production capacity and minimizes flaring of excess biogas. The project includes installation of a 4.5-megawatt (MW) gas turbine, gas conditioning units (for siloxane removal), gas compression equipment, electrical transformers and substations. A ferric chloride storage and feed system is installed at the primary sedimentation tanks to reduce hydrogen sulfide production in the digesters. The Power

[1] Stormwater at the existing MWWTP site is captured and sent to the headworks for treatment, so coverage under the Construction General Permit would not be required. The West End property is not yet connected to the MWWTP storm drain system, so coverage under the General Permit would be necessary.

[2] Separate from the Solid Waste Facility Permit that will be required for the Food Waste Preprocessing Facility, EBMUD's existing Food Waste Facility operates as a biosolids composting operation under the Notification Tier, Solid Waste Information System (SWIS) No. 01-AA-0299. It is possible that digestion of food waste separately from biosolids could result in a change in the regulatory tier status. EBMUD is working with ACDEH, the Local Enforcement Agency for CalRecycle, to determine if additional permitting is needed.

Generation Station (PGS) expansion could ultimately include construction of two 4.5-MW turbines, air handling and heat recovery units, and ancillary equipment.

The EBMUD *Initial Study/Negative Declaration for the Digester Upgrade Project - Phase II* (2008b) evaluated a continuation of digester system improvements that EBMUD began in 2003. Phase II rehabilitates four digesters by replacing the floating covers with fixed covers and adding mixers, modifying the sludge feed system by adding a feed loop, adding a feed/blend tank to preheat solids before feeding to the digesters, and relocating EBMUD's existing fats, oils and grease (FOG) receiving station to the feed/blend tank area. The FOG receiving area and blend tank facility are being constructed on a portion of the West End property. These modifications help improve process performance and efficiency.

The City of Pittsburg *Initial Study/Mitigated Negative Declaration for the Proposed K2 Pure Solutions ECU and Bleach Plant Project* (2009) addressed the discharge of a brine waste through the EBMUD outfall. This project will require the construction and installation of one or more holding tanks and piping between the tanks and the EBMUD effluent channel or outfall pipeline. The project is relatively small and is not expected to conflict with any of the proposed Master Plan layouts, therefore the exact location is not shown on the figures. The location will not affect the analysis of the impacts in this EIR.

EBMUD has leased land at the MWWTP to Clear Channel Outdoor, Inc. to allow construction of a static billboard for commercial use on the northwestern end of the MWWTP boundary, facing I-80. An existing billboard at the MWWTP is also being converted for commercial use.

1.7 Organization of the EIR

This Draft EIR is organized into the following main chapters:

Executive Summary. This chapter includes a summary of the Land Use Master Plan and the two projects evaluated in this EIR. It includes a table that summarizes the impacts, mitigation measures, and level of significance after mitigation measures are incorporated.

Chapter 1: Introduction. This chapter provides an introduction and overview describing the program objectives, purpose and scope of this Draft EIR, brief explanation of the areas of consideration and issues to be resolved, a summary of the CEQA review process, list of responsible agencies and approvals, and description of related projects.

Chapter 2: Project Description. This chapter includes a detailed description of the proposed Land Use Master Plan, as well as the two specific project components moving forward in the near term. Project location, operations, equipment and processes, and construction methods are all discussed.

Chapter 3: Environmental Analysis. This chapter analyzes the environmental impacts of the proposed project. Each topic area includes a description of the environmental setting, methodology, significance criteria, impacts, mitigation measures, and significance after mitigation.

Section 3.1: Introduction to Environmental Analysis. This section provides an overview of the environmental analysis and presents the format for each topical section. It describes issues that have been determined to have no or less-than-significant impacts and therefore are not carried forward for further analysis.

Section 3.2: Aesthetics. This section evaluates impacts on the visual and scenic resources.

Section 3.3: Air Quality. This section addresses local and regional air quality impacts as well as consistency with BAAQMD rules and regulations.

Section 3.4: Biological Resources. This section addresses impacts on habitat, vegetation, and wildlife; the potential degradation or elimination of important habitat; and impacts on listed, proposed, and candidate threatened and endangered species.

Section 3.5: Cultural Resources. This section addresses impacts on known historical resources and potential archaeological and paleontological resources.

Section 3.6: Energy. This section evaluates energy consumption and production.

Section 3.7: Geology, Soils and Seismicity. This section evaluates the potential for local geological hazards to impact facilities.

Section 3.8: Greenhouse Gas Emissions. This section addresses the potential for construction and operation of projects to generate greenhouse gases (GHG).

Section 3.9: Hazards and Hazardous Materials. This section addresses the likelihood of the presence of hazards and hazardous materials or conditions on the project site that may have the potential to impact human health.

Section 3.10: Hydrology and Water Quality. This section addresses impacts on local hydrological conditions, including drainage areas, and changes in water quality.

Section 3.11: Land Use and Recreation. This section evaluates compatibility with existing land use, consistency with applicable local, regional, and State plans and policies, and impacts on recreational facilities.

Section 3.12: Noise. This section addresses potential construction and operational noise impacts from mobile and stationary sources. The section also addresses the impact of noise generation on neighboring uses.

Section 3.13: Public Services. This section evaluates impacts on police and fire protection services.

Section 3.14: Transportation. This section addresses impacts on the local and regional roadway system, public transportation, bicycle, and pedestrian access.

Section 3.15: Utilities. This section evaluates impacts on water, wastewater, solid waste, and utility systems.

Chapter 4: Other CEQA Considerations. This chapter describes potential growth-inducing impacts associated with the Land Use Master Plan, a summary of significant environmental impacts, including unavoidable and cumulative effects, and the project's irreversible and irretrievable commitment of resources.

Chapter 5: Alternatives. This chapter compares the impacts of the Land Use Master Plan with other alternatives considered by EBMUD, including the No Project Alternative. The environmentally superior alternative is evaluated.

Chapter 6: Document Preparation. This chapter lists the authors that assisted in the preparation of the Draft EIR, by name and company or agency affiliation.

Chapter 7: References and Persons Consulted. This chapter contains a full list of references that were used in the preparation of this Draft EIR, and also includes a list of persons and organizations that were consulted with during the preparation of the EIR.

Appendices. This section includes all notices and other procedural documents pertinent to the Draft EIR, as well as all technical material prepared to support the analysis.

Chapter 2 Project Description

The Land Use Master Plan determines appropriate uses for available land at the MWWTP (both existing site and West End property). This document will serve as a guide as individual projects are implemented by EBMUD. The project includes the overall MWWTP Land Use Master Plan, which is evaluated at a program level, and two specific projects that are part of the Land Use Master Plan and evaluated at a project level. **Figure 2-1** shows the projects that are being considered for implementation within the next 10 years and includes the two proposed renewable energy projects that are being evaluated in this EIR at a project level: biodiesel production and food waste preprocessing. **Figure 2-2** shows the elements that are being considered within the next 30 years and are evaluated in this EIR at the program level. Note that because the site is entirely below the 10-foot elevation as shown on the United States Geological Survey (USGS) topographic map for the project area, topographic contours are not shown on **Figures 2-1** and **2-2**. Descriptions for the two specific projects and the overall Land Use Master Plan are provided below.

2.1 Project Site and Location

The project site is located in the western portion of the City of Oakland near the convergence of I-80, I-580, and I-880 in Alameda County (refer to **Figure 1-1**). The project site is composed of EBMUD's existing 48-acre MWWTP (Assessor's Parcel Number 000-0305-002-03) and the 15.9-acre West End property (Assessor's Parcel Number 000-0305-003-16) that was acquired from the United States Army Reserve in 2007 (refer to **Figure 1-2**).

2.2 Existing Facilities and Operations

The EBMUD MWWTP provides wastewater treatment services for 650,000 residents in seven East Bay communities, including Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont, and Stege Sanitary District (El Cerrito, Kensington, and part of Richmond). The facility was originally constructed in 1951. The MWWTP's dry weather design capacity is 120 million gallons per day (mgd). During wet weather flow conditions, the facility has the capacity to treat 168 mgd of wastewater to secondary treatment standards and 320 mgd to primary treatment standards. An on-site wet weather storage basin provides additional capacity for a short-term hydraulic peak of 415 mgd. The annual average daily flow is 65 mgd. Final effluent is discharged from the MWWTP to San Francisco Bay in accordance with EBMUD's National Pollutant Discharge Elimination System (NPDES) permit, which is issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB). Existing facilities are shown in **Figure 2-3**.

2.2.1 Influent Pump Station

The Influent Pump Station (IPS) is located at the far eastern end of the property, where raw wastewater is pre-chlorinated for odor control. Influent passes through coarse bar screens to remove large debris and is then "lifted" by large pumps to allow the wastewater to flow by gravity through the plant. Following pumping, the wastewater flows through fine screens prior to entering the grit removal system. Grit (i.e., rocks, sand) is removed to prevent damage to downstream equipment. Screenings and grit are collected and hauled to a landfill for disposal.

2.2.2 Primary Treatment

Following grit removal, wastewater enters large sedimentation tanks where solids that are heavier than water settle to the bottom and are removed and light, floatable material, such as oil and grease are skimmed from the surface of the tanks. Light material is concentrated and sent to a landfill. Heavier material, called "primary sludge," is sent to anaerobic digesters for further treatment.

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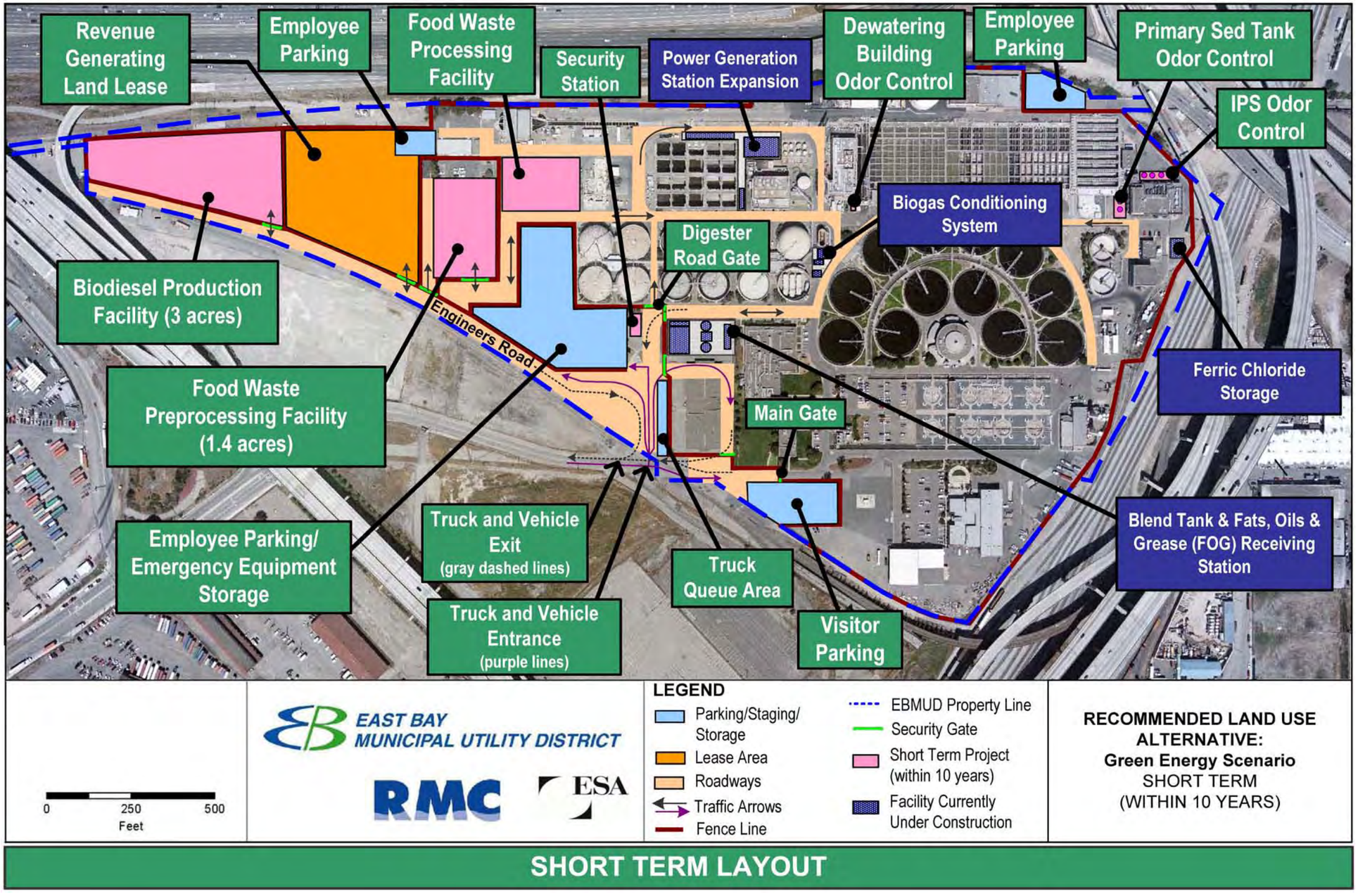

Figure 2-1: MWWTP Recommended Land Use Alternative – Short Term

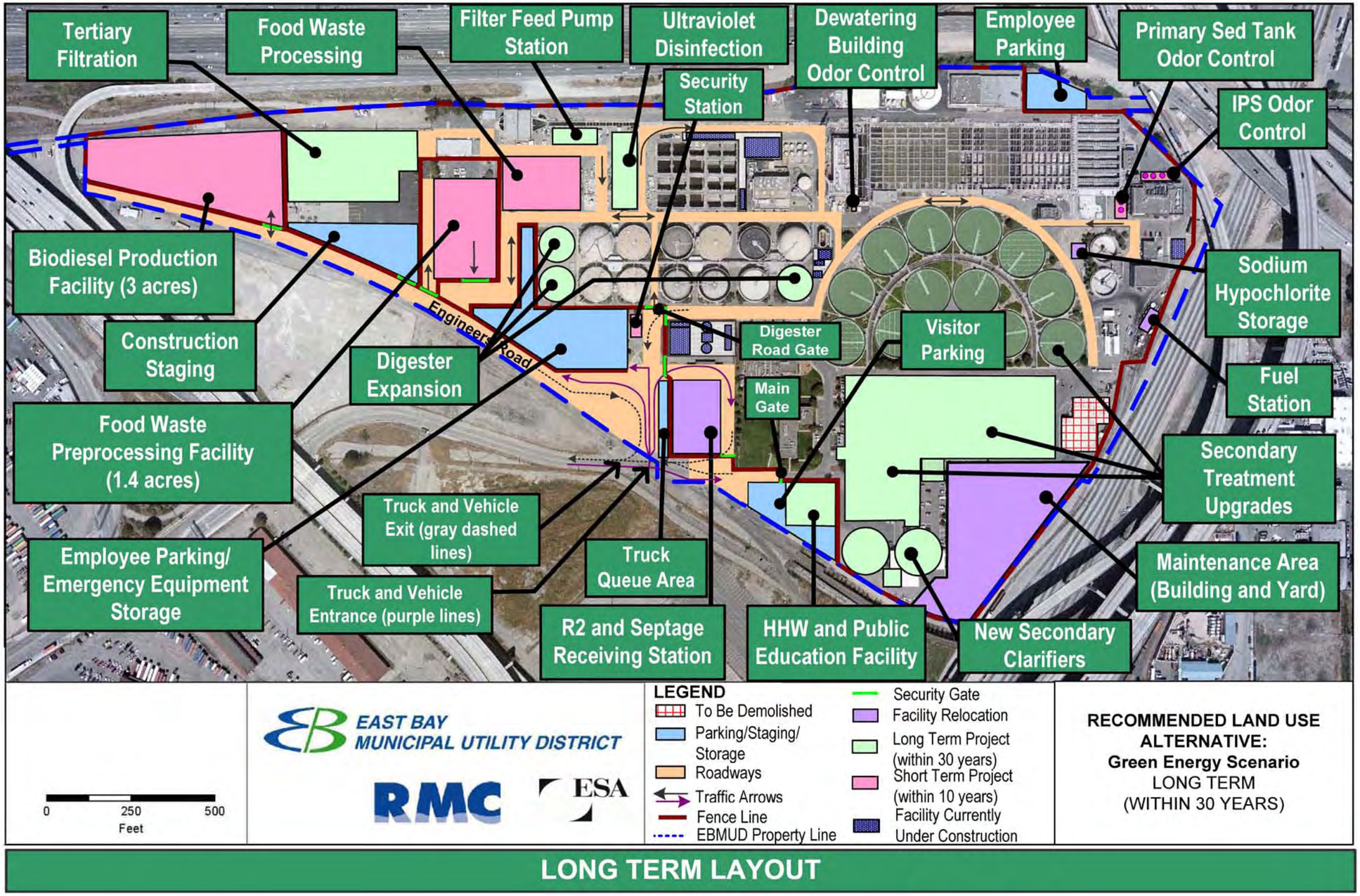

Figure 2-2: MWWTP Recommended Land Use Alternative – Long Term

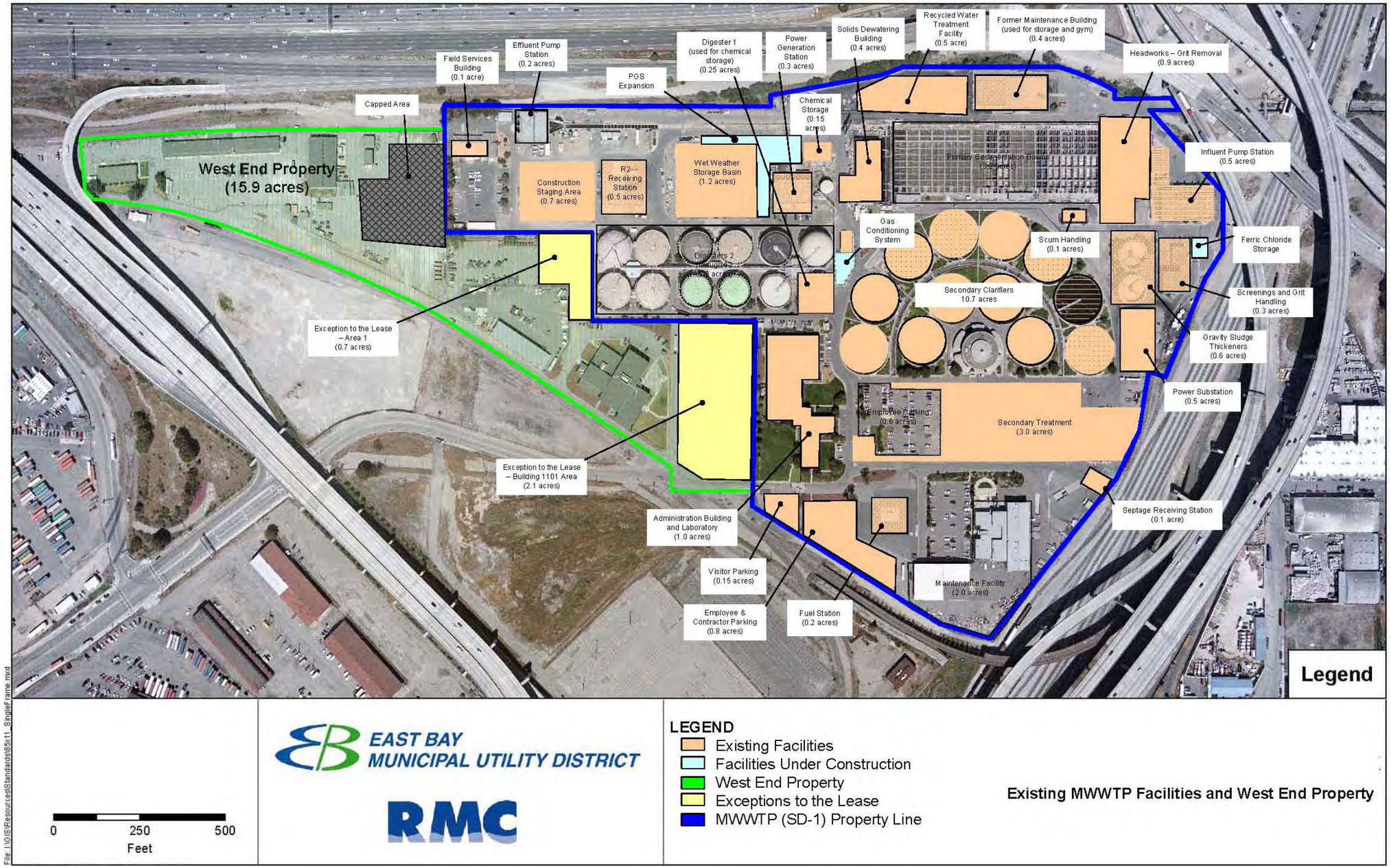

Figure 2-3: Existing MWWTP Facilities and West End Property

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2.2.3 Secondary Treatment

Secondary treatment consists of a biological, high-purity oxygen activated sludge process, followed by circular, peripheral feed secondary clarifiers. The secondary treatment capacity is 168 mgd during wet weather. Primary effluent from the primary sedimentation tanks is combined with biological microorganisms (or "biomass") that are grown and recycled through the secondary treatment process. Oxygen is added and this biomass effectively breaks down and converts organic matter present in the wastewater. The effluent flows from the activated sludge reactor trains to 12 secondary clarifiers where biomass is separated from the treated secondary effluent. A portion of the biomass, called "secondary sludge," is removed for further treatment in the anaerobic digesters.

2.2.4 Digesters

A total of eleven anaerobic digesters are used to stabilize the waste sludges and reduce pathogen content by holding the material at elevated temperatures for greater than 15 days. This process produces a "biosolids" end product that is dewatered and then beneficially reused as either a soil amendment (similar to a fertilizer) on nearby non-edible crop farms or as an alternative daily cover at area landfills. EBMUD has completed the first of three planned upgrades to its anaerobic digesters. The second phase is currently under construction.

2.2.5 Resource Recovery

In 2002, EBMUD began implementing the Resource Recovery (R2) Program to utilize existing capacity at the MWWTP by treating low- and high-strength trucked wastes. Low-strength wastes are off-loaded at the Septage Receiving Station for routing to the headworks (i.e., start of treatment process). Higher strength and/or higher solids wastes are off-loaded at the R2 Receiving Station for direct feed to the anaerobic digesters. This program was implemented in part to provide haulers with an alternative to waste disposal at landfills by providing an option that would use the valuable organic content in these waste streams to produce renewable energy. EBMUD generates revenue to offset operating costs and impacts to ratepayers directly through tipping fees applied to each truck load and indirectly through sales of electricity generated from increased digester gas production in the anaerobic digesters. The R2 Program has successfully helped EBMUD maintain reasonable rates for its rate-payers by making full use of existing wastewater infrastructure and available excess processing capacity.

2.2.6 Power Generation Station

The Power Generation Station (PGS), located north of the digesters, was constructed in 1985. The facility includes three internal combustion engines rated at 2.15 megawatts (MW) each for use with digester gas. Waste heat from PGS is used to maintain elevated temperatures in the anaerobic digesters. Since 2004, the trucked waste program has continued to grow producing enough digester gas to utilize the full capacity of its existing PGS facility, requiring periodic flaring of excess digester gas. On average, PGS produces enough electricity to meet approximately 90 percent of the MWWTP electrical demand. PGS is currently being expanded to include a 4.5-MW gas turbine and a gas conditioning system to treat the biogas for both the engines and the turbine.

2.3 Biodiesel Production Facility

EBMUD is considering siting a biodiesel facility that would be owned and operated by a private company on a portion of the West End property under a land-lease agreement (see **Figure 2-1**). The facility may utilize a variety of oils, including virgin oil from plants (such as soy), yellow grease (from waste cooking oil), or animal fats to produce ASTM quality biodiesel. Glycerin, a byproduct of the biodiesel production process, would be sent to the existing anaerobic digesters at the MWWTP to generate biogas and increase renewable energy production at the MWWTP. The biodiesel produced is a diesel fuel substitute that has much lower particulate matter emissions and can be used by local trucking companies, including those

operating at the Port of Oakland. At the ultimate capacity, the facility would produce 20 million gallons per year (mgy) of biodiesel as well as enough glycerin byproduct to generate approximately 1 additional MW of power, which is enough renewable energy to power 1,500 California households.

2.3.1 Project Purpose

The biodiesel facility would address EBMUD's objective to enhance revenues in order to maintain reasonable rates through the continued growth of successful resource recovery programs that increase renewable energy production and the lease of unused land.

2.3.2 Facilities

The biodiesel production facility would occupy approximately 3 acres and would consist of an office, a quality control laboratory, processing equipment, truck parking, and storage tanks (see **Figure 2-4**). The facility would be located in the northwest corner of the West End property to avoid land availability conflicts with future regulatory-driven projects and provide potential rail access for transport of inputs and products. The facility would initially be designed to produce 5 mgy of biodiesel. It may be expanded to process a maximum of 20 mgy by expanding the building, and adding additional processing equipment and storage tanks. This EIR addresses, at a project level, potential impacts associated with the ultimate, maximum capacity of the biodiesel facility (20 mgy).

Initial facilities would include an outdoor tank storage area and a pre-engineered, corrugated metal building that would be approximately 140 feet by 110 feet with an exterior height of approximately 20 feet. The facility would have permanent exterior lighting for safety and security. Once expanded to the ultimate capacity of 20 mgy, an addition would be added to the north side of the building to approximately double the size. In addition, an existing building on the lease site would be demolished and an additional 40-foot by 100-foot administrative office building would be constructed.

Feedstock receiving, preparation, processing, and equipment maintenance would occur inside the biodiesel production facility buildings. Biodiesel storage, loading, and truck parking would occur outdoors. A distillation column, which could be up to 65 feet tall, may be included in the process facilities. Storage tanks would be required for the feedstock, biodiesel product, glycerin byproduct, methanol, and acid and base catalysts (e.g., sulfuric acid and sodium methoxide). **Table 2-1** lists the individual tank contents, capacity and height for the proposed tank farm for the initial capacity of 5 mgy and the ultimate capacity of 20 mgy.

Table 2-1: Biodiesel Tank Farm (Initial and Ultimate Capacity)

Material	Number of Tanks	Tank Capacity (1,000 gallons)	Height (feet)
Initial Capacity Facility (5 mgy)			
Biodiesel	5	30	30
Glycerin	1	20	20
Oil Feedstocks	6	30	30
Trap Grease Feedstock	2	8	14
Wastewater	1	6	12
Methanol [b]	1	12	8.5[a]
Sulfuric Acid [b]	1	4	12
Sodium Methoxide [b]	1	8	8.5[a]
Additional Storage Required for Ultimate Capacity Facility (20 mgy)			
Biodiesel	4	135	30
Oil Feedstocks	4	150	30

[a] Tanks are horizontal, so height represents tank diameter.
[b] Tanks located inside building

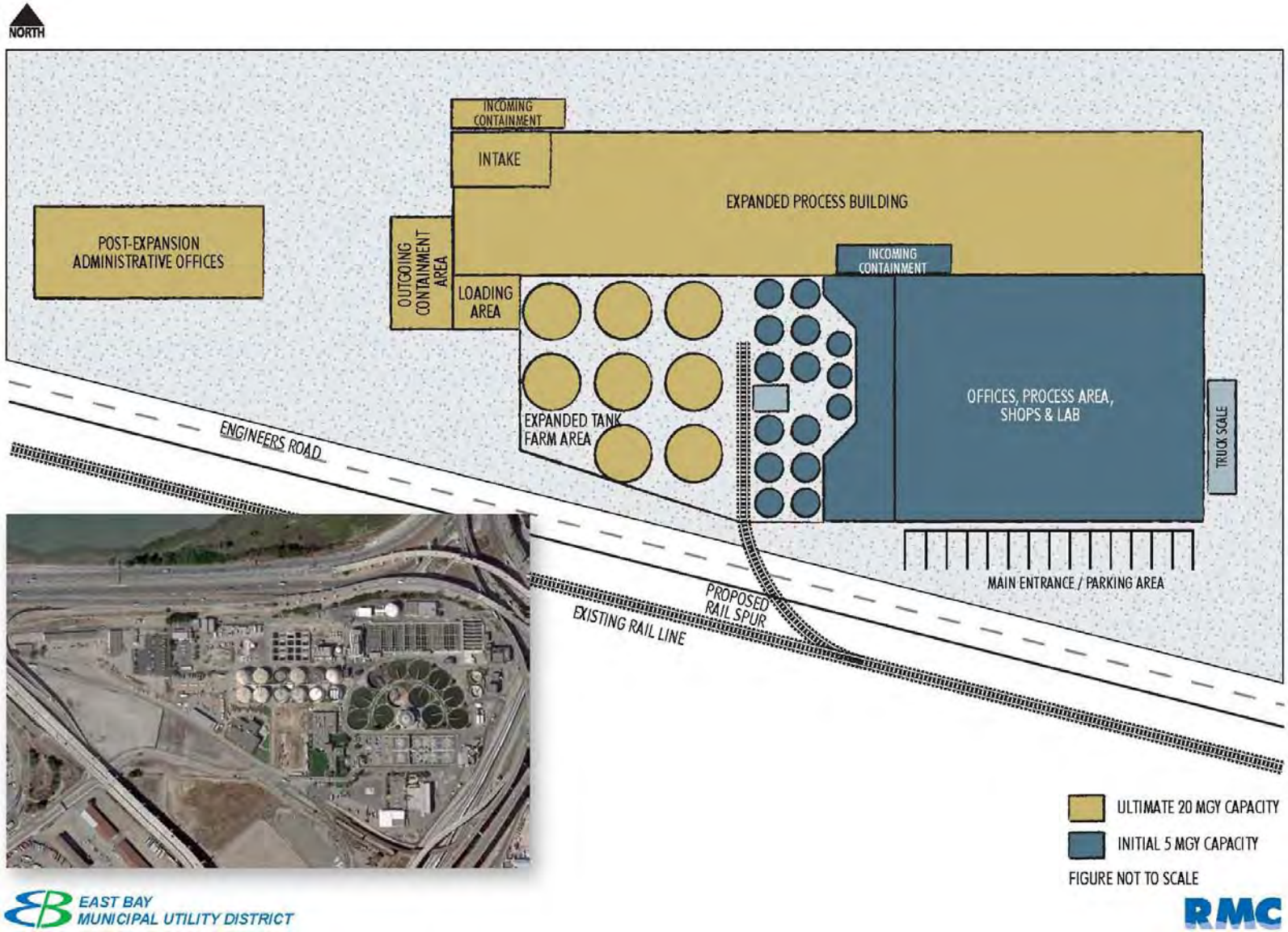

Figure 2-4: Biodiesel Production Facility Preliminary Site Plan

The project may also include construction of a rail spur so that both delivery of materials and conveyance of biodiesel produced could occur by rail. Two tracks with capacity for four rail cars each would be constructed roughly parallel to Engineers Road. Oil feedstocks would be off-loaded from the railcars into the site tankage. Biodiesel would be loaded onto the railcars via a loading rack.

Utilities required to serve the biodiesel production facility would include electrical power, natural gas, potable water supply, wastewater treatment, and stormwater drainage. The ultimate capacity facility would require a 4,000 ampere (amp), 480 Hertz electrical service connection, and would typically use 1,300 kilowatt of electrical power at full production capacity. Natural gas service would be required for process heating and general commercial facility requirements, with an estimated maximum usage of 12 million British Thermal Units per hour (Btu/h). Potable water use would be limited to that required for employee personal needs. Process wastewater from the waste oil pretreatment and acid esterification processes may contain trace amounts of oil, methanol (50 to 150 parts per million [ppm]) and sulfuric acid. Stormwater captured in containment areas would be treated the same as process water. These process wastewaters would be reviewed in accordance with established waste acceptance criteria. If approved for discharge, they would be either trucked or piped for treatment at the MWWTP. All stormwater runoff would be directed to the existing storm drains.

2.3.3 Process Description

Biodiesel is produced through a transesterification reaction between triglycerides in oil and an alcohol (commonly methanol) in the presence of a base catalyst, such as sodium methoxide. Feedstocks include virgin oil from plants (such as soy), yellow grease (from waste cooking oil), or animal fats. Several additional pretreatment steps are also required for production depending on the feedstock. The primary reaction products are biodiesel and glycerin (also referred to as glycerol). The glycerin byproduct, which would likely contain some amount of methanol, soap, biodiesel, and possibly un-reacted oil and water, would be conveyed to the MWWTP for digestion to increase biogas for renewable energy production. Potential waste streams include small volumes of wash water, which would be treated at the MWWTP, and small amounts of spent adsorbent (which is used to remove impurities from biodiesel), which would be sent to a landfill.

The biodiesel production process may include waste oil pretreatment (filtration, drying), acid esterification, transesterification, biodiesel separation and purification, and methanol recovery. The process facilities and tank farm for feedstock and product storage would be constructed by the biodiesel facility owner/operator. **Figure 2-5** shows a simplified process flow diagram of the biodiesel production process.

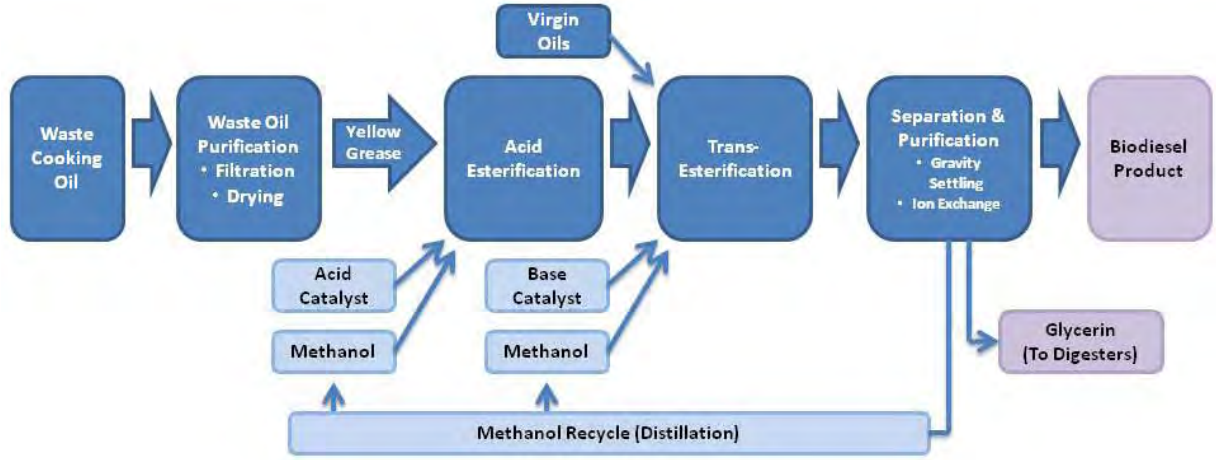

Figure 2-5: Biodiesel Production Facility Flow Diagram

Biodiesel Production Steps

- **Waste Oil Pretreatment** is required to remove moisture and other impurities if waste oil is used as a feedstock. Processes may include filtration, heating, centrifugation and decanting.
- **Acid Esterification** is required prior to transesterification for yellow grease or other non-virgin oils, to convert the free fatty acids to biodiesel. Methanol is reacted with pretreated oil at elevated temperatures in the presence of a strong acid, commonly sulfuric acid.
- **Transesterification** is used to convert triglycerides (the primary constituent of oils) to biodiesel and glycerin. A one- or two-stage chemical reaction may be used. The esterified oil and/or virgin oils are combined with methanol in the presence of a base catalyst such as sodium methoxide. Transesterification occurs at a fixed temperature, pressure, and residence time.
- **Separation** is required to remove the heavy glycerin byproduct from the crude biodiesel product. It may be accomplished by either gravity settling or centrifugation, in which the heavier crude glycerin is separated from the lighter crude biodiesel product. The crude glycerin byproduct would contain some methanol, heavy soaps, and catalyst.
- **Biodiesel Purification** is required to remove any soaps, free glycerin, and residual catalyst. An ion exchange tower may be used, which attracts impurities to the packed resin beads, while the biodiesel passes through the tower. An additional polishing process using an absorbent such as magnesium silicate may be used to remove additional compounds (e.g., sterol glucosides and monoglycerides) that may adversely affect engine performance.
- **Methanol Recovery** is used to recover the excess methanol and recycle it back into the process, leading to savings on chemical costs and eliminating disposal requirements. It is recovered for reuse from the biodiesel and/or the glycerin byproduct through a distillation process.

Auxilliary Processes

- **Air Emissions Control** is used to eliminate discharges of any of the chemicals used in the process. All reactors and tanks would be either enclosed or vented to exhaust air handling equipment with an activated carbon filtration system to remove odors and volatile organic compounds (VOCs).
- **Heating** is required for the reactors and would be generated by a natural gas fired boiler.

2.3.4 Operations

Table 2-2 summarizes estimated gallons per day (gpd) of feedstock use and biodiesel produced at the ultimate facility capacity of 20 mgy. **Table 2-3** provides a summary of existing and future biogas production and power generation resulting from implementation of the biodiesel production facility. Once the EBMUD PGS Renewable Energy Expansion Project is complete (scheduled for 2011), there will be sufficient permitted capacity to utilize all additional biogas from the anaerobic digestion of the glycerin byproduct.

Table 2-2: Maximum Daily Material Inputs and Outputs for Biodiesel Production (20-mgy Facility at Peak Output)

Material	Quantity (gpd)
Feedstock use	68,000
Biodiesel production	55,600
Glycerin byproduct to be conveyed to EBMUD digesters[a]	14,400
Process associated wastewater to be treated at MWWTP[b]	7,000

[a] Maximum daily glycerin byproduct (i.e., crude glycerin) production.

[b] The wastewater total does not include stormwater run off from the 3-acre site.

Table 2-3: Existing and Future Biogas Production and Power Generation

Category	Scenario	Existing Facility	With Implementation of Food Waste Phase 2 Project	Future Facility With Proposed Biodiesel Facility at Ultimate Capacity [a]
Liquid (gpd)	Glycerin byproduct	0	0	5,500
Gas (scfm[b])	Biogas production from glycerin byproduct	0	0	300
	Biogas production from municipal solids and R2 waste	2,000	2,900	3,200
Power (MW)	Equivalent power production for total biogas	5.7	8.3	9.1
	MWWTP Power Generation Capacity	6.5	6.5	6.5
	PGS 2 future capacity with 1 turbine	11.0	11.0	11.0
	PGS 2 future capacity with 2 turbines	15.5	15.5	15.5

[a] Future conditions figures assume implementation of the Food Waste Phase 2 Project.

[b] Scfm = standard cubic feet per minute

Note: All values are based on average operating conditions. Peak values may exceed these.

The total processing time ranges from approximately 40 to 120 hours. In order to ensure adequate supplies are available, up to a ten-day supply of feedstock and reagents would be stored on site. Up to a 10-day supply of biodiesel product and up to a 5-day supply of glycerin byproduct would be stored on site. Glycerin byproduct, along with any other residual oil materials suitable for anaerobic digestion, would be conveyed to the existing EBMUD digesters either by truck or by enclosed pipeline.

The biodiesel production process occurs within a sealed system. All tank vents would be connected to an exhaust air system to allow vent gases to be accumulated and condensed for methanol recovery and reuse. Exhaust air from within the building would be passed through a pre-filter to remove particulates, followed by activated carbon to capture VOCs and odors. All tanks would be double walled or have secondary containment. Pressure relief valves would have activated carbon filters to capture any trace VOCs and odors. All loading areas would have secondary containment. Containment area drains would be routed through in-ground oil/water separators. As described above, wastewater would be reviewed in accordance with established waste acceptance criteria and disposed of as appropriate.

Materials Transport

Materials would be transported into and out of the site by truck or a combination of truck and rail if a rail spur can be obtained. Trucks furnishing feedstocks and reagents may arrive at any time, but would mostly operate between the hours of 5:00 a.m. and 6:00 p.m. For the 20 mgy facility, an average of approximately nine trucks per day plus either 19 additional trucks or five railcars per day would deliver feedstock and reagents to the site and transport biodiesel from the site (see **Table 2-4**). Incoming and outgoing vehicles would be a combination of 2,200-gallon and 6,000-gallon tanker trucks and/or 24,000-gallon railcars.

For the 20-mgy facility, oil deliveries of up to 68,000 gpd would require approximately eight local truck deliveries per day in addition to either two railcars or nine tanker truck deliveries per day. The facility would offload up to 55,600 gallons of biodiesel per day which would be hauled by up to three railcars or ten tanker trucks per day. Other chemicals for the biodiesel production process (methanol, sodium methoxide, sulfuric acid, magnesium silicate, and boiler fuel) would require fewer than one truck per day (an average of 17 trucks and one to two railcar deliveries per month). Glycerin byproduct, if transported by truck rather than enclosed pipeline, would require up to three additional trucks per day. Other truck

deliveries associated with the biodiesel facility would not occur daily. The digestion of glycerin would produce approximately two tons per day of additional biosolids, equivalent to one additional truck load every 12.5 days or an additional 30 truck loads per year. Additionally, natural calcium bentonite, used as a polishing filter, would be brought in and the spent product trucked via waste hauler to a landfill at a rate of approximately 13 tons per month, requiring two additional trucks per month for delivery and disposal.

Table 2-4: Anticipated Truck and Rail Numbers for Biodiesel Production – 20-mgy Facility

	NO RAIL	WITH RAIL	
Source	**Max Daily Trucks without Rail**	**Max Daily Trucks with Rail**	**Avg Daily Rail Trips**
Feedstock oil delivery	17	8	2
Biodiesel product	10	0	3
Methanol delivery	1.4	0	<0.1 [b]
Chemical deliveries	0.9 [a]	0.6	
Glycerin to existing EBMUD digesters	3	3	
Calcium bentonite from supplier and to landfill	<0.1 [c]	<0.1 [c]	
Biosolids produced by glycerin digestion	<0.1[d]	<0.1[d]	
Total	**32.5**	**11.8**	**5**

[a] Trucked chemical deliveries include sodium methoxide, sulfuric acid, magnesium silicate, and boiler fuel.

[b] Rail deliveries for methanol would average one to two per month.

[c] Trucks would average about two per month.

[d] Trucks would average 2.5 per month.

2.3.5 Construction Activities

Construction of the proposed biodiesel facility would be expected to begin in the fall of 2011 and be complete by the spring of 2012. All staging and construction parking would occur at the far western end of the proposed site on the West End property; the area directly adjacent to the project site would be left intact for future parking and office space. Construction would require site grading to remove the existing asphalt surfaces and about 1,500 cubic yards of soil, requiring up to 75 trucks, each making a roundtrip. Soil would be scraped to a level of 14 to 18 inches below grade with subsurface trenching below that. Piles would be driven in the area where the equipment and tank farm would be located. Sand and gravel would be placed and then an approximately 2- to 2.5-foot thick reinforced concrete slab would be placed over the pile layout. Equipment for the plant would be placed on the slab. The pre-engineered metal building would be installed around the process equipment. Soil removal would be handled in accordance with a soil management plan, which would address existing soil contamination on the West End property.

Construction would involve the following equipment:

- Backhoe for asphalt removal and loading, and for soils removal
- 10-yard end dumps for off-haul of debris, and for sand and gravel delivery
- Boom crane for building erection and placement of equipment
- Roller compactor for soil preparation
- Roller tire boom truck for form and rebar setting
- Concrete trucks and pumps for placement of slab
- 18-wheel flatbed for building and equipment delivery
- Pile driver for piles

Truck traffic for off-hauling, equipment deliveries, and material deliveries would access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via

Wake Avenue and down Engineers Road. No project-related truck traffic would occur on local streets. Construction workers would utilize on-site parking, there would be no need for off-site parking.

2.4 Food Waste Preprocessing Facility

EBMUD is considering siting a food waste preprocessing facility that would be owned and operated by one or more private companies on a portion of the existing MWWTP and West End property (the site would straddle the former boundary between the two properties) under a land-lease agreement (refer to **Figure 2-1**). EBMUD has an existing food waste processing facility, which was recently approved for expansion to process up to 250 tons per day (tpd) of preprocessed food waste. Currently, food waste is collected, and in some cases, preprocessed, to remove material that is not readily digestible at a combination of facilities located in the greater San Francisco Bay Area, including but not limited to facilities in Vacaville, San Carlos, and Martinez. With the construction of a food waste preprocessing facility at the MWWTP, organics-rich waste would be delivered directly to the MWWTP to be preprocessed to improve process efficiency and material consistency. This material would then be conveyed to the existing EBMUD Food Waste Facility. Non-digestible material separated from food waste during preprocessing would be transported off site for further processing at a compost facility.

Siting the preprocessing facility adjacent to the existing EBMUD Food Waste Facility (which is located close to the West End property boundary) would assist expansion of the EBMUD food waste program to reach its planned capacity of 250 tpd. Locating these food waste facilities at the same site would help support a sustainable, long-term approach to continued on-site renewable energy production. Locally-generated food waste would not need to be sent to more distant locations for preprocessing. Processing of all incoming raw material through an on-site facility also ensures that a higher and more consistent quality of food waste feedstock is generated for use at the EBMUD facility. Food waste digestion is an important component of EBMUD's renewable energy generation program. At the ultimate capacity, the food waste associated with this project would generate approximately 2.5 MW of power, which is enough renewable electricity to power 3,700 California households. In addition, digestion of food waste would assist local Bay Area cities and counties in meeting landfill waste diversion goals. It would also reduce greenhouse gas (GHG) production by turning food waste into electricity rather than sending this material to landfills where it would degrade and release methane (a highly potent GHG). Methane produced through anaerobic digestion would instead be captured, used for electricity production and emitted as carbon dioxide, which has a global warming potential that is 20 times less than methane.

2.4.1 Project Purpose

The food waste preprocessing facility would address EBMUD's objective to enhance revenues in order to maintain reasonable rates through the continued growth of successful resource recovery programs that increase renewable energy production and the lease of unused land. This project also meets environmental stewardship objectives by diverting organic material from landfills for recycling and green energy production. By locating the food waste preprocessing facility close to the food waste processing facility at the EBMUD MWWTP, greater process efficiency may be achieved.

2.4.2 Facilities

A food waste preprocessing building, ancillary facilities (such as utility connections), processing systems, and office space would occupy approximately 1.4 acres of land on the West End property, directly northwest of the existing digesters (see **Figure 2-1**). All waste receipt, processing, and loading for disposal would be conducted indoors. An adjacent paved area would be used for truck maneuvering. The initial phase of the project would accept between 200 and 300 tpd of incoming raw material to produce approximately 125 tpd of preprocessed material for treatment at the existing food waste facility. The preprocessing building would be approximately 29,000 square feet, of steel-frame construction with an interior height of 30 feet and an exterior height of up to 40 feet. The structure would be designed to be consistent with surrounding wastewater treatment buildings. Both interior and exterior lighting would be

incorporated. The building would be equipped with code-compliant security systems for fire and intruder alarms.

Full build-out of the facility would double capacity to accept between 400 and 600 tpd of incoming raw material to produce up to 250 tpd of preprocessed material for delivery to the existing Food Waste Processing Facility. The building would be expanded to accommodate a second parallel processing train within the same 1.4-acre footprint. Building material removed for the expansion would be reused to the extent practicable. The expanded building would be approximately 58,000 square feet. Depending on market conditions at the time of the initial construction phase, the larger building (with either one or two processing trains) may be constructed immediately upon completion of environmental review. This EIR addresses, at a project level, potential impacts associated with the ultimate capacity of the preprocessing facility, assuming the larger building, two processing trains, and a maximum acceptance of 600 tpd of raw material.

Utilities required to serve the food waste preprocessing facility would include electrical power, potable and process water supply and a sewer connection. Electrical loads for the preprocessing facility would require 2,000-amp incoming service (480 volt, 3 phase, 60 hertz) for equipment, lighting and scales. The peak electric demand would be 1,600 amps. A small amount of potable water use would be required for employee personal needs. An additional 2,500 gpd would be required for facility and equipment washdown, in order to clean up any free liquids associated with the receipt and processing of incoming food wastes as well to keep equipment clean and sanitary. If possible and cost-effective, non-potable water (i.e., recycled water produced at the MWWTP) would be used for washdown.

2.4.3 Process

Figure 2-6 shows a preliminary site plan for the food waste preprocessing facility. Organics-rich waste would be delivered to the facility via enclosed (tarp-covered, leak-proof) trucks, where it would be screened and ground. The fully-enclosed building would house a feed hopper, trommel screen, high-speed grinder, a system of conveyor belts for materials transport, and an optional shredder. All waste receiving, processing, and loading activities would occur indoors. The facility would preprocess the incoming organics-rich feedstock so that it contains a minimal amount of non-digestible material and is broken down to a suitable size to be effectively processed at the existing food waste facility and ultimately degraded in the anaerobic digesters.

All material would be processed through a trommel screen, where items greater than the screen opening size would continue along a belt conveyor for further processing off-site and material passing through the screen would be ground for delivery to the food waste facility. A magnet fixed above the grinder would collect and separate out ferrous metal objects, such as silverware. A shredder may be used upstream of the trommel screen to break material up prior to screening. The preprocessed material would be conveyed to the food waste facility one of three ways: by truck, by mechanical conveyor, or slurried and pumped through an enclosed pipeline. If by truck, all loading of the materials would be conducted inside the building. Oversized material (i.e., material larger than the screen size) and other process rejects would be trucked off site for further processing at a composting facility. Organic materials would be composted; non-compostable materials resulting from the further processing at the compost facility (such as plates, silverware, plastic) would be landfilled.

Certain incoming food waste streams (e.g., from restaurants) may have some liquids separated in transit when delivered. Although the remaining body of material would absorb most of the liquids as soon as they are mixed together again, any liquid residuals that are not incorporated would be collected. Process liquids and washdown waters would either be captured for transport to the food waste facility (for anaerobic digestion) or directed to the sanitary sewer for treatment at the MWWTP headworks. Discharges would be reviewed in accordance with established waste acceptance criteria. Stormwater runoff from the site that resides within the existing MWWTP footprint would be collected and directed to the MWWTP headworks, consistent with treatment of stormwater runoff from the existing MWWTP site.

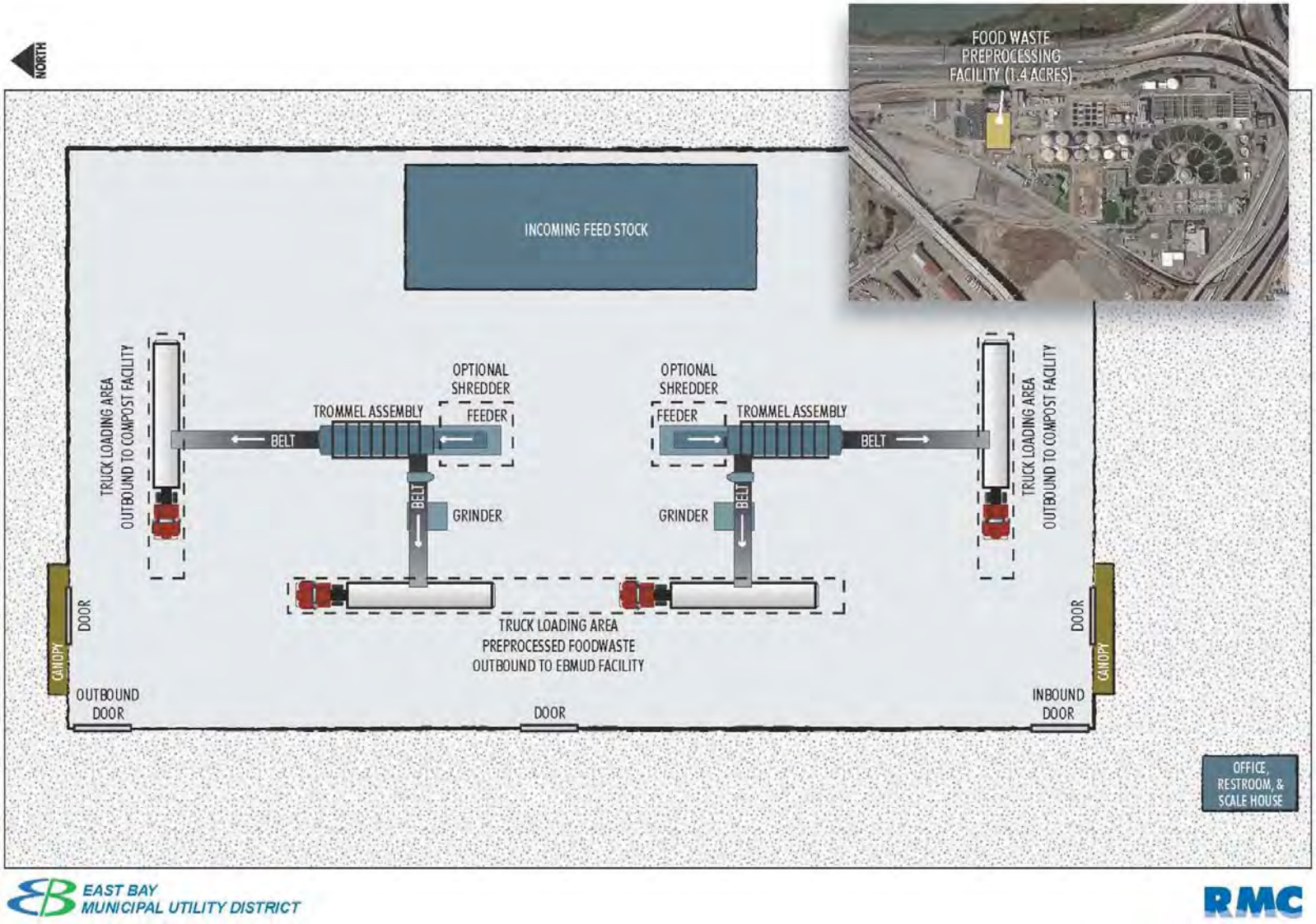

Figure 2-6: Food Waste Preprocessing Facility Preliminary Site Plan

Stormwater runoff from the West End property portion of the site would be collected and directed to the existing storm drains.

2.4.4 Operations

Daily maximum material throughput at the food waste preprocessing operation is summarized in **Table 2-5**. The system is capable of processing up to 45 tons per hour per process line. The system would operate on a "first-in/first out" basis to minimize the residence time of any unprocessed food materials or post processing materials.

Table 2-5: Daily Material Flows for Food Waste Preprocessing (Ultimate, Maximum Capacity)

Material	Quantity (tpd)
Incoming organics-rich material	600
Preprocessed food waste to EBMUD Food Waste Processing Facility	250
Oversized reject material to off-site compost facility	350

The following is an overview of the proposed process equipment. All equipment would be specified to comply with the United States Environmental Protection Agency (USEPA) noise standards.

- Trommel screen with feed hopper and collection conveyer, including full top covers with drum cleaning brush assemblies and perforated plates;
- Grinder with overhead permanent magnet in feed conveyer;
- High-speed grinder;
- Grinder discharge conveyer;
- Oversized reject material conveyer;
- Motor starter/control panel with approximate 600-amp, 3-phase, 460-volt incoming circuit breaker and motor starters;
- Front loaders;
- Tractor/trailer combinations, either possum belly type or end dump;
- Optional incoming material shredder (200 horsepower); and
- Optional 36-inch transfer conveyor to send processed material to food waste facility.

The preprocessing facility would be ventilated to protect human health and safety from rolling stock, mobile equipment, and truck exhaust. The building would be designed with natural ventilation, including standard roof vents and interior fans. Odors would be controlled by avoiding their creation through proper material management and meticulous housekeeping practices. Inventory would be kept moving in and out of the facility within 48 to 72 hours of receipt. In addition to other best management practices, any malodorous waste would be prioritized for processing to limit potential odors.

Materials Transport

It is anticipated that the organics-rich materials would be transported to the preprocessing facility from the surrounding communities in the Bay Area. Truck deliveries and processing of food waste would occur up to 24 hours per day, seven days per week. This schedule would allow flexible timing of deliveries to minimize travel time, and allow sufficient storage of material at the facility to optimize the efficiency of feedstock processing (i.e., to ensure sufficient unprocessed material is available at all times). Inbound trucks are likely to arrive between 3 a.m. and 12 p.m. Monday through Saturday, at an estimated rate of six to eight trucks per hour and between 12 p.m. and 3 p.m., Monday through Saturday, at an estimated rate of up to four trucks per hour. Additional loads may arrive at any time, but are likely to be delivered intermittently between 3 p.m. and 3 a.m.. Outbound trucks with the rejected materials for

further processing would leave the site between 5 a.m. and 4 p.m. on a steady basis as the truck drivers dedicated to the project would drive a loop to the compost operation and return.

A total of approximately 76 trucks per day delivering organics-rich material and taking away non-digestible material would be required at peak capacity (see **Table 2-6**).

Table 2-6: Anticipated Waste Sources, Truck Routes, and Delivery Assumptions for Food Waste Preprocessing

Source	Current Truck Routes Serving Food Waste	Proposed Truck Routes Serving Food Waste	Roundtrip Truck Deliveries with Implementation of Proposed Project		
			Assumptions	Per day	Per year
San Francisco County	Currently sent to San Francisco for consolidation, then to Vacaville composting/preprocessing facility. Processed materials are back hauled to MWWTP.	Sent directly from San Francisco to MWWTP by transfer trailer. Direct haul may occur from San Francisco by packer vehicle, but this is expected to be minimal.	70% transfer trucks/ 30% route trucks	15	5,460
Alameda County	Currently sent to Gilroy and Vacaville for composting/ preprocessing and to Altamont Landfill for land disposal.	Sent directly from Alameda County to the MWWTP, either by packer or transfer vehicle.	40% transfer trucks/ 60% route trucks	19	6,916
Contra Costa County	Currently sent to Martinez for preprocessing and back haul to MWWTP, and to Keller Canyon Landfill for land disposal.	Hauled to Martinez transfer facility and then to MWWTP, most likely by transfer vehicle.	80% transfer trucks/ 20% route trucks	7	2,548
San Mateo County	Currently sent to San Carlos for preprocessing and back haul to MWWTP, and to Ox Mountain in Half Moon Bay for land disposal.	Sent directly from San Carlos to MWWTP for further processing.	100% transfer trucks	5	1,820
Processed material to existing EBMUD Food Waste Processing Facility			Within MWWTP property only	10	3,640
Processing rejects to composting facility in Vacaville			100% outbound transfer trucks	20	7,280
Total				**76**	**27,664**

2.4.5 Construction Activities

Construction of the food waste preprocessing facility would be expected to begin by the spring or summer of 2012, and would take 14 to 16 months to complete, with start up in the summer or fall of 2013. Construction equipment staging and construction parking would occur adjacent to the proposed site, on the asphalt-capped area. Construction may involve site grading of up to 2 feet on half of the area (0.75 acres) requiring up to 2,500 cy of fill, which would be brought in by approximately 130 trucks, each making a roundtrip during the construction period. Soil removal would be handled in accordance with a soil management plan, which would address existing soil contamination on the West End property.

Construction materials would be brought onto the site by truck. The basic building would be a “Butler-type” building (steel frame and attached exterior with 3-foot wall from ground level), consistent with applicable seismic design criteria. There would be some site preparation work including grubbing, installation of footings, and grading to eliminate different grades on site. Appropriate supports to ensure

structural integrity of the building and ensure its seismic safety would be included. Interior construction would be done so as to provide an adequate structural support for all operating equipment and a smoothly functioning operating system. Parking areas would be paved.

Construction would involve the following equipment and machinery:

- Backhoe, excavator, and bulldozer for asphalt removal and loading, and for soils removal
- 10-yard end dumps for off-haul of debris, sand and gravel delivery
- Boom crane for building erection and placement of equipment
- Roller compactor for soil preparation
- Roller tire boom truck for form and rebar setting
- Concrete trucks and pumps for placement of slab
- 18-wheel flatbed for building and equipment delivery
- Miscellaneous hand and power tools

Truck traffic for off-hauling, equipment deliveries, and materials deliveries would access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. No project-related truck traffic would occur on local streets. Construction workers would utilize on-site parking: there would be no need for off-site parking.

2.5 Land Use Master Plan

In addition to the biodiesel and food waste preprocessing projects, the Land Use Master Plan has identified eleven other plan elements with potential for implementation at the MWWTP. These eleven plan elements are described below, along with the estimated acreage requirements for each, the preferred site locations, the key project drivers (e.g., regulatory, revenue enhancement), and the estimated timeframe for implementation. Two layouts are developed, the short-term layout, which includes projects that may be implemented within 10 years and a long-term layout, which includes projects that may be implemented within 30 years. As shown in **Figure 2-2** the Land Use Master Plan would likely entail some demolition of existing buildings at the MWWTP. The elements of the Land Use Master Plan, as they appear in the long-term layout are evaluated in this Draft EIR at a program level.

2.5.1 Plan Elements

The long-term layout for the Land Use Master Plan includes biodiesel and food waste preprocessing as well as eleven other plan elements, described here. Estimated land area needs are shown in parentheses in acres (ac).

Odor Control (0.2 ac)

This plan element encompasses several small parcels of land for odor control upgrades for the IPS, primary sedimentation tanks, Solids Dewatering Building, and R2 Receiving Station. The odor control equipment would be sited close to the facility that it serves. It is anticipated that the projects would be undertaken as necessary to enhance community relations and address regulatory needs. It is estimated that 0.2 acres are required and the individual estimates on facility timelines range from three to five years, to more than 10 years in the future.

Food Waste Processing (0.8 ac)

This plan element would relocate and convert the existing EBMUD Food Waste Facility to an advanced processing facility to receive preprocessed food waste, slurry, and remove grit and other contaminants prior to feeding to the digesters. This 0.8-acre facility may be implemented in the near term, within 10 years. It would be sited near the proposed food waste preprocessing facility and the digesters.

Emergency Response Equipment Storage (0.3 ac)

This plan element would provide 0.3 acres for the storage of emergency response equipment (e.g., portable pumps, generators, hoses and piping) to allow continued conveyance and treatment of wastewater when normal treatment or conveyance facilities are not operational (e.g., due to severe earthquake). EBMUD is planning to implement near-term improvements for emergency equipment storage. The storage area would be sited close to Wake Avenue for better access to wastewater interceptors and remote pumping facilities.

Secondary Treatment Upgrade for Nutrient Removal (4.7 ac)

If a future EBMUD NPDES permit were to include limits on effluent ammonia, the secondary treatment system would need to be upgraded for nitrification. This plan element includes converting and enlarging the existing high-purity oxygen activated sludge plant to air activated sludge with an enhanced biological process (which would require construction of two new concrete basins) and constructing two additional secondary clarifiers. The 4.7-acre footprint includes space for the activated sludge process, the aeration building, two additional center-feed secondary clarifiers and expansion of the return activated sludge/waste activated sludge (RAS/WAS) pump station. To make the best use of existing equipment and piping as well as to preserve the areas allocated for liquid stream processes, the secondary treatment upgrade would be sited as close to the existing secondary process as possible. Expanding the facility in its current location would require relocation of the maintenance yard and fuel station. Because this plan element is driven by the potential for future regulatory requirements that may be many years in the future; the facility is only included in the long-term layout.

Ultraviolet Disinfection (0.4 ac)

This plan element would replace existing chlorination and dechlorination facilities with ultraviolet (UV) disinfection. The 0.4-acre footprint is based on sizing a system to treat peak wet weather flows of 320 mgd during blending. It includes a blending basin to combine tertiary effluent and primary effluent during wet weather events, and to split flow to the UV disinfection channels. It is assumed that for UV disinfection to be technically and economically feasible, secondary effluent must be filtered prior to disinfection (see *Tertiary Treatment Facility*, below). Even with the provision of tertiary treatment, however, the technical and economic feasibility of converting to UV disinfection is uncertain. Additionally, providing UV disinfection capacity for peak wet weather flows of 320 mgd may not be cost effective due to the infrequency of peak wet weather events. UV disinfection would provide the benefit of completely eliminating the need for the chlorination and dechlorination facilities. A more technically feasible and cost effective scenario would be to provide UV disinfection for the average dry weather flows and maintain the chlorination and dechlorination facilities to treat wet weather flows. However, in order to provide a more conservative footprint, it is assumed for the purposes of the Land Use Master Plan that UV disinfection of peak wet weather flows is both cost effective and technically feasible.

To maintain process continuity and reuse existing facilities, the UV disinfection facility would be sited adjacent to the secondary effluent channel. Although there may be operational efficiency drivers, the main driver would be future regulatory requirements that significantly favor or require UV disinfection, which may be many years in the future, therefore the facility is only included in the long-term layout.

Tertiary Treatment Facility (2.4 ac)

This plan element would provide a facility for tertiary treatment (i.e., granular media filtration) of secondary effluent. The land requirement of 2.4 acres includes ancillary facilities (e.g., backwash tanks, filter feed pump station, and backwash pumps and equipment). The facility would treat secondary effluent (168 mgd capacity) minus the 2 mgd in flows that are diverted to the East Bayshore Recycled Water Facility, which already receive tertiary treatment. The tertiary treatment facilities are thus sized to accommodate peak flows of 166 mgd.

To maintain continuity of the existing liquid treatment process train, the tertiary treatment facility would be sited near the effluent channel, on the northern side of the MWWTP site. As a regulatory-driven facility expected to be many years in the future, this facility only appears in the long-term layout.

Digester Expansion (1.0 ac)

Digester capacity would be expanded to treat additional waste streams and to provide adequate redundancy for improved facility operation. This plan element includes up to three new, egg-shaped digesters that would be on the order of 65 feet above grade. It is assumed that one digester would be located in the area of former Digester No. 1 (currently used for sodium hypochlorite storage). Sodium hypochlorite storage, if still necessary, would be relocated to an area northeast of the existing clarifiers. The other two new digesters would be located adjacent and to the west of the existing digesters. A total of approximately 1.0 acres would be required. The diameter of the digesters was assumed to be the same as the existing digesters. Currently, the existing digesters provide sufficient capacity for the planned solids loading; therefore, this facility is only included in the long-term layout. With or without expansion of digester capacity, piping modifications may be undertaken in order to separate the digestion of food wastes and other high strength wastes from wastewater solids.

Temporary Land Lease (as available)

Land leases of varying durations could be negotiated to generate revenue to help minimize wastewater rate increases, while reserving land for future needs in the short and long term. The specific locations and timeframe for implementation depend on land availability and uses designated for other projects and plan elements. Unlike the food waste preprocessing and biodiesel production projects, which are also land leases, this plan element refers to shorter-term, low-capital commitment leases for activities without any relation to MWWTP processes. Examples include Port of Oakland-related container storage, vehicle parking, or equipment storage. Lease contracts would allow EBMUD to reclaim the land with little notice or penalty, in order to provide maximum future flexibility for alternative demands and uses. As a result, it is expected that tenants would not invest in any significant land improvements or facility construction.

Household Hazardous Waste Collection Facility (0.4 ac)

This plan element would provide a public facility for disposal of household hazardous waste from the local community to reduce pollutant discharges to the sanitary sewer system. The 0.4-acre facility could be sited in a number of different locations. In order to provide convenient and safe public access, it would be located near the MWWTP fenceline, out of the way of heavy truck traffic, and adjacent to on-site parking.

Bay Stewardship Exhibit/Public Education Facility (0.3 ac)

This plan element would provide an exhibit and public education facility to showcase and educate the public on stewardship of San Francisco Bay. It would contribute to EBMUD's ongoing efforts in environmental stewardship. The 0.3-acre facility could be sited in a number of different locations. In order to provide convenient and safe public access, it would be located near the MWWTP fenceline, out of the way of heavy truck traffic, and adjacent to on-site parking.

Relocation of Septage and R2 Receiving Stations (0.8 ac)

In order to reduce the impact of truck traffic within the MWWTP and improve safety, the Septage Receiving Station and the R2 Receiving Station would be relocated closer to the front entrance of the MWWTP. The 0.8-acre facility could be located anywhere along Engineers Road to provide convenient access from Wake Avenue.

2.5.2 Circulation Improvements

In addition to the specific projects described above, as part of the overall Land Use Master Plan, EBMUD anticipates improving traffic circulation within the MWWTP. Improvements would include

establishment of a truck queue area within the MWWTP, so that trucks would not need to line up off-site. The circulation improvements would require relocation of the existing security station.

2.5.3 Short-Term Layout

Figure 2-1 shows projects considered for implementation in the short term, defined as within approximately the next 10 years. Included are the biodiesel production facility, the food waste preprocessing facility, relocation of the existing food waste facility, odor control facilities, space for employee parking, visitor parking and emergency equipment storage, temporary land lease, and the three approved projects currently planned or in construction. The locations for each of the new facilities were selected to avoid conflicts with future regulatory-driven wastewater treatment process infrastructure that may be implemented in the longer term. In order to improve traffic routing to the various facilities, Engineers Road would be widened to three lanes, which would require demolition of two buildings on the West End property.

2.5.4 Long-Term Layout

In the long term, defined as within approximately the next 30 years, there are a number of regulatory-driven projects that could be implemented. A long-term layout was developed to determine appropriate locations for all of these projects (**Figure 2-2**). Siting of long-term, regulatory-driven projects was based on maintaining continuity with existing solids and liquids process layouts and alignment at the MWWTP, while minimizing demolition of existing facilities and buildings. Costs and implementation schedules were not considered. Instead, it was assumed that all projects identified above would be implemented sometime within 30 years. This EIR addresses the impacts associated with the long-term layout, assuming all projects are implemented. However, it is possible that the facilities included in the long-term layout may not be implemented or may be implemented outside the 30-year timeframe. Over time, it is expected that all of the existing buildings on the West End property would be demolished to allow construction of wastewater facilities, such as those identified in **Figure 2-2**.

2.6 Environmental Commitments

The standard EBMUD construction specifications contain safety and environmental requirements that would be implemented during construction to ensure that the biodiesel and food waste preprocessing projects and future facilities constructed as part of the Land Use Master Plan would be completed in accordance with EBMUD policies to minimize environmental impacts from construction. Applicable measures from Sections 013524 (Project Safety Requirements) and 013544 (Environmental Requirements) of EBMUD standard construction specifications are summarized below, along with other environmental commitments that would be implemented for all elements of the Land Use Master Plan, including the biodiesel and food waste preprocessing facilities.

2.6.1 Aesthetics

Construction Site Management

Throughout the period of demolition and construction, EBMUD would require the construction contractor to keep the work site free and clear of all rubbish and debris, and to promptly remove from the site, or from property adjacent to the site of the work, all unused and rejected materials, surplus earth, concrete, plaster, and debris.

The construction specifications require that when construction is completed excess materials or debris shall be removed from the work area (Section 013544-1.1 (B)).

2.6.2 Air Quality

Dust Control and Monitoring Plan

EBMUD's Construction Specifications require development of a Dust Control and Monitoring Plan in order to control construction-related dust (Section 013544-1.3(E)). The plan shall detail the means and methods for controlling and monitoring dust generated by construction activities, as well as measures for the control of paint overspray generated during the painting of exterior surfaces.

Equipment and Vehicle Idling

Section 2485, Title 13, CCR requires limiting the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds, both California- and non-California-based trucks) to five minutes at any location.

2.6.3 Hazardous Materials / Hydrology and Water Quality

Notification of Hazardous Materials

EBMUD's Construction Specifications General Conditions, Article 7.6.1, requires that "Pursuant to Public Contract Code Section 7104, the Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of: (1) Material that the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is not indicated in the Contract Documents and that is required by law to be removed to a Class I, Class II, or Class III disposal site; (2) Subsurface or latent physical conditions at the site differing materially from those indicated in this contract; or (3) Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract."

Project Safety and Health Plan

EBMUD's Construction Specifications require a Project Safety and Health Plan (013524-1.3(B)) if actual, potential, or anticipated hazards include: a) hazardous substances; b) fall protection issues; c) confined spaces; d) trenches or excavations; or, e) lockout/tagout. The Plan shall detail measures to be taken to alleviate the identified risks, identify appropriate health and safety requirements, and designate a contractor's project safety and health representative.

Construction and Demolition Waste Disposal Plan

EBMUD's Construction Specifications require a Construction and Demolition Waste Disposal Plan (013544-1.3(C)) specifying how the contractor will remove, handle, transport and dispose of all material to be disposed of in a safe, appropriate, and lawful manner. The plan must identify each type of waste material to be reused, recycled, or disposed of; list reuse facilities, recycling facilities, processing facilities, or landfills that will be receiving the materials; and include the sampling and analytical program for characterization of any waste material for disclosure to EBMUD.

Spill Prevention and Response Plan

EBMUD's Construction Specifications require a Spill Prevention and Response Plan (013544-1.3(D)) detailing the hazardous materials (including petroleum products) proposed for use or generated at the job site and describing the means and methods for controlling spills, monitoring hazardous materials, and providing immediate response to spills. Spill response measures would address notification of EBMUD, safety issues regarding construction personnel and public health, and methods for spill response and cleanup.

Controls on Site Activities

EBMUD's Construction Specifications require controls on site activities and describe measures that shall be implemented to prevent the discharge of contaminated stormwater runoff from the site. Erosion control measures specified in the specifications include:

- No debris, soil, silt, sand, bark, slash, sawdust, asphalt, rubbish, paint, oil, cement or concrete or washings thereof, oil or petroleum products, or other organic or earthen materials from construction activities shall be allowed to enter into or be placed where it may be washed by rainfall or runoff outside the construction limits. (013544-1.1(B)(1))
- Divert or otherwise control surface water and waters flowing from existing projects, structures, or surrounding areas from coming onto the work areas. The method of diversions or control shall be adequate to ensure the safety of stored materials and of personnel using these areas. Following completion of work, ditches, dikes, or other ground alterations made by the Contractor shall be removed and the ground surfaces shall be returned to their former condition, or as near as practicable, in the Engineer's opinion. (013544-1.1(B)(6))
- Maintain construction sites to ensure that drainage from these sites will minimize erosion of stockpiled or stored materials and the adjacent native soil material. (013544-1.1(B)(7))

Water Control and Disposal Plan

EBMUD's Construction Specifications require a Water Control and Disposal Plan (013544-1.3(B)) describing measures for containment, handling, and disposal of groundwater (if encountered), runoff of water used for dust control, stormwater runoff, wash water, and construction water or other liquid that has come into contact with any interior surface of a reservoir or inlet/outlet pipeline. The discharge must comply with regulations of the RWQCB, CDFG, County Flood Control Districts, and any other regulatory agency having jurisdiction, whichever is most stringent.

Excavation and Trenching

EBMUD's Construction Specifications require an Excavation Safety Plan (013524-1.3(C)) for worker protection and control of ground movement for the Engineer's review prior to any excavation work at the jobsite. The Plan shall include drawings and details of system or systems to be used, area in which each type of system will be used, de-watering, means of access and egress, storage of materials, and equipment restrictions.

Section 013524-3.2(B) of the Construction Specifications establishes requirements for excavations under hazardous conditions. As required in Section 6705 of the Labor Code, excavation of any trench five feet or more in depth shall not begin until the Contractor has received notification of EBMUD's acceptance of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation.

a. Such plan shall show the details of the design of shoring, bracing, sloping, or other provisions to be made for worker protection during such excavation.

b. No such plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders, Title 8, CCR, and if such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared and signed by an engineer who is registered as a Civil or Structural Engineer in the State of California. California Occupational Safety and Heath Administration (Cal/OSHA) Permit: Title 8, CCR Section 341(a)(1) 31 requires excavators to obtain a permit PRIOR to digging trenches or excavations which are 5 feet or deeper and into which a person is required to descend.

In the event of any violation of Article 6 of the Construction Safety Orders or deviation from the submitted plan for worker protection and control of ground movement, EBMUD may suspend work, or notify Cal/OSHA, or both.

2.6.4 Noise

Compliance with Noise Ordinance

EBMUD's Construction Specifications require compliance with local noise ordinances (013544-3.4). The Contractor is responsible for taking appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other mitigations as needed to bring construction noise into compliance.

Chapter 3 Environmental Analysis

3.1 Introduction to Environmental Analysis

This Draft EIR provides analysis of impacts for those environmental topics where it was determined that the Land Use Master Plan may result in "potentially significant impacts." *Sections 3.2* through *3.15* discuss the environmental impacts that may result with approval and implementation of the Master Plan. Each environmental issue area that follows contains a description of:

1. The environmental setting as it relates to the specific resource topic;
2. The regulatory framework governing that issue;
3. The methodology used in identifying the issues;
4. The significance criteria;
5. An evaluation of the program and project-specific impacts and identification of mitigation measures; and
6. A determination of the level of significance after mitigation measures are implemented.

3.1.1 Impact Mechanisms

During analysis of potential environmental impacts, the following elements of the Land Use Master Plan were evaluated for their potential to result in changes in resource areas:

- Construction activities, including ground disturbance, grading and excavation, vegetation removal, trench excavation, tunneling, and surface restoration, associated with build-out of the Land Use Master Plan;
- Operation and maintenance of the food waste preprocessing facility; and
- Operation and maintenance of the biodiesel production facility.

3.1.2 Determination of Impact Significance

Determining the severity of project impacts is fundamental to achieving the objectives of CEQA. According to the CEQA Guidelines Section 15382, a significant effect on the environment means "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…" The study area for each environmental resource topic includes the project site, plus any additional locations adjacent to the project site that could be affected by the project. Depending on the resource area, the study area could be fairly broad (for example, effects on the entire San Francisco Bay Area Air Basin evaluated in the air quality analysis) or impacts could be largely confined to the project site (for example potential to disrupt cultural resources). For each category of physical condition evaluated in this EIR, thresholds of significance have been developed: (1) using criteria discussed in the CEQA Guidelines; (2) criteria based on factual or scientific information; (3) criteria based on regulatory standards of local, state, and/or federal agencies; and/or (4) criteria based on goals, objectives, and policies identified in applicable city, county, and regional plans.

Mitigation measures identified in this report are characterized in one of three categories: (1) measures necessary to reduce the identified impact below a level of significance; (2) measures recommended to reduce the magnitude of a significant impact, but not below a level of significance; and (3) measures recommended to reduce the magnitude of a less than significant impact. Where implementation of more than one mitigation measure is needed to reduce an impact below a level of significance, multiple mitigations are listed.

Terminology Used in the EIR

This Draft EIR uses the following terminology to describe environmental effects of the project:

- **Significance Criteria**. A set of criteria used by the Lead Agency to determine at what level or "threshold" an impact would be considered significant. Significance criteria used in this EIR include some that are set forth in the CEQA Guidelines, or can be discerned from the CEQA Guidelines; criteria based on factual or scientific information; criteria based on regulatory standards of local, state, and federal agencies; and criteria based on goals, and policies identified in and requirements established by EBMUD.
- **Less-than-Significant Impact**. A project impact is considered less than significant when it does not reach the standard of significance and would therefore cause no substantial change in the environment. No mitigation is required for less-than-significant impacts.
- **Potentially Significant Impact**. A potentially significant impact is an environmental effect that may reach the level of significance identified in the EIR; however, additional information is needed regarding the extent of the impact to make the determination of significance. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact.
- **Significant Impact**. Significant impacts are identified by the evaluation of project effects against the significance criteria identified in the EIR. A project impact is considered significant if it reaches the level of significance identified in the EIR; mitigation measures and/or project alternatives are identified to reduce these effects to the environment.
- **Significant Unavoidable Impact**. A project impact is considered significant and unavoidable if it is significant but cannot be avoided or mitigated to a less-than-significant level if the project is implemented.
- **Cumulative Significant Impact**. A cumulative impact can result when a change in the environment results from the incremental impact of a project when added to other related past, present, or reasonably foreseeable future projects. Significant cumulative impacts may result from individually minor but collectively significant projects.

3.1.3 Issues Determined to Have Less Than Significant or No Impacts

Based on comments received during the NOP circulation period (see *Appendix A*) and the professional judgment of EBMUD staff, a number of issues are not expected to have any significant program or project-level impacts when compared to existing conditions, and do not require further analysis. These resource areas include:

- Agricultural Resources
- Mineral Resources
- Population and Housing

Further discussion for each of the above resources areas is provided below to convey EBMUD's supporting rationale as to why program- and project-level effects to these resources would not be significant with the implementation of the proposed improvements.

Agriculture Resources

The project site was previously graded and disturbed for construction of the former United States Army Reserve facility and the existing MWWTP, and agricultural use is not a characteristic of the surrounding area. The California Department of Conservation's Farmland Mapping and Monitoring Program identifies the project site as Urban and Built-Up Land, defined as "…land [that] is used for residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures" (California Department of Conservation 2004).

The project site does not contain agricultural uses and is not zoned for such uses, and the project would not include any improvements that would require a change in land use. Therefore, the project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, and would not conflict with existing zoning for agricultural land use or a Williamson Act contract.

Mineral Resources

The project site was previously graded and disturbed for construction of the former United States Army Reserve facility and the existing MWWTP, and the project would not alter the existing use of the site. Further, the MWWTP is located in an area mapped as MRZ-1 by the California Department of Conservation, Division of Mines and Geology (EBMUD 2008a). Areas designated as MRZ-1 are "areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence." Therefore, the project would not result in a loss of mineral resources and would have no impacts related to mineral resources.

Population and Housing

The Land Use Master Plan would use existing MWWTP capacity to preprocess food waste for on-site renewable energy generation and produce biodiesel for use by local trucking companies; it would not contribute to population growth. The project would be constructed at the existing MWWTP (and on a portion of the newly-acquired West End property) and operated by existing EBMUD personnel with up to 60 additional staff required for operation of the project. Although new jobs would be generated at the biodiesel and food waste preprocessing facilities, it is expected that these positions could be filled from the local workforce. Therefore, no existing housing units or people would be displaced, and no additional demand for housing is expected to result.

Chapter 4, *Other CEQA Considerations*, contains a detailed discussion of the potential growth-inducing effects of the Land Use Master Plan.

3.2 Aesthetics

This section evaluates the potential impacts on aesthetic and visual resources associated with construction and implementation of the proposed MWWTP Land Use Master Plan, including the biodiesel and food waste preprocessing projects. For the purposes of this analysis, aesthetic or visual resources are generally defined as the natural and built features of the landscape that can be seen. The overall visual character of a given area results from the unique combination of natural landscape features, including landform, water, and vegetation patterns, as well as built features, such as buildings, roads, and other structures. The analysis is based on field observations and review of aerial photos, maps, site drawings, project information, and local plans.

3.2.1 Environmental Setting

Regional Setting

The project site is located in northwestern Oakland in the East Bay, which is generally bounded by the Berkeley Hills to the east and San Francisco Bay to the west. The region's visual character is shaped by three visually distinct zones, from east to west: uplands, flatlands, and the Bay. The uplands consist of relatively steep hills that provide a mix of natural and developed views and block longer-range views to the east. The flatlands, which lie between the hills and the Bay, exhibit a highly urbanized mixed-use visual setting, including residential neighborhoods, the downtown Oakland business district, and industrial facilities such as the MWWTP and the Port of Oakland. Visual features of the Bay include the Port's industrial maritime shoreline, the Bay waters, the San Francisco-Oakland Bay Bridge (Bay Bridge) and Yerba Buena Island, and the urbanized San Francisco skyline to the west.

Local Setting

The visual setting of the project site and the vicinity is topographically flat and highly industrialized. The area is characterized by tanks, warehousing facilities, processing facilities, and Port facilities. Portions of the site can be viewed by motorists from elevated freeway ramps leading to and from the Bay Bridge toll plaza and from adjacent freeways; these roadways also separate much of the site from surrounding land uses and limit views of the site from other areas.

The project site consists of EBMUD's 48-acre MWWTP and the recently acquired 15.9-acre West End property. The MWWTP site is extensively developed with large open and enclosed tanks, pumps, generators, piping, and associated industrial facilities and infrastructure, in addition to an administrative building and employee/visitor parking lots. The West End property, previously owned by USAR, consists of paved parking lots and approximately seven abandoned buildings previously used for various USAR purposes, including administrative offices.[1] Landscaping at both the MWWTP and the West End property consists of trees, shrubs, and small grass areas primarily in parking lot medians and around administrative buildings. The existing buildings on the West End property are approximately 13 to 15 feet tall (single-story buildings). Building 1086 on the West End property is two stories and the digesters at the MWWTP are 30 to 35 feet tall. The exhaust stack for the turbine is 55 feet tall, the existing billboard, which faces I-80 from the Bay Bridge, is 63 feet tall, the new billboard currently under construction will be 40 feet tall and the oxygen production towers, which are located near the eastern MWWTP boundary are 77 feet tall. The project site does not include scenic resources such as rock outcrops or unique topography. Nighttime security lighting is used at the project site and at properties in the project vicinity, and the general area is substantially lighted at night.

[1] When the property was first acquired there were eight buildings, one has since been demolished as part of the Digester Upgrade Project - Phase II.

The site is bounded on the north, northeast, and east by freeways and another freeway is located a short distance to the south. Adjacent to the southern boundary of the site is the Oakland Army Base (OAB) sub-district of the OAB Area Redevelopment Plan (City of Oakland Redevelopment Agency 2000). This area consists of vacant undeveloped parcels, a complex of one- to four-story warehouses and approximately 22 administration/business buildings, and industrial maritime and rail facilities. Because the MWWTP and OAB sub-district include a variety of industrial facilities, the area is typical of industrial development and is visually unremarkable.

The undeveloped land immediately south of the MWWTP is primarily designated as the Gateway Development Area of the OAB sub-district and a portion of it (referred to as the Subaru Lot and the Baldwin Yard) was formerly the planned location of the OAB Auto Mall. The City of Oakland has indicated that this project is not likely to move forward, but is exploring other options for a future use at this site, from which the southern boundaries of the MWWTP and West End property are visible.

Short-term views of the project site are available to passing motorists from the following roadways:

- From I-80 exiting the Bay Bridge, east-bound travelers have short-term foreground views of the north side of the site. A pre-development planning report for the OAB Gateway Development Area indicates that visibility of the site and vicinity from I-80 will be greater with the realignment of the eastern span of the Bay Bridge (currently under construction), due to more direct lines of site (City of Oakland Redevelopment Agency 2007).
- From elevated portions of I-580 at the convergence of I-80, I-880, and I-580 (known as the MacArthur Maze), near the northeast corner of the MWWTP, travelers have short-term, foreground and mid-ground views of the site.
- From the elevated portions of West Grand Avenue and the westbound link between I-880 and the Bay Bridge above West Grand Avenue, to the south, and from I-880 to the east, travelers have short-term, mid-ground views of the site.

3.2.2 Regulatory Framework

There are no federal regulations regarding visual resources relevant to the proposed MWWTP Land Use Master Plan.

State Policies and Regulations

California State Scenic Highways Program

While there are no designated state scenic highways in the project vicinity, I-80 along the northern boundary of the project site is classified as eligible for designation under the State Scenic Highways Program for the segment "from I-280 near First Street in San Francisco to State Route 61(SR 61) in Oakland[2]" (Caltrans 2010a). The nearest designated state scenic highway is I-580 in Oakland, from the San Leandro city limit to Highway 24 (Caltrans 2010a), which is more than a mile east of the project site.

San Francisco Bay Plan

Because it is not located within 100 feet of the Bay shoreline, the project is not subject to the provisions of the San Francisco Bay Plan, which guides development of the Bay and the land area within 100 feet of

[2] I-80 and SR 61 do not actually meet in Oakland; SR 61 is currently located only in the City of Alameda and a small area of Oakland adjacent to Alameda. This definition of the eligible segment apparently refers to a portion of SR 61 that was once planned. The eligible section of I-80 is shown terminating between the I-80/I-880/I-580 convergence and State Route 24 (SR 24) on the State Scenic Highway Map (Caltrans 2010b).

its shoreline, and is not in the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), which administers the plan.

Local Policies and Regulations

City of Oakland General Plan

Scenic Highways Element

The Scenic Highways Element of the General Plan (originally part of the 1974 Oakland Comprehensive Plan and part of the current General Plan [Pearson, 2010]) designates the MacArthur Freeway (I-580) as a scenic route for its entire length through Oakland, from the San Leandro city limits to the San Francisco-Oakland Bay Bridge approach and shows I-80 along the eastern bridge approach and the eastern end of the bridge itself as a continuation of the MacArthur Freeway scenic route. The Scenic Highways Element recognizes that the visual setting from I-80/I-580 toward the project site is industrial in nature. The element does not identify the project site or vicinity as a "problem area" along the route (City of Oakland 1974). Scenic Highways Element policies specific to the MacArthur Freeway scenic route include restricting signage to informational purposes, having new construction within the scenic corridor be harmonious with the surrounding landscape, and ensuring that new structures not obliterate panoramic vistas and interesting views that are now available.

Open Space, Conservation, and Recreation (OSCAR) Element

The Open Space, Conservation, and Recreation (OSCAR) Element of the General Plan (City of Oakland 1996) recognizes the Oakland shoreline, scenic vistas, and flatlands as possessing diverse values, including their value as an aesthetic resource, and as gateways to other aesthetic resources, such as the Bay. The OSCAR Element includes specific goals, objectives, and policies regarding view protection, minimizing adverse visual impacts, and enhancing underutilized visual resources.

- *Policy OS-9.3: Gateway Improvements* – Enhance neighborhood and City identity by maintaining and creating gateways. Maintain view corridors and enhance the sense of arrival at the major entrances to the city, including freeways, BART lines, and the airport entry. Use public art, landscaping, and signage to create stronger City and neighborhood gateways. This policy identifies the Bay Bridge as one of Oakland's more dramatic and memorable gateways, and states that especially in heavily traveled corridors gateways should be managed to create positive and distinct visual images of the city.
- *Policy OS-10.1: View Protection* – Protect the character and existing scenic views in Oakland, paying particular attention to (a) views of the Oakland Hills from the flatlands; (b) view of downtown and Lake Merritt; (c) views of the shoreline; and (d) panoramic views from Skyline Boulevard, Grizzly Peak Road, and other hillside locations.

3.2.3 Impact Analysis

Methodology for Analysis

Visual impacts were identified by comparing the project elements to the existing visual character of the study area. For visual analysis, the study area includes all areas from which the MWWTP and West End Property are visible. The analysis is based on a site reconnaissance, review of aerial photos and maps, and review of descriptive and graphic information on proposed facilities.

Thresholds of Significance

For the purposes of this analysis and consistent with Appendix G of the *CEQA Guidelines*, the Land Use Master Plan would have a significant impact on aesthetic or visual resources if it would:

- Have a substantial adverse effect on a scenic vista;

- Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Criteria Requiring No Further Evaluation

A criterion listed above that is not applicable to actions associated with the Land Use Master Plan is identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Have a substantial adverse effect on a scenic vista* – Of the four types of views that require particular attention under Policy OS-10.1 of the Oakland General Plan OSCAR Element, only "(d) panoramic views from Skyline Boulevard, Grizzly Peak Road, and other hillside locations" could potentially apply to the project site. However, while the MWWTP and West End property sites would be included in some panoramic views from some hillside locations, at such distances (at least three to four miles) and scale, the MWWTP site and West End property would constitute a very minor component of the view. The physical changes resulting from the project would be barely discernable, if at all. Therefore the project would have no impact on a scenic vista.

Impacts and Mitigation Measures

The MWWTP Land Use Master Plan is evaluated below at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level.

Impact AES-1 Potential To Damage Scenic Resources, Including Trees, Rock Outcroppings, And Historic Buildings Within A State Scenic Highway

All Land Use Master Plan Elements

Although the project site lies south of I-80, which is considered eligible for designation as a California Scenic Highway, the project site is a developed industrial site in an industrial area and contains no scenic resources such as rock outcrops or unique topography. As discussed in *Section 3.5, Cultural Resources*, although the project would involve demolishing a number of USAR buildings on the West End property, none of the buildings were identified as historic resources and the MWWTP would not qualify for listing as a historic resource due to substantial changes and expansion that have occurred since its original construction. Therefore, the project would not have a significant impact on scenic or historic buildings.

Several of the existing landscaping trees would be removed to accommodate project components, including (1) one or two trees at the proposed biodiesel production facility site when the facility is developed to full capacity; (2) several trees in an existing parking lot adjacent to the food waste preprocessing and processing facilities, to accommodate truck turning; and (3) several trees in the area south of the MWWTP biogas conditioning system when the secondary treatment upgrades, a long term component of the Land Use Master Plan, are implemented. The row of trees adjacent to I-80 north of the food waste preprocessing and processing facility sites, which provide screening, would not be affected by the project. The few landscaping trees that would be affected at these individual project component sites and collectively within the overall project site do not constitute substantial scenic resources, and do not lie within a state scenic highway, and their removal would not result in altering the scenic quality of the area. Therefore, the impact on scenic resources from tree removal necessitated by project components would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact AES-2 Alter Existing Visual Character And Views In The Study Area

Biodiesel Production Facility

The biodiesel production facility would be located at the western boundary of the West End property, which is in the foreground viewshed of I-80 north of the site. At buildout, the facility would include the following facilities:

- a 115,000-square-foot, 20-foot-tall, pre-engineered corrugated metal building,
- a second 40,000-square-foot, 20-foot-tall building,
- a distillation column approximately 65 feet high
- a waste oil truck parking area,
- 23 vertical storage tanks measuring up to 30 feet tall, and
- two horizontal storage tanks.

The aesthetic characteristics of the proposed facility would be industrial in nature, similar to the existing conditions at the West End property.

Construction of the biodiesel production facility would require demolition of existing buildings at the site on the West End property. Construction activities could temporarily obstruct some foreground views along I-80 north of the site. However, any obstruction of views from construction activities would be minor and short-term, since construction activities are expected to last approximately eight months. EBMUD would implement standard measures listed as Environmental Commitments and Construction Specifications in *Chapter 2, Project Description*. Construction Specifications Section 013544-1.1(B) requires that when construction is complete, excess materials or debris be removed from the work area. In addition, implementation of **Mitigation Measure AES-2a,** below, would ensure that the project construction site is kept clean of rubbish and debris from construction activities. Therefore, project construction would not adversely affect or degrade the existing visual character or quality of the project site or its surroundings.

As discussed under *Impact AES-1*, above, development of the biodiesel production facility to full capacity would require the removal of one or two existing landscape trees from the site. However, given the location of the trees in a highly industrial setting next to freeway ramps and the limited nature of this aspect of the project, the removal of these trees would not substantially affect the visual character of the project site and vicinity.

Addition of a new industrial use to the West End property would be consistent with the existing visual character of the MWWTP. **Mitigation Measure AES-2b**, below, would ensure that the biodiesel production facility would be consistent visually with the existing facilities at the MWWTP. The biodiesel production facility could represent a slight intensification of the existing heavy industrial uses at the site. The site would form a part of the southern view of the proposed San Francisco Bay Trail alignment (see *Section 3.11, Land Use and Recreation*, for details) that would traverse the northern boundary of the MWWTP property. The trail would afford views of the Bay to the north and of the MWWTP property to the south. A visually prominent feature of the biodiesel production facility would likely be the 65-foot distillation column. However, the distillation column and other features at the site would be a part of the existing industrial setting. Given the current built up character of the MWWTP and surrounding areas, the project structures would not adversely affect the views along the highway or substantially degrade the existing visual character or quality of the site and its surroundings. The impact would be less than significant.

Food Waste Preprocessing Facility

The food waste preprocessing facility would be located close to the northeast boundary of the West End property in an area currently occupied by a parking lot adjacent to the existing Food Waste Facility. At buildout, the proposed food waste preprocessing facility would occupy approximately 1.4 acres and include an approximately 58,000-square-foot, 40-foot-tall, steel frame building, as well as ancillary facilities such as utility connections, processing systems, and office space. **Mitigation Measure AES-2b** would require that the building would be designed to be aesthetically consistent with surrounding wastewater treatment buildings. Materials from the preprocessing facility would be conveyed to the Food Waste Facility by one of three methods: by truck, by mechanical conveyor, or through an enclosed pipeline. The use of trucks would be consistent with other activities at the site and would not affect the site visually. The mechanical conveyor that may be used would be fully-covered and leak proof and elevated high enough above ground to allow trucks to pass underneath. The enclosed pipeline, if used, would likely be below ground. The conveyor would be a new outdoor structure and therefore would be visible from some areas outside the site. However, since the two food waste facilities are adjacent to each other (as shown in **Figures 2-2** and **2-4** in *Chapter 2, Project Description*), the length required for either structure would be relatively short, limiting the impact on the visual character of the facility. In addition, either type of structure would be consistent in character with existing piping, tubing and other auxiliary structures currently used at the MWWTP site.

Construction of the food waste preprocessing facility could temporarily obstruct some foreground views along I-80 north of and from the Baldwin Yard and Subaru Lot. However, any obstruction of views from construction activities is expected to be minor and would be short-term, since construction activities are expected to last 14 to 16 months. EBMUD would implement standard measures listed as Environmental Commitments and Construction Specifications in *Chapter 2, Project Description*. EBMUD Construction Specifications Section 013544-1.1(B) requires that when construction is complete, excess materials or debris be removed from the work area. In addition, implementation of **Mitigation Measure AES-2a** below would ensure that the project construction site is kept clean of rubbish and debris from construction activities. Therefore, project construction would not adversely affect or degrade the existing visual character of the surrounding area or views from the highway or the Subaru Lot and Baldwin Yard. The food waste preprocessing facility would be similar to the existing facilities at the MWWTP, and **Mitigation Measure AES-2** would require that its design, exterior finishes, and color would blend with the surrounding facilities. Overall, the proposed food waste preprocessing facility would not appear dissimilar to existing facilities found at the MWWTP site in terms of their scale and general appearance. In this respect, the new facilities would represent an incremental aesthetic change that would not adversely affect the views along the highway or substantially degrade the existing visual character or quality of the site and its surroundings.

As discussed under *Impact AES-1*, above, several landscape trees located in the existing parking lot at the proposed food waste preprocessing facility site would need to be removed to accommodate truck turning. The existing parking lot is an industrialized area, experiences substantial levels of site traffic, and has limited intrinsic aesthetic appeal. The proposed facility, despite the need to remove several landscape trees and assuming an above-ground material conveyance structure, thus would not have a significant impact on the existing visual character of the area. Therefore, this impact would be less than significant.

Other Land Use Master Plan Elements

Eleven other plan elements are proposed as part of the MWWTP Land Use Master Plan. Construction activities associated with these projects at the MWWTP/West End property site could to some extent, depending on the project's location, obstruct foreground views along I-80 north of the site, West Grand Avenue/the I-880-Bay Bridge freeway link south of the site, southbound I-880 east of the site, and the Subaru Lot and Baldwin Yard directly south of the MWWTP. However, as with the projects evaluated above, construction would be temporary. EBMUD would implement standard measures listed as

Environmental Commitments and Construction Specifications in *Chapter 2, Project Description*. Construction Specifications Section 013544-1.1(B) requires that when construction is complete, excess materials or debris be removed from the work area. In addition, implementation of **Mitigation Measure AES-2a** below, would ensure that the project construction site is kept clean of rubbish and debris from construction activities. Therefore, construction of the Land Use Master Plan components would not adversely affect or degrade the existing visual character or quality of the project site or its surroundings. Similar to the biodiesel and food waste preprocessing projects, **Mitigation Measure AES-2b** would require that the facilities and structures associated with the Land Use Master Plan components be consistent in design, exterior finishes, and color with existing MWWTP structures and the surrounding area. Therefore, the impact of these components on the visual character of the site and vicinity is considered at a programmatic level to be less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

The following measures are applicable to the proposed biodiesel production facility, food waste preprocessing facility, and the other Land Use Master Plan elements:

Mitigation Measure AES-2a: Maintenance of Construction Worksite

Throughout the period of demolition and construction, EBMUD will require that the construction contractor keep the worksite free and clean of all rubbish and debris and promptly remove from the site or from property adjacent to the site of the work, all unused and rejected materials, surplus earth, concrete, plaster, and debris.

Mitigation Measure AES-2b: Design of Facilities to Be Aesthetically Consistent with Existing Visual Character

EBMUD would require all new facilities be, at a minimum, designed to be aesthetically consistent with existing visual character and surrounding wastewater treatment buildings. Design, exterior finishes, and color would blend with the surrounding facilities.

Significance Determination after Mitigation

Less than significant.

Impact AES-3 New Source Of Substantial Light Or Glare

Biodiesel Production Facility

The biodiesel production facility would be located at the western boundary of the West End property, which is located in the foreground viewshed of eastbound I-80 north of the project site, the northbound Bay Bridge-I-880 link southeast of the site, and West Grand Avenue southwest of the site. Facilities would include pre-engineered, corrugated metal buildings approximately 20 feet tall and site facilities would have permanent exterior lighting for safety and security. New lighting could potentially be a source of light and glare that would affect surrounding area. However, **Mitigation Measure AES-3** would require that lighting would be consistent with existing lighting in terms of height, spacing and design, and EBMUD would require that it be shielded and directed to the interior of the project site. The new lighting would be visible from sections of the nearby freeways and roads; however, it would be similar to existing lighting in the site vicinity and at the West End property and MWWTP site. **Mitigation Measure AES-3** would also require that new structures and buildings be painted in low reflective paint consistent with existing structures at the MWWTP. Construction activities would occur during daytime, weekday hours, and would not introduce a new source of nighttime light in the project

area. Therefore, the effect of the proposed biodiesel production facility as a new source of light and glare would be less than significant.

Food Waste Preprocessing Facility

The food waste preprocessing facility would be located close to the northeast boundary of the West End property in the foreground view of eastbound I-80 north of the site and the Subaru Lot and Baldwin Yard south of the MWWTP, and would be in mid-ground views from the elevated freeways at the convergence of I-80, I-880, and I-580 northeast of the site and West Grand Avenue/I-880-Bay Bridge link south of the site. The food waste preprocessing building (approximately 40 feet tall) would be made up of steel frame and would include exterior lighting. **Mitigation Measure AES-3** would require that new lighting be consistent with existing lighting in terms of height, spacing and design, and EBMUD would require that it be shielded and directed to the interior of the project site. The new lighting would be visible from sections of the nearby freeways and roads; however, it would be similar to existing lighting in the site vicinity and at the West End property and MWWTP site. **Mitigation Measure AES-3** would also require that new structures be painted in low reflective paint consistent with existing structures at the MWWTP. Construction activities would occur during daytime, weekday hours, and would not introduce a new source of nighttime light in the project area. Therefore, the effect of the proposed food waste preprocessing facility as a source of light and glare would be less than significant.

Other Land Use Master Plan Elements

Eleven other plan elements are proposed as part of the MWWTP Land Use Master Plan. Because these projects would all be located at the project site they would to varying degrees, depending on their specific locations, be in the foreground and mid-ground views from I-80 north of the site, West Grand Avenue/the I-880-Bay Bridge freeway link south of the site, elevated freeways at the convergence of I-80, I-880, and I-580 northeast of the site, southbound I-880 east of the site, and the Subaru Lot and Baldwin Yard directly south of the MWWTP. It is assumed that all proposed facility buildings would include permanent exterior lighting for safety and security. However as discussed above, the existing site and area includes security lighting; **Mitigation Measure AES-3** would require that new lighting for the proposed projects included in the land use master plan would be consistent with existing lighting in terms of height, spacing and design, and would be shielded and directed to the interior of the project site. **Mitigation Measure AES-3** would also require that new structures would be painted in low reflective paint consistent with existing structures at the MWWTP. Construction activities related to the projects would occur during daytime, weekday hours, and would not introduce a new source of nighttime light in the project area. Therefore, the effect of the proposed land use master plan as a source of light and glare would be less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure AES-3: Lighting Design and Low Reflective Paint

EBMUD would require that lighting be consistent with existing lighting in terms of height, spacing and design. New lighting would be shielded and directed to the interior of the project site. New structures and buildings would be painted in low reflective paint consistent with existing structures at the MWWTP.

Significance Determination after Mitigation

Less than significant.

3.3 Air Quality

This section addresses the air quality impacts that could result from implementation of the proposed Land Use Master Plan, including the biodiesel production and food waste preprocessing projects. This analysis evaluates the project's consistency with air quality attainment plans and regulatory standards and estimates potential increases in criteria air pollutants associated with project implementation.

3.3.1 Air Pollutant Properties, Effects, and Sources

Air quality conditions are indicated by the presence of criteria air pollutants, as described below (BAAQMD 1999).

Ozone (O_3). O_3 is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_X). The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of NO_X emissions. ROG sources in the Bay Area are split semi-equally between stationary, areawide, and mobile sources and concentrated in urban areas. O_3 is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. O_3 causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide (CO). CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause dizziness and fatigue, impair central nervous system function, and induce angina in persons with serious heart disease. Ambient CO levels have declined throughout California due to the dramatically reduced CO emissions from automobiles and other on-road combustion sources.

Suspended Particulates (PM_{10} and $PM_{2.5}$). Particulate matter (PM) is a class of air pollutants that consists of solid and liquid airborne particles in an extremely small size range. PM is measured in two size ranges: PM_{10} for particles less than 10 microns in diameter, and $PM_{2.5}$ for particles less than 2.5 microns in diameter. Fine particulates small enough to be inhaled into the deepest parts of the human lung can cause adverse health effects. Among the criteria pollutants that are regulated, particulates appear to represent the most serious overall health hazard. High levels of particulates have also been known to exacerbate chronic respiratory ailments, such as bronchitis and asthma, and have been associated with increased emergency room visits and hospital admissions (BAAQMD 1999).

Diesel exhaust is a serious concern throughout California. The California Air Resources Board (CARB) identified diesel engine particulate matter as a toxic air contaminant. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the diesel particles, which are very small and can penetrate deeply into the lungs. Diesel engine particulate matter has been identified as a human carcinogen. Mobile sources such as trucks, buses, and automobiles are some of the primary sources of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. The cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. Diesel exhaust contains both pulmonary irritants and hazardous compounds that can affect sensitive receptors such as young children, senior citizens, or those susceptible to chronic respiratory disease such as asthma, bronchitis, and emphysema.

In 2001, the California Health Interview Survey (CHIS) found that California's lifetime asthma prevalence, at 11.5 percent of the population, is higher than the national lifetime asthma prevalence of

10.1 percent (UCLA Center for Health Policy Research 2007).[1] When asthma symptom prevalence in 2001 is sorted by county, the CHIS found that people who live in rural areas have more frequent asthma symptoms. Asthma symptom prevalence by region ranged from 10.4 to 13.8 percent for all ages. The highest rates occurred in Northern California, Sierra Nevada, and Sacramento area counties (13.8 percent). These data indicate that asthma is a regional (not localized) problem. However, these regional statistics mask the fact that asthma rates are higher among African-Americans (16.2 percent) than the rest of the population (7.0 to 13.1 percent), suggesting there may be asthma "hot spots" in some communities that are not well characterized by regional averages.

Nitrogen Oxides (NO_X) and Nitrogen Dioxide (NO_2). NO_X is the generic term that represents a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. In addition to NO_2, nitrogen oxides include nitrous acid and nitric acid. While state and federal air quality standards cover the entire group of NO_X, NO_2 is the component of greatest interest and the indicator for the larger group of nitrogen oxides. NO_2 is a reddish brown gas that is a byproduct of combustion processes, forming quickly from emissions from cars, trucks and buses, power plants, off-road equipment, and other industrial operations. In addition to contributing to the formation of ground-level O_3 and fine particle pollution, NO_2 is linked to a number of adverse effects on the respiratory system.

Sulfur Dioxide (SO_2). SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease (BAAQMD 1999).

3.3.2 Environmental Setting

The following sections describe the environmental setting for air quality within the study area, which includes the entire San Francisco Bay Area Air Basin (SFBAAB):

Climate and Meteorology

Climate and meteorology are important considerations for air quality. Local dispersion and regional transport of air pollutants directly relate to prevailing meteorology. Diurnal, seasonal, and regional air pollution patterns are controlled by a variety of meteorological factors. Wind directions and speeds and vertical temperature structure (inversions) are the primary determinants of transport and dispersion effects.

The Land Use Master Plan study area is located on the east side of San Francisco Bay, opposite the Golden Gate. California's climate is considered to be a Mediterranean type climate. This climate type is characterized by moist mild winters and dry summers. The East Bay climate is further influenced by the relatively cool waters of the Pacific Ocean on the west, which create summer temperatures that are 10 to 20 degrees Fahrenheit (°F) cooler than in inland valleys farther east.

Summertime in the Bay Area is characterized by cool marine air and persistent coastal stratus and fog, with average maximum temperatures between 60°F and 70°F, and minimum temperatures between 50°F and 55°F. Rainfall from May through September is relatively rare, with an aggregate of less than an inch, or only about 5 percent of the yearly average total of about 21.5 inches. Winter temperatures in the Bay Area are quite moderate, with highs between 55°F and 60°F and lows in the range of 45°F to 50°F.

Ambient Air Quality

The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network that measures the ambient concentrations of six criteria air pollutants: O_3, CO, PM (PM_{10} and $PM_{2.5}$), NO_2,

[1] "Lifetime asthma prevalence" includes people diagnosed with asthma at some point in their lives, while "asthma symptom prevalence" includes those who experience asthma symptoms at least once per year.

SO_2, and lead. Existing and probable future air quality in the study area can be best inferred from ambient air quality measurements conducted by BAAQMD at its closest monitoring stations in downtown Oakland and Concord.

Table 3.3-1 presents local ambient air quality monitoring data for 2003 through 2009, and **Table 3.3-2** presents a summary of BAAQMD's attainment status with respect to federal and state standards. These annual average data indicate that the project area is currently subject to particulate levels (PM_{10} and $PM_{2.5}$) that marginally meet the $PM_{2.5}$ state annual standard of 12 micrograms per cubic meter (µg/m^3) and have periodically exceeded the PM_{10} state annual standard of 20 µg/m^3. As indicated in **Table 3.3-2**, the SFBAAB is designated as "nonattainment" for state O_3, PM_{10}, and $PM_{2.5}$ standards, while it is

Table 3.3-1: Local Ambient Air Quality Monitoring Summary (2003-2009)

Monitoring Station & Pollutant	Most Stringent Applicable Standard	Number of Days Standards were Exceeded and Maximum Concentrations Measured						
		2003	2004	2005	2006	2007	2008	2009
Oakland Data								
Ozone (O_3)								
- Days 1-hour standard exceeded	>0.09 ppm[1]	0	0	0	0*	0	0	0
- Maximum 1-hour (ppm)		0.08	0.08	0.07	0.09*	0.04	0.09	0.09
- Days 8-hour standard exceeded	>0.07 ppm[1]	0	0	0	0*	0	0	0
- Maximum 8-hour (ppm)		0.05	0.06	0.04	0.07*	0.04	0.06	0.06
Carbon Monoxide								
- Days 1-hour standard exceeded	>20 ppm[1]	0	0	0	0*	0	0	0
- Maximum 1-hour (ppm)		3.9	3.5	3.4	1.7**	2.9	NA	NA
- Days 8-hour standard exceeded	>9 ppm[1]	0	0	0	0**	0*	0	0
- Maximum 8-hour (ppm)		2.8	2.6	2.4	1.3**	1.4	1.6	2.0
Concord Data								
Suspended Particulates (PM_{10})								
- Maximum 24-hour (µg/m^3)	>50 µg/m^3 [1,3]	34	**51**	42	**81**	**52**	**51**	33
- Estimated Days 24-hour standard exceeded		NA	NA	NA	18	12	6	0
Suspended Particulates ($PM_{2.5}$)								
- Maximum 24-hour (µg/m^3)	>35 µg/m^3 [2,4]	**50**	**74**	**49**	**62**	**47**	**60**	**39**
- Days 24-hour standard exceeded		0	1	5	6	7	7	1
- Annual average (µg/m^3)	>12 µg/m^3 [1]	9.7	11.5	9.3	10.0	8.7	9.3	8.3

NOTES: **Bold** values are in excess of applicable standard. NA = Not Applicable, no data available; ppm = parts per million, µg/m^3 = micrograms per cubic meter

* Data from San Leandro during 2006 (no data available from Oakland Station for 2006)

** Data from Concord station during downtown Oakland station closure

1 State standard, not to be exceeded.

2 Federal standard, not to be exceeded.

3 Since PM_{10} is only sampled every sixth day, actual days over the standard can be estimated to be six times the number shown.

4 Standard reduced from 65 to 35 µg/m^3 in 2006.

Source: CARB 2003 to 2009.

Table 3.3-2: State and Federal Ambient Air Quality Standards and Attainment Status

		(State) SAAQS[1]		(Federal) NAAQS[2]	
Pollutant	**Averaging Time**	**Standard**	**Bay Area Attainment Status**	**Standard**	**Bay Area Attainment Status**
Ozone (ROG)	One hour	0.09 ppm	**N**	NA	_ [3]
	Eight hour	0.07 ppm	**N** [4]	0.08 ppm	**N/Marginal** [4]
Carbon Monoxide (CO)	One hour	20 ppm	A	35 ppm	A
	Eight hour	9 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	One hour	0.18 ppm	A	NA	NA
	Annual	0.030 ppm	A	0.053 ppm	A
Sulfur Dioxide (SO_2)	One hour	0.25 ppm	A	NA	NA
	24 hour	0.04 ppm	A	0.14 ppm	A
	Annual	NA	NA	0.03 ppm	A
Particulate Matter (PM_{10})	24 hour	50 µg/m^3	**N**	150 µg/m^3	U
	Annual[5]	20 µg/m^3 [6]	**N**	NA	NA
Fine Particulate Matter ($PM_{2.5}$)	24 hour[6]	NA	NA	35 µg/m^3	**N**
	Annual	12 µg/m^3 [7]	**N**	15 µg/m^3	A
Sulfates	24 hour	25 µg/m^3	A	NA	NA
Lead	30 day	1.5 µg/m^3	A	NA	NA
	Quarter	NA	NA	1.5 µg/m^3	A
Hydrogen Sulfide	One hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	Eight hour	See Note 8	U	NA	NA

NOTES: A = Attainment; **N** = Nonattainment; U = Unclassified; NA = Not Applicable, no applicable standard; ND = no designation; ppm = parts per million; µg/m^3 = micrograms per cubic meter.

1 SAAQS = state ambient air quality standards (California). SAAQS for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (one-hour and 24-hour), nitrogen dioxide, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.

2 NAAQS = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The eight-hour ozone standard is attained when the three-year average of the fourth highest daily concentration is 0.08 ppm or less. The 24-hour PM_{10} standard is attained when the three-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour $PM_{2.5}$ standard is attained when the three-year average of the 98th percentile is less than the standard.

3 USEPA revoked the national one-hour ozone standard on June 15, 2005.

4 This state eight-hour ozone standard was approved in April 2005 and became effective in May 2006. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.080 to 0.075 PPM effective May 27, 2008. EPA will issue final designations based upon the new 0.75 ppm ozone standard by July 31, 2011.

5 State standard = annual geometric mean; national standard = annual arithmetic mean.

6 USEPA lowered the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 in 2006. USEPA designated the Bay Area as nonattainment of the PM2.5 standard on October 8, 2009. The effective date of the designation is December 14, 2009 and the Air District has three years to develop a plan, called a State Implementation Plan (SIP), that demonstrates the Bay Area will achieve the revised standard by December 14, 2014. The SIP for the new PM2.5 standard must be submitted to the USEPA by December 14, 2012.

7 In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.

8 Statewide visibility-reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Source: BAAQMD 2010a.

designated as "attainment" for all other criteria pollutants. With respect to federal standards, the Bay Area is "nonattainment" for ozone (marginally) and $PM_{2.5}$, but "attainment" for all other criteria pollutants.

Ozone. Automobiles are the single largest source of ozone precursors in the Bay Area. O_3 is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. **Table 3.3-1** shows that, according to published data, the applicable O_3 standards were not exceeded at the Oakland station over this seven-year period.

CO. Table 3.3-1 shows that no exceedances of any CO standards were recorded between 2003 and 2009 at the Oakland monitoring station. Because no data are available for the Oakland monitoring station in 2006, data from the San Leandro station were reviewed and also did not exceed the CO standard. Maximum 8-hour CO levels average less than 25 percent of the allowable 8-hour standard.

Suspended and Inhalable Particulate Matter (PM_{10} and $PM_{2.5}$). Motor vehicles generate about half of Bay Area particulates through tailpipe emissions, brake pad and tire wear, and turbulent re-suspension of roadway dust. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as construction are other sources of fine particulates. Among the criteria pollutants that BAAQMD regulates, particulates appear to represent the most serious overall health hazard. Studies have shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area (BAAQMD 1999).

Table 3.3-1 shows that exceedances of the state PM_{10} standard have occurred infrequently in the study area over this seven-year period. It is estimated that the state 24-hour PM_{10} standard was exceeded on 3 percent of days per year between 2006 and 2009. The less stringent federal 24-hour PM_{10} standard was not exceeded at the Concord monitoring station during this period. The federal 24-hour $PM_{2.5}$ standard was not exceeded until the standard was reduced from 65 to 35 $\mu g/m^3$ in 2006. The more stringent standard was exceeded almost 4 days per year. The maximum 24-hour standard of 35 $\mu g/m^3$ has been exceeded for the past seven years, but 2009 had the lowest maximum for these years.

Odors

EBMUD operates a 24-hour Odor Hotline to respond to community concerns regarding odors from the MWWTP. Staff collects detailed information regarding the complaint, conducts site investigations, and takes action when possible to reduce off-site odors.

BAAQMD public records for the last five years indicate that five odor complaints related to the MWWTP facility were received and three were confirmed by BAAQMD (two of the complaints involved the same incident). One complaint was received on July 29, 2005, but could not be confirmed. There were two confirmed incidents in 2006 (August 11 and December 4). The detected odors were described as digester gas-like odor, as well as rancid oil odor. The inspector indicated that on-going construction at the MWWTP resulted in temporary plant shutdowns and decreased digester capacity, which could have been the cause of digester gas-like odors. The rancid oil odor was attributed to the fats, oils and grease receiving and processing facility located adjacent to the MWWTP, which has since been removed. No odor complaints have been received by BAAQMD since December 2006.

As part of EBMUD's continuing efforts to reduce the potential for off-site impacts, an Odor Control Master Plan Update was completed for the MWWTP in June 2009. It included phased implementation of several large-scale capital projects over the next 10 years. These projects are incorporated in the Land Use Master Plan.

Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work

or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses or parks are also considered sensitive due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.

Potentially sensitive receptors located in proximity to the MWWTP are limited to residential uses. The closest residential uses are located east of Mandela Parkway on the west side of Ettie Street (north of 32nd Street) with additional residential uses further south (between 28th and 32nd Streets). These residences are located a minimum of approximately 1,200 feet from the eastern MWWTP Land Use Master Plan boundary, 3,000 feet from the proposed food waste preprocessing facility site, and 3,600 feet from the proposed biodiesel production facility site.

In 2004, BAAQMD initiated the Community Air Risk Evaluation (CARE) program to identify locations with high levels of risks from toxic air contaminants (TACs) corresponding to locations with sensitive populations. The CARE program identified West Oakland as an impacted community, with higher levels of exposure to diesel particulate matter (DPM) due to on-road heavy-duty trucks, followed by ships, harbor craft, locomotives, and cargo handling equipment. CARB has adopted numerous regulations to reduce DPM emissions and these rules will significantly reduce cancer and non-cancer risk in West Oakland (BAAQMD 2010b).

3.3.3 Regulatory Framework

Federal Policies and Regulations

The Clean Air Act Amendments of 1970 established national ambient air quality standards (NAAQS), and individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established, and, because of the unique meteorological conditions in California, there is considerable difference between the state and NAAQS, as shown in **Table 3.3-2**. California ambient air quality standards (CAAQS) tend to be at least as protective as national ambient standards and are often more stringent.

The ambient air quality standards are intended to protect the public health and welfare, and they specify the concentration of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. Air quality standards are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, the elderly, people weak from other illness or disease, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above the ambient air quality standards before adverse health effects are observed.

The 1977 Clean Air Act (last amended in 1990, 42 United States Code [USC] 7401 et seq.) required that regional planning and air pollution control agencies prepare regional air quality plans outlining the measures by which both stationary and mobile pollutant sources will be controlled to achieve all standards by the deadlines specified in the Clean Air Act. For SFBAAB, the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and BAAQMD jointly prepared the *Bay Area Air Quality Plan* in 1982, which predicted attainment of the federal clean air standards within the basin by 1987. This forecast was somewhat optimistic; the entire basin did not meet federal clean air standards until 1991. The plan, which is referred to as the State Implementation Plan (SIP), must contain control strategies that demonstrate attainment of national ambient air quality standards by deadlines established in the federal Clean Air Act.

SFBAAB's current attainment status with respect to federal standards is summarized in **Table 3.3-2** . In general, the Bay Area experiences low concentrations of most pollutants when compared to the federal

standards, except for ozone and particulate matter (PM_{10} and $PM_{2.5}$), for which standards are exceeded periodically. The Bay Area's attainment status for O_3 has changed several times during the past decade, first from "nonattainment" to "attainment" in 1995, then back to "unclassified nonattainment" in 1998 for the 1-hour federal O_3 standard. In June 2004, the Bay Area was designated as "marginal nonattainment" for the 8-hour ozone standard. In 2008, USEPA lowered the 8-hour O_3 standard from 0.08 parts per million (ppm) to 0.075 ppm. Given the revised standard, it is expected that SFBAAB's attainment status may be downgraded to remove the "marginal" designation when USEPA issues its final designations in 2011. In 1998, after many years without violations of any CO standards, SFBAAB's attainment status for CO was upgraded to "attainment."

In response to USEPA's redesignation of SFBAAB as nonattainment for the 1-hour federal O_3 standard, BAAQMD, ABAG, and MTC were required to develop an ozone attainment plan to meet this standard. The *1999 Ozone Attainment Plan* (OAP) was prepared and adopted by these agencies in June 1999. In March 2001, USEPA proposed and took final action to approve some portions but disapprove other portions of the 1999 OAP while also making the finding that the Bay Area had not attained the national 1-hour O_3 standard. As a result, a revised OAP was prepared and adopted in October 2001. The 2001 OAP provided for attainment of the federal 1-hour O_3 standard by 2006, the attainment deadline, but in 2004 the Bay Area was designated "marginal nonattainment" for the 8-hour O_3 standard. In June 2005, the federal 1-hour O_3 standard was revoked by USEPA and replaced by the 8-hour O_3 standard.

The 2001 OAP contains control strategies for stationary and mobile sources. The adopted mobile-source control program was estimated to significantly reduce volatile organic compound (VOC) and NO_X emissions between 2000 and 2006, lowering emissions from on- and off-road diesel engines (including construction equipment). In addition to emission reduction requirements for engines and fuels, the OAP identified 28 transportation control measures to reduce automobile emissions, including improved transit service and transit coordination, new carpool lanes, signal timing, freeway incident management, and increased state gas tax and bridge tolls. With a marginal nonattainment designation of the federal 8-hour O_3 standard, and with attainment of the federal PM_{10} standard, no federal attainment planning as part of a SIP was required over the last several years. However, when the nonattainment designation for the federal $PM_{2.5}$ standard (24-hour) went into effect in April 2009, an SIP preparation cycle was triggered. The anticipated nonattainment designation for the current federal 8-hour O_3 standard of 0.075 ppm may also require preparation of a SIP for ozone. Since then, USEPA has proposed a revision of the 8-hour ozone standard from 0.075 ppm to 0.065 ppm. If that proposal is adopted, SFBAAB will be clearly in non-attainment. A revised SIP for O_3 will be required if/when such a redesignation occurs.

State Policies and Regulations

In 1988, California passed the California Clean Air Act (California Health and Safety Code Section 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment but based on the state ambient air quality standards rather than the federal standards. SFBAAB attainment status with respect to State standards is summarized in **Table 3.3-2**. As shown in the table, the Bay Area experiences low concentrations of most pollutants when compared to State standards, except for O_3, PM_{10}, and $PM_{2.5}$, for which standards are exceeded periodically. All current basinwide air quality plans address required progress toward meeting State standards.

CARB is the state agency responsible for regulating air quality. CARB's responsibilities include establishing state ambient air quality standards, emissions standards, and regulations for mobile emissions sources (e.g., autos, trucks), in addition to overseeing the efforts of countywide and multi-county air pollution control districts, which have primary responsibility over stationary sources. CARB also regulates vehicle fuels with the intent to reduce emissions; it has set emission reduction performance requirements for gasoline (California reformulated gasoline) and limited the sulfur and aromatic hydrocarbons content of diesel fuel to make it burn cleaner. CARB also sets the standards used to pass or fail vehicles in smog-check and heavy-duty truck inspection programs.

In 2005, CARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles, which altered five sections of Title 13 of the CCR. The changes relevant to the project are in Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which limit idling of a vehicle's primary diesel engine for greater than five minutes in any location (except as noted) or operation of a diesel-fueled auxiliary power system within 100 feet of residential areas (except as noted).[2]

Local Policies and Regulations

Bay Area Air Quality Management District

BAAQMD is the regional agency responsible for air quality regulation within SFBAAB. BAAQMD regulates air quality through its planning and review activities; has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits; and can impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. BAAQMD regulates new or expanding stationary sources of toxic air contaminants.

In September 2005, BAAQMD, in cooperation with the MTC and ABAG, prepared the *Bay Area 2005 Ozone Strategy*. The *Ozone Strategy* is a roadmap showing how the San Francisco Bay Area will achieve compliance with the state 1-hour O_3 standard as expeditiously as practicable and how the region will reduce the transport of ozone and ozone precursors to neighboring air basins. The *2005 Ozone Strategy* describes how the Bay Area will fulfill California Clean Air Act planning requirements for the state 1-hour O_3 standard through the proposed control strategy. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with MTC, local governments, transit agencies, and others.

An update of the *2005 Ozone Strategy* is currently in progress. The objectives of the *2009 Clean Air Plan* (CAP) are to:

- Comply with California Clean Air Act requirements;
- Develop an integrated plan that addresses multiple pollutants;
- Adopt control strategies to minimize public health risk;
- Achieve state standards as soon as practical;
- Update previously adopted control strategies;
- Reduce O_3 transport to downwind air basins; and
- Report on progress and update baseline and trends.

It is expected that the 2009 CAP and associated CEQA documents will be adopted in 2010.

On June 2, 2010, BAAQMD adopted new CEQA Air Quality Guidelines, which include quantitative CEQA significance thresholds for construction-related emissions of criteria pollutants, O_3 precursors (ROG, which includes VOCs), TACs, and GHGs (BAAQMD 2010b). According to BAAQMD, these recently adopted thresholds of significance are only intended to apply to environmental analyses that began on or after June 2, 2010 and thresholds pertaining to the health risks to sensitive receptors are only intended to apply to environmental analyses for new sensitive receptors that began on or after January 1,

[2] There are 12 exceptions to this requirement (e.g., emergency situations, military uses, adverse weather conditions), including: when a vehicle's power takeoff is being used to run pumps, blowers, or other equipment; when a vehicle is stuck in traffic, stopped at a light, or under direction of a police officer; when a vehicle is queuing beyond 100 feet from any restricted area; or when an engine is being tested, serviced, or repaired.

2011. The analysis in this EIR evaluates project emissions using both the 1999 and 2010 thresholds, but since the environmental analysis of the project began well in advance of June 2, 2010 and the project does not involve new sensitive receptors, significance determinations made in this EIR are based on the thresholds from the 1999 BAAQMD Guidelines, except with regard to areas, such as emissions during construction, for which there are no thresholds in the 1999 Guidelines, as described below.

3.3.4 Impact Analysis

Methodology for Analysis

The air quality impact analysis considers construction and operational impacts associated with the Master Plan projects. Construction and operational air emissions are evaluated in accordance with both the 1999 and 2010 BAAQMD CEQA Guidelines for assessing and mitigating air quality impacts, which were adopted in June 2010 (BAAQMD 1999; 2010b). A summary of the 1999 and 2010 thresholds of significance for the various pollutants is presented in **Table 3.3-3** and the thresholds applied in this analysis are indicated in this table. The approach to analysis of various categories of air pollutants is also described below.

Criteria Pollutants and Precursors

As indicated above (*Section 3.3.3, Regulatory Framework*), BAAQMD recently adopted new quantitative thresholds of significance for construction-related and operational emissions. Therefore, this EIR includes a quantitative analysis of the project's construction-related emissions using worst-case assumptions for the project's construction and operational emissions. Under the 1999 BAAQMD thresholds of significance for criteria pollutants and precursors, the project would result in a significant impact if operational emissions were to exceed the following thresholds: more than 80 pounds per day of ROG, NO_x, or PM_{10} (exhaust emissions only). The 1999 thresholds do not apply to construction emissions, although the 1999 BAAQMD Guidelines indicate that construction emissions are considered to be less than significant if BAAQMD-recommended dust and exhaust control measures are implemented. Although not applicable to this project, under the 2010 BAAQMD thresholds of significance for criteria pollutants and precursors, the project would result in a significant impact if construction-related or operational emissions were to exceed the following thresholds: more than 54 pounds per day of ROG or NO_x, 54 pounds per day of $PM_{2.5}$ (exhaust emissions only), or 82 pounds per day of PM_{10} (exhaust emissions only). The 2010 BAAQMD Guidelines also provide the following additional significance thresholds for criteria pollutant emissions associated with project operation: more than 10 tons per year of ROG, NO_x, or $PM_{2.5}$ (exhaust emissions only), or 15 tons per year of PM_{10} (exhaust emissions only). The 1999 thresholds, which apply to this project, are 15 tons per year of ROG, NO_x, or PM_{10}.

Toxic Air Contaminants and Community Risks and Hazards

BAAQMD's 1999 and 2010 TAC thresholds are both an increased cancer risk of more than 10 in 1 million for a person with maximum exposure potential and increased non-cancer risk of 1.0 Hazard Index (chronic or acute). The 2010 BAAQMD Guidelines also include the following additional criterion: not to exceed the annual average ambient $PM_{2.5}$ concentration of 0.3 $\mu g/m^3$. The analysis in this EIR compares project operational emissions to both the 1999 and 2010 thresholds; because the environmental analysis of the project began well in advance of June 2, 2010, and the project does not involve new sensitive receptors, significance determinations are based on the thresholds from the 1999 BAAQMD Guidelines. The 2010 BAAQMD Guidelines also apply these thresholds to construction emissions. Because there are no 1999

Table 3.3-3: Summary of BAAAQMD CEQA Significance Thresholds Applied in this Analysis

	1999 Construction-related Thresholds of Significance	2010 Construction-related Thresholds of Significance	1999 Operational Thresholds of Significance		2010 Operational Thresholds of Significance		Threshold Applied in this Analysis[1]
		Maximum Daily Emissions (pounds/day)	Maximum Daily Emissions (pounds/day)	Annual Emissions (tons/year)	Maximum Daily Emissions (pounds/day)	Annual Emissions (tons/year)	
Criteria Pollutants and Precursors (Regional)							
– ROG	**None**	54	**80**	**15**	54	10	Construction: 1999 Thresholds Operational: 1999 Thresholds
– NO_X	**None**	54	**80**	**15**	54	10	
– PM_{10} (Particulate Matter Exhaust)	**None**	82	**80**	**15**	82	15	
– $PM_{2.5}$ (Particulate Matter Exhaust)	**None**	54	**None**	**None**	54	10	
– PM_{10}/ $PM_{2.5}$ (Fugitive Dust)	**None**	Best Management Practices	**None**	**None**	None	None	
Criteria Air Pollutants and Precursors (Local)							
– CO	**None**	**None**	**9.0 ppm (8-hour average) 20.0 ppm (1-hour average)**		9.0 ppm (8-hour average) 20.0 ppm (1-hour average)		Construction: 1999/2010 Thresholds (Same) Operational: 1999/2010 Thresholds (Same)
Risks and Hazards							
– Siting a New Source or Receptor (Individual Project)	None	**Cancer Risk: >10 in a million Non-Cancer Hazard Index: >1.0 $PM_{2.5}$ Level: >0.3 μg/m^3 annual average**	Cancer Risk: >10 in a million Non-Cancer Hazard Index: >1.0		**Cancer Risk: >10 in a million Non-Cancer Hazard Index: >1.0 $PM_{2.5}$ Level: >0.3 μg/m^3 annual average**		Construction: 2010 Thresholds Operational: 1999/2010 Cancer Threshold (Same); 2010 Non-Cancer and $PM_{2.5}$ Thresholds

NOTES: While this EIR evaluates the project's impact when compared to both the 1999 and 2010 BAAQMD CEQA significance thresholds, the thresholds applied in this analysis to determine impact significance are indicated in **bold**.

1 It is the BAAQMD's policy that the adopted thresholds apply to projects for which a Notice of Preparation is published, or environmental analysis begins, on or after the applicable effective date. The adopted CEQA thresholds, except for the risks and hazards thresholds for new receptors are effective June 2, 2010. The risks and hazards thresholds for new receptors are effective May 1, 2011. Since the project's NOP was published prior to June 2, 2010,the 1999 thresholds would apply to this project. However, where there is no 1999 threshold, such as for non-cancer health risks and PM2.5, the 2010 thresholds have been applied.

2 The 1999 BAAQMD CEQA Guidelines do not specify quantitative significance thresholds for construction-related emissions, but considers construction-related emissions to be a significant impact unless BAAQMD-recommended dust control measures are implemented during construction. While the impact analysis compares project impacts to both the 1999 non-quantitative threshold and 2010 threshold, the significance of project-related construction emissions is determined using the1999 non-quantitative threshold.

thresholds for construction, significance determinations are based on the 2010 BAAQMD thresholds. The 2010 Guidelines also require a cumulative evaluation when siting a new source or receptor, and BAAQMD cumulative TAC thresholds for both construction-related and operational emissions (considering all sources within a 1,000-foot radius) are an increased cancer risk of more than 100 in 1 million for a person with maximum exposure potential, increased non-cancer risk of 1.0 Hazard Index (chronic or acute), and increase in annual average ambient $PM_{2.5}$ of more than 0.8 $\mu g/m^3$. Because the 1999 thresholds do not require cumulative evaluation, the significance determinations are based on the 2010 Guidelines and are analyzed in Section 4 as part of the Cumulative Impact Analysis.

Thresholds of Significance

For the purposes of this analysis, an impact to air quality would be significant if the Land Use Master Plan would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Impacts and Mitigation Measures

This section discusses potential impacts to air quality that could result in conjunction with construction and operation of the Land Use Master Plan. Mitigation measures are identified where appropriate.

Impact AIR-1 Construction Emissions Of Criteria Pollutants and Precursors

Construction of project facilities would generate particulate matter (dust) emissions during grading activities as well as criteria air pollutant (including CO, SO_2, PM_{10}, and $PM_{2.5}$) and precursor emissions (e.g., ROG and NO_X), primarily as a result of combustion emissions. Sources of combustion or exhaust emissions would include on-road haul trucks, delivery trucks, worker commute vehicles, off-road heavy-duty equipment, and stationary equipment such as compressors and generators. Sources of fugitive emissions (e.g., particulate matter or dust) would include construction-related activities such as soil disturbance, grading, and material hauling. Sources of off-gas emissions could include asphalt paving and the application of architectural coatings. Emissions of VOCs and NO_X from these emission sources would incrementally add to regional atmospheric loading of ozone precursors during project construction.

The 2010 BAAQMD CEQA Guidelines specify quantitative significance thresholds for construction-related emissions, while there are no quantitative thresholds in the 1999 BAAQMD Guidelines for construction emissions. Consistent with the 2010 BAAQMD CEQA Guidelines, this analysis uses the CARB computer model (URBEMIS2007), to quantify all construction-related criteria pollutant and precursor emissions associated with construction of the proposed biodiesel production facility, food waste preprocessing facility, and other Land Use Master Plan elements (model outputs are summarized in *Appendix B*). A summary of emissions associated with these projects is presented in **Table 3.3-4**.

Table 3.3-4: Criteria Air Pollutant Emissions From Construction Activities (pounds per day)

	ROG	NO_X	CO	SO_2	PM_{10}[1]	$PM_{2.5}$[1]
Biodiesel Production Facility[2]						
Demolition and Grading (2011)[3]						
- Before Mitigation	4.1	35.3	17.6	0.0	18.1	5.1
- After Mitigation	4.1	30.5	17.6	0.0	1.6	0.6
Construction (2012)						
- Before Mitigation	3.2	21.1	18.8	0.0	1.3	1.2
- After Mitigation	3.2	18.5	18.8	0.0	0.4	0.3
Food Waste Preprocessing Facility[4]						
Demolition and Grading (2012)[5]						
- Before Mitigation	2.9	23.4	12.8	0.0	13.6	3.7
- After Mitigation	2.9	20.2	12.8	0.0	1.1	0.4
Construction (2012-2013)						
- Before Mitigation	3.6	20.2	16.8	0.0	1.5	1.3
- After Mitigation	3.6	17.4	16.8	0.0	0.3	0.3
Other Land Use Master Plan Elements (Other Short-Term and Long-Term Projects) [5]						
Paving (2011)						
- Before Mitigation	2.8	16.6	12.9	0.0	1.5	1.3
- After Mitigation	2.8	14.2	12.9	0.0	0.2	0.2
Grading (2012)						
- Before Mitigation	3.2	25.3	13.7	0.0	6.2	2.3
- After Mitigation	3.2	21.6	13.7	0.0	0.6	0.3
Construction (2013)						
- Before Mitigation	3.1	18.0	14.1	0.0	1.3	1.2
- After Mitigation	3.1	15.5	14.1	0.0	0.3	0.2
Construction (2015 – 2030)						
- Before Mitigation	1.6-2.6	10.4-15.6	11.3-13.3	0.0	0.6-1.1	0.5-1.0
- After Mitigation	1.6-2.6	8.9-13.4	11.3-13.3	0.0	0.1-0.2	0.1-0.2
Maximum Combined Master Plan and Project Emissions in 2011						
- Before Mitigation	6.9	51.9	30.5	0.0	19.6	6.4
- After Mitigation	6.9	44.7	30.5	0.0	1.8	0.8
Maximum Combined Master Plan and Project Emissions in 2012						
- Before Mitigation	6.1	48.7	26.5	0.0	19.8	6.0
- After Mitigation	6.1	41.8	26.5	0.0	1.7	0.7
Maximum Combined Master Plan and Project Emissions in 2013						
- Before Mitigation	6.7	38.2	30.9	0.0	2.8	2.5
- After Mitigation	6.7	32.9	30.9	0.0	0.6	0.5
2010 BAAQMD CEQA Significance Thresholds	54	54	--	--	82	54

1 Fugitive emissions plus equipment exhaust.

2 Assumed equipment fleet for the Biodiesel Production Facility would be: 1 concrete saw, 2 dump trucks, 1 tractor/loader/backhoe, 1 dozer for asphalt demolition; 1 grader, 1 roller, 1 scraper, 1 water truck, and 1 tractor/loader/backhoe for grading of 3 acres (1,500 cubic yards [cy] of soil); and 1 boom, 2 forklifts, 1 pile driver, 1 crane, 1 concrete pumper truck, 1 cement mixer, 2 welders, 1 tractor/loader/backhoe for construction.

3 Assumed 1,500 cy of earthwork using 20-cy capacity trucks.

4 Assumed equipment fleet for the Food Waste Preprocessing Facility would be: 1 concrete saw, 2 dump trucks, 1 tractor/loader/backhoe, 1 dozer for asphalt demolition; 1 grader, 1 roller, 1 scraper, 1 water truck, and 1 tractor/loader/backhoe for grading of 1.4 acres (2,500 cy of soil); and 1 boom, 2 forklifts, 1 air compressor, 1 generator set, 1 crane, 1 concrete pumper truck, 1 cement mixer, 2 welders, 1 tractor/loader/backhoe for construction.

5 Master Plan construction is assumed to be paving of 1 acre in 2011, grading of 1 acre in 2012, and construction on 1 acre in 2013. Assumed equipment fleet for the Master Plan projects would be: 4 cement mixers, 1 paver, 1 roller, 1 signal board, 1 sweeper/scrubber, 1 tractor/loader/backhoe for paving in 2011; 1 grader, 1 roller, 1 scraper, 1 tractor/loader/backhoe for grading in 2012; 1 aerial lift, 1 crane, 1 forklift, 1 generator set, 1 tractor/loader/backhoe, 1 welder for construction in 2013; and 1 aerial lift, 1 crane, 1 forklift, 1 generator set, 1 tractor/loader/backhoe, 1 welder, 1 air compressor, 1 dumper, 1 pump, 1 mortar mixer for construction in 2015-2030.

Source: URBEMIS2007 Model, Output in Appendix B.

Biodiesel Production Facility and Food Waste Preprocessing Facility

Construction of the biodiesel production facility is expected to occur from late-2011 through late-2012 and construction of the food waste preprocessing facility is expected to occur from mid-2012 through late-2013, with some overlap in 2012. It is expected that the biodiesel construction would be winding down as the food waste preprocessing construction is starting up, such that construction-related impacts would not coincide. Therefore, emissions from each project were estimated separately and results are presented in **Table 3.3-4**. As indicated in this table, demolition, grading, and construction emissions associated with the biodiesel production and food waste preprocessing facilities would not exceed BAAQMD's significance thresholds for criteria pollutants and precursors. Under BAAQMD's 1999 CEQA Guidelines, BAAQMD considers construction-related dust emissions from all construction projects to be potentially significant, but mitigated to a less-than-significant level if BAAQMD-recommended dust controls are implemented. Under the 2010 BAAQMD CEQA Guidelines, construction-related fugitive dust and exhaust emissions are considered by BAAQMD to be mitigated to a less-than-significant level if the BAAQMD significance thresholds for criteria pollutants and precursors are not exceeded and BAAQMD-recommended Basic Construction Mitigation Measures are implemented. Controls reflected in both the 1999 and 2010 Guidelines are included as **Mitigation Measure AIR-1** and implementation of this measure would reduce the project's construction-related emissions to less than significant. This measure includes idling limits (as required in CCR Title 13 Section 2485), which are also included as one of the EBMUD Environmental Commitments (see *Chapter 2, Project Description, Section 2.5*). EBMUD Policy 7.05 requires limiting the idling of all mobile and stationary construction equipment.

Other Land Use Master Plan Elements

Construction of the other short- and long-term Land Use Master Plan elements over the next 20 to 30 years could generate criteria pollutant and precursor emissions due to paving, grading, and construction activities. **Table 3.3-4** presents the range of construction-related criteria pollutant and precursor emissions that could occur at times over the next 20 to 30 years, depending on the intensity of construction, which would vary from year to year. BAAQMD-recommended Basic Construction Mitigation Measures are included as **Mitigation Measure AIR-1** and implementation of this measure would reduce the Master Plan projects' construction-related emissions to less than significant.

Combined Impacts

Although construction periods for the biodiesel and food waste preprocessing facilities are not expected to overlap, there is potential for construction associated with the other Master Plan elements to coincide with construction of one of these facilities. Combined criteria pollutant emissions from potentially overlapping activities in 2011, 2012, and 2013 are listed in **Table 3.3-4**. As indicated in **Table 3.3-4**, combined emissions would not exceed 2010 BAAQMD thresholds with implementation of BAAQMD-recommended measures, which are included as **Mitigation Measure AIR-1.** Implementation of this measure would reduce the Master Plan projects' construction-related emissions to less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure AIR-1: Criteria Air Pollutant and Precursor Reduction Measures

To limit dust, criteria pollutant, and precursor emissions associated with construction of all Land Use Master Plan projects, EBMUD shall include the following measures, as applicable, in contract specifications:

a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

b. All haul trucks transporting soil, sand, or other loose material off site shall be covered.

c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

d. All vehicle speeds on unpaved areas shall be limited to 15 miles per hour.

e. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure CCR Title 13 Section 2485). Clear signage shall be provided for construction workers at all access points.

g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

h. A publicly visible sign with the telephone number and person to contact at the Lead Agency regarding complaints related to excessive dust or vehicle idling shall be posted at the MWWTP entrance. This person shall respond and take corrective action within 48 hours.

Significance Determination after Mitigation

Less than significant.

Impact AIR-2 Local Community Risks And Hazards During Construction

In order to evaluate air quality impacts at the local level, the 2010 BAAQMD Guidelines establish thresholds of significance for local community risks and hazards associated with TACs and $PM_{2.5}$. The 2010 thresholds are applied because the 1999 BAAQMD Guidelines do not include thresholds for community risks and hazards during construction. With respect to project-related construction activities, the primary emissions source would be combustion emissions from construction equipment and vehicles (i.e., heavy equipment and delivery/haul trucks, worker commute vehicles, air compressors, and generators). Off-site emissions would include those generated by worker vehicles as well as by diesel haul/delivery trucks used during construction, particularly trucks used to transport excavated materials from project facility sites. Emissions from construction worker commute trips would be minor compared to the emissions generated by construction equipment and haul/delivery trucks.

Diesel trucks would be used to transport excavated materials, pipeline materials, and backfill and diesel-powered construction equipment would be operated on site. As noted under Impact AIR-1, combustion emissions include suspended fine particulates ($PM_{2.5}$), and when these emissions are generated by diesel-powered equipment they are referred to as DPM, which contain substances that are known carcinogens. Diesel exhaust contains both pulmonary irritants and hazardous compounds that may affect sensitive receptors such as young children, senior citizens, or those susceptible to respiratory disease.

DPM is classified by BAAQMD as a TAC and BAAQMD CEQA Guidelines include quantitative thresholds to determine the significance of the project's construction-related emissions, both on a project-specific and cumulative basis. These thresholds are described above under Methodology for Analysis and summarized in **Table 3.3-5**.

Table 3.3-5: Summary of 2010 BAAQMD Risks and Hazards Construction-Related Significance Thresholds

Pollutant	Construction-Related Thresholds
Risks and Hazards – TACs & $PM_{2.5}$ (Siting a New Source or Receptor)	Increased cancer risk of >10.0 in a million Increased non-cancer risk of >1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: >0.3 µg/m^3 annual average

Biodiesel Production Facility

Construction of the proposed biodiesel production facility would require site grading to remove the existing asphalt surfaces and about 1,500 cy of soil, requiring up to 75 trucks, each making a roundtrip. This would occur over approximately one month. Truck traffic for off-hauling, equipment deliveries, and materials deliveries would access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. No project-related truck traffic would occur on local streets.

The primary local community risks and hazards impact associated with project construction activities would be exhaust from diesel-powered construction equipment, which contains DPM and is considered a TAC. The proposed biodiesel production facility is estimated to generate approximately 174 pounds of DPM from demolition, clearing, grading and construction.

In order to compare construction activity impacts from TAC emissions (DPM), a screening level dispersion analysis was conducted for the proposed biodiesel production facility. EPA's SCREEN3 dispersion model was run to calculate the diesel exhaust concentration for the peak exposure hour at the closest off-site residence. The peak exposure hour concentration was adjusted for the duration of construction and an individual cancer risk was calculated based upon generally accepted unit risk factors. The resulting peak hour and annual average exposure if the above emissions are assumed dispersed over a 70-year exposure period (the standard basis for risk calculation) would be as follows: increased cancer risk of 0.46 in a million,[3] acute non-cancer risk of 0.002, chronic non-cancer risk of 0.004, and $PM_{2.5}$ emissions of 0.021 µg/m^3 (annual average). The limited duration of the construction activity and the substantial distance separation between project-related sources and closest sensitive receptors would create DPM exposure risks that would be well below the BAAQMD CEQA significance thresholds of 10 excess cancer cases in a million, 1.0 acute hazard index, 1.0 chronic hazard index, and $PM_{2.5}$ emissions of 0.3 µg/m^3. Therefore, the project's construction-related local community risks and hazards impact would be less than significant.

Food Waste Preprocessing Facility

Construction of the proposed food waste preprocessing facility would require site grading of up to 2 feet on half of the facility site (0.75 acres), and importation of up to 2,500 cy of fill, which would be transported by approximately 130 trucks, each making a roundtrip. This would occur over approximately 2 to 3 months. Truck traffic for off-hauling, equipment deliveries, and materials deliveries would access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. No project-related truck traffic would occur on local streets.

The primary local community risks and hazards impact associated with project construction activities would be exhaust from diesel-powered construction equipment. The proposed food waste preprocessing

[3] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants, and youths age 2 to 16). The excess cancer risk for the biodiesel production facility is estimated to be 1.15 in a million. However, the CARB has recently indicated (CARB, 2010) that the OFFROAD2007 Model over predicts DPM emissions by a factor of around 3 because of lower load factors, fewer hours of actual use, and newer equipment than assumed in the model. Therefore, the adjusted excess cancer risk is conservatively estimated to be approximately 60 percent lower for this project.

facility is estimated to generate approximately 323 pounds of DPM from proposed grading and construction activities.

Results of the SCREEN3 dispersion model indicate that peak hour and annual average exposure (70-year exposure period assumed) would be as follows: increased cancer risk of 0.93 in a million,[4] acute non-cancer risk of 0.005, chronic non-cancer risk of 0.009, and $PM_{2.5}$ emissions of 0.046 µg/m^3 (annual average). The limited duration of the construction activity and the substantial distance separation between project-related sources and closest sensitive receptors would create DPM exposure risks that would be well below the BAAQMD CEQA significance thresholds of 10 excess cancer cases in a million, 1.0 acute hazard index, 1.0 chronic hazard index, and $PM_{2.5}$ emissions of 0.3 µg/m^3. Therefore, the project's construction-related local community risks and hazards impact would be less than significant.

Other Land Use Master Plan Elements

Construction would require site grading to remove the existing asphalt surfaces and some undetermined quantity of soil, which would need to be off-hauled by trucks during the construction of each short- and long-term project. Site grading and asphalt removal would typically occur for a short period (one to three months) during each project's construction, and therefore, daily on- and off-site DPM emissions are expected to be similar to those generated by the biodiesel production and food waste preprocessing facilities. Truck traffic associated with other Land Use Master Plan elements for off-hauling, equipment deliveries, and materials deliveries would access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. No Master Plan-related construction truck traffic is expected to occur on local streets. Construction of short- and long-term Land Use Master Plan elements would occur over the next 20 years, and the long duration of a limited level of construction activity is expected to create the following DPM exposure risks (based on the assumed one acre of paving, grading, or construction annually): 3.78 excess cancer risk,[5] acute non-cancer risk of 0.002, and $PM_{2.5}$ emissions of 0.025 µg/m^3 (annual average), well below the BAAQMD CEQA significance thresholds of 10 excess cancer cases in a million, 1.0 acute hazard index, 1.0 chronic hazard index, and $PM_{2.5}$ emissions of 0.3 µg/m^3. At a program level, the overall Master Plan's construction-related local community risks and hazards impact are estimated to be less than significant for plan implementation.

Construction of some of these Land Use Master Plan components would require demolition of existing structures, which could result in airborne release of hazardous building materials, such as asbestos fibers. If found to be present in building materials to be removed, asbestos abatement practices such as containment and removal would be required prior to demolition. EBMUD would also be required to obtain clearance for asbestos removal from BAAQMD prior to issuance of a demolition permit. Compliance with this requirement would reduce to less than significant the potential for public health

[4] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants, and youths age 2 to 16). The excess cancer risk for the food waste preprocessing facility is estimated to be 2.32 in a million. However, the CARB has recently indicated (CARB, 2010) that the OFFROAD2007 Model over predicts DPM emissions by a factor of around 3 because of lower load factors, fewer hours of actual use, and newer equipment than assumed in the model. Therefore, the adjusted excess cancer risk is conservatively estimated to be approximately 60 percent lower for this project.

[5] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants, and youths age 2 to 16). The excess cancer risk for Land Use Master Plan projects is estimated to be 8.33 in a million. However, the CARB has recently indicated (CARB, 2010) that the OFFROAD2007 Model over predicts DPM emissions by a factor of around 3 because of lower load factors, fewer hours of actual use, and newer equipment than assumed in the model. Therefore, the adjusted excess cancer risk is conservatively estimated to be about 60 percent lower over the next few years (2011 to 2013) and 50 percent lower between 2015 and 2030.

hazards associated with the release of airborne asbestos fibers at the project site. Refer to Impact HAZ-3 in *Section 3.9, Hazards and Hazardous Materials* for additional discussion of impacts associated with building demolition and measures to ensure protection of public health from exposure to hazardous building materials.

Combined Impacts

Table 3.3-6 shows combined DPM emissions associated with construction of the biodiesel production facility, food waste preprocessing project, and other Land Use Master Plan elements, which would not exceed BAAQMD CEQA significance thresholds. Therefore, the project's combined construction-related local community risks and hazards impacts would be less than significant.

Table 3.3-6: Summary of Risks and Hazards Associated with Construction-Related Emissions and Significance Thresholds

	Excess Cancer Cases (per million)[1]	Acute Hazard Index	Chronic Hazard Index	One-Hour $PM_{2.5}$ ($\mu g/m^3$)	Annual Average $PM_{2.5}$ ($\mu g/m^3$)
Biodiesel Production Facility	0.46	0.002	0.004	0.21	0.021
Food Waste Preprocessing Project	0.93	0.005	0.009	0.46	0.046
Other Land Use Master Plan Elements	3.78	0.002	- -[2]	0.25	0.025
Combined Emissions	5.17	0.009	0.013		0.091
1999 BAAQMD CEQA Significance Threshold	—	—	—		—
2010 BAAQMD CEQA Significance Threshold	**10**	**1.0**	**1.0**		**0.3**

NOTE: "—" No applicable threshold. The thresholds applied in this analysis to determine impact significance are indicated in **bold**. Acute hazards are not additive unless construction of these projects overlap. However, since some overlap could occur, the acute hazards are added together to represent a conservative, worst-case evaluation.

[1] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants, and youths age 2 to 16). The combined excess cancer risk is estimated to be 11.8 in a million. However, the CARB has recently indicated that the OFFROAD2007 Model over predicts DPM emissions by a factor of around 3 because of lower load factors, fewer hours of actual use, and newer equipment than assumed in the model (CARB 2010). Therefore, the adjusted excess cancer risk is conservatively estimated to be approximately 60 percent lower over the next few years (2011 to 2013) and 50 percent lower between 2015 and 2030.

[2] Office of Environmental Health Hazard Assessment (OEHHA) considers an exposure of more than 8 years in a lifetime to be "chronic" (2000). Since construction of Master Plan projects would occur over the next 20 years, chronic non-cancer hazards associated with construction have been added to operational emissions (see Table 3.3-17).

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact AIR-3 Odors Generated During Project Construction

Objectionable odor problems would not likely result from project-related construction activities. Diesel exhaust generated by heavy equipment could cause some diesel odors when operated at the MWWTP. Although the closest sensitive receptors (residential uses) are located downwind of the MWWTP, prevailing onshore winds would create sufficient dispersal of construction-related diesel odors so that nuisance odor problems at these receptors are not expected to occur. In addition, all construction activities associated with Land Use Master Plan elements would be subject to the existing idling limits specified in CCR Title 13 Section 2485 (see **Mitigation Measure AIR-1**), and compliance with this regulation would help limit diesel odor potential of project-related construction vehicles. Therefore, given the limited

duration of construction equipment operations, substantial distance separation between project-related sources and closest sensitive receptors, and dispersal of diesel odors by onshore winds in the project area during the daytime hours, odor impacts would be less than significant.

Biodiesel Production Facility

The closest sensitive receptors are located more than two-thirds mile to the east. Given this distance and prevailing onshore winds, nuisance diesel odor problems associated with operation of construction equipment at this facility site are expected to be less than significant.

Food Waste Preprocessing Facility

The closest sensitive receptors are located more than one-half mile to the east. Given this distance and prevailing onshore winds, nuisance diesel odor problems associated with operation of construction equipment at this facility site are expected to be less than significant.

Other Land Use Master Plan Elements

The closest sensitive receptors are located approximately one-fourth mile to the east. Given this distance and prevailing onshore winds, nuisance diesel odor problems associated with operation of construction equipment at this facility site are expected to be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

See **Mitigation Measure AIR-1: Criteria Air Pollutant and Precursor Reduction Measures** above.

Impact AIR-4 Direct Criteria Pollutant Emissions During Project Operation

The MWWTP is classified as a major facility based on current emissions of more than 35 tons per year of precursor organic compounds (POCs) and/or NO_X (EBMUD 2008a). Implementation of the proposed Land Use Master Plan would result in both increases and decreases in criteria pollutant emissions from stationary and mobile sources as described below.

Master Plan implementation would also result in indirect emissions associated with increased electricity demand at the MWWTP. Because short- and long-term Land Use Master Plan projects are expected to utilize renewable energy (generated by the MWWTP's power generation facilities),[6] only the proposed biodiesel production and food waste preprocessing facilities would increase electricity demand from the regional power grid. This increased electricity demand would result in indirect criteria pollutant emissions associated with electricity generation. Because electricity from the power grid can be generated from renewable resources or from outside SFBAAB or even California, indirect air quality impacts on SFBAAB from electricity generation cannot be predicted. However, since impacts of these indirect emissions would have an effect on global climate change, indirect GHG emissions associated with increased electricity generation have been estimated and are discussed under Impact GHG-2 in *Section 3.8*.

[6] No increase in indirect criteria pollutant emissions are expected to be associated with increased power demand from short- and long-term Land Use Master Plan projects served by on-site power.

Biodiesel Production Facility

Stationary Source Emissions

The proposed biodiesel production facility would produce biodiesel through a reaction (transesterification) between feedstock,[7] alcohol (assumed to be methanol), and a catalyst (i.e., sodium methoxide). The major steps required to synthesize biodiesel are feedstock *Pretreatment*, *Reactions*, and *Product Purification*, which are characterized as follows:

- *Pretreatment* would involve the removal of water.
- *Reactions* would involve the production of biodiesel, as well as glycerin, excess alcohol, soap, and trace amounts of water as byproducts.
- *Product Purification* would involve the removal of byproducts. Glycerin (or glycerol) byproduct would be removed and then sent to EBMUD digesters for anaerobic digestion and gas generation, and ultimately for production of renewable energy at the MWWTP power generation facilities. Residual methanol would be removed through distillation and then reused (although it could be washed out with water as a waste). Soaps and any residual water would also be removed.

Process emissions from biodiesel facilities would be primarily from vent condensers, fugitive emissions, and boiler emissions, which are described as follows (see *Appendix C* for a more detailed description of facility design assumptions and emissions estimates):

- *Vent Condenser Emissions Point 1* – Storage Tank Farm: Uncontrolled working and breathing losses of methanol and other VOCs from each storage tank containing methanol as a liquid component and the predicted total uncontrolled vent losses when piped to the tank farm vent condenser system.
- *Vent Condenser Emissions Point 2* – Acid Esterification Unit: Methanol and other VOC emissions from the vapor outlet of the vent condenser system connected to the acid esterification reactor and the drying section where excess methanol and water formed during the esterification reaction would be removed.
- *Vent Condenser Emissions Point 3* – First and Second Stage Reactors and Intermediate Settler: Methanol and other VOC emissions from the vapor outlet of the vent condenser unit connected to the first and second stage reactors.
- *Vent Condenser Emissions Point 4* – Methanol Recovery Unit: Methanol and other VOC emissions from entrained non-condensables in the oil feed and air leakage into the distillation column (due to the vacuum methanol distillation column).
- *Fugitive Emissions:* Fugitive VOC leak emissions from the valves, flanges, pumps, vents, and compressor connectors. Exhaust air from within the process building would be processed through an activated carbon filtration system to capture VOCs, odors, and other gas phase contaminants, although no reduction credit is included for purposes of this impact analysis.
- *Boiler Emissions:* Criteria pollutant emissions (NO_X, CO, VOC, SO_X, $PM_{2.5}$) from the natural gas-fired boiler based on best available control technology emissions limits.

Criteria pollutant emissions from each of the above sources are estimated and a detailed breakdown of these estimates and description of the methodologies used to estimate these emissions are presented in *Appendix C*. Criteria pollutant emissions estimates are summarized below in **Table 3.3-7**. Impacts associated with methanol emissions are also discussed below under Impact AIR-5.

[7] Feedstock could include animal fats, yellow grease (from waste cooling oil), or virgin oil from plants (such as soy).

Table 3.3-7: Operational Criteria Air Pollutant Emissions from Stationary Sources - Biodiesel Production Facility (pounds per day and tons per year)

	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Average Daily Emissions (pounds per day)						
Stationary Sources	33	4	11	10	26	26
1999 BAAQMD CEQA Significance Thresholds	80	80	--	--	80	--
2010 BAAQMD CEQA Guidelines	54	54	--	--	82	54
Maximum Annual Emissions (tons per year)						
Stationary Sources	5.95	0.70	1.78	1.69	4.29	4.29
1999 BAAQMD CEQA Significance Thresholds	**15**	**15**	**--**	**--**	**15**	**--**
2010 BAAQMD CEQA Significance Thresholds	10	10	--	--	15	10

NOTE: "—" No applicable threshold. The thresholds applied in this analysis to determine impact significance are indicated in **bold**.
SOURCE: CH2MHILL, 2010. For a detailed breakdown of estimates by source and description of methodologies, see Appendix C.

As indicated in this table, daily and annual emissions associated with operation of the biodiesel production facility would not exceed BAAQMD's 1999 or 2010 operational significance thresholds for criteria air pollutants. Therefore, the project's operational emissions would be less than significant. While design details for this facility have not been finalized, it should be noted that biodiesel plants often incorporate water and/or oil scrubbers at the final emission point, and the addition of scrubbers would likely provide significant reduction in the methanol emissions.

Conversion of fats, oils, and grease (FOG) into biodiesel and use of biodiesel instead of petroleum-based diesel fuel would also reduce criteria pollutant emissions. According to USEPA (2002), biodiesel emissions contain substantially lower levels of hydrocarbons (HC) (HC or ROG, 21 percent less), carbon monoxide (CO, 11 percent less), and particulate matter (PM, 10 percent less), but slightly higher levels of nitrogen oxides (NO_X, 2 percent more) when compared to petroleum-based diesel. This EPA analysis evaluated one of the most common blends of biodiesel (20 percent soybean-based biodiesel/80 percent conventional diesel) performance in heavy-duty highway engines.

Mobile Source Emissions

Mobile source emissions associated with operation of the biodiesel production facility would be limited to on-site truck operations (internal to the MWWTP) and off-site truck or rail operations associated with delivery of feedstock and chemicals and transport of biodiesel product to distributors and byproduct to the area landfills. Expected truck operations and assumed trip lengths are presented in **Table 3.3-8**.

The proposed facility would utilize different sources of feedstock that would be delivered by truck from their point of origin, or from the Port of Oakland. It is assumed that half of the feedstock would be derived from local sources, collected within a 100-mile radius of the MWWTP, and transported to the MWWTP by truck. The remaining half of the feedstock as well as chemical deliveries are assumed to be transported by rail to the Port of Oakland from sources outside SFBAAB. Since project-related rail cars would become part of much larger trains, any increase in rail operations would not be directly attributable to this project. Trucks would then be used to transport materials from the Port of Oakland to local distributors or directly to the biodiesel production facility at the MWWTP. Biodiesel product is also assumed to be transported by truck to local distributors within 20 miles of the MWWTP, while waste byproduct would be transported by truck from the MWWTP to the area landfills. Average daily miles traveled by trucks were then estimated based on these various truck operations and average trip lengths to these various locations.

Table 3.3-8: Truck Travel Patterns with Operation of Biodiesel Production Facility

Source Location	Project-Related Vehicle Daily Trip Ends	Proposed Daily Average Miles Travelled
Inputs		
Feedstock Delivery	34	864
Other Materials	4	44
Outputs		
Off-Load Biodiesel	20	400
Byproduct (Calcium Bentonite)	0.133	6
Additional Biosolids (Indirect)	0.16	11
Internal Daily Trips in MWWTP (Glycerin Byproduct)	3	1.25
Total New Truck Trips	61	1,326
Employee Vehicle Trips	113	1,128
Net Increase in Trips and Vehicle Miles Traveled	174	**2,456**
Decrease with Rail Spur Option[1] Inputs	- 21	- 496
Outputs	- 20	- 400
Total New Truck Trips with Rail Option	20	**430**
Employee Vehicle Trips	113	1,128
Total Net New Trips and Vehicle Miles Traveled With Rail Option	133	**1,560**

NOTE: As indicated in *Chapter 2, Project Description*, Table 2-4, feedstock, chemical deliveries, and biodiesel product would be transported to and from the MWWTP site by truck from their point of origin or from the Port of Oakland, where they arrived by rail. Glycerin, the biodiesel byproduct, would be transported within the site by trucks. If all materials are transported to and from the site by truck, a maximum of 32.5 trucks per day would be required. To estimate average daily miles traveled, approximately half of the feedstock is assumed to be collected from waste oil collection centers within a 100-mile radius (average trip length between all 35 centers within this radius and the MWWTP is 51 miles or 102 miles round trip per load, assuming one load per collection center is received; but a round-trip distance of 41 miles was used to account for existing miles traveled for collection/transportation of waste oil from these collection centers) and half is assumed to come from soybean oil shipped from the Midwest via rail to the Port of Oakland, then transferred by truck to a supplier within 10 miles of the MWWTP or directly to the MWWTP. Chemical and fuel deliveries are assumed to be transported by rail to the Port of Oakland, then transferred by truck to suppliers within 10 miles of the MWWTP. Biodiesel product is assumed to be delivered to vendors/distributors within a 20-mile radius of the MWWTP. Local truck transport is a conservative assumption since rail transport directly to/from the site could occur. Two truck trip ends per month would be generated to the Altamont Landfill for disposal of calcium bentonite waste. Two and a half trips per month would be generated from the transport of digested glycerin (as biosolids) from the MWWTP to alternative daily cover or land application.

[1] If a rail spur is obtained and utilized, a maximum of 12 trucks per day and 5 railcars per day would be required.

Source: Orion Environmental Associates 2010.

Using the average daily miles traveled estimate presented in **Table 3.3-8** and the URBEMIS2007 model, criteria pollutant emissions associated with project-related mobile sources were estimated and results are presented in **Table 3.3-9**. When compared to both the 1999 and 2010 BAAQMD significance thresholds for criteria pollutants, project-related mobile source emissions would not exceed BAAQMD significance thresholds without or with the rail spur option. When the project's stationary and mobile source emissions are considered together, project-related criteria pollutant emissions would not exceed either the 1999 or 2010 BAAQMD significance thresholds. Therefore, project-related criteria pollutant emissions would be less than significant.

Table 3.3-9: Operational Criteria Air Pollutant Emissions from Stationary and Mobile Sources - Biodiesel Production Facility (pounds per day)

	ROG	NO_X	CO	SO_2	PM_{10}[1]	$PM_{2.5}$[1]
Mobile Sources – Trucks	2.9	34.9	11.5	0.0	1.7	1.5
Mobile Sources – Employees[2]	2.0	0.7	10.5	0.0	1.9	0.4
Total	4.9	35.6	22.0	0.0	3.6	1.9
Mobile Sources – Trucks with Rail Spur Option[3]	1.0	12.8	4.2	0.0	0.6	0.5
Mobile Sources – Employees	2.0	0.7	10.5	0.0	1.9	0.4
Total	3.0	13.5	14.7	0.0	2.5	0.9
Total Stationary and Mobile Sources – Trucks Only Option	37.9	39.6	33.0	10.0	29.6	27.9
Total Stationary and Mobile Sources – Rail Spur Option	36.0	17.5	25.7	10.0	28.5	26.9
1999 BAAQMD CEQA Significance Thresholds	**80**	**80**	**--**	**--**	**80**	**--**
2010 BAAQMD CEQA Significance Thresholds	54	54	--	--	82	54

Note: the thresholds applied in this analysis to determine impact significance are indicated in **bold**.

1 Fugitive emissions plus equipment exhaust emissions.

2 Employee trips are conservatively considered to be new trips even though they may already be commuting to other jobs and already generating emissions. An additional 10 miles per day is assumed for each employee, which conservatively accounts for any additional distances traveled by employees.

3 This option accounts for an 80 percent reduction in vehicle miles traveled by trucks and a 20 percent increase in rail emissions, based on a comparison of rail versus truck efficiencies (Federal Railroad Administration, 2009).

Source: Estimated using the EMFAC2007 (Version 2.3) emission factors for year 2012 (see Appendix B) and average miles traveled presented in Table 3.3-8.

Food Waste Preprocessing Facility

Stationary Source Emissions

All processing equipment at the food waste preprocessing facility would be electric so there would be no stationary source emissions other than the mobile equipment and other rolling stock.[8] Emissions associated with these mobile sources are discussed below.

The primary criteria pollutant associated with preprocessing of 600 tpd of food waste would be fugitive dust (PM_{10}) generated from the unloading and processing of food waste. However, given the high moisture content (approximately 65 percent) of incoming organic material and based on operation of other similar facilities, fugitive dust emissions from this facility would be minimal. Nevertheless, BAAQMD would require a permit for this facility. An air permit would typically identify all processing equipment and specify limits for PM_{10} emissions and volume of food waste that can be processed on a daily, quarterly and annual basis.

Mobile Source Emissions

This analysis evaluates and compares the criteria pollutant emissions associated with current disposal practices of 600 tpd of food waste generated in the Bay Area, primarily in four Bay Area counties: San Francisco, Alameda, Contra Costa, and San Mateo. Approximately half of the 600 tpd of food waste is diverted either to compost facilities or the EBMUD MWWTP (after preprocessing at compost facilities),

8 No diesel-powered backup generator is proposed.

while the remaining half is transported to landfills, as shown in **Table 3.3-10**. As indicated in this table, with the proposed food waste preprocessing facility, the 300 tpd of food waste currently transported to landfills would be diverted to the MWWTP for processing. Larger materials (overs) would then be separated into compostable and non-compostable materials and transported to compost operations or landfill. After preprocessing, approximately half (250 tpd) would be transferred to the Food Waste Facility for further processing, and ultimately sent to the MWWTP digesters.

Table 3.3-10: Existing and Proposed Practices for Disposal of Commercial Food Waste

Source	Disposal Practices for Food Waste	Input Volume (tpd)
Current Practice for Commercial Food Waste		
San Francisco	Sent to a composting facility in Vacaville either for composting or processing for shipment and backhauled to EBMUD; non-compostable materials sent to adjacent Hay Road Landfill or other permitted landfill.	200
Alameda County	Sent to Z-Best Compost in Gilroy for composting – 20 tpd Sent to Grover Compost in Vernalis for composting– 40 tpd Sent to Altamont Landfill for disposal – 140 tpd	200
Contra Costa County	Sent to Newby Island Landfill for processing, then to EBMUD-5 tpd Sent to Keller Canyon Landfill – 95 tpd	100
San Mateo County	Sent to Newby Island Landfill for composting– 40 tpd Sent to Ox Mountain Landfill for disposal – 100 tpd	100
Proposed Waste Sources, Truck Routes, and Key Travel Assumptions		
San Francisco	Send directly to MWWTP from transfer station (approximately 30% would be direct haul)	200
Alameda County	Send directly to MWWTP from four main transfer stations in the county (approximately 60% would be direct haul)	200
Contra Costa County	Send directly to MWWTP from Martinez transfer facility (approximately 20% would be direct haul)	100
San Mateo County	Send directly to MWWTP from San Carlos (Shoreway) preprocessing facility (no trips would be direct haul)	100

Source: EBMUD 2010.

When food waste is placed in landfills, uncontrolled biogenic emissions, the natural decay of food waste, are generated at the landfills. The most important biogenic emissions are VOCs, which react in the atmosphere with NO_X to form ground-level O_3, a criteria pollutant. VOCs can also react with ammonia (NH_3) to create fine particulates (PM), another criteria pollutant. These biogenic emissions currently contribute to the nonattainment status of the SFBAAB for O_3 and PM_{10}. VOCs are a class of more than 1,000 chemicals with greatly varying degrees of reactivity and toxicity. Biogenic emissions associated with food waste decomposition are highest when placed in landfills, and less when placed in composting facilities (Büyüksonmez and Evans 2007). However, there is some disagreement among scientists on how much VOCs and/or NH_3 are actually released by composting. Since the types of compounds being emitted and their reactivity vary greatly, the degree that VOCs from composting operations are reacting with other pollutants and making a significant contribution to regional air pollution has not been determined (CalRecycle 2010). Regardless of the level of reduction achieved by composting operations, biogenic emissions can be reduced further when food waste is diverted from either landfills or composting operations to the MWWTP for processing in a controlled environment where fugitive gases are captured and the product gas is utilized (see impact discussion below for EBMUD Power Generation

Station Renewable Energy Expansion Project, under Land Use Master Plan). Ultimately, food waste undergoes anaerobic decomposition in completely enclosed digesters at the MWWTP and biogas (which is approximately 60 percent methane [CH_4] and 40 percent carbon dioxide [CO_2]) generated by this process is utilized in the MWWTP's power generation facilities. This process essentially replaces food waste-related uncontrolled VOC emissions in the region with emissions from the MWWTP power generation facilities, which are subject to BAAQMD permit controls. By diverting this food waste from landfills, the project would reduce uncontrolled biogenic emissions at landfills and possibly reduce biogenic emissions generated during transport by shortening the transport time between source, preprocessing, processing, and decomposition.

At present, approximately one-half of commercial food waste materials in four Bay Area counties (300 of 600 tpd in San Francisco, Alameda, Contra Costa, and San Mateo Counties) is transported to various composting operations located mostly in outlying areas such as Vacaville, Gilroy, Vernalis, and Milpitas or local landfills for preprocessing or composting. Of this 300 tpd, approximately 40 tpd are currently transported by truck to the EBMUD MWWTP after preprocessing at various locations (mostly Vacaville). With the project, 600 tpd would be transported to the MWWTP for preprocessing, then larger materials (overs) would be transported from the MWWTP to composting operations or landfills.[9] The proposed practice for disposing food waste would be as presented on the bottom of **Table 3.3-10**.

Based on the proposed change in disposal practices, operation of the food waste preprocessing facility would alter truck travel patterns and trip lengths. Because food waste is currently hauled to landfills and composting operations in the Bay Area, project implementation would change the distribution of food waste-related haul truck traffic in the region and increase the overall mileage traveled by these trucks. Under the approved 250 tpd scenario, the number of trucks traveling to the MWWTP from the surrounding four counties would increase overall mileage traveled by incoming trucks by approximately 371 miles per day (EBMUD 2009). Under the proposed 600 tpd scenario, overall mileage traveled by incoming trucks would increase by approximately 1,100 miles per day from existing conditions or 730 miles per day from the previously approved 250 tpd scenario. The proposed change in truckloads and resulting trip lengths are presented in **Table 3.3-11**.

This increase in truck mileage would result in additional exhaust emissions and fugitive dust being generated by these trucks. Using the URBEMIS2007 model, emissions factors for heavy-duty diesel-fueled trucks, project-related increases in vehicle exhaust emissions were estimated based on the net increase in miles traveled associated with the project (the increase over baseline waste transport conditions). Currently, on a daily basis, approximately 30 truckloads are required to transport food waste from various sources to various composting operations, landfills and a small portion to EBMUD. In addition, approximately 9 truckloads are required to transport rejected material from the composting operations to the nearest landfill and from EBMUD to composting. Under the project, trucks would be re-routed to the food waste preprocessing facility, where approximately 60 percent would be sent to the EBMUD food waste facility and approximately 40 percent would be transported to composting operations for further processing. The change would result in some increases and some decreases in miles traveled in specific regions with an overall net increase as indicated in **Table 3.3-11**. Operation of the proposed food waste preprocessing facility would increase the number of workers at the MWWTP, resulting in an increase of 38 vehicle trips per day and emissions increases are also included in this table.

[9] Under the previously approved 250 tpd scenario, the practices for disposing food waste would be similar to those described on the top of Table 3.3-9 (current practice) except that additional food waste (210 tpd) would be transported to the MWWTP after preprocessing either at these landfills or composting operations.

Table 3.3-11: Comparison of Existing and Proposed Truck Travel Patterns with Operation of Food Waste Preprocessing Facility

		Existing Conditions			Project Conditions	
Source Location (Volume)	Truck Trip Direction	Existing Number of Loads	Existing Daily Miles Traveled	Truck Trip Direction	Proposed Number of Loads	Daily Miles Traveled Added by Project
San Francisco County (200 tpd)	SF to Jepson Prairie Organics (JPO) for Composting	10	1,340	Source to MWWTP	15	360
	JPO to MWWTP (backhaul) or Non-Compostable to Hay Road Landfill	5	0	MWWTP to Compost Operation	7	756
Alameda County (200 tpd) [1]	Transfer Stations to Composting in Gilroy (10%), Vernalis (20%), or Altamont Landfill (70%)	10	824	Transfer Stations or Source to MWWTP	19	182
	Non-Compostable from Composting to Altamont Landfill	3	264	MWWTP to Compost Operation	7	830
San Mateo County (100 tpd)	San Carlos Transfer Station to Newby for Composting (40%) or Ox Mountain Landfill	5	184	San Carlos Transfer Station to MWWTP	5	310
	Non-Compostable from Composting to Ox Mountain Landfill	1	80	MWWTP to Compost Operation	3	336
Contra Costa County (100 tpd)	Martinez Transfer Station to MWWTP (5%) or Keller Canyon Landfill (95%)	5	150	Martinez Transfer Station to MWWTP	7	462
	Non-Compostable from MWWTP to Altamont Landfill	0.125	11	MWWTP to Compost Operation	3	337
	Total Trucks:	39	**2,853**		76	**3,573**
Employee Trips					38	380
Net Change from Existing Conditions (2,853 Daily Miles for Unprocessed Material)						**1,100**
Net Change from Previously Approved 250 tpd Scenario Evaluated in IS/ND for Food Waste Facility Phase 2 Project (EBMUD 2009) (371 Daily Miles of Deliveries to MWWTP)						**729**

NOTE: Under existing conditions, trucks travel from the source to specific landfills or composting operations via transfer stations using 20-ton transfer trucks, which is considered a more conservative assumption since direct haul trips would be allowed if they are closer than transfer stations. It is also conservatively assumed that approximately 50 percent of the food waste delivered to composting operations for preprocessing/processing are not compostable and are then transported to landfills. Food waste from San Francisco would be transported to the composting operation in Vacaville for preprocessing, then processed food waste would be backhauled to MWWTP (no additional miles traveled). Under project conditions, trucks would travel either directly to the MWWTP instead of to composting operations or landfills, and up to 60 percent of the pre-processed food waste is conservatively assumed to be non-digestible, and this material would be transferred from MWWTP to composting operations in Vacaville (EBMUD, 2010c). Since transfer trucks are larger than route trucks, 60% of food waste can be hauled to Vacaville (non-digestibles) with a smaller number of trucks (about 40% of incoming trucks).

[1] Under existing conditions, route trucks currently transport food waste generated in this area to transfer stations and transfer trucks then transport food waste to various composting or landfill operations. Under project conditions, it is estimated that 60% of food waste generated in Alameda County (in the MWWTP vicinity) would be delivered via route trucks. Since route trucks are smaller than transfer trucks, it is estimated that 15 of the 19 truckloads of food waste would be route trucks. Also, since only the route trucks that are closer to the MWWTP than the transfer stations would transport food waste directly to the MWWTP, trip lengths associated with these route trucks would be shorter than their current trips to transfer stations. Thus, route truck trips (80% of Alameda County trips to the MWWTP) would be shorter than current route truck trips, which would result in a net reduction in vehicles miles traveled. For purposes of analysis, this change in about 80% of truck travel patterns in Alameda County is conservatively considered to result in no change in daily vehicle miles traveled.

Source: Orion Environmental Associates 2010.

In addition to off-site mobile source emissions, on-site mobile sources associated with operation of the food waste preprocessing facility would include rolling stock (two loaders, one excavator, and two end-dump trucks at full buildout) that would operate at the facility (on site).[10]

Using the average daily miles traveled estimate presented in **Table 3.3-11** and the URBEMIS2007 model, criteria pollutant emissions from all project-related mobile sources were estimated and results are presented in **Table 3.3-12**. As indicated in this table, when all mobile source emissions associated with operation of the food waste preprocessing facility are considered together and compared to BAAQMD significance thresholds, net increases in criteria pollutants would not exceed either the 1999 or 2010 BAAQMD significance thresholds. Therefore, operational criteria pollutant emissions associated with this facility would be less than significant. It should also be noted that the project would result in a reduction in VOCs, also an ozone precursor, by increasing diversion of food waste from landfills (thereby reducing uncontrolled biogenic emissions at landfills).

Table 3.3-12: Operational Criteria Air Pollutant Emissions from Mobile Sources – Food Waste Preprocessing Facility (pounds per day)

	ROG	NO_X	CO	SO_2	PM_{10}[1]	$PM_{2.5}$[1]
Existing Truck Operations (2,853 on-road miles per day from heavy-duty trucks)	8.7	109.0	34.1	0.1	5.2	4.6
Proposed Truck Operations (3,575 on-road miles per day from heavy-duty trucks)	10.1	123.5	39.8	0.1	5.9	5.2
Net Increase in Truck Emissions	1.4	14.5	5.7	0.0	0.7	0.6
Employee Vehicles	0.7	0.2	3.5	0.0	0.7	0.1
On-site Rolling Stock Emissions	1.9	15.5	8.8	0.0	0.9	0.8
Total Facility, Net Increase	4.0	30.2	18.0	0.0	2.3	1.5
1999 BAAQMD CEQA Significance Thresholds	**80**	**80**	**--**	**--**	**80**	**--**
2010 BAAQMD CEQA Significance Thresholds	54	54	--	--	82	54

Note: The thresholds applied in this analysis to determine impact significance are indicated in **bold**.

1 Fugitive emissions plus equipment exhaust emissions.

Source: Estimated using the EMFAC2007 (Version 2.3) emission factors for year 2012 (see Appendix B) and average miles traveled presented in Table 3.3-11.

Other Land Use Master Plan Elements

There are eleven elements of the proposed Land Use Master Plan that would be developed over the next 30 years. Implementation of the short- and long-term Master Plan projects would have some potential to generate criteria pollutants or precursors either from traffic associated with these projects (mobile sources) or operation of project facilities (stationary sources).

Mobile Source Emissions

Most of the elements describe expansions or improvements to the wastewater process and operation of these new facilities is not expected to generate new traffic and associated mobile source emissions. One element, digester expansion, which is linked to continued growth of the Resource Recovery (R2) program, would result in increased vehicle trips to deliver high- and low-strength trucked waste. Currently the R2 program receives an average of 100 trucks per weekday at the MWWTP. On a weekly

[10] The 2 loaders, 1 excavator, and 2 end-dump trucks are expected to operate approximately 11,000 hours per year when processing 600 tpd (averaging 12 hours per day, 365 days per year or 2,200 hours per year for each piece of equipment).

basis, the average is 90 trucks per day and current peak is 125 trucks per day. The program gains and loses customers every year due to changes in the marketplace including opening and closing of businesses, changes in product lines, regulations, and new waste disposal options. In the past year, the R2 program experienced a small net reduction in truck trips, but is expected to increase annually by an average of approximately 0.7% over the next 30 years, resulting in an average of 123 trucks per day, in addition to trucks already accounted for due to the biodiesel production and food waste preprocessing projects.[11] Currently, the average one-way distance travelled by an incoming truck is 66 miles. Over time, it is expected that there will be a decrease in the average miles traveled as the number of trucks coming from farther away (e.g., the Central Valley, San Jose and Napa) decreases (as facilities that accept trucked wastes are constructed closer to these areas) while the number of local trucks increases (as it becomes more cost effective to harvest this urban waste). On balance, the overall average one-way distance is expected to fall from 66 to 45 miles. The net change in roundtrip vehicle miles is a reduction of 2,130 miles per day, as indicated in **Table 3.3-13**. It is estimated that an additional 23 trucks per day would be expected over the next 30 years. Due to an expected reduced average travel distance, the total miles associated with these trucks and the resulting air emissions would be reduced. For purposes of this emissions calculation it is assumed, conservatively, that there would be no change in vehicle miles traveled or vehicle emissions.

Table 3.3-13: Change in Truck Travel Patterns with Growth of the Resource Recovery Program

Conditions	Number Trucks [1]	Average Distance (One Way)	Total Roundtrip Miles
Current Conditions	100	66	13,200
Future Conditions	123	45	11,070
Net Change	23	(21)	(2,130)

[1] Average week day rate, while on a weekly basis, the average is currently 90 trucks per day, and will increase to 110 trucks per day.
Source: EBMUD (2010)

Stationary Source Emissions

While other direct operational emissions estimates cannot be made at this time for all plan elements, this program-level analysis characterizes the emissions potential for each element. In general, criteria pollutant and precursor stationary source emissions associated with short- and long-term Master Plan projects are not expected to be significant since either no criteria or precursor emissions would be associated with the project, there would be some beneficial impact, or if there are such emissions, the project would be subject to permit review and approval by BAAQMD (permit to operate), which would ensure that any operational stationary source emissions would meet BAAQMD thresholds or mitigation would be required as part of the permit.

Short-Term Projects (2010 to 2020)

- Odor Control: This project would upgrade odor control facilities to address community concerns and respond to regulatory requirements. It is expected that this project would reduce odors and have beneficial impacts to the community and air quality.
- Food Waste Processing: This project would convert the existing EBMUD Food Waste Facility to an advanced processing facility. The primary air emissions associated with food waste processing are biogenic emissions (VOCs), haul truck emissions associated with food waste transport, and odors. While details of the proposed facility have not been defined, the potential for

[11] A net annual R2 program growth rate of 1 percent is expected with these two projects.

increases in these emissions would depend on the handling of food wastes at the site and food waste sources. In general, if advanced processing reduces processing time, then faster handling of food waste would reduce biogenic emissions and odor potential, a beneficial impact. The haul truck emissions would not change as a result of this project, as the maximum facility capacity would be the same.

- Emergency Response Equipment Storage: Since this area would be used to store emergency response equipment, no criteria pollutant emissions would be associated with this storage use, because low levels of vehicular/equipment activity are typically associated with storage uses.
- Land Lease (as available): While future uses on leased lands have not been specified, expected uses involving container storage, vehicle parking, or equipment storage are not expected to generate significant levels of criteria pollutants, particularly given the low level of vehicular/equipment activity typically associated with storage uses. While use for vehicle parking could generate new emissions from these vehicles, it is expected that these would be captured vehicles (vehicles already traveling on local roadways) since there are no major destination uses in the project vicinity.

Long-Term Projects (2020 to 2040)

- Secondary Treatment Upgrade for Nutrient Removal: This upgrade would be implemented if required under a future NPDES permit, and would involve upgrades to convert ammonia to nitrite, nitrate, and ultimately to nitrogen (N_2) gas. This process would remove nitrogen from wastewater and return it to the atmosphere as elemental N_2 in a process called denitrification. Assuming emissions increases associated with this project would be limited to N_2, no direct increases in criteria pollutant emissions could occur from the introduction of this process at the MWWTP. Indirect criteria pollutant emissions could be associated with increased energy requirements, but since the MWWTP's power generation facilities would produce sufficient amounts of electricity on site to power this project, there would be no indirect criteria pollutant emissions. Details of the proposed upgrades would be evaluated as part of project-level review to determine if the project and associated impacts are consistent with this Program EIR, and, if necessary, supplemental CEQA documentation would be prepared. However, direct criteria air pollutant emissions are not expected to exceed BAAQMD significance thresholds since primary treatment has already occurred and criteria pollutant content has already been reduced.
- Ultraviolet Disinfection: No direct criteria pollutant emissions would be associated with this type of facility; indirect criteria pollutant emissions could be associated with increased energy requirements, but since the MWWTP's power generation facilities would produce sufficient amounts of electricity on site to power this project, there would be no indirect criteria pollutant emissions.
- Tertiary Treatment Facility: This project would provide tertiary treatment (i.e., granular media filtration) and include ancillary facilities such as backwash tanks, filter feed pump station, and backwash pumps and equipment. Tertiary treatment processes secondary effluent, which has very low levels of solids and VOCs, minimizing the potential for odors and VOC emissions. While minor indirect or secondary air pollutant emissions could result from electrical demand for pumping water through the treatment system, there would be no indirect criteria pollutant emissions since the MWWTP's power generation facilities would produce sufficient amounts of electricity on site to power this project. In addition, a negligible increase in trucks (2 trucks every 10 years to replenish filter media, 1 truck ever 2 weeks for coagulant delivery) would also generate secondary emissions. This facility could be subject to BAAQMD permit requirements, which would require use of Best Available Control Technology (BACT) and Best Available Control Technology for Toxics (TBACT) as necessary to meet BAAQMD significance thresholds. Typical BACT and TBACT include process modifications (reduction in turbulence,

alternate disinfectants), industrial source controls, ferrous chloride injections, and caustic scrubbers for hydrogen sulfide removal/odor control.

- Digester Expansion: Future expansion of the MWWTP's digester capacity would increase biogas production. However, biogas emissions would be captured and used in the MWWTP power generation facilities, and emissions associated with these power generation facilities are subject to permit controls and were already considered in the PGS Renewable Energy Expansion Project IS/MND (EBMUD 2008a). Addition of new digesters could be subject to BAAQMD permit requirements. Permit requirements include the use of BACT and TBACT as necessary to meet BAAQMD significance thresholds. For POCs, typical BACT and TBACT include collection and venting of gases to boiler, flare or power generation facilities.
- Household Hazardous Waste Collection Facility: Household hazardous waste (HHW) would be collected at this facility, stored in sealed containers and transferred off site to appropriate hazardous waste disposal facilities. No direct criteria pollutant emissions would be associated with operation of this facility except emissions associated with minor amounts of traffic dropping off waste at this facility. Since traffic associated with this facility would consist primarily of light-duty vehicles or cars, not heavy-duty trucks, such traffic increases would contribute minor levels of criteria pollutants.
- Bay Stewardship Exhibit/Public Education Facility: No direct emissions of criteria pollutants would be expected except emissions associated with visitor-related traffic increases. Since traffic associated with this project would consist of light-duty vehicles or cars, not heavy-duty trucks, such traffic increases would contribute minor levels of criteria pollutants.
- Relocation of Septage and R2 Receiving Stations: This project would relocate existing receiving stations from their current locations in the northern portion of the MWWTP property (R2) and adjacent to the eastern MWWTP property boundary (septage) to a new location closer to the southern boundary. The relocation would reduce traffic through the plant and result in slightly fewer vehicle miles traveled and associated criteria pollutant emissions. No new direct or indirect emissions of criteria pollutants would be expected.

Combined Impacts

Total stationary and mobile source emissions from operation of the biodiesel production and food waste preprocessing projects are presented in **Table 3.3-14**. When these two projects are considered together, the combined NO_X emissions would be 69 pounds per day, which would not exceed the 1999 BAAQMD threshold for NO_X but would exceed the 2010 threshold for NO_X by 15 pounds per day. Since the 1999 thresholds apply to this project, project-related criteria pollutant emissions would be less than significant. As indicated above, operation of the short- and long-term Master Plan projects would not contribute substantially to stationary or mobile source emissions (i.e., any stationary source emissions would be subject to permit review and approval by BAAQMD, which would ensure that any operational stationary source emissions would meet BAAQMD thresholds or mitigation would be required as part of the permit).

In order to reduce the NO_x emissions to below the 2010 thresholds, several potential mitigation measures can be considered. First, construction of a rail spur to serve the Biodiesel Production Facility and mandating that rail be utilized for transporting feedstock, chemical inputs and product. If implemented, this measure would reduce the combined NO_x emissions to 47 pounds per day, below the 2010 threshold, as indicated in **Table 3.3-14**. However, this mitigation would require coordination with the railroad and therefore is not wholly within the control of EBMUD. Nonetheless, EBMUD will support pursuing a rail spur and utilizing it to the extent possible. Second, mobile source emissions could be reduced by mandating that trucks be equipped with Tier 3 diesel engines and have 2004 or newer model-year trucks with factory-built engines as defined in CCR Title 13 Section 2485, are electric or utilize lower-emission alternative fuels. However, many of the trucks are not under the control of EBMUD or the private

companies that will own and operate either the biodiesel production or food waste preprocessing facilities. In addition, the increased cost to replace or retrofit trucks may make the project economics no longer viable. Nonetheless, EBMUD will encourage all truck operators to utilize either Tier 3 diesel engines, alternative fuels or electric vehicles.

Table 3.3-14: Combined Total Operational Criteria Air Pollutant Emissions from Biodiesel Production and Food Waste Preprocessing Facilities (pounds per day)

	ROG	NO_X	CO	SO_2	PM_{10}[1]	$PM_{2.5}$[1]
Total Biodiesel Production Facility Net Increase	37.9	39.6	33.0	10.0	29.6	27.9
Total Food Waste Preprocessing Facility Net Increase	4.0	30.2	8.8	0.0	2.3	1.5
Total Combined Net Increase	41.9	69.8	41.8	10.0	31.9	29.4
Total Combined Net Increase with Rail Spur Option (for Biodiesel Production Facility)	40.0	47.7	34.5	10.0	30.8	28.4
1999 BAAQMD CEQA Significance Thresholds	**80**	**80**	**--**	**--**	**80**	**--**
2010 BAAQMD CEQA Significance Thresholds	54	54	--	--	82	54

Note: the thresholds applied in this analysis to determine impact significance are indicated in **bold**.

[1] Fugitive emissions plus equipment exhaust emissions.

Source: Tables 3.3-6, 3.3-8, and 3.3-11

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact AIR-5 Local Community Risks And Hazards During Project Operation

In order to evaluate air quality impacts at the local level, BAAQMD Guidelines establish thresholds of significance for local community risks and hazards associated with TACs. The local community risks and hazards impacts associated with implementation of the proposed Land Use Master Plan would vary with each project facility at the MWWTP. In addition to specific facility emissions, combustion emissions from diesel-powered delivery trucks and worker commute vehicles would be generated during project operation. Combustion emissions associated with diesel trucks used to transport materials and product to and from the MWWTP include suspended fine particulates ($PM_{2.5}$). When these emissions are generated by diesel-powered equipment, they are referred to as DPM, which contain substances that are known carcinogens. DPM is classified by BAAQMD as a TAC.

The 1999 and 2010 BAAQMD CEQA Guidelines establish quantitative thresholds for determining the significance of TAC and, for the 2010 Guidelines, $PM_{2.5}$ (including DPM) emissions from a proposed facility at the closest affected receptors, when considered by itself (a single new source) and, for the 2010 Guidelines, when considered cumulatively (i.e., from multiple sources). The operational significance thresholds for a single new source are summarized in **Table 3.3-15**. The significance determination is made based on the 1999 thresholds, as these are the thresholds that apply to this project. However, project emissions are presented for comparison to both the 1999 and 2010 thresholds.

Table 3.3-15: Summary of 1999 and 2010 BAAQMD Risks and Hazards Operational Significance Thresholds

Pollutant	Operational Thresholds	1999 Guidelines	2010 Guidelines
Risks and Hazards – TACs & $PM_{2.5}$ (Siting a New Source or Receptor)	Increased cancer risk:	>10.0 in a million	>10.0 in a million
	Increased non-cancer risk:	>1.0 Hazard Index (Chronic or Acute)	>1.0 Hazard Index (Chronic or Acute)
	Ambient $PM_{2.5}$ increase:	--	>0.3 $\mu g/m^3$ annual average

Biodiesel Production Facility

At full buildout (20 mgy), the proposed biodiesel production facility would generate approximately 10,569 pounds per year of methanol (from all facility emissions points) and 308 pounds per year of other TACs from the boiler. Process TAC emissions from the biodiesel production facility would include methanol from four vent condensers, fugitive emissions, and the natural gas-fired boiler. Methanol is classified as a non-carcinogenic compound with acute and chronic health effects and is classified as a Hazardous Air Pollutant (HAP)/TAC. Other TAC emissions, primarily ammonia, would be associated with the natural gas-fired boiler. All estimated TAC emissions associated with operation of this facility are presented in **Table 3.3-16**.

In order to evaluate the local community risks and hazards impact, a screening level dispersion analysis was conducted for all TAC emissions from the biodiesel production facility's stationary sources (**Table 3.3-16**) and DPM emissions from mobile sources.[12] EPA's SCREEN3 dispersion model was run to calculate the concentration of identified TACs for the peak exposure hour at the closest off-site residence and results are presented in **Table 3.3-16**. Due to the substantial distance separating this facility from the closest sensitive receptors and the low level of TAC emissions associated with operation of this facility, the combined cancer and hazard exposure risks at the closest sensitive receptor would be 0.13 excess cancer cases in a million, 0.0009 acute hazard risk index, 0.0008 chronic hazard risk index, and $PM_{2.5}$ emissions of 0.0002 $\mu g/m^3$ (on-site mobile sources only since they would be the only source of $PM_{2.5}$), which are well below BAAQMD CEQA significance thresholds of 10 excess cancer cases in a million, 1.0 acute hazard index, 1.0 chronic hazard index, and $PM_{2.5}$ emissions of 0.3 $\mu g/m^3$. Therefore, the project's operational local community risks and hazards impact would be less than significant.

[12] It is estimated that each truck delivering feedstock or chemicals or picking up biodiesel product would travel approximately 0.70 mile from the entrance, to the proposed facility, then back to the entrance, for a total of 41 miles traveled at the MWWTP per day by diesel trucks associated with operation of the biodiesel production facility.

Table 3.3-16: Estimated Operational Toxic Air Contaminant Emissions - Biodiesel Production Facility (pounds per year)

Pollutant	Estimated Emissions One Hour, pounds/hour	Annual, pounds/year	Excess Cancer Cases in a Million[1]	Acute Hazard Index	Chronic Hazard Index
Methanol from All Facilities	1.21	10,569	NA	0.0006	0.0004
TAC Emissions from Natural Gas-Fired Boiler					
Benzene	0.000068	0.55	0.004	0.000001	0.000001
Formaldehyde	0.00014	1.2	0.002	0.00003	0.00002
Total PAHs (excluding Napthalene)	0.0000012	0.0094	0.003[2]	NA	NA
Napthalene	0.0000035	0.028	0.0002	NA	0.0000005
Acetaldehyde	0.000036	0.29	0.0002	0.000001	0.0000003
Acrolein	0.000032	0.25	NA	0.0002	0.0001
Ammonia[3]	0.038	301	NA	0.0001	0.0002
Ethyl Benzene	0.000081	0.65	0.0004	NA	0.00000005
Hexane	0.000054	0.43	NA	NA	0.00000001
Toluene	0.00031	2.5	NA	0.0000001	0.000001
Xylene	0.00023	1.9	NA	0.0000001	0.0000004
$PM_{2.5}$ (DPM) from Mobile Sources[4]	0.0002	1.56 (0.0002 $\mu g/m^3$)	0.12	0.000002	0.00005
Total Emissions	**1.249**	**10,877.8**	**0.13**	**0.0009**	**0.0008**
BAAQMD 1999 CEQA Significance Thresholds	- -	- -	10	1.0	1.0
BAAQMD 2010 CEQA Significance Thresholds	**- -**	**$PM_{2.5}$: 0.3 $\mu g/m^3$**	**10**	**1.0**	**1.0**

Note: The thresholds applied in this analysis to determine impact significance are indicated in **bold**. "NA" = Cancer risk is not applicable to these TACs, and chronic and/or acute hazard is not applicable to these carcinogens. Hazard impacts were analyzed in terms of their acute and chronic health indexes. The annual emissions were converted to ambient concentration at the closest residential receptor using the EPA's SCREEN3 Model; these concentrations were then converted to the acute and chronic hazard Indexes using the acute and chronic reference exposure levels published by California Office of Environmental Health Hazard Assessment (OEHHA).

[1] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants, and youths age 2 to 16).

[2] Assumes all are Benzo[a]pyrene (worst-case).

[3] Assumes boiler is not equipped with selective non-catalytic reduction or selective catalytic reduction.

[4] Mobile sources reflect truck activity within MWWTP boundaries only.

Source: CH2MHILL (2010) for estimated emissions; Orion Environmental Associates (2010) for cancer and hazard risks. For a detailed breakdown of these estimates by source, see Appendix C.

Food Waste Preprocessing Facility

TAC emissions associated with operation of this project would include DPM from diesel trucks transporting food waste to the facility, and emissions from diesel equipment operated at the site. DPM poses cancer and chronic non-cancer health risks. It also contains a small increment of acrolein, which poses acute non-cancer health risks. No other TAC emissions would be associated with the proposed food waste preprocessing facility's stationary sources.

In order to evaluate the local community risks and hazards impact, a screening level dispersion analysis was conducted for DPM emissions associated with the food waste preprocessing facility's mobile sources within MWWTP boundaries.[13] EPA's SCREEN3 dispersion model was run to calculate the concentration of DPM for the peak exposure hour at the closest off-site residence and internal truck operations. Excess cancer risk at the closest sensitive receptors associated with diesel equipment and truck-related DPM would be 18.25 in a million,[14] 0.005 acute hazard risk index, 0.01 chronic hazard risk index, and annual average $PM_{2.5}$ emissions of 0.05 µg/m^3, which would exceed the BAAQMD CEQA significance threshold of 10 excess cancer cases in a million, but would not exceed the BAAQMD thresholds of 1.0 acute hazard index, 1.0 chronic hazard index, and $PM_{2.5}$ emissions of 0.3 µg/m^3. Therefore, the project's operational local community risks and hazards impact would be potentially significant. With implementation of diesel particulate controls included as **Mitigation Measure AIR-5**, the on-site mobile sources emissions associated with the food waste preprocessing facility would be reduced sufficiently so that the project's $PM_{2.5}$ emissions would not exceed 1999 and 2010 BAAQMD thresholds for excess cancer risk. Implementation of this measure would reduce the project's operational local community risks and hazards impact to less than significant.

Other Land Use Master Plan Elements

There are eleven elements of the proposed Land Use Master Plan that would be developed over the next 30 years, and projects such as the ultraviolet disinfection and tertiary treatment facility projects could release small amounts of TAC emissions from chemicals used in the treatment process or from increased truck traffic within the MWWTP. There is not sufficient design detail to evaluate the local community risks and hazards impact associated with operation of short- and long-term Land Use Master Plan projects. Details of the proposed facilities would be evaluated to determine if each project and its associated TAC emission levels are consistent with this Program EIR. If necessary, supplemental CEQA documentation would be prepared. However, emissions from Land Use Master Plan projects would not be expected to pose significant local community risks and hazards to sensitive receptors. TAC levels are typically higher in the initial stages of treatment, so that TAC levels are much lower in later treatment stages (secondary treatment, UV disinfection, or tertiary treatment). In addition, the chemical or biological treatment facilities would be constructed primarily in enclosed tanks and under controlled conditions. Emission controls must be adequate to protect workers in immediate physical contact with treatment processes. Given the substantial distance between the locations of the other Land Use Master Plan elements and the closest sensitive receptors, public exposure from any small amount of fugitive TAC releases would therefore be expected to be less than significant. This would be confirmed by project-specific review for projects that are implemented in the future.

DPM emissions from diesel trucks associated with the other Land Use Master Plan elements that would be operated within the MWWTP are expected to travel distances similar to on-site trucks associated with the biodiesel production facility (resulting in 0.13 cancer cases in a million, 0.00003 acute hazard risk

[13] It is estimated that each truck delivering food waste would travel approximately 0.46 mile from the entrance to and through the proposed facility, then back to the entrance, for a net increase of 13 miles traveled at the MWWTP per day by diesel trucks associated with operation of the food waste preprocessing facility when existing delivery trucks are considered.

[14] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants, and youths age 2 to 16). The calculated excess cancer risk for the food waste preprocessing facility is estimated to be 25.5 in a million. However, the CARB has recently indicated (CARB, 2010) that the OFFROAD2007 Model over predicts DPM emissions by a factor of around 3 because of lower load factors, fewer hours of actual use, and newer equipment than assumed in the model. Therefore, the adjusted excess cancer risk, almost all attributable to on-site rolling stock (off-road heavy equipment that is assumed to operate a total of 11,000 hours per year), is conservatively estimated to be approximately 50 percent less for 20 of the 70-year exposure period analyzed (net 30 percent reduction).

index, 0.0056 chronic hazard risk index, and $PM_{2.5}$ emissions of 0.0003 µg/m^3). Similarly, the DPM exposure risk at the closest sensitive receptors would be expected to be well below the BAAQMD CEQA significance thresholds of 10 excess cancer cases in a million, 1.0 acute hazard index, 1.0 chronic hazard index, and $PM_{2.5}$ emissions of 0.3 µg/m^3. Therefore, operational local community risks and hazards impacts associated with the Master Plan projects' truck operations within the MWWTP boundaries would be expected to be less than significant.

Combined Impacts

Table 3.3-17 shows combined stationary and mobile source emissions from operation of the biodiesel production facility and mobile sources from operation of the food waste preprocessing project and other Land Use Master Plan elements. The combined cancer and hazard exposure risks at the closest sensitive receptor would be 18.5 excess cancer cases in a million, 0.006 acute hazard risk index, 0.017 chronic hazard risk index, and $PM_{2.5}$ emissions of 0.05 µg/m^3 (annual average), which would exceed the BAAQMD CEQA significance threshold for excess cancer risk, but not exceed thresholds for other non-cancer (acute and chronic) and annual average $PM_{2.5}$ emissions. Therefore, the project's combined operational local community risks and hazards impact for excess cancer risk would be potentially significant. With implementation of diesel particulate controls included as **Mitigation Measure AIR-5**, the on-site mobile sources emissions associated with the food waste preprocessing facility would be reduced sufficiently so that combined emissions would not exceed 1999 and 2010 BAAQMD thresholds for excess cancer risk. This measure would be applied to all diesel equipment and trucks that operate solely within the MWWTP and West End property under the control of EBMUD. Although the biodiesel production facility and other Land Use Master Plan elements include little to no operation of on-site diesel equipment, use of diesel particulate filters on any on-site diesel equipment would provide further reduction in emissions. Implementation of this measure would reduce the combined operational local community risks and hazards impact to less than significant.

Table 3.3-17: Summary of Risks and Hazards Associated with Operational Emissions and Significance Thresholds

	Excess Cancer Cases (per million)	Acute Hazard Index	Chronic Hazard Index	Annual Average $PM_{2.5}$ (µg/m^3)
Biodiesel Production Facility	0.13	0.0009	0.0008	0.0002[1]
Food Waste Preprocessing Facility	18.25	0.005	0.0101	0.05[1]
Other Land Use Master Plan Elements	0.13	0.00003	0.0056[2]	0.0003[1]
Combined Risks and Hazards	18.5	0.006	0.017	0.05
1999 BAAQMD CEQA Significance Threshold	10	1.0	1.0	—
2010 BAAQMD CEQA Significance Threshold	**10**	**1.0**	**1.0**	**0.3**

NOTE: "—" No applicable threshold. The thresholds applied in this analysis to determine impact significance are indicated in **bold**.

[1] PM2.5 emissions are attributable to on-site truck and equipment operations only (see Table 3.3-12 for PM2.5 emissions from on-site rolling stock for the food waste preprocessing facility and Table 3.3-16 for PM2.5 emissions related to DPM from mobile sources for the biodiesel facility). For purposes of analysis, PM2.5 emissions from on-site truck/equipment operations from Land Use Master Plan projects are expected to be similar to the biodiesel production facility, but located closer to sensitive receptors.

[2] OEHHA (2000) considers an exposure of more than 8 years in a lifetime to be "chronic". Since construction of Master Plan projects would occur over the next 20 years, chronic non-cancer hazards as well as annual average associated with construction have been added to operational emissions.

Significance Determination Before Mitigation

Less than significant for biodiesel production facility and Land Use Master Plan components. Potentially significant for food waste preprocessing facility.

Mitigation Measures

Mitigation Measure AIR-5: Diesel Particulate Reduction Measures

Diesel-powered on-site rolling stock (2 loaders, excavator, and 2 end dump trucks) associated with the food waste preprocessing facility and any other diesel equipment or trucks operating solely within the MWWTP and West End property under the control of EBMUD shall install a CARB-verified Level 3 Diesel Particulate Filter to reduce PM2.5 emissions to achieve a minimum reduction of 50 percent (sufficient to reduce combined emissions to below the BAAQMD CEQA excess cancer risk threshold of 10 in a million). Alternative options for achieving this reduction can also be implemented, including the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as such become available.

Significance Determination after Mitigation

Less than significant.

Impact AIR-6 Odor Emissions During Project Operation

As described above in *Section 3.3.2, Environmental Setting*, BAAQMD public records for the last five years indicate that five odor complaints related to the MWWTP facility were received and three were confirmed by BAAQMD.

Biodiesel Production Facility

Potential sources of odor associated with the biodiesel production facility include methanol, fats, oils, and yellow grease. Methanol has a pungent alcoholic odor, while yellow grease has a common commercial odor. One of the odor complaints on record was rancid oil odor associated with the former FOG receiving and processing facility at the MWWTP. Yellow grease odor is caused by the release of product particulates into the air. However, yellow grease has a sufficiently high boiling point so that the VOC emissions potential is minimized, and this tends to confine odor detectability to a very small radius.

The biodiesel production facility's process would be a completely closed loop system and all process vent gases would be accumulated and condensed. Exhaust air from within the building would be processed through an activated carbon filtration system to capture VOCs, odors, and other gas phase contaminants. Process vapor emissions would be sent to chillers and accumulators to recover all methanol in the gaseous phase, which would be recycled back to the process. Such recovery of methanol would help to reduce the potential for nuisance odors from methanol. Pressure relief valves would have activated carbon filters to capture odors. The closed-loop system combined with these proposed odor controls would be sufficient to reduce the potential for odors to less than significant.

Food Waste Preprocessing Facility

To minimize and control odors, receipt, processing, and loading of all food waste would be done within a fully-enclosed and ventilated building. This building would be designed to contain odors, but the following standard Best Management Practices (BMPs) are also proposed to be implemented to minimize odor potential:

- A constant flow of inventory would be maintained to prevent backlogs and delays in waste acceptance; "first in – first out" means of inventory control would be implemented to limit odors.
- All incoming materials would typically be pre-processed within 24 hours of receipt, then processed and transferred to the EBMUD Food Waste Facility within 48 to 72 hours of receipt.

Depending on the time of delivery and availability of operations at both the proposed food waste preprocessing facility and EBMUD MWWTP operations, processing could take 48 to 72 hours during downtime at either facility.

- Any malodorous waste would be prioritized for processing to limit potential odor.
- Natural ventilation would be used at the preprocessing facility with standard roof vents and interior fans included in the facility design to ensure a safe operating environment for employees and other facility users. Fan sizes would be limited to avoid dispersion of odors to a larger area. No other odor control mechanisms are proposed.
- Cleanup and washdown of equipment and work areas would occur daily to minimize odors.

If end-dump trucks are used to transport processed feedstock to the EBMUD receiving tank, all loading of processed materials would be done indoors. If a conveying system is used, it would either be fully covered or a tube shaped, leak proof conveyor system would be used.

Since the proposed building would have large openings on multiple sides to allow for truck ingress and egress, there are several locations that could be potential sources of odors: roof vents, access doors, and open (uncovered) end-dump trucks used to transport processed materials to the EBMUD Food Waste Facility. Although these are potential odor sources, they also provide for effective ventilation of the structure. The proposed building would be designed similar to the design of the existing Recology facility, located at 501 Tunnel Avenue in San Francisco. This building does not have any vent fans or specific odor control systems other than best operating practices (first in/first out inventory control method and incoming materials shipped out within 24 to 36 hours of receipt) and odors are reported by the operator, Recology, to be contained within the building envelope itself. This observation is corroborated by a review of BAAQMD records indicates that no odor complaints are on file for this facility despite the presence of sensitive receptors in the vicinity (BAAQMD 2010b). While BMPs appear to be an effective method of odor control most of the time (as indicated by the San Francisco facility), there could still be instances when food waste receipts could exceed the processing capacity of the facility (since inflow of food waste cannot necessarily be controlled) and processing time could take longer. Any delays or other operational problems could result in odor problems, and therefore, the potential for odors is considered potentially significant. Implementation of **Mitigation Measure AIR-6a**, which requires odor control, would reduce this impact to less than significant.

Other Land Use Master Plan Elements

There are eleven elements of the proposed Land Use Master Plan that would be developed over the next 30 years. Projects such as the proposed odor control project would help to reduce odors, but other projects such as the food waste processing, secondary treatment upgrade for nutrient removal, tertiary treatment facility, and digester expansion projects could introduce new sources of odor. Odors result mainly from anaerobic decomposition of organic matter and since these projects would involve treatment during the later stages of processing, which is when only very low residual levels of organics are present, their odor potential would be limited. The odor potential would also depend on whether these facilities would be enclosed and the degree of odor controls that would be incorporated into the project design. Other projects such as the UV disinfection, emergency response equipment storage, and public education facility would not produce odors. Odor potential of each Land Use Master Plan element would be evaluated during each project's design phase and the need for odor controls would be determined at that time. Odor controls are included on the approved Digester Upgrade Project, Phase II, as well as on the approved Food Waste Facility Phase 2 project. Implementation of **Mitigation Measure AIR-6b**, which requires odor control, would ensure that this impact remains less than significant.

Significance Determination before Mitigation

Less than significant for biodiesel production facility. Potentially significant for food waste preprocessing facility and Land Use Master Plan components.

Mitigation Measures

Mitigation Measure AIR-6a: Odor Controls in Food Waste Preprocessing Facility

EBMUD shall include the following measures in contract specifications:

- Roof vents on the proposed building or point sources should be designed to accommodate odor controls in the event that odor problems occur in the future and controls are ultimately needed.
- All food waste shall be processed within 48 hours of receipt or protocols shall be implemented to minimize nuisance odor problems and ensure compliance with applicable BAAQMD air permit requirements.

Mitigation Measure AIR-6b: Odor Controls on Other Land Use Master Plan Elements

All short- and long-term Land Use Master Plan projects shall be reviewed for odor potential during the design phase. Operational and design odor control measures shall be incorporated into the project to minimize off-site odor impacts and ensure compliance with BAAQMD air permit fenceline monitoring limits. Odor controls that could be implemented where appropriate include: activated carbon filter/carbon adsorption, biofiltration/bio trickling filters, fine bubble aerator, hooded enclosures, wet and dry scrubbers, caustic and hypochlorite chemical scrubbers, ammonia scrubber, energy efficient blower system, thermal oxidizer, capping/covering storage basins and anaerobic ponds, mixed flow exhaust, wastewater circulation technology, and exhaust stack and vent location with respect to receptors.

Significance Determination after Mitigation

Less than significant.

Impact AIR-7 Consistency With Applicable Air Quality Plans

Biodiesel Production Facility

Criteria pollutant emissions associated with operation of the proposed biodiesel production facility would not exceed either the 1999 or 2010 BAAQMD operational significance thresholds for criteria air pollutant emissions (see Impact AIR-4). When the entire lifecycle of biodiesel is compared to lifecycle emissions associated with petroleum-based diesel fuel, criteria pollutant emissions associated with operation of this facility would be even less.[15] Therefore, this project would not conflict with air quality planning efforts related to criteria pollutants.

Food Waste Preprocessing Facility

Implementation of the proposed food waste preprocessing facility would alter current disposal practices of 600 tpd of food waste generated in the Bay Area, primarily in four Bay Area counties: San Francisco, Alameda, Contra Costa, and San Mateo. At present, approximately half of the 600 tpd of food waste is diverted either to compost facilities or the MWWTP (after preprocessing at compost facilities), while the remaining half is transported to landfills. When food waste is placed in landfills, uncontrolled biogenic emissions, the natural decay of food waste, are generated at the landfills. The most important biogenic emissions are VOCs, which react in the atmosphere with NO_X to form ground-level ozone, a criteria pollutant. VOCs can also react with NH_3 to create fine particulates (PM), another criteria pollutant. These biogenic emissions currently contribute to the nonattainment status of SFBAAB for O_3 and PM_{10}.

[15] According to USEPA (2002), biodiesel emissions contain substantially lower levels of HC, CO, and PM, but slightly higher levels of NOx when compared to petroleum-based diesel.

Because food waste is currently hauled to landfills and composting operations in the Bay Area, project implementation would change the distribution of food waste-related haul truck traffic in the region and increase the overall mileage traveled by these trucks when compared to existing conditions. However, criteria pollutants generated by this increase in haul truck travel would not exceed 1999 or 2010 BAAQMD operational significance thresholds for criteria air pollutant emissions (see Impact AIR-4).

By reducing uncontrolled biogenic emissions at landfills and electricity produced at conventional fossil-fuel power plants, development of the proposed food waste preprocessing facility would not conflict with air quality planning efforts related to criteria pollutants.

Other Land Use Master Plan Elements

Implementation of the proposed short- and long-term Land Use Master Plan elements would expand resource recovery, address future regulatory requirements intended to increase water quality by upgrading treatment and the disinfection processes, reduce odors, improve emergency response and safety, and provide community benefits. R2 facilities would help reduce criteria pollutant emissions by capturing these emissions in digesters and utilizing them for power generation in the MWWTP's power generation facilities.

While other direct operational emissions estimates cannot be made at this time for each Master Plan project, criteria pollutant and precursor emissions generally associated with these projects are expected to be less than significant since either: no criteria pollutant or precursor emissions would be associated with the project; the project would have some beneficial air quality impact; or the project would require a permit to operate, which would ensure that any operational stationary source emissions would be required to meet BAAQMD significance thresholds.

Combined Emissions

When stationary and mobile source emissions associated with operation of the biodiesel production and food waste preprocessing projects are considered together, the combined NO_X emissions would not exceed the 1999 BAAQMD significance thresholds for NO_X, an ozone precursor, but would exceed the 2010 threshold for NO_X by 4 pounds per day. Since the 1999 thresholds apply to this project, combined operational emissions would be less than significant. As discussed under Impact AIR-4, several potential mitigation measures could reduce the combined NO_X emissions to below the 2010 threshold. As indicated above, operation of the short- and long-term Master Plan elements would not contribute substantially to stationary or mobile source emissions of criteria pollutants, which would ensure that any operational stationary source combined emissions would meet BAAQMD thresholds or be mitigated through permit regulations. Therefore, implementation of the biodiesel production and food waste preprocessing facilities as well as the short- and long-term Land Use Master Plan elements would not conflict with air quality planning efforts related to criteria pollutants.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are necessary.

3.4 Biological Resources

This section identifies existing biological resources, including any special-status species and sensitive natural communities, present or potentially present at the proposed MWWTP Land Use Master Plan project site, For biological resources, the study area includes surrounding nearby open space areas because these areas are biologically rich, and could be affected by project construction or operational activities. The federal, state, and local regulations pertaining to biological resources within the region are described. This section describes impacts of the project on biological resources and measures to mitigate those impacts determined to be potentially significant.

On January 26, 2010, a biologist conducted a reconnaissance-level survey of the project site and surrounding open space areas in order to characterize existing conditions, assess habitat quality, and assess the potential for presence of special-status species and sensitive natural communities. No sensitive biological resources were observed at this site, although there is a potential for the presence of native nesting birds. Information used in preparation for the site visit and for writing this section was obtained from existing documents pertaining to plant and wildlife species found at or around the project site, including the California Natural Diversity Database (CNDDB) (California Department of Fish and Game [CDFG] 2009), California Native Plant Society (CNPS) Electronic Inventory (CNPS 2009), the U.S. Fish and Wildlife Service's (USFWS) *Quick Endangered Species List* for the project areas (USFWS 2009), and standard biological literature.

3.4.1 Environmental Setting

The following sections describe the environmental setting for biological resources within the study area.

Regional Setting

The project site is located in the Bay Area-Delta Bioregion, as defined by the State's Natural Communities Conservation Program (NCCP). This bioregion consists of a variety of natural communities that range from the open waters of San Francisco Bay and Delta to salt and brackish marshes to chaparral and oak woodlands. The temperate climate is Mediterranean in nature, with relatively mild, wet winters and warm, dry summers. The highly diverse and endemic vegetation and wildlife found in Alameda County, which reflects that of the region as a whole, is a result of soils, topography, and micro-climate. The rapid pace of development in the region has resulted in a relatively high degree of endangerment for local flora and fauna.

Terrestrial Habitat within the Project Site

The project site is located within a highly urbanized area and consists of EBMUD's 48-acre MWWTP and the 15.9-acre West End property, which is located west of EBMUD's existing MWWTP boundary. The site is surrounded by I-880, I-580, and I-80 in Oakland. The study area is completely disturbed and either graded or paved, and within the footprint of an established, highly developed industrial site. There are scattered non-native, landscape trees throughout the MWWTP property, mostly eucalyptus (*Eucalyptus globulus*) and acacia (*Acacia* spp.).

Urban, developed areas, dominated by roads, structures, concrete, and asphalt provide little to no quality wildlife habitat and essentially no habitat for plants other than opportunistic weedy species adapted to harsh conditions. Wildlife species in urban areas are typically able to tolerate the presence of humans and their activities and are capable of utilizing limited food sources, such as garbage and horticultural plants and their fruit. Urban wildlife species in the Oakland area include feral cat (*Felis catus*), rock dove (*Columba livia*), common raven (*Corvus corax*), raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), and Virginia opossum (*Didelphis virginiana*). Bird species observed on site during the January 26, 2010 site visit include American kestrel (*Falco sparverius*), gull (*Larus* sp.), Anna's

hummingbird (*Calypte anna*), and red-tail hawk (*Buteo jamaicensis*). In addition, bufflehead (*Bucephala albeola*) and American coot (*Fulica americana*) were observed in the secondary clarifiers.

Sensitive Natural Communities

Sensitive natural communities are designated by various resource agencies (such as CDFG) or in local policies and regulations and are generally considered to have important functions or values for wildlife or humans, are recognized as declining in extent or distribution, and are considered threatened enough to warrant some sort of protection. For example, many local agencies in California consider protection of oak woodlands important, and federal, state, and most local agencies also consider wetlands and riparian habitat as sensitive communities. CNDDB tracks communities of conservation concern; these communities are typically considered sensitive for the purposes of CEQA analysis. CNDDB lists four sensitive natural communities as occurring in the vicinity of the study area: northern coastal salt marsh, northern maritime chaparral, serpentine bunchgrass, and valley needlegrass grassland (CDFG 2009). None of these communities are present in the project site.

Jurisdictional Waters and Wetlands

There are no potentially jurisdictional waters, wetlands, or riparian habitat in the project site. San Francisco Bay and associated wetlands lie approximately 500 feet north of the project site, and are separated from the site by the I-80 freeway.

Special-Status Species

A number of species known to occur in the project site vicinity are protected pursuant to federal and/or State of California endangered species laws, or have been designated Species of Special Concern by CDFG. In addition, Section 15380(b) of the CEQA Guidelines provides a definition of rare, endangered, or threatened species that includes, but is broader than, federal and state species lists.[1] Species recognized under these terms are collectively referred to as "special-status species." For the purposes of this section, special-status species include:

- Plant and wildlife species listed as Rare, Threatened or Endangered under the federal or state endangered species acts;
- Species that are candidates for listing under either federal or state law;
- Species that are Fully Protected by California;
- Species formerly designated by the USFWS as Species of Concern or designated by CDFG as Species of Special Concern;
- Species protected by the federal Migratory Bird Treaty Act (16 USC 703-711); and
- Species such as candidate species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines.

Table 3.4-1 provides a comprehensive list of the special-status species that have been documented from, or have potential to occur in suitable habitat within the project site vicinity, and the potential for each species to be adversely affected by proposed project activities. Occurrences in this list were obtained from the CNDDB (CDFG 2009), California Native Plant Society Electronic Inventory (CNPS 2009), and USFWS (USFWS 2009). Once site surveys were completed and all sources reviewed, species were designated as having a "low potential" for occurrence if: (1) their known current distribution or range is outside of the study area, (2) only limited or marginally suitable habitat is present within the study area, (3) their specific habitat requirements (e.g., serpentine grasslands, as opposed to grasslands occurring on other soils) are not present, or (4) they are presumed, based on the best scientific information available, to be extirpated from the study area or region. Species were designated as having a "moderate potential"

[1] For example, vascular plants listed as rare or endangered or as List 1 or 2 by CNPS are considered subject to Section 15380(b).

for occurrence if there is low to moderate quality habitat within the study area or immediately adjacent areas, even though the species was not observed during biological surveys. A species has been designated as having a "high potential" for occurrence if: (1) moderate to high quality habitat is present within the study area, and (2) the study area is within the known range of the species.

Due to the area's long-standing industrial development, no special-status species have a moderate or high potential to occur at the project site, and it is unlikely that the project would have direct or indirect adverse effects on any of the special-status plant or wildlife species presented in **Table 3.4-1**. This is because either the project site's developed, industrialized environment does not provide suitable habitat, or because the known range for the species is outside of the project site.

Table 3.4-1: Special Status Species Considered

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Species Listed and Proposed for Listing				
ANIMALS				
Amphibians				
California tiger salamander *Ambystoma californiense*	FT/CSC	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools.	**Absent.** Suitable habitat is not present in the study area.	Winter rains and Mar-Apr
California red-legged frog *Rana draytonii*	FT/CSC	Breed in stock ponds, pools, and slow-moving streams.	**Absent.** Suitable habitat is not present in the study area.	May-Aug
Reptiles				
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/CT	Coast ranges in chaparral and riparian habitats.	**Absent.** Suitable habitat is not present in the study area.	March-Nov
Birds				
Western snowy plover *Charadrius alexandrinus nivosus*	FT/CSC	Nests and forages on sandy beaches on marine and estuarine shores - requires sandy, gravelly, or friable soils for nesting.	**Absent.** Suitable habitat is not present in the study area.	Year-round (San Francisco Bay)
Bald eagle *Haliaeetus leucocephalus*	--/CE, FP	Winter foraging at lakes and along major rivers. Nests in large, old-growth, or dominant live trees with open branchwork. Winters in communal roosts in dense, sheltered, conifer stands.	**Absent.** Suitable habitat is not present in the study area.	Aug-Jan
California black rail *Laterallus jamaicensis coturniculus*	--/CT, FP	Nests and forages in tidal emergent wetland with pickleweed and cordgrass.	**Absent.** There is a 2001 record for this species approximately 0.3 miles northwest of the proposed biodiesel production area (CDFG, 2009), but suitable habitat is not present at the MWWTP.	Year-round
California brown pelican *Pelecanus occidentalis californicus*	FE/CE, FP	Nests on islands, seeks cover on islands, mudflats, beaches, wharves.	**Absent (nesting).** No nesting habitat is present, but may roost in project vicinity.	May-Feb
California clapper rail *Rallus longirostris obsoletus*	FE/CE, FP	Nests and forages in emergent wetlands with pickleweed, cordgrass, and bulrush.	**Absent.** The study area does not provide suitable habitat for this species.	Year-round

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
California least tern *Sterna antillarum browni*	FE/CE, FP	Colonial breeder on bare or sparsely vegetated flat substrates including sand beaches, alkali flats, land fills, or paved areas.	**Absent.** This species has been observed roosting in the undeveloped lands on the southern side of the Bay Bridge, approximately one mile west of the MWWTP property boundary (City of Oakland, 2002), but the study area does not provide suitable habitat for this species.	Apr-Oct
Mammals				
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE/CE, FP	Saline emergent marsh with dense pickleweed.	**Absent.** There are 1986 records of this species in the salt marsh on the north side of I-80 (CDFG, 2009), approximately 400 feet north of the MWWTP, but suitable habitat is not present in the study area.	Year-round
Fish				
Green sturgeon *Acipenser medirostris*	FT/CSC	Spends majority of life in ocean waters near shore, estuaries, and bays, spawns in fresh water rivers.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Tidewater goby *Eucyclogobius newberryi*	FE/CSC	Shallow waters of bays and estuaries.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Delta smelt *Hypomesus transpacificus*	FT/CT	Brackish and freshwater of large channels in the Sacramento-San Joaquin Delta region.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Coho salmon – Central CA coast *Oncorhynchus kisutch*	FE/CE	Central and northern California coastal rivers and streams.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Steelhead – Central CA Coast DPS *Oncorhynchus mykiss*	FT/--	Drainages of San Francisco and San Pablo bays, central CA coastal rivers.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Steelhead – Central Valley DPS *Oncorhynchus mykiss*	FT/--	Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from SF Bay and San Pablo Bay and their tributaries, as well as two artificial propagation programs: the Coleman NFH, and Feather River Hatchery steelhead hatchery programs.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Chinook salmon – Central Valley spring-run ESUs *Oncorhynchus tshawytscha*	FT/CT	Central Valley rivers and their tributaries, west to the Pacific Ocean.	**Absent.** Suitable habitat is not present in the study area.	Mar-Apr
Chinook salmon – winter-run ESUs *Oncorhynchus tshawytscha*	FE/CE	Spawning and rearing restricted to Sacramento River basin, migrate through San Francisco Bay and Sacramento-San Joaquin Delta, require clean, cold water and gravel beds for spawning.	**Absent.** Suitable habitat is not present in the study area.	July-Oct

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Invertebrates				
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--	Vernal pools or other areas capable of ponding water seasonally.	**Absent.** Suitable habitat is not present in the study area.	Year-round (eggs in dry season, adult shrimp in wet season)
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/--	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. *Plantago erecta* is the primary host plant; *Castilleja exserta,* and *C. densiflora* are the secondary host plants.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/--	Coastal areas in dunes, prairie, scrub, and grassland supporting johnny jump-ups.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
PLANTS				
Pallid manzanita *Arctostaphylos pallida*	FT/CE/1B.1	Broadleaf upland forest, woodland, chaparral on siliceous shale.	**Absent.** Suitable habitat is not present in the study area.	Dec-Mar
Robust spineflower *Chorizanthe robusta* var. *robusta*	FE/--/1B.1	Openings in woodlands, coastal dunes and scrubs.	**Absent.** Suitable habitat is not present in the study area.	May-Sep
Presidio clarkia *Clarkia franciscana*	FE/CE/1B.1	Coastal scrub and grasslands on serpentine soils.	**Absent.** Suitable habitat is not present in the study area.	May-Jul
Santa Cruz tarplant *Holocarpha macradenia*	FE/CE/1B.1	Grassland, coastal prairie; often with non-natives in light sandy or sandy clay soil.	**Absent.** Suitable habitat is not present in the study area.	June-Oct
Contra Costa goldfields *Lasthenia conjugens*	FE/--/1B.1	Generally on mesic, alkaline soils in valley and foothill grassland or in vernal pools.	**Absent.** Suitable habitat is not present in the study area.	Mar-June
Beach layia *Layia carnosa*	FE/CE/1B.1	On sparsely vegetated, semi-stabilized coastal dunes and coastal scrub. 0-60 m.	**Absent.** Suitable habitat is not present in the study area.	Mar-July
Adobe sanicle *Sanicula maritima*	--/CR/1B.1	Clay or serpentine soils in coastal prairie or valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Feb-May
California seablite *Suaeda californica*	FE/--/1B.1	Coastal salt marshes and swamps, coastal dunes.	**Absent.** All naturally occurring San Francisco Bay area populations thought to have been extirpated. Has been reintroduced on San Francisco Peninsula.	July-Oct
Additional Special-Status Species				
ANIMALS				
Fish				
Sacramento perch *Archoplites interruptus*	--/CSC	Historically found in the sloughs, slow-moving rivers, and lakes of the central valley. Prefers warm water. Aquatic vegetation is essential for young. Tolerates wide range of water conditions.	**Absent.** Suitable habitat is not present in the study area.	Year-round

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Invertebrates				
Sandy beach tiger beetle *Cicindela hirticollis gravida*	FSC/--	Inhabits sandy areas adjacent to non-brackish water along the coast of CA, from SF Bay to N. Mexico.	**Absent.** Suitable habitat not present and no known populations in the study area.	Year-round
Monarch butterfly *Danus plexippus*	--/* (wintering sites)	Protected tree groves of eucalyptus, Monterey pine, and cypress with nearby nectar and water sources.	**Absent.** Suitable habitat is not present for this species in the project site.	Dec-Mar
Bridges' coast range shoulderband *Helminthoglypta nickliniana bridgesi*	FSC/--	Found in tall grasses and weeds on open grassy hillsides. Hides under downed branches, logs, and other woody debris.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Lee's micro-blind harvestman *Microcina leei*	--/--	Found beneath sandstone rocks in open oak grasslands, in the San Francisco Bay region.	**Absent.** Suitable habitat is not present in the study area.	Year-round
A leaf-cutter bee *Trachusa gummifera*	--/--	Needs broad-leafed vegetation.	**Low.** There are no records of this species from the project site, and essentially no native habitat remaining here. Possibility for the species to occur in unexpected locations.	Unknown
Mimic tryonia (=California brackishwater snail) *Tryonia imitator*	FSC/--	Inhabits permanently submerged areas in coastal lagoons, estuaries, and salt marshes, from Sonoma County south to San Diego County.	**Absent.** Suitable habitat is not present in the study area.	Year-round
Amphibians				
Foothill yellow-legged frog *Rana boylii*	FSC/--	Shallow, flowing water, preferably with cobbles.	**Absent.** Suitable habitat is not present in the study area.	Dec-May
Reptiles				
Western pond turtle *Actinemys marmorata*	FSC/CSC	Freshwater ponds and slow streams, marshes, rivers, and irrigation ditches with upland sandy soils for laying eggs.	**Absent.** Suitable habitat is not present in the study area. Although turtles can occur in wastewater ponds, EBMUD has no treatment ponds at the MWWTP.	Year-round
Birds				
Cooper's hawk *Accipiter cooperii*	--/WL	Nests in dense oak and riparian woodland.	**Low.** Limited low-quality nesting habitat in study area.	Year-round
Golden eagle *Aquila chrysaetos*	--/CSC, FP	Nests in canyons and large trees in open habitats.	**Absent.** Suitable nesting habitat is not present in study area.	Year-round
Burrowing owl *Athene cunicularia*	FSC/CSC	Nests and forages in low-growing grasslands that support burrowing mammals.	**Absent.** Suitable nesting habitat is not present in study area.	June-Oct
Northern harrier *Circus cyaneus*	--/CSC	Nests on ground primarily in emergent vegetation, wet meadows, or near rivers and lakes, but may nest in grasslands away from water.	**Low.** Known to occur at Alameda NAS, but there is very limited, low-quality habitat for this species in the study area.	June-Oct

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Snowy egret *Egrett thulla*	--/*/-- (rookery site)	Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	**Low.** Transient individuals may pass through project site, but there is very limited potential nesting habitat for this species.	Year-round
White-tailed kite *Elanus leucurus*	FSC/FP	Nests in trees adjacent to grasslands, forages over grasslands and agricultural lands.	**Low.** May occasionally forage in nearby wetlands, but nesting habitat in study area is low quality for this species.	June-Oct
Salt-marsh common yellowthroat *Geothlypis trichas sinuosa*	FSC/CSC	Inhabits tidal salt and brackish marshes in winter, but breeds in freshwater to brackish marshes and riparian woodlands during spring to early summer.	**Low.** There is a 1989 occurrence of this species approximately 400 feet north of the MWWTP (CDFG, 2009), in the marsh habitat on the north side of I-80, but very limited, low-quality habitat for this species in the study area.	Apr-July
Caspian tern *Hydroprogne caspia*	--/*/-- (nesting colony)	Nests on sandy or gravely beaches and shell banks in small colonies inland and along the coast. Inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.	**Low.** Transient individuals may pass through project site.	Summer
Alameda song sparrow *Melospiza melodia pusillula*	FSC/CSC	Emergent wetlands in the San Francisco Bay area.	**Low.** There is a 2004 record of this species approximately 400 feet north of the project site (CDFG, 2009), in the undeveloped marsh habitat on the north side of I-80, but there is limited, low-quality habitat for this species in project site.	Apr-July
San Pablo song sparrow *Melospiza melodia samuelis*	FSC/CSC	North SF Bay and San Pablo Bay salt marshes.	**Absent.** Suitable habitat is not present in the study area.	Apr-July
Black-crowned night heron *Nycticorax nycticorax*	--/* (rookery site)	Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	**Absent.** No suitable nesting habitat, although may forage nearby.	Year-round
Double-crested cormorant *Phalacrocorax auritus*	--/CSC	Nests along coast on isolated islands or in trees along lake margins.	**Absent.** Suitable nesting habitat is not present in study area.	Year-round
Black skimmer *Rynchops niger*	--/CSC	Nests on gravel bars, sandy beaches, islands in unvegetated areas near salt or brackish water.	**Absent.** Suitable habitat in project site is small, and low-quality.	June-Oct
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	--/CSC	Nests in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or ponds. Nests only where large insects are abundant, nesting timed with maximum emergence of aquatic insects.	**Low.** Transient individuals may pass through.	Year-round

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Mammals				
Pallid bat *Antrozous pallidus*	FSC/CSC	Occurs in various habitats including grasslands, scrubs, woodlands, mixed conifer forests, but it is most common in open, dry habitats with rocky areas for roosting. Day roosts include hollow trees, buildings, caves, crevices, and mines.	**Low.** Habitat in the study area is low quality for this species.	Year-round
Townsend's big-eared bat *Corynorhinus townsendii*	--/SSC	Cave-dwelling bat, also sometimes found in buildings.	**Low.** This species may roost in buildings and sheds onsite, although the buildings showed no noticeable signs of bats during a 2009 visit.	Year-round
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	FSC/*	Foothill grassland, oak/pine woodlands, and open chaparral.	**Absent.** Suitable habitat is not present in the study area. Furthermore, this species is believed to be extinct.	Year-round
Silver-haired bat *Lasionycteris noctivagans*	FSC/--	Roost almost exclusively in trees – in natural hollows and bird excavated cavities or under loose bark of large diameter snags.	**Low.** Suitable habitat in study area is limited.	Year-round
Hoary bat *Lasiurus cinereus*	--/CSC	Prefers open habitats or habitat mosaics, with trees for cover and open areas or habitat edges for feeding. Prefers to roost in dense foliage of medium to large trees.	**Low.** There is a small potential for this species to roost in trees in the study area, although habitat is poor quality for this species.	Year-round
Big free-tailed bat *Nyctinomops macrotis*	--/CSC	Inhabits rugged, rocky habitats in arid landscapes such as desert shrub, woodlands, and evergreen forests, in southeastern California.	**Absent.** Range is south of the study area, and suitable habitat is not present.	Year-round
Alameda Island mole *Scapanus latimanus parvus*	FSC/CSC	Found in moist, friable soils on Alameda Island.	**Absent.** Project study area is outside of known range for this species.	Year-round
Salt-marsh wandering shrew *Sorex vagrans halicoetes*	FSC/CSC	Inhabits tidal salt marshes with dense pickleweed around south San Francisco Bay.	**Absent.** Suitable habitat is not present in the study area.	Year-round
American badger *Taxidea taxus*	--/CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	**Absent.** Suitable habitat is not present in the study area.	Year-round
PLANTS				
Bent-flowered fiddleneck *Amsinckia lunaris*	--/--/1B.2	Coastal bluff scrub, valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
Alkali milk-vetch *Astragalus milk-vetch*	--/--/1B.2	Adobe clay soils in valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
San Joaquin spearscale *Atriplex joaquiniana*	--/--/1B.2	Alkaline soils in chenopod scrub, meadows, playas, valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Apr-Sep
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	--/--/1B.2	Cismontane woodland, valley/foothill grassland, sometimes on serpentinite.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Round-leafed filaree *California marcrophylla*	--/--/1B.1	Cismontane woodland, valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Mar-May
Coastal bluff morning-glory *Calystegia purpurata ssp. saxicola*	--/--/1B.2	Coastal dunes and coastal scrub, 15-105 m.	**Absent.** Suitable habitat is not present in the study area.	May-Sep
Bristly sedge *Carex comosa*	--/--/2.1	Marshes and swamps, lake margins, wet places. 5-1005 m.	**Absent.** Suitable habitat is not present in the study area.	May-Sep
San Francisco Bay spineflower *Chorizanthe cuspidata* var. *cuspidata*	FSC/--/1B.2	Sandy soils in coastal bluff scrub, coastal dunes, coastal prairie, or coastal scrub.	**Absent.** Suitable habitat is not present in the study area.	Apr-Jul
Point Reyes bird's-beak *Cordylanthus maritimus* ssp. *palustris*	FSC/--/1B.2	Coastal salt marsh.	**Absent.** Suitable habitat is not present in the study area.	Jun-Oct
Western leatherwood *Dirca occidentalis*	--/--/1B.2	Broad-leafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, riparian woodland/mesic.	**Absent.** Suitable habitat is not present in the study area.	Jan-Mar
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	--/--/1B.2	Serpentine soils in coastal prairie, chaparral, and valley and foothill grasslands.	**Absent.** Suitable habitat is not present in the study area.	May-Sep
Fragrant fritillary *Fritillaria liliacea*	FSC/--/1B.2	Coastal prairie and scrub, grasslands, often on serpentine soils.	**Absent.** Suitable habitat is not present in the study area.	Feb-Apr
Dune gilia *Gilia capitata* ssp. *chamissonis*	--/--/1B.1	Coastal dunes and coastal scrub.	**Absent.** Suitable habitat is not present in the study area.	Apr-Jul
Diablo helianthella *Helianthella castanea*	--/--/1B.2	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
Seaside tarplant *Hemizonia congesta ssp. congesta*	--/--/1B.2	Coastal scrub, valley and foothill grassland, on grassy valleys and hills, often in fallow fields. 25-200 m.	**Absent.** Suitable habitat is not present in the study area.	April-Nov
Loma Prieta hoita *Hoita strobilina*	--/--/1B.1	Chaparral, cismontane woodland, riparian woodland/usually serpentinite, mesic.	**Absent.** Suitable habitat is not present in the study area.	May-Jul
Kellogg's horkelia *Horkelia cuneata* ssp. *sericea*	--/--/1B.1	Closed-cone coniferous forests, coastal scrub.	**Absent.** Suitable habitat is not present in the study area.	Apr-Sep
Rose leptosiphon *Leptosiphon rosaceus*	--/--/1B.1	Coastal bluff scrub.	**Absent.** Suitable habitat is not present in the study area.	Apr-Jul
Oregon meconella *Meconella oregana*	--/--/1B.1	Coastal prairie, coastal scrub.	**Absent.** Suitable habitat is not present in the study area.	Mar-Apr
Robust monardella *Monardella villosa ssp. globosa*	--/--/1B.2	Broadleafed upland forest (openings), chaparral (openings), cismontane woodland, coastal scrub, valley/foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Jun-Jul

Table 3.4-1: Special Status Species Considered (Cont'd)

Common Name Scientific Name	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Occurrence in Project Study Area	Period of Identification
Choris' popcorn-flower *Plagiobothrys chorisianus var. chorisianus*	--/--/1B.2	Coastal prairie, valley and foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
San Francisco popcorn-flower *Plagiobothrys diffusus*	--/CE/1B.1	Coastal prairie, and valley/foothill grassland.	**Absent.** Suitable habitat is not present in the study area.	Mar-Jun
Slender-leaved pondweed *Potamogeton filiformis*	--/--/2.2	Marshes and swamps (assorted shallow freshwater).	**Absent.** Suitable habitat is not present in the study area.	May-Jul
Adobe sanicle *Sanicula maritima*	--/CR/1B.1	Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie. Found on moist clay or ultramafic soils. 30-240 m.	**Absent.** Suitable habitat is not present in the study area.	Feb-May
Most beautiful jewel-flower *Streptanthus albidus ssp. peramoenus*	--/--/1B.2	Chaparral and grasslands on serpentine soils.	**Absent.** Suitable habitat is not present in the study area.	Apr-Sep
Saline clover *Trifolium depauperatum var. hydrophilum*	--/--/1B.2	Marshes and swamps, valley and foothill grassland, vernal pools.	**Absent.** Suitable habitat is not present in the study area.	Apr-Jun

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)
FE = Listed as Endangered (in danger of extinction) by the Federal Government.
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.
FP = Proposed for Listing as Endangered or Threatened.
FC = Candidate to become a *proposed* species.
FSC = former federal Species of Concern. Species designated as such were listed by the Sacramento FWS office until 2006, when they stopped maintaining their list. These species are still considered to be at-risk species by other federal and state agencies, as well as various organizations with recognized expertise such as the Audubon Society.
MMPA = Marine Mammal Protection Act

STATE: (California Department of Fish and Game)
CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California (plants only)
CSC = California Species of Special Concern
WL = California Watch List
FP = California Fully Protected
3503.5=Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)
*Special animal—listed on CDFG's Special Animals List

California Native Plant Society
List 1A = Plants presumed extinct in California
List 1B = Plants rare, Threatened, or Endangered in California and elsewhere
List 2 = Plants rare, Threatened, or Endangered in California but more common elsewhere
List 3 = Plants about which more information is needed
List 4 = Plants of limited distribution

"--" = Not Listed

An extension reflecting the level of threat to each species is appended to each rarity category as follows:
.1 – Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

Sources: CDFG 2009; CNPS 2009; USFWS 2009

3.4.2 Regulatory Framework

This subsection describes federal, state, and local regulations, permits, and policies pertaining to biological resources, as they apply to the proposed project.

Federal Policies and Regulations

Endangered Species Act

Under the 1973 Endangered Species Act (ESA) (16 USC Sections 1531 et seq.), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as Threatened or Endangered and to designate protected "critical habitat" for listed species. The ESA is administered by both the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) and USFWS. NOAA Fisheries is responsible for animals that predominantly live in marine waters, including marine fish, most marine mammals, and anadromous fish (fish that hatch in fresh water, then migrate to the ocean) such as Pacific salmon. USFWS is responsible for all other federally listed plants and animals.

Pursuant to the requirements of the ESA, a federal agency that undertakes, funds or approves a project (which includes the issuance of a license or permit for a non-federal project) must determine whether the project may affect listed species or designated critical habitat. If so, pursuant to Section 7 of the ESA, the federal agency must consult with NOAA Fisheries or the USFWS, as appropriate, to ensure that the project will not jeopardize the species' continued existence or result in the adverse modification of designated critical habitat. The consultation process can be informal, resulting in a determination that the project is not likely to adversely affect listed species or critical habitat, or it can be formal, resulting in the issuance of a biological opinion including reasonable and prudent measures to minimize adverse impacts to protected species and critical habitat.

Projects that would result in a "take" of any federally listed Threatened or Endangered species are required to obtain authorization from NOAA Fisheries and/or USFWS, as appropriate. Under the federal ESA definition, "take" means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Authorization for a "take" that is incidental to a lawful activity is obtained through one of two processes, depending on whether a federal agency is involved in carrying out, funding or permitting the project. For projects with a federal nexus, take authorization is provided through an "incidental take statement," which is typically included as a part of a biological opinion issued after completion of the formal Section 7 consultation process described above. For projects without a federal nexus, the project proponent must obtain an "incidental take permit" issued under Section 10 of the ESA, which requires completion of a habitat conservation plan.

For this project, there would be no "take" of a federally Threatened or Endangered species, therefore no "incidental take permit" would be required.

Clean Water Act

The objective of the Clean Water Act (CWA) (33 USC Sections 1251 et seq) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Section 404 of the CWA regulates activities that involve a discharge of dredged or fill material into waters of the United States. USACE is responsible for issuing permits for discharges covered by Section 404, including most notably the filling of wetlands. Section 401 of the CWA, administered by State Water Resources Control Board (SWRCB), requires that an applicant for a federal permit, such as a Section 404 permit for discharge of dredged or fill material into waters of the United States, must obtain a "water quality certification" from the appropriate state agency stating that the permitted activity is consistent with the state's water quality standards.

As stated in *Section 3.4.1, Environmental Setting*, the project site is predominantly developed and there are no wetlands present, therefore a CWA 404 permit and 401 compliance would not be required.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 USC Sections 703 et seq.) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs that could be present at the project site.

State Policies and Regulations

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Sections 2050 et seq.) was enacted in 1984. Under CESA, CDFG has the responsibility for maintaining a list of Threatened and Endangered species. CDFG also maintains lists of "Species of Special Concern" to focus attention on those species that may be at risk but that are not formally listed as threatened or endangered. CESA prohibits the "take" of any state listed Threatened or Endangered species, unless an incidental take authorization is obtained from CDFG. Under CESA's definition, "take" means to "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill." Unlike the federal ESA, CESA's definition of "take" includes not only actions that "harass" or "harm" a listed species but also critical habitat of a listed species.

For species listed under both the federal and state statutes, CDFG is authorized to rely on a federal incidental take authorization for purposes of authorizing an incidental take under CESA. For species listed only under the CESA, an incidental take permit must be obtained from CDFG.

California Fish and Game Code - Sections 3503, 3503.5, and 3513

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided under the Fish and Game Code or its implementing regulations. Section 3503.5 of the Code protects all birds-of-prey (raptors) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird designated in the Migratory Bird Treaty Act; species covered by these Sections of the Code could possibly occur within the MWWTP vicinity.

Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the Code designate certain species as "Fully Protected." Fully Protected species may not be taken or possessed at any time. CDFG may not issue permits for, or otherwise authorize, the take of such species, except for very limited purposes such as necessary scientific research. There is no habitat for Fully Protected species at the project site, therefore no take is expected.

CEQA Guidelines Section 15380

Although Threatened and Endangered species are protected by specific federal and state statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or State list of protected species may nevertheless be considered for CEQA purposes to be endangered, threatened or rare, if the species can be shown to meet certain criteria. These criteria allow a public agency, when reviewing a project under CEQA, to undertake a review to determine if a significant effect on species that have not yet been listed under the federal ESA or the CESA (e.g., a CDFG species of concern) would occur. Special-status species occurring in the study area are shown in **Table 3.4-1**.

California Native Plant Society

CNPS maintains an inventory of special-status plant species and four lists of species of varying rarity. Vascular plants listed as rare or endangered by CNPS, but which have no designated status or protection under federal or State-endangered species legislation, are defined as follows:

- List 1A Plants believed extinct.

- List 1B Plants rare, threatened, or endangered in California and elsewhere.
- List 2 Plants rare, threatened, or endangered in California, but more numerous elsewhere.
- List 3 Plants about which more information is needed - a review list.
- List 4 Plants of limited distribution - a watch list.

In general, plants appearing on CNPS List 1 or 2 are considered to meet CEQA Guidelines Section 15380 criteria and have a very low potential to occur at the project site.

State Wetlands Policies and Streambed Alteration Agreement

State regulation of activities in waters and wetlands resides primarily with CDFG and SWRCB. CDFG provides comments on USACE permit actions under the Fish and Wildlife Coordination Act. CDFG is also authorized under the California Fish and Game Code, Sections 1600-1616, to enter into a Streambed Alteration Agreement with applicants and to develop mitigation measures when a proposed project would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams.

There are no wetlands or creeks at the project site, therefore the project would not be subject to a Streambed Alteration Agreement.

Local Policies and Regulations

City of Oakland General Plan

Open Space, Conservation, and Recreation (OSCAR) Element

The OSCAR Element of the City of Oakland General Plan was adopted in 1996. Because of the intensely developed urban nature of the project site, most of the policies pertaining to natural resources are not applicable to the project. The following City of Oakland policy pertaining to natural resources has potential relevance to implementation of the proposed project:

- *Policy CO-7.4* – Discourage the removal of large trees on already developed sites unless removal is required for biological, public safety, or public works reasons.

City of Oakland Tree Preservation and Removal Ordinance

City of Oakland Tree Preservation and Removal Ordinance (Oakland Municipal Code Chapter 12.36, 1997) requires permits for removing or potentially damaging a protected tree(s). Protected trees include *Quercus agrifolia* (coast live oak) measuring four inches diameter at breast height (dbh) or larger, and any other tree measuring nine inches dbh or larger except *Eucalyptus* and *Pinus radiata* (Monterey pine). Removal of Eucalyptus and/or Monterey pines would not require a permit, but if they were to be removed, verification would be required prior to removal. Some acacia trees at the project site could be sufficiently large that they meet the size criterion to be considered a protected tree.

Factors to be considered in determining significance of removal of any protected trees include the number, type, size, location, and condition of (a) the protected trees to be removed and/or affected (e.g., pruned or damaged by excavation) by construction; and (b) the protected trees to remain, with special consideration given to native trees.[2]

City of Oakland Creek Protection, Storm Water Management, and Discharge Control Ordinance

The City of Oakland Creek Protection, Storm Water Management, and Discharge Control Ordinance was updated in 1997, and includes permitting guidelines for construction near creeks within Oakland. According to the ordinance, a creek is defined as a watercourse that is a naturally occurring swale or

[2] Oakland Planning Code Section 17.158.280E2 states that "Development related" tree removal permits are exempt from CEQA if no single tree to be removed has a dbh of 36 inches or greater **and** the cumulative trunk area of all trees to be removed does not exceed 0.1 percent of the total lot area.

depression, or engineered channel, which carries fresh or estuarine water either seasonally or year-round within the City boundaries.

There are no creeks (as defined by this ordinance) within the boundaries of the project site; therefore, the project would not be subject to the ordinance.

3.4.3 Impact Analysis

Methodology for Analysis

Potential impacts resulting from implementation of the project were evaluated based on field reconnaissance surveys performed by qualified biologists on January 26, 2010, and a review of the following sources:

- Existing resource maps and aerial photographs of the project site and greater area;
- Data requests for the Oakland West, Oakland East, and Richmond USGS 7.5-minute topographic quadrangles, which include the project site and vicinity, from the CNDDB (CDFG 2009), CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2009), and USFWS (2009) databases;
- Standard biological references (e.g., Hickman 1993; Zeiner et al. 1990); and
- Other available literature regarding the natural resources of the area, such as the *Final Food Waste Facility Phase 2 Project Initial Study/Negative Declaration* (EBMUD 2009), and the *Oakland Army Base Area Redevelopment Plan EIR* (City of Oakland 2002).

For purposes of this EIR, the analysis considered the following three principal components of the guidelines and criteria outlined above:

- Magnitude of the impact (e.g., substantial/not substantial)
- Uniqueness of the affected resource (rarity)
- Susceptibility of the affected resource to perturbation (sensitivity)

The evaluation of significance must consider the interrelationship of these three components. For example, a relatively small magnitude impact to a state or federally listed species would be considered significant because the species is very rare and is believed to be very susceptible to disturbance. Conversely, a plant community such as California annual grassland is not necessarily rare or sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to result in a significant impact. Impacts are generally considered less than significant if the habitats and species affected are common and widespread in the region and the state. Impacts are considered beneficial if the action causes no detrimental impacts and results in an increase of habitat quantity and quality.

Thresholds of Significance

For the purposes of this analysis and consistent with Appendix G of the *CEQA Guidelines*, the project would have a significant impact on biological resources if it would:

- 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 CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- 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;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Criteria Requiring No Further Evaluation

Criteria that are not applicable to actions associated with the Land Use Master Plan are identified below, along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or a special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS* – There is currently no suitable habitat for any special-status species at the project site. The special-status aquatic species that occur in San Francisco Bay would not be adversely affected by the project because the project would not result in any changes in discharges or require any revision to the existing NPDES permit. Therefore, the project would have no impact, directly or through habitat modification, on special status species.
- *Adversely affect any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS* – There are no sensitive natural communities (including riparian habitat) within the project footprint. There would be no adverse effects to any such communities.
- *Have a substantial adverse effect on federally protected wetlands (as defined by Section 404 of the CWA) or State protected wetlands, through direct removal, filling, hydrological interruption, or other means* – There are no federally protected wetlands at the project site. Stormwater from the proposed facilities would be collected by the site's existing stormwater collection system. Stormwater on the MWWTP site would be treated at the MWWTP and discharged to San Francisco Bay in accordance with the MWWTP's existing NPDES permit requirements. Stormwater on the West End property would be conveyed through the existing storm drain system to the San Francisco Bay. Potential adverse impacts on any wetlands located outside the immediate study area would be prevented. Any impacts to San Francisco Bay water through stormwater or drainages are addressed in *Section 3.10, Hydrology and Water Quality*.
- *Conflict with the provisions of a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan* – There are no conservation plans for the project site, and thus the Master Plan would not conflict with any such plan.

Impacts and Mitigation Measures

The MWWTP Land Use Master Plan is evaluated below at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level.

Impact BIO-1 Potential To Interfere With Wildlife Movement Or Impede The Use Of Native Wildlife Nursery Sites

Biodiesel Production Facility

The proposed 3-acre biodiesel production facility site is not considered a wildlife movement corridor because it is an industrialized site with a high level of human activity, and the surrounding fencing, industrialized areas, and major roadways act as barriers for terrestrial wildlife movement. While there are

no known wildlife nursery sites at the biodiesel production facility site, native birds could nest at or near this site, including in the empty lot south of the proposed site. Although the MWWTP in general is not an ideal nesting bird habitat due to the lack of native vegetation communities and the (unshielded) proximity to several highways, more disturbance-tolerant birds could nest in trees, shrubs, buildings planned for demolition, or power lines that are located in or within the vicinity of this site. As discussed in *Section 3.4.2, Regulatory Framework*, nesting native birds are protected under Section 3503 and 3503.5 of California Fish and Game Code, and the federal Migratory Bird Treaty Act.

Construction of the biodiesel production facility is proposed to occur from the fall of 2011 through the fall of 2012, and would therefore overlap with nesting bird season (February through August). If construction starts before the nesting season, ongoing construction would be expected to discourage nesting of birds that are sensitive to disturbance. If birds are already nesting in an area when construction starts, nest failure could occur if the bird's nest structure is removed, or if construction-related noise and vibration stresses the birds and causes them to abandon their nest. Nest failure would be considered a "take" and therefore the impact would be significant. However, implementation of **Mitigation Measure BIO-1** would reduce the impact to a less-than-significant level.

Food Waste Preprocessing Facility

The proposed 1.4-acre site for the food waste preprocessing facility, ancillary facility, processing systems, and office space would be located northwest of the existing digesters, in an area currently occupied by a parking lot. This site is not considered a wildlife movement corridor, because it is a developed site lacking native habitat, and the surrounding industrialized areas and major roadways act as barriers for terrestrial wildlife movement.

There are no known wildlife nursery sites at the proposed food waste preprocessing site and the MWWTP is not an ideal nesting bird habitat due to the lack of habitat and the (unshielded) proximity to several highways. Nevertheless, more disturbance-tolerant birds could nest in or near this site. Specifically, there are buildings, non-native trees (i.e., eucalyptus, pines, and acacia), and bushes in the area where the food waste preprocessing facility is proposed, that can provide a suitable nesting platform for native birds.

Construction of the food waste preprocessing facility is proposed to begin by the spring or summer of 2012 and last 14 to 16 months; therefore, the construction activity would overlap with nesting bird season (February through August). If construction starts before the nesting season, ongoing construction would be expected to discourage nesting of birds that are sensitive to disturbance. If birds are already nesting in an area when construction starts, nest failure could occur if the bird's nest tree/building is removed, or if construction-related noise and vibration stresses the birds and causes them to abandon their nest. Nest failure would be considered a "take" resulting in a significant impact. However, implementation of **Mitigation Measure BIO-1** would reduce the impact to a less-than-significant level.

Other Land Use Master Plan Elements

Eleven project elements are proposed for implementation at the MWWTP property as part of the Land Use Master Plan. As described above, the MWWTP property is not considered part of a wildlife movement corridor because it is an industrialized site with a high level of human activity. The surrounding fencing, industrialized areas, and major roadways act as barriers for terrestrial wildlife movement. While the property does not provide an ideal habitat for nesting birds due to the lack of native vegetation and the proximity to several major highways, buildings and ornamental trees at the MWWTP can provide suitable nesting platforms for more disturbance-tolerant native birds. If construction of project elements starts before the nesting season, ongoing construction would be expected to discourage nesting of birds that are sensitive to disturbance. If birds are already nesting in an area when construction starts, nest failure could occur if the bird's nest tree/building is removed, or if construction-related noise and vibration stresses the birds and causes them to abandon their nest. Nest failure could be considered a

"take" resulting in a significant impact, however implementation of **Mitigation Measure BIO-1** would reduce this potential impact to a less-than-significant level.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

The following measure is applicable to the proposed biodiesel production facility, food waste preprocessing facility, and the Land Use Master Plan:

Mitigation Measure BIO-1: Protection of Nesting Birds

To the extent practicable, project construction activities including tree removal/pruning and demolition will occur outside of the generally accepted nesting season (February 1 to August 31). If tree removal cannot be completed between September 1 and January 31, and it is not feasible to avoid starting construction during the nesting season, then the following measures will be taken:

a) No more than two weeks before the initiation of construction/demolition activities that would commence between February 1 and August 31, a nesting bird survey will be conducted within 250 feet of the project site by a qualified biologist. If active nests are observed, buffer zones will be established around the nests, with a size acceptable to CDFG. Construction activities will not occur within buffer zones until young have fledged or the nest is otherwise abandoned.

b) If construction/demolition is halted for more than two weeks during the nesting season, then additional surveys will be conducted as above.

c) Nests that are established during construction/demolition will be protected from direct project impact (e.g., trees or a buffer area around the nests shall be flagged and avoided).

Significance Determination After Mitigation

Less than significant.

Impact BIO-2 Potential For Conflict With Local Policies Or Ordinances Protecting Biological Resources, Such As Tree Preservation Policy Or Ordinance

As discussed in the *Section 3.4.1, Environmental Setting* above, the project site is mostly developed. Scattered non-native trees are present which could be considered protected under the City of Oakland Tree Preservation and Removal Ordinance (see *Section 3.4.2, Regulatory Framework*). However, California Government Code Section 53090 et seq. provides that EBMUD receive intergovernmental immunity from zoning and building laws of cities and counties for the construction or operation of its facilities. Local regulations may thus not be applicable to EBMUD, but are considered here for the purpose of determining significance of potential impacts.

Biodiesel Production Facility

Eucalyptus and acacia at the southwest and southeast corners of the proposed biodiesel facility site would likely be removed for the biodiesel production facility. Eucalyptus trees do not qualify as protected trees under the City of Oakland Tree Preservation and Removal Ordinance (Chapter 12.36). The acacia trees may meet the size criterion (i.e., at least 9 inches dbh) for a protected tree; therefore removal of these trees would be a significant impact. Although EBMUD is not subject to tree removal permits from the City of Oakland, EBMUD would implement **Mitigation Measure BIO-2** prior to tree removal to reduce the impact to a less-than-significant level.

Food Waste Preprocessing Facility

Several large eucalyptus trees lie on the north side of the proposed food waste preprocessing facility site and non-native trees, such as acacia and pine trees, lie on the east side of the site. Some of the trees on the east side of the site may need to be removed to provide adequate space for trucks. Eucalyptus is not considered a protected tree under the City ordinance. However, the acacia and pine trees may meet the size criteria for a protected tree as defined in the ordinance. Therefore, any damage to or removal of the trees without a permit would conflict with the City ordinance (Chapter 12.36) resulting in a potentially significant impact. Although EBMUD is not subject to tree removal permits from the City of Oakland, **Mitigation Measure BIO-2** would minimize the impact of tree removal to a less-than-significant level.

Other Land Use Master Plan Elements

No native trees were observed on the project site. However, several non-native trees occur throughout the MWWTP site, and some non-eucalyptus trees could meet the size criteria (9 inches dbh or larger) for a protected tree under the City ordinance. The trees could be removed for proposed Land Use Master Plan activities in the long term, such as for construction of the Household Hazardous Waste Collection Facility and Public Education Facility. This could be a significant impact, which would be minimized by implementing **Mitigation Measure BIO-2**.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

The following measure is applicable for any protected trees that would be removed as part of the Land Use Master Plan facilities:

Mitigation Measure BIO-2: Replacement of Protected Trees

EBMUD will replace each tree that is removed for this project and that is considered a "protected tree" under the City of Oakland Tree Preservation and Removal Ordinance. The replacement tree (e.g., 5-gallon size) will be planted on site in a suitable location at the MWWTP/West End property.

Significance Determination After Mitigation

Less than significant.

3.5 Cultural Resources

Cultural resources include historic-period architectural/structural resources, archaeological resources, paleontological resources, and human remains. This section provides an assessment of potential impacts on cultural resources that might be present in the study area, defined as the project site and immediate vicinity.

3.5.1 Environmental Setting

The following sections describe the environmental setting for cultural resources within the study area. Potential impacts to cultural resources would be confined to the actual project site, but the setting of both the project site and immediate vicinity are described to account for uncertainties about precise locations of buried cultural and paleontological resources.

Paleontological Setting

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and coral), and fossils of microscopic plants and animals (microfossils). Paleontological resources are distinct from archaeological resources in that they record past plant and animal life, and not human history. On a regional scale, fossilized plants, animals and microorganisms are prevalent throughout the East Bay. Many of the hills in the East Bay are made up of sedimentary bedrock that is known to contain a wide range of fossils, including radiolarians, mollusks, diatoms, foraminifers and non-marine vertebrates. In addition, Pleistocene-age (1.8 million to 10,000 years ago) alluvial fan and fluvial deposits have been known to yield freshwater mollusks and extinct late Pleistocene vertebrate fossils (Graymer 1996). Thus, the East Bay as a whole is rich in potentially fossil-yielding rock formations.

However, the study area overlies geologic units that have low paleontological potential. The surface geology of the study area is composed of artificial fills and Bay Mud. These geologic units represent either historic (in the last 200 years) or Holocene-age (last 10,000 years) geologic units. Such recent deposits are unlikely to preserve the remains of organisms due to the lack of time and burial needed for the organisms to be fossilized. Older Bay Mud may yield invertebrate fossils, but such fossils are not typically considered scientifically significant (as opposed to vertebrate fossils of extinct animals), and occur in similar bay muds around the margins of the bay. In addition, artificial fills are man made, and have been mixed and reworked from native geologic materials, and therefore are not fossil-yielding.

Cultural Setting

The project site is located in Oakland, near the base of the San Francisco-Oakland Bay Bridge and is bounded on the north by the I-80 freeway and I-580 on-ramp, on the south by the Burlington Northern Santa Fe Railroad (BNSF) right-of-way, on the west by the former Oakland Army Supply Depot, and on the east by the I-80/I-880 interchange. The project site is underlain by artificial fill overlaying San Francisco Bay estuarine deposits. Although there is some evidence that buried archaeological sites may be located in this type of landform (Meyer and Rosenthal 2007), nearby site distribution of buried archaeological sites and previous construction disturbance indicates that the project site has a low potential to contain such resources.

Prehistoric Background

The natural marshland biotic communities along the edges of bays and channels were the principal source for subsistence and other activities during the prehistory of the San Francisco Bay region. Surveys of archaeological sites in the Bay region between 1906 and 1908 yielded the initial documentation of nearly 425 “earth mounds and shell heaps” along the shore of the Bay (Nelson 1909). The surveys listed the most notable sites in the Bay region such as the Emeryville shellmound (CA-ALA-309), the Ellis Landing Site (CA-CCO-295) in Richmond, and the Fernandez Site (CA-CCO-259) in Rodeo Valley (Morrato,

1984). These dense midden sites, such as CA-ALA-309, have been carbon-14 dated to be 2310 ± 220 years old, but other evidence from around the Bay suggests that human occupation in the region is of greater antiquity, perhaps as early as 7000 B.C. (Davis & Treganza 1959 as cited in Moratto 1984).

Ethnographic Background

Prior to Euroamerican contact, the Ohlone (also known by their linguistic group, Costanoan[1]) occupied the area that is currently Alameda County. Politically, the Ohlone were organized into groups called tribelets. A tribelet constituted a sovereign entity that held a defined territory and exercised control over its resources. It was also a unit of linguistic and ethnic differentiation. Oakland, and a large area of the East Bay, is located within the territory of a people that spoke Chochenyo, one of several Costanoan languages (Levy 1978).

The Ohlone economy was based on fishing, gathering, and hunting, with the land and waters providing a diversity of resources including acorns, various seeds, salmon, deer, rabbits, insects, and quail. The acorn was the most important dietary staple of the Ohlone, and the acorns were ground to produce a meal that was leached to remove the bitter tannin. Technologically, the Ohlone crafted tule balsa, basketry, lithics (stone tools) such as mortars and metates (a mortar-like flat bowl used for grinding grain), and household utensils. The Ohlone, like many other Native American groups in the Bay Area, likely lived in conical tule thatch houses. Native American archaeological sites that could shed light on the Ohlone ways of life tend to be situated along the historic extent of the Bay tidal marshland and along perennial streams. Although primarily channelized beneath city streets, a branch of Glen Echo Creek runs roughly parallel to and west of Broadway, approximately quarter-mile from the project site.

Historical Background

The project site lies within the Rancho San Antonio land grant that was granted to Luis Maria Peralta on August 3, 1820 for his service to the Spanish government. The 43,000-acre rancho included the present-day cities of Oakland, Berkeley, Alameda, and parts of San Leandro and Piedmont. Peralta's land grant was confirmed after Mexico's independence from Spain in 1822, and the title was honored when California entered the Union by treaty in 1848. Despite the title, by the middle of the 19th century, squatters had moved in to use portions of Peralta's undeveloped land. The Gold Rush and California statehood brought miners, businessmen, lumbermen and other speculators to the area in search of opportunities. Early settlers of that period include Edson Adams, Andrew Moon, and Horace Carpentier, who squatted on 480 acres of Vicente Peralta's (one of Luis Peralta's sons) land. Adams, Moon, and Carpentier subsequently hired Jules Kellsersberger, an Austrian-educated Swiss military engineer, to plot a new city – Oakland, which was incorporated in 1852.

The city originally encompassed the area roughly bordered by the Oakland Estuary on the south, Market Street on the west, 14th Street on the north, and the Lake Merritt Channel on the east. Broadway served as the main street. The majority of the early city dwellers, numbering under one hundred, lived near the foot of Broadway in proximity to the estuary. In 1869, transcontinental rail service began along 7th Street, which was followed by the 1st Street freight line and Long Wharf in 1891. With the arrival of the railroad, Oakland was transformed into a commercial center with a rapidly growing population. The city's population tripled from 10,500 in 1870 to 34,555 in 1880. City development moved north along the street car lines of Broadway and Telegraph Avenue towards the Oakland Hills and ultimately towards East Oakland.

The 1906 earthquake and fire in San Francisco prompted a population increase in Oakland, and by 1910 the City's population of 150,000 was more than double the 1900 level of 67,000. Residential and

[1] "Costanoan" is derived from the Spanish word Costanos meaning "coast people." No native name of the Costanoan people as a whole existed in prehistoric times as the Costanoan were neither a single ethnic group nor a political entity.

commercial development in Oakland increased during this time to accommodate displaced San Francisco residents. Older neighborhoods became more densely populated as new apartment buildings and related growth became part of Oakland's residential fabric. Population growth also increased the demand for retail goods, and shopping districts expanded throughout the next decade to meet this demand. The post-earthquake development boom defined much of downtown Oakland as it is known today.

The majority of the project area lies on top of a large, human-made fill plain, most of which was constructed between 1900 and 1945 for transportation purposes (Caltrans 1990). Construction of the San Francisco-Oakland Bay Bridge and approach roads in the mid-1930s, and completion of the East Shore Freeway (now I-80) in the 1940s, defined much of the northern and eastern boundaries of the project site. During World War II, the federal government undertook construction of two separate military facilities south and east of the project area: the Oakland Army Base (OAB) and the Naval Supply Center, Oakland (NSCO). Each of these are described below.

The OAB originally was known as the Oakland Army Terminal. The large terminal was located on the Oakland waterfront just south of the San Francisco-Oakland Bay Bridge. Construction of the base began in January of 1941 and the facility was placed into service one day after Pearl Harbor was attacked. The primary objective of the Army Terminal was to provide materials and men for operations in the Pacific. By 1944, the terminal was renamed the OAB. The OAB continued to function as a military installation through the Cold War Era; however, in 1995 the Defense Base Realignment and Closure Commission recommended that the OAB be closed (USAR, 2007).

In 1990, the California Department of Transportation (Caltrans) first identified an OAB Historic District, which was formally determined eligible by the State Office of Historic Preservation for listing on the National Register of Historic Places. In 1994, USACE provided detailed documentation of the district according to the standards of the Historic American Engineering Record. The OAB Historic District is comprised of 18 contributory buildings in two locations; the northeast (inland) section of the district contains 12 contributing structures historically associated with warehousing and maintenance. The northwest section, bordering the shoreline, retains six contributors associated with administrative and maritime uses (Minor 2006). The northeast subarea of the district is about 500 feet south of the Land Use Master Plan area.

The NSCO (later called the Fleet and Industrial Supply Center, Oakland [FISCO]) has subsequently undergone redevelopment for industrial port and regional recreational use (City of Oakland 2002).

Among the military buildings constructed on the OAB was Building 1101. Although now demolished, it was located at the northernmost part of the base and within the proposed Land Use Master Plan area. Building 1101, also known as the Heroic War Dead Building, was constructed circa 1944. It served as a cafeteria for personnel working in one of the communication centers. According to a 1949 topographic map, Building 1101 and a warehouse were the only buildings at the extreme northern portion of the base (USAR, 2007). Areas north and west of Building 1101 (see **Figure 3.5-1**) were undeveloped in 1949.

With the onset of the Korean War, the military installation continued to expand in the early 1950s. The area to the north of Building 1101 was converted from open land into a sewage treatment area by 1959 for EBMUD. The facility was further expanded between 1973 and 1980 (USAR, 2008). Although the MWWTP has greatly expanded since 1959, some of the original treatment plant structures, such as a cluster of four digester tanks in the west-center of the plant, still exist on the site.

Figure 3.5-1: Historical OAB Structures, Circa 1949

Located on approximately 16 acres in the northernmost portion of the former OAB was the United States Army Reserve (USAR) Center facility (now referred to as EBMUD's West End property). This part of the base was previously the Army's 801st Engineers Public Works Section, constructed in the 1950s and early 1960s. In the 1970s, the Army relocated its Public Works section across the railroad tracks to the main Army Base, vacating the USAR facility. While some buildings on this site date to the Army's occupancy, others were constructed by the USAR (USAR 2007). The West End property includes a number of industrial warehouse structures, such as former USAR Buildings 1060, 1064, 1070, 1072, 1074, 1084, and 1086. A survey conducted by the USAR (2007) found that the West End property contains a variety of old and newer structures designed for public works and other military operations use. The older portion of the facility contains buildings originally constructed in the mid-1950s by the Army for its public works facility on the Oakland Army Terminal. USAR took possession of the eastern portion of the property and constructed buildings of their own during the 1960s. When the Army vacated, USAR took occupancy and modified many of the older buildings for their own use.

Study Results

In order to assess project impacts on cultural resources, background research was conducted that included a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System. The records search at the NWIC at Sonoma State University was completed on February 13, 2009 (File No. 08-0943). The review included the project site and a 0.5-mile radius around the project. Previous surveys, studies, and archaeological site records were accessed. Records were also reviewed in the *Historic Property Data File for Alameda County* that contains information on sites of recognized historical significance including those evaluated for listing in the *National Register of Historic Places (NRHP)*, the *California Register of Historical Resources (CRHR)*, the *California Inventory of Historical Resources*, *California Historical Landmarks*, and *California Points of Historical Interest*.

The purpose of the records search was to (1) determine whether known cultural resources have been recorded within or adjacent to the project area; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites; and (3) develop a context for the identification and preliminary evaluation of cultural resources.

Historical Resources (Buildings and Structures)

No historic-period architectural or structural resources are located in the project site. One recorded building is located within a quarter-mile radius. Building 823 of the OAB (P-01-010615) is located south of I-880 approximately 500 feet from the project site. One building within the Heroic War Dead USAR Center (Building 1101), originally built by the U.S. Army circa 1944 as part of the OAB, was located in the project site until it was demolished in 2008. This building was found to be ineligible for listing as a historical resource for CEQA purposes (USAR 2007).

The USAR architectural inventory and evaluation of the West End property (USAR 2007) concluded that the varied site history has led to a lack of architectural cohesion. According to the report, there is nothing significant or noteworthy about the architecture that implies it was considered significant at the time of its construction or use. None of the buildings are associated with a significant event, person, or period in national, state, or local history, nor do they reflect the work of an artist, designer, craftsman, or master builder. As a result, none of the facilities appear to be eligible for inclusion in the NRHP, nor does the West End property appear to be an historical resource for the purposes of the National Environmental Policy Act (NEPA) or CEQA (USAR 2007).

Although, based on USGS maps, some existing portions of the EBMUD MWWTP such as a cluster of four digester tanks in the west-center of the site date to the late 1950s, it is unlikely that the plant itself would meet the NRHP/CRHR criteria for listing, as the setting of these initial structures has been highly altered with the addition and expansion of the MWWTP in the 1970s and 1980s. As such, none of the

buildings at the EBMUD MWWTP site, or those which could be subject to demolition as a result of the project, appear to qualify as historical resources for CEQA purposes.

Archaeological Resources

The NWIC records search indicated that several cultural resource investigations have been conducted within and adjacent to the project site, which has been previously surveyed by a qualified archaeologist (City of Oakland 2002; Chavez and Hupman 2000; EBMUD 2003; EBMUD 2008). No archaeological resources have been recorded. Five recorded archaeological sites are located on the north side of the I-80 Bay Bridge approach in Emeryville within a one-mile radius of the project site. The sites are large prehistoric shellmounds (CA-ALA-309, CA-ALA-310, CA-ALA-311, CA-ALA-312, and CA-ALA-313) originally recorded in the early 1900s.

Paleontological Resources

The University of California, Museum of Paleontology (UCMP) maintains the world's largest database of fossil discoveries and collections, with thousands of records for the East Bay. A search of the database by both sediment age and location revealed few invertebrate fossils and no vertebrate fossils in similar geologic environments in Alameda County. Marine invertebrate fossils of Holocene age (within the last 10,000 years) including oysters and mudsnails have been recovered from similar geologic deposits in six locations within Alameda County (UCMP 2009). However, recent marine invertebrate fossils are not typically considered significant fossil resources because they usually occur in similar geologic deposits available nearby and do not represent unique specimens that contribute substantially to scientific knowledge. Overall, there is a low potential to encounter significant paleontological resources in the project site.

3.5.2 Regulatory Framework

Numerous laws and regulations require federal, State, and local agencies to consider the effects a project may have on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the various agencies proposing the action, and prescribe the relationship among other involved agencies.

Federal Policies and Regulations

National Historic Preservation Act

First authorized by the Historic Sites Act of 1935, the National Register of Historic Places (NRHP) was established by the National Historic Preservation Act (NHPA) of 1966, as "an authoritative guide to be used by federal, State, and local governments, private groups and citizens to identify the nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment" (Code of Federal Regulations [CFR] 36 Section 60.2). NRHP recognizes both historic-period and prehistoric archaeological properties that are significant at the national, state, and local levels.

To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (U.S. Department of the Interior 2002):

- Are associated with events that have made a significant contribution to the broad patterns of our history;
- Are associated with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

- Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for NRHP listing (U.S. Department of the Interior 2002).

In addition to meeting the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance" (U.S. Department of the Interior 2002). NRHP recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance. The seven factors that define integrity are: location, design, setting, materials, workmanship, feeling, and association.

State Policies and Regulations

The State of California implements NHPA through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of NHPA on a statewide level. OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code [PRC] Section 5024.1[a]). The criteria for eligibility to CRHR are based on NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for, or listed in, NRHP.

To be eligible for the CRHR, a prehistoric or historical-period property must be significant at the local, state, and/or federal level under one or more of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the CRHR, it must also retain enough of its character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. A historical resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

CRHR consists of resources that are listed automatically as well as those that must be nominated through an application and public hearing process. CRHR automatically includes the following:

- California properties listed on the NRHP and those formally determined to be eligible for the NRHP;
- California Historical Landmarks from No. 770 onward;
- California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Resources Commission for inclusion on the CRHR; and
- Other resources that may be nominated to the CRHR, including:

- Historical resources with a significance rating of Category 3 through 5 (i.e., properties identified as eligible for listing in the NRHP, the CRHR, and/or a local jurisdiction register);
- Individual historical resources;
- Historical resources contributing to historic districts; and
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as a historic preservation overlay zone.

Local Policies and Regulations

City of Oakland General Plan

Historic Preservation Element

City of Oakland goals and policies that pertain to cultural resources are provided primarily in the General Plan Historic Preservation Element (1998a). The following goal is applicable to the project:

- *Historic Preservation Goal 2* – To preserve, protect, enhance, perpetuate, use, and prevent the unnecessary destruction or impairment of properties or physical features of special character or special historic, cultural, educational, architectural or aesthetic interest or value. Such properties or physical features include buildings, building components, structures, objects, districts, sites, natural features related to human presence, and activities taking place on or within such properties or physical features.

3.5.3 Impact Analysis

Methodology for Analysis

The analysis considers direct and indirect impacts on cultural and paleontological resources within the project site. Potential impacts on historic architectural resources are assessed by identifying the activities that could affect the architectural resources that have been identified as historical resources for the purposes of CEQA. While most historic buildings and many historic-period archaeological properties are generally significant because of their association with important events, people, or styles (CRHR Criteria A, B, and C), the significance of most prehistoric and historic-period archaeological properties is usually assessed under Criterion D. This criterion stresses the importance of the potential information contained within the site rather than the resource's significance as a surviving example of a type of construction or its association with an important person or event.

As defined in PRC Section 21083.2, a "unique" archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In addition, the CEQA Guidelines define a historical resource as: (1) a resource listed in CRHR; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific,

economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of PRC Section 21083 regarding unique archaeological resources. The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

Once a resource has been identified as significant, it must be determined whether the project would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines 15064.5[b]). A substantial adverse change in the significance of a historical resource or unique archaeological resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired" (CEQA Guidelines Section 15064.5[b][1]). A historical resource is materially impaired through the demolition or alteration of the historical resource's physical characteristics that convey its historical significance and that justify its inclusion in the CRHR(CEQA Guidelines Section 15064.5[b][2][A]).

The impact analysis for paleontological resources is based on the paleontological potential of the rock units to be disturbed by project-related excavations.

Thresholds of Significance

A cultural resource impact would be considered significant if the project would result in any of the following:

- Cause a substantial adverse change in the significance of a historical resource, as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of a unique archaeological resource, pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Cause a Substantial Adverse Change in the Significance of a Historical Resource* – No historic-period architectural resources are located within the project site. Although the project would involve demolishing a number of the former USAR buildings on the western edge of the site, none of the buildings were identified as historical resources, as defined in CEQA Section 15064.5. As such, their removal would have no impact on historical resources under CEQA. Although certain portions of the MWWTP date to the late 1950s, such as a cluster of four digesters in the west-central portion of the facility, the plant itself has been substantially modified and expanded in the 1970s and 1980s to the extent that it would not qualify for listing in the CRHR as a historical resource. As such, any modifications to the plant as a result of the Land Use Master Plan would also have no impacts to historical resources under CEQA. Therefore, this issue is not discussed further.

Impacts and Mitigation Measures

The MWWTP Land Use Master Plan is evaluated below at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level. Because the impacts of program and project-level facilities are similar the discussion is combined.

Impact CUL-1 Potential To Cause A Substantial Adverse Change In The Significance Of A Unique Archaeological Resource

All Land Use Master Plan Elements

The project site is underlain by artificial fill overlaying San Francisco Bay estuarine deposits. Although there is some evidence that buried archaeological sites may be located in this type of landform, nearby site distribution of buried archaeological sites and previous construction disturbance indicates that the area has a low potential to contain such resources. NWIC records search indicated that several cultural resource investigations have been conducted within and adjacent to the project site and that the entire project site has been previously surveyed by a qualified archaeologist. No archaeological resources have been recorded. In the unlikely event of inadvertent discovery of cultural materials during excavation during construction, the impact could be significant. However, implementation of **Mitigation Measure CUL-1** would reduce the impact to less than significant.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CUL-1: Recovery of Buried Cultural Resources

If previously unidentified cultural materials are unearthed during construction, EBMUD will halt work in that area until a qualified archaeologist can assess the significance of the find. Prehistoric materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. If any find is determined to be significant, EBMUD and the archaeologist will determine the appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered will be, as necessary and at the discretion of the consulting archaeologist, subject to scientific analysis, professional museum curation, and documentation according to current professional standards. In considering any suggested measures proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, EBMUD will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations.

If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the project while mitigation for historical resources or unique archaeological resources is being carried out.

Significance Determination After Mitigation

Less than significant.

Impact CUL-2 Potential To Cause A Substantial Adverse Change In The Significance Of A Paleontological Resource

All Land Use Master Plan Elements

As discussed in *Section 3.5.1, Environmental Setting*, there are no significant paleontological resources in the study area. However, project construction activities for the biodiesel production facility or the food waste preprocessing facility or the other Land Use Master Plan elements could affect unknown resources. There is a potential for fossils to be discovered and inadvertently damaged during project construction even in areas with a low likelihood of occurrence. In the unlikely event that paleontological resources are discovered, there could be a significant impact, which would be minimized by implementing **Mitigation Measure CUL-2** to less than significant levels.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CUL-2: Recovery of Buried Paleontological Resources

In the event that paleontological resources are discovered, EBMUD will notify a qualified paleontologist. The paleontologist will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. If a breas[2] or other fossil is discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find.

If EBMUD determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important. The plan will be submitted to EBMUD for review and approval prior to implementation.

Significance Determination After Mitigation

Less than significant.

Impact CUL-3 Potential To Disturb Human Remains

All Land Use Master Plan Elements

The EBMUD MWWTP site is developed and is located in an industrial area with low likelihood of presence of human remains. Although there is no indication that the project site contains human remains, the project would involve construction activities that could disturb or encounter potential human remains and therefore the resource could get damaged. This impact could be significant. However, implementation of **Mitigation Measure CUL-3**, the impact would be minimized to a less-than-significant level.

Significance Determination Before Mitigation

Potentially significant

[2] A seep of natural petroleum that has trapped extinct animals, thus preserving and fossilizing their remains.

Mitigation Measures

Mitigation Measure CUL-3: Recovery of Discovered Human Remains

In the event human burials are encountered, EBMUD will halt work in the vicinity and notify the Alameda County Coroner and contact an archaeologist to evaluate the find. If human remains are of Native American origin, the Coroner will notify the Native American Heritage Commission (NAHC) within 24 hours of this identification. The NAHC will then identify the person(s) thought to be the Most Likely Descendent of the deceased Native American, who would then help determine what course of action should be taken in dealing with the remains.

Significance Determination After Mitigation

Less than significant.

3.6 Energy

The proposed Land Use Master Plan projects include two renewable energy projects: a biodiesel production facility and a food waste preprocessing facility. The biodiesel production facility would produce an alternative fuel that would help the State of California meet its goals for use and production of alternative fuels and would also generate biogas, a renewable fuel, to power the on-site Power Generation Station (PGS). The food waste preprocessing facility would increase the efficiency of EBMUD's existing Resource Recovery (R2) program, which uses food waste to generate biogas to produce renewable energy at PGS. The production of biodiesel and preprocessing of food waste would both contribute to the production of renewable energy[1] at the MWWTP. This section addresses the potential for construction and operation of the proposed facilities to result in impacts related to the wasteful, unnecessary, or ineffient use of energy resources, and identifies mitigation measures to reduce impacts to a less-than-significant level.

3.6.1 Environmental Setting

The study area for energy resources includes the entire state of California. The following sections describe the electricity supply in California, and summarize California's status in achieving statewide renewable energy goals. Renewable energy production at the MWWTP is summarized as well as the benefits of providing renewable energy via distributed generation sources such as PGS at the MWWTP. Alternative fuels are also discussed.

California's Electricity Supply

Californians consumed 285,574 gigawatt hours (GWH) of electricity in 2008, supplied by several sources (California Energy Commission [CEC] 2009). In 2008, the California electricity mix included natural gas (45.7 percent), coal (18.2 percent), large hydroelectric plants (11 percent), and nuclear (14.4 percent). The remaining 10.6 percent was supplied from renewable resources such as wind, solar, geothermal, biomass, and small hydroelectric facilities. California's natural gas use is continuing to grow, from 41.5 percent in 2006 to 45.7 percent in 2008 (CEC 2007; CEC 2009), partly due to the use of natural gas for electric power production.

California's energy use per person has remained stable for more than 30 years while the national average has steadily grown (CEC 2009). However, CEC estimates that California's energy consumption will grow by 1.2 percent per year from 2010 to 2018, with peak demand growing an average of 1.3 percent annually over the same period (CEC 2009). Further, additional energy efficiency measures are needed to meet the Assemby Bill (AB) 32 greenhouse gas (GHG) reduction goal of reducing statewide GHG emissions to 1990 levels by 2020 (see *Section 3.8, Greenhouse Gas Emissions,* for a discussion of AB 32).

In 2002, California established its Renewable Portfolio Standard program[2] with the goal of increasing the annual percentage of renewable energy in the state's electricity mix by the equivalent of at least 1 percent of sales, with an aggregate total of 20 percent by 2017. The California Public Utilities Commission (CPUC) subsequently accelerated that goal to 2010 for retail sellers of electricity (Public Utilities Code

[1] Renewable energy is energy obtained from sources that are essentially inexhaustible, unlike fossil fuels of which there is a finite supply. Renewable sources of energy include sources such as biogas, wood, waste, geothermal, wind, hydropower and solar energy.

[2] The Renewable Portfolio Standard is a flexible, market-driven policy to ensure that the public benefits of wind, solar, biomass, and geothermal energy continue to be realized as electricity markets become more competitive. The policy ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or country.

Section 399.15(b)(1)). Governor Schwarzenegger signed Executive Order S-14-08 in 2008, increasing the target to 33 percent renewable energy by 2020. In July 2009, CEC reported that as of 2008, three investor owned utilities were providing 13 percent of their sales from eligible renewable resources and it was expected that the 15 largest publicly owned utilities would achieve 12.4 percent by 2011, both far below the goal of 20 percent for 2010 (CEC 2009). The Pacific Gas & Electric Company (PG&E), the provider of electricity and natural gas service to the City of Oakland, uses a comprehensive energy strategy that relies on expansion of customer energy efficiency and demand-side management programs to meet its customers' future power needs in ways that are consistent with the state's Energy Action Plan, described below (PG&E, 2008). The strategy also includes securing additional renewable power resources before seeking to meet customer energy needs through efficient traditional generation sources.

In 2008, PG&E's retail customers purchased 81,935 GWH of electricity. Of that amount, 25,481 GWH were generated by PG&E's own natural gas, hydroelectric, and nuclear facilities as well as small amounts of fuel oil, diesel, and solar energy. PG&E purchased the remainder of the electricity under contracts or from the open market. In total, the 2008 PG&E power mix included natural gas (39 percent), coal (8 percent), large hydroelectric plants (16 percent), nuclear (22 percent), renewable resources (14 percent), and other (1 percent). Renewable resources used include geothermal (34 percent), biomass and waste (32 percent), small hydroelectric (20 percent), wind (14 percent), and solar (less than 1 percent).

In 2008, 12 percent of PG&E's delivered electricity mix came from Renewable Portfolio Standard-eligible renewable resources.[3] Although PG&E held contracts for renewable energy that represented more than 20 percent of its future energy needs, there were substantial obstacles in the ability of these providers to actually bringing the new resources online, including tight capital markets and the lack of sufficient transmission. Regardless, PG&E continues to pursue avenues for increasing the procurement of eligible renewable energy resources.

Western Area Power Administration (WAPA), one of four power marketing administrations within the U.S. Department of Energy (USDOE), delivers cost-based hydroelectric power and related services within a 15-state region of the central and western U.S, including the project site (WAPA, 2010). The WAPA transmission system carries electricity from 57 power plants operated by the Bureau of Reclamation, USACE and the International Boundary and Water Commission. Together, these plants have an installed capacity of 10,489 megawatts (MW).

Natural Gas

Natural gas is the cleanest of the fossil fuels used in the state and will continue to be a substantial energy source for the forseeable future (CEC 2009). Estimates of recoverable shale reserves are as high as 842 trillion cubic feet, a 37-year supply at today's consumptions rates.

PG&E operates one of the largest natural gas distribution networks in the country, including 6,400 miles of natural gas transmission pipelines and more than 42,000 miles of distribution lines (PG&E 2008). In all, PG&E delivers gas to approximately 4.3 million customer accounts in northern and central California, including the MWWTP.

Renewable Power Generation at MWWTP

The existing PGS at the MWWTP currently produces up to 6.5 MW of power. PGS has an approximately 10 percent parasitic load, resulting in a net of approximately 5.8 MW of power available for use at the MWWTP. Overall, PGS provides about 90 percent of the average 4.7 MW needed to operate the MWWTP. Energy production sometimes exceeds demand and excess electricity is transferred to the

[3] In accordance with the Renewable Portfolio Standard, eligible renewable resources include geothermal facilities, hydroelectric facilities with a capacity rating of 30 MW or less, biomass, selected municipal solid waste facilities, solar facilities, and wind facilities. Two percent of the renewable energy resources used by PG&E in 2008 were not eligible under the Renewable Portfolio Standard because they came from open-market purchases.

regional PG&E power distribution system. Likewise, electricity is purchased from WAPA through PG&E lines when the demand at the MWWTP is higher than the PGS output. At times, such as when an engine is down for maintenance, the biogas production at the MWWTP can exceed the capacity of the existing cogeneration facilities and excess gas is then flared in compliance with EBMUD's existing BAAQMD air permit, described in *Section 3.3, Air Quality*.

As described in *Chapter 2, Project Description*, two new turbines will be added to PGS as part of the PGS Renewable Energy Expansion Project. The expansion project will be completed in two phases. The first turbine is expected to be operational by 2011 and will increase the capacity of PGS to 11 MW. The schedule for installation of the second turbine has not been determined, but once operational, the capacity of PGS will be increased to 15.5 MW. The net capacity of the expanded PGS will exceed the existing average power requirements of the MWWTP by 5.2 MW with one turbine, and by 9.3 MW with both turbines.

Distributed Generation

Distributed generation systems include small-scale power generation systems located close to where the energy is being used (CEC 2009), and are a key element of California's loading order strategy to help meet the state's energy efficiency and renewable energy goals. Cogeneration systems (or combined heat and power systems), such as the system at the MWWTP, are considered by CEC to be the most efficient and cost-effective form of distributed generation. These systems reduce emissions, reduce the need for new transmission and distribution infrastructure, reduce system losses at peak delivery times when used to provide on-site power supplies, reduce energy costs, provide improved reliability and power quality, and are located near load centers. They also produce electricity more efficiently and have fewer environmental impacts than tradition conventional fossil fuel-fired generation plants.

In 2005, California had more than 770 active cogeneration systems totaling more than 9,000 MW of power (CEC 2005). Of these, 28 were biomass plants producing approximately 1,000 MW of electricity, including 600 MW from solid-fuel biomass (residues from forestry and agriculture) and about 400 MW of other biomass sources such as landfill gas, biogas from wastewater treatment and livestock manure digestion, and direct burning of municipal solid waste. These systems are often key to preserving the reliability of the power grid, and biomass fuels utilize an otherwise wasted resource, reduces air quality concerns, and reduces GHG emissions. CEC recommends that California explores production credits for CO_2 reductions from these facilities.

Alternative Fuels

California's transportation sector is more than 95 percent reliant on petroleum, and over 60 percent of the nations's petroleum consumption comes from foreign fuel sources (CARB and CEC 2007). In 2006, Californians consumed an estimated 20 billion gallons of gasoline and diesel fuel on the state's roadways. Use of alternative fuels[4] such as the biodiesel that would be produced at the proposed biodiesel production facility helps reduce the state's reliance on petroleum. When an existing waste stream is used for production of alternative fuels there are multiple benefits, including contributing to the State's reduction in use of petroleum-based fuels, reducing the amount of landfilled waste, and contributing to the achievement of GHG reduction goals. Alternative fuels are measured in units of gasoline gallon equivalents, the amount of alternative fuel it takes to equal the energy content of one liquid gallon of gasoline. The gasoline gallon equivalent for biodiesel is 0.96 U.S. gallons (USDOE, 2010).

[4] Alternative fuels include, but are not limited to, electricity, natural gas, propane, hydrogen, ethanol, renewable diesel, and biodiesel.

3.13.2 Regulatory Framework

Federal Policies and Regulations

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it is regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment. Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government, and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Excecutive Order 13423 were expanded upon in Exectuive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) signed in 2009.

State Policies and Regulations

California Energy Action Plan

California's Energy Action Plan II is the state's principal energy planning and policy document (CPUC and CEC 2005). The plan describes a coordinated implementation plan for state energy policies and refines and strengthens California's original Energy Action Plan I published in 2003. California Energy Action Plan II identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. It adopts a loading order of preferred energy resources to meet the state's needs and reduce reliance on natural gas and other fossil fuels, also important for achieving GHG emission reductions from the electricity sector.

Energy efficiency and demand response[5] are considered the first ways to meet the energy needs of California's growing population. Renewable energy and distributed generation are considered the best ways on the supply side. To the extent that energy efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, CEC supports clean and efficient fossil fuel-fired generation to meet California's energy needs. The 2008 Energy Action Plan Update provides a status update to the 2005 Energy Action Plan II and continues the goals of the original California Energy Action Plan (CPUC and CEC 2008).

Combined Heat and Power Systems

Several state policies have been enacted to encourage the use of combined heat and power systems, a form of distributed generation, as a way of meeting the state's climate action goals, while increasing reliability. Two that apply to systems the size of the PGS at the MWWTP include:

- AB 1613 (Waste Heat and Carbon Emissions Reduction Act) encourages the development of new combined heat and power systems in California with generating capacities of up to 20 MW. This

[5] Demand response is the reduction of customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure.

bill requires CEC to establish policies and procedures for the purchase of electricity from eligible combined heat and power systems.

- The Climate Action Plan (also discussed in *Section 3.8, Greenhouse Gas Emissions*), sets a target of 4,000 MW of combined heat and power systems that would displace 30,000 GWH of demand from other power generation sources.

California Bioenergy Action Plan

The California Bioenergy Action Plan (Bioenergy Interagency Working Group 2006) proposed targets for biodiesel fuel use in California of nearly 1 billion gasoline gallon equivalents in 2010, 1.6 billion in 2020, and 2 billion in 2050. The plan also called for the state to produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. These goals were formalized by the Governor's Executive Order S-06-06.

State Alternatives Fuel Plan

The State Alternatives Fuel Plan (CARB and CEC 2007) presents strategies and steps that California must take to increase the use of alternative fuels without adversely affecting air quality, water quality, or causing negative health effects. The plan recommends alternative fuel targets of 9 percent in 2012, 11 percent in 2017, and 26 percent by 2022. The plan also presents a 2050 Vision that extends the plan outcomes and presents a transportation future that greatly reduces the energy needed for transporation, provides energy through a diverse set of transportation fuels, eliminates ovedependency on oil, and achieves an 80 percent reduction in GHG emissions. With these goals, more than 4 billion gasoline gallon equivalents (20 percent) would be displaced by alternative fuels in 2020. CEC estimates that by 2050, alternative fuels could provide more than half of the energy needed to power California's transportation system.

Building Energy Efficiency Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24 Part 6) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. CEC adopted an update in 2008, and the new standards went into effect on January 1, 2010. The new standards require, on average, a 15 percent increase in energy savings compared with the 2005 Building Efficieny Standards.

Local Policies and Regulations

There are no local policies or regulations relating to inefficient use of energy resources in Oakland or Alameda County.

3.13.3 Impact Analysis

Methodology for Analysis

This analysis evaluates the temporary use of energy resources such as fuel and electricity during construction and the permanent use of energy resources during operation of the Land Use Master Plan projects. The analysis discusses how construction activities would be conducted to minimize the use of fuels and to ensure that energy is not used in a wasteful manner. The analysis considers the renewable energy that would be produced as a result of project operation, and also evaluates the energy needed for operational purposes as well as energy efficiency measures to be implemented to ensure that energy resources are not used in a wasteful manner during operation.

Thresholds of Significance

For the purposes of this analysis, an impact to energy resources would be significant if the Land Use Master Plan projects would:

- Result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, especially fossil fuels such as coal, natural gas, and oil.

Impacts and Mitigation Measures

This section discusses potential impacts to energy resources that could result in conjunction with construction and operation of the Land Use Master Plan components. Mitigation measures are identified where appropriate.

Impact ENE-1 Inefficient, Wasteful, Or Unnecessary Use Of Energy Resources

Construction

All Land Use Master Plan Elements

Construction of the Land Use Master Plan elements, including the biodiesel production and food waste preprocessing facilities, would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation, grading, demolition, and vehicle travel. During these activities, fuel for construction worker commute trips would be minor in comparison to the fuel used by construction equipment. Based on the estimated duration of construction and types of construction equipment that would be used (see *Section 3.3, Air Quality*), construction of the biodiesel production facility would consume approximately 25,300 gallons of diesel fuel and construction of the food waste preprocessing facility would consume approximately 34,400 gallons of diesel fuel. The precise amount of construction-related energy consumption is uncertain for the remaining Land Use Master Plan components. Use of these fuels would not be wasteful or unnecessary because their use is necessary to contribute to the long-term production of renewable energy resources, comply with upcoming water quality regulations, support the production of renewable energy at PGS, support wastewater operations, and/or provide a community service related to household hazardous wastes or public education.

However, excessive idling and other inefficient site operations could result in the inneficient use of fuels during construction of all projects. Therefore, impacts related to the inneficient use of fuels during construction would be potentially significant. However, as disussed in Impact AIR-1 in *Section 3.3, Air Quality*, the biodiesel production facility, food waste preprocessing facility, and other Land Use Master Plan components would be required to implement controls in accordance with **Mitigation Measure AIR-1**, including idling limits for trucks and construction equipment in accordance with the requirements of CCR Title 13 as well as proper maintenance and tuning of construction equipment. With implementation of this measure, impacts related to the inefficient use of construction-related fuels would be less than significant.

Operation

EBMUD will require that applicable energy efficiency and load management measures are included in the design specifications for all Master Plan projects (including the biodiesel production and food waste preprocessing facilities). Specific technologies may include variable frequency drives and energy efficient motors, as appropriate. EBMUD will incorporate, as appropriate, electrical load management measures and operational procedures to reduce peak electrical demands at the MWWTP, and shall require that the project developers for the biodiesel production and food waste preprocessing facilities incorporate similar measures, as appropriate, into their operating procedures to reduce power consumption during peak demand periods on the regional power system. Incorporation of electrical load management measures would not result in energy efficiency, but could reduce peak demands on PGS and/or the electrical grid by shifting loads to off-peak periods.

Biodiesel Production Facility

The biodiesel production facility would require an average of 1.3 MW of electricity to operate (11,400 MWh per year), and up to 12 million Btu/hour of natural gas for heating and general facility requirements. The biodiesel production process would generate approximately 300 standard cubic feet per minute of biogas from the anaerobic digestion of the glycerin byproduct, enough to generate an additional 0.8 MW (7000 MWh per year) of electricity at the expanded PGS, once this facility is completed in 2011.

The biodiesel production facility would be operated by a private owner/operator and would use electricity and natural gas provided by PG&E. However, the use of this energy would not be either wasteful or unnecessary because it would be used to produce 20 million gallons per year (mgy) of biodiesel. Production of this diesel fuel substitute would help meet the State's goal of 9 percent alternative fuels by 2012, and would provide approximately 1 percent of the State's goal of using 1.6 billion gallons of alternative fuel by 2020, a beneficial impact of the project (see *Section 3.6.2, Regulatory Framework*). Further, the project would provide 0.8 MW (7000 MWh per year) of renewable energy produced at the expanded PGS, which would provide power for the operation of the Land Use Master Plan projects. While increased truck traffic associated with operation of the project (see *Section 3.14, Transportation*) would use approximately 406,000 gallons of diesel fuel annually, this represents only about 2 percent of the total volume of biodiesel that would be produced at the facility, and would not substantially offset the benefit of producing 20 mgy of biodiesel.

Project facilities as applicable, including the office, quality control laboratory, chemical storage and handling equipment, and processing equipment would be designed in accordance with the 2008 Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR, Title 24, Part 6), which would ensure that the energy needed to operate these facilities would not be used in an inefficient manner.

Food Waste Preprocessing Facility

The food waste preprocessing facility would require an average of 0.56 MW (or an average of 4,900 MWh per year) of electricity to operate when both process lines are in operation. The facility would be operated by a private owner/operator and would use electricity provided by PG&E. In addition, increased truck traffic associated with operation of the project (discussed in *Section 3.14, Transportation*) would use approximately 165,800 gallons of diesel fuel annually. However, the use of this energy would not be either wasteful or unnecessary because the facility would contribute to the production of renewable energy at the expanded PGS and contribute to a reduction in food wastes disposed of at regional landfills and composting facilities.

Project facilities as applicable, including the office and processing system would be designed in accordance with the 2008 Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24 Part 6), which would help ensure that the energy needed to operate the project would not be used in a wasteful manner.

Other Land Use Master Plan Elements

All of the Land Use Master Plan elements would require power to operate. Although the amount of power required for operation has not been quantified, some wastewater treatment processes may require a substantial amount of energy, such as ultraviolet disinfection. However, as discussed above, operation of the biodiesel production facility evaluated in this EIR would increase renewable power generation at PGS by 0.8 MW, or 7,000 MWh per year and operation of the food waste preprocessing facility would also contribute to the production of renewable energy at the expanded PGS. Although operation of Land Use Master Plan projects could exceed this amount of energy, the energy would not be used in a wasteful or unnecessary manner because these projects would be necessary to comply with upcoming water quality regulations, support the production of renewable energy at PGS, support wastewater operations, or

provide a community service related to household hazardous wastes or public education. Furthermore, as discussed in *Chapter 4*, *Other CEQA Considerations* (*Section 4.3*, *Cumulative Effects*), EBMUD intends that all of the energy used for operation of the Land Use Master Plan projects would be renewable energy supplied by the expanded PGS utilizing increased biogas produced by biodiesel production facility, the expanded food waste facility, and general growth in the R2 program.

All of the proposed Land Use Master Plan projects, as applicable, would be designed in accordance with the 2008 Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR, Title 24, Part 6), which would help ensure that the energy used to operate the projects would not be used in an inefficient or wasteful manner. With incorporation of energy efficiency measures this impact would be less than significant.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

3.7 Geology, Soils and Seismicity

This section evaluates the potential adverse impacts related to local geology, existing soil conditions, or seismicity that could result from implementation of the proposed MWWTP Land Use Master Plan. The analysis is based on a review of geologic maps and reports including geologic and geotechnical reports and information from state and local agencies. In particular, Ninyo and Moore (2008) conducted a geotechnical investigation within a portion of the project site. This information was used, to the extent possible, to confirm and enhance existing data available from public agencies.

3.7.1 Environmental Setting

The following sections describe the environmental setting for geologic resources and hazards within the study area, which includes the project site and geologic features in the project vicinity (such as faults) that could affect project facilities.

Regional and Site Geology

The project site lies within the geologically complex region of California referred to as the Coast Ranges geomorphic province.[1] The Coast Ranges province lies between the Pacific Ocean and the Great Valley province (Sacramento and San Joaquin Valleys) and stretches from the Oregon border to the Santa Ynez Mountains near Santa Barbara. Much of the Coast Ranges province is composed of marine sedimentary deposits and volcanic rocks that form the northwest-trending mountain ridges and valleys, running roughly parallel to the San Andreas Fault Zone.

The topography at the project site is relatively flat, with the entire site being at less than ten feet elevation, and slightly sloping towards the southeast. The site is located on artificial fill over bay mud (California Geological Survey [CGS] 2003). Bay mud consists of thick deposits of soft, unconsolidated silty clay that is saturated with water. Soils at the site are categorized by the National Resource Conservation Survey as urban land. As a result of the study area being highly industrialized, soils at the project site have been moved and reworked such that native soils are no longer present. Consequently, there is little to no agricultural or ecological value to the soils.

Seismicity

The San Francisco Bay Area is a region of high seismic activity with numerous active and potentially active faults.[2] Major earthquakes have affected the region in the past and are expected to occur in the near future on one of the principal active faults in the San Andreas Fault System. The USGS Working Group on California Earthquake Probabilities determined a 63 percent likelihood of one or more earthquakes of magnitude 6.7 or greater occurring in the San Francisco Bay Area region within the 30-year period from 2007 to 2037 (USGS 2008).

Richter magnitude (expressed as M) is a measure of the size of an earthquake as recorded by a seismograph. The reported Richter magnitude for an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically, with each whole-number step representing a tenfold increase in the amplitude of the recorded seismic waves. Earthquake magnitudes are also measured by their moment magnitude, which is

[1] A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has eleven geomorphic provinces (CGS 2002).

[2] An *active* fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 11,000 years). A *potentially active* fault is a fault that has shown evidence of surface displacement during the last 1.6 million years, unless direct geologic evidence demonstrates inactivity for the last 11,000 years or longer. This definition does not mean that faults lacking evidence of surface displacement are necessarily inactive. *Sufficiently active* is also used to describe a fault if there is some evidence that Holocene surface displacement occurred on one or more of its segments or branches (Hart 1997).

related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the movement or displacement across a fault (CGS 2002).

The San Andreas Fault System forms the boundary between the North American and Pacific crustal plates and includes the San Andreas, Hayward, Calaveras, Mt. Diablo Thrust, Marsh Creek-Greenville, and the Concord-Green Valley Faults (see **Figure 3.7-1**). A number of these faults, such as the San Andreas and Hayward, have experienced significant activity during historic time (within the last 200 years). **Table 3.7-1** lists the location of regionally active faults and potentially active faults relevant to the project in terms of proximity, activity status, date of most recent motion, and maximum moment magnitude (Mmax). Mmax is the strongest earthquake that is likely to be generated along a fault and is based on empirical relationships of surface rupture length, rupture area, and fault type, all of which are related to the physical size of fault rupture and displacement across a fault.

The Hayward (when combined with the Rodgers Creek) and the San Andreas Faults have the highest probabilities of generating an M 6.7 or greater earthquake before 2037 (USGS 2008). The closest active fault to the project site is the Hayward fault, which is approximately four miles east. The Hayward Fault is of particular concern because of the density of urban development along its length and the major infrastructure lines (water, electricity, gas, and transportation) that cross it. A characteristic feature of the Hayward Fault is its well-expressed and relatively consistent fault creep.[3] Although large earthquakes on the Hayward Fault have been rare since 1868, slow fault creep has continued to occur and has caused measurable offset across the fault trace. Fault creep on the East Bay segment of the Hayward Fault is estimated at 9 millimeters per year (mm/yr) (Peterson et al. 1996). However, a large earthquake could occur on the Hayward Fault with an estimated Mmax of 7.1 (see **Table 3.7-1**).

The San Andreas Fault, although at least 14 miles from the project site, was the source of two major seismic events in recent geologic history that affected the San Francisco Bay region. The 1906 San Francisco earthquake, estimated at M 7.9, resulted in approximately 290 miles of surface fault rupture, the longest of any known to occur on a continental strike-slip fault. The more recent 1989 Loma Prieta earthquake, with a magnitude of M 7.1, resulted in widespread damage throughout the Bay Area.

The Mt. Diablo Thrust and the Concord Faults are the faults with the least likelihood of causing an M 6.7 earthquake (USGS 2003). The historical record indicates that no large earthquakes have occurred on the Mt. Diablo or Concord Faults; however, a moderate earthquake of M 5.4 occurred on the Concord Fault segment in 1955.

[3] Fault creep is the slow, continuous deformation observed across a fault trace as a result of constant seismic stress.

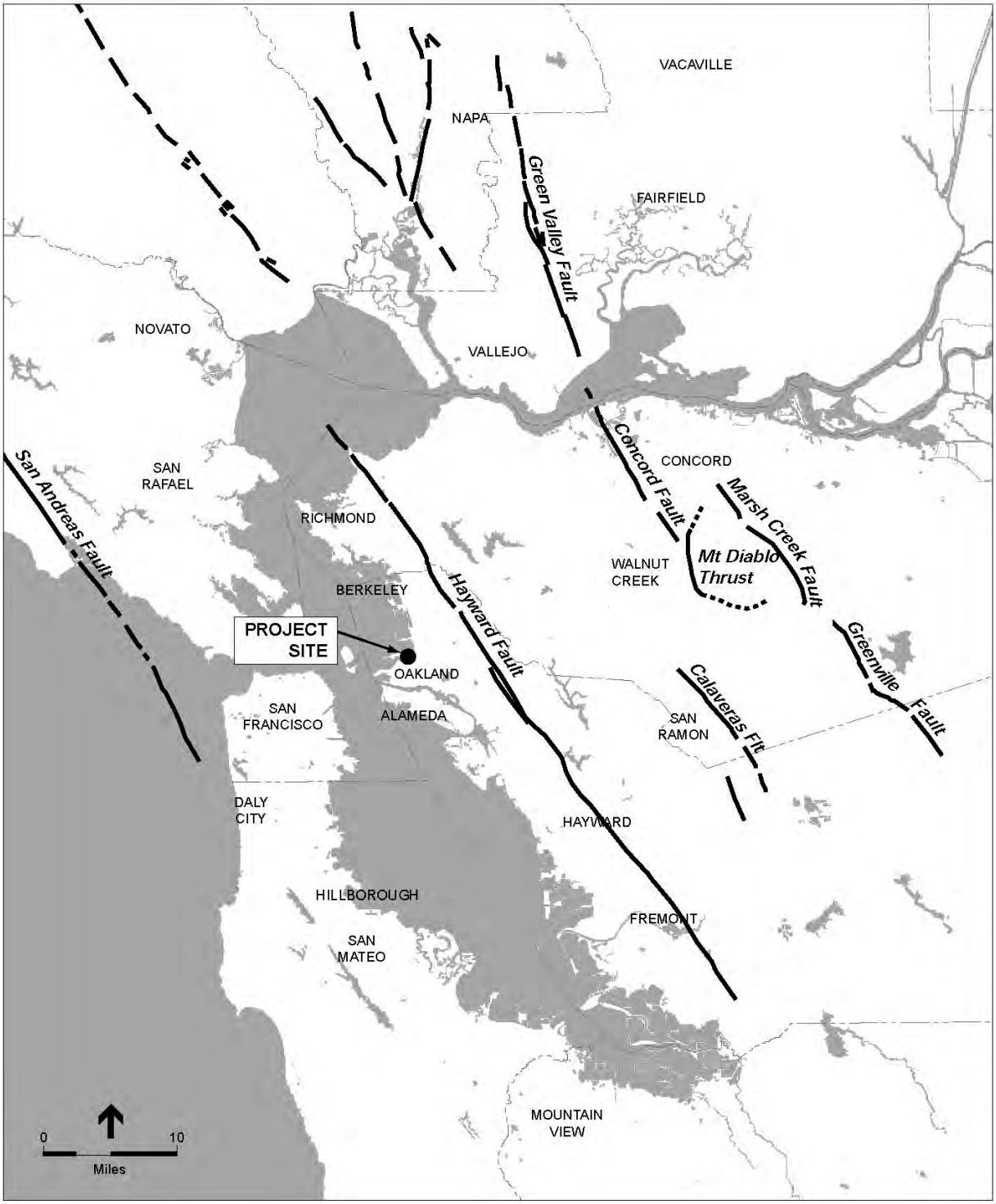

Figure 3.7-1: Regional Fault Map

Table 3.7-1: Active Faults in the Project Vicinity

Fault	Nearest Location and Direction from Project Site	Recency of Movement	Fault Classification[a]	Historical Seismicity[b]	Maximum Moment Magnitude Earthquake (Mmax)[c]
Hayward	3.9 miles	Historic (1868 rupture) Holocene	Active	M 6.8, 1868 Many <M 4.5	7.1
San Andreas	14.1 miles	Historic (1906; 1989 ruptures)	Active	M 7.1, 1989 M 7.9, 1906 M 7.0, 1838 Many <M 6	7.9
Calaveras (northern)	15.7 miles	Historic (1861 rupture) Holocene	Active	M 5.6 to M 6.4, 1861 M 4 to M 4.5 swarms 1970, 1990	6.8
Mt. Diablo Thrust	14.5 miles	Holocene	Active(Blind)	Many <M 4.5	6.65
Concord–Green Valley	17.3 miles	Historic (1955) Holocene	Active	Historic active creep	6.8
Marsh Creek–Greenville	27.7 miles	Historic (1980 rupture) Holocene	Active	M 5.6, 1980	6.9

a An active fault is defined by the California Geological Survey as one that has had surface displacement within approximately the last 11,000 years. A potentially active fault is defined as a fault that has showed evidence of surface displacement during approximately the last 1.6 million years.
b Richter magnitude (expressed as M) and year for recent and/or large events. Richter magnitud e scale reflects the maximum amplitude of a seismic wave measured at a distance of 100 kilometers from the epicenter.
c Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The maximum moment magnitude (Mmax) is the strongest earthquake that is likely to be generated along a fault and is based on empirical relationships of surface rupture length, rupture area, and fault type.
Source: Jennings 1994; Hart 1997

Seismic and Geologic Hazards

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults, or even along different strands of the same fault. Ground rupture is considered more likely along active faults, which are referenced in **Table 3.7-1**, and within Alquist Priolo Earthquake Fault Zones.

The project site does not lie within an Alquist-Priolo Earthquake Fault Zone, as designated through the Alquist-Priolo Earthquake Fault Zoning Act, and no mapped active faults are known to pass through the immediate project region. The nearest Alquist-Priolo Earthquake Fault Zone lies approximately 3.5 miles from the project site, along the Hayward Fault. Therefore, the risk of ground rupture at the project site is low.

Groundshaking

Earthquakes in the Bay Area could produce strong groundshaking in the project region. Groundshaking intensity is partly related to the size of an earthquake, the distance to the site, and the response of the geologic materials that underlie a site. As a rule, the greater the earthquake magnitude and the closer the fault rupture to a site, the greater the intensity of groundshaking. Violent groundshaking is generally expected at and near the epicenter of a large earthquake; however, different types of geologic materials

respond differently to earthquake waves. For instance, deep unconsolidated materials can amplify earthquake waves and cause longer periods of groundshaking.

The Modified Mercalli (MM) scale is commonly used to measure earthquake intensity due to groundshaking. **Table 3.7-2** presents a description of the MM scale. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total). MM intensities ranging from IV to X can cause moderate to significant structural damage, although the damage may not be uniform. Some structures experience substantially more damage than others. The age, material, type, method of construction, size, and shape of a structure affect its performance in an earthquake. As a comparison, the 1906 San Francisco earthquake, with an M 7.9 on the San Andreas Fault, produced shaking intensities modeled as violent (MM IX) within the project area (ABAG 2003a).

The Association of Bay Area Governments (ABAG) has compiled Earthquake Shaking Hazard Maps, which predict the potential for groundshaking during major earthquakes on the active fault in the Bay Area. The Shaking Hazard Maps rank degrees of groundshaking intensity based on the MMI scale. A seismic event in the Bay Area could produce violent ground accelerations (MMI-IX) at the project site (ABAG 2009). As shown in **Table 3.7-2**, this level of shaking intensity could include considerable structural damage, even in well-designed structures.

After the Loma Prieta earthquake in 1989, EBMUD initiated a seismic evaluation program to evaluate the performance of essential components of the wastewater system following a major earthquake, and to identify and evaluate projects to improve the system's post-earthquake performance. The seismic evaluation program evaluated each component of the EBMUD wastewater system according to three performance goals: life safety of personnel and the public, protection of public health, and protection of the Bay. The seismic evaluation program studied the maximum earthquake[4] on the Hayward Fault and the probable earthquake for all major faults in the Bay Area[5]. The seismic evaluation studies, conducted between 1991 and 1994, involved investigations to:

- Establish target levels of service (service goals) for post-earthquake conditions;
- Assess site seismic hazards (groundshaking, liquefaction, landslides, and surface faulting);
- Evaluate the structural integrity of facilities;
- Develop seismic scenarios;
- Prioritize improvements;
- Prepare cost estimates; and
- Estimate total system recovery times and achievement of service goals.

[4] The maximum earthquake represents the largest credible earthquake given the regional tectonics.

[5] Major faults in the Bay Area include the Hayward, Rodgers Creek, San Andreas, Calaveras, Concord-Green Valley, and San Gregorio faults.

Table 3.7-2: Modified Mercalli Intensity Scale

Intensity Value	Intensity Description	Average Peak Acceleration (% g[a]) Header
I	Not felt except by a very few persons under especially favorable circumstances.	< 0. 17
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	0.17–1.4
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck.	0.17–1.4
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. S tanding motor cars rocked noticeably.	1.4–3.9
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	3.5–9.2
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	9.2–18
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving.	18–34
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	34–65
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked. Underground pipes broken.	65–124
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed over banks.	> 124
XI	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 124
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 124

a. g (gravity) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.
Source: ABAG 2003b

The seismic evaluation program was designed to identify and prioritize those facilities most prone to seismic damage that would cause an unacceptable level of service, life safety hazard, and/or cost to customers. Conceptual recommendations in the form of geotechnical mitigations, structural retrofits, operational alternatives and emergency response measures were developed (EBMUD 1994). A 2005 draft report, "Summary of Seismic Deficiencies for Structures at MWWTP," provides more specific information on structures at the MWWTP site, placing them into one of the following three categories: (1) structures that have had a detailed (qualitative) evaluation; (2) structures that have had a preliminary (qualitative) evaluation; detailed evaluation and seismic retrofit required; and (3) structures that have been seismically retrofitted (EBMUD 2005). Additional information is provided for the structures in the first

category. (The solids dewatering building, the operations center, and the oxygenation tank control building are the three MWWTP facilities that have been retrofitted to date.) The draft summary states that the analysis is not complete, that site visits are needed to verify seismic strengthening, and that a thorough in-house document search should be made (EBMUD 2005).

Landslides

Landslides occur throughout the state; however, the spatial density of incidents increases in zones of active faulting. Slope failures, commonly referred to as landslides, include phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. A slope failure is a mass of rock, soil, and debris displaced down slope by sliding, flowing, or falling. Exposed rock slopes undergo rock falls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides. Landslides may occur on slopes of 15 percent or less; however, the probability is greater on steeper slopes. Landslide-susceptible areas are characterized by steep slopes and down slope creep of surface materials. Slope stability can depend on a number of variables such as the geology, structure, amount of groundwater in the slope, and external processes (i.e., climate, topography, slope geometry, and human activity). For example, a soil slope may be considered stable until it becomes saturated with water (e.g., during heavy rains or due to a broken pipe or sewer line). Under saturated conditions, the water pressure in the individual pores within the soil increases, reducing the strength of the soil.

Earthquake motions can induce significant horizontal and vertical dynamic stresses in slopes that can trigger failure. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake triggered thousands of landslides over an area of 770 square miles. The Oakland-Berkeley Hills could experience some earthquake-induced rock falls, slumps, and debris flows during an event on the Hayward Fault or other active Bay Area fault capable of generating strong ground motion. However, given that the topography in the vicinity of the project site is relatively flat, the nearest earthquake-induced landslide would occur at least one mile east of the project site (CGS 2003).

Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, noncompacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or bay mud. EBMUD's seismic evaluation program (refer to the discussion under *Groundshaking* above) found that settlement on the order of 1.5 inches would occur from soil densification due to an earthquake (EBMUD 1994). Post-earthquake settlement would also occur as a result of liquefaction, discussed below.

Liquefaction and Lateral Spreading

Liquefaction is a phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, san ds, silty sands, and gravels within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include vertical settlement from densification, lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects. Lateral spreading occurs when liquefaction in a gently sloping are results in ground movement. Damage from liquefaction and lateral spreading is generally most severe when liquefaction occurs within 15 to 20 feet of the ground surface.

USGS classifies liquefaction susceptibility according to five categories that describe the likely proportion of all liquefaction occurrences that could take place in each category; the abundance or frequency of liquefaction occurrence within the category; the strength of shaking required to produce liquefaction; and the Quaternary-age geologic units included (USGS 2006). The five categories are described as follows:

- *Very High.* USGS estimates that about 40 to 50 percent of future liquefaction effects would occur within geologic units assigned this category. Only modest groundshaking (peak ground acceleration of about 0.1 g) would be required to cause liquefaction. Geologic map units that fall within this category include the latest Holocene and historical stream channel deposits as well as artificial fills over bay and other estuarine mud.
- *High.* USGS estimates that about 20 to 30 percent of future liquefaction effects would occur within geologic units assigned this category. Relatively modest groundshaking (peak ground acceleration of about 0.1 to 0.2 g) would be required to cause liquefaction. Geologic map units within this category include the latest Holocene and historical alluvium, natural levees, and stream terraces.
- *Moderate.* USGS estimates that about 20 to 30 percent of future liquefaction effects would occur within geologic units assigned this category. Somewhat stronger groundshaking (greater than peak ground acceleration of about 0.1 to 0.2 g) would be required to cause liquefaction. Geologic map units within in this category include the latest Pleistocene and Holocene bay and other estuarine mud, alluvial fan and levee deposits, and stream terrace deposits.
- *Low.* USGS estimates that about 2 percent of future liquefaction effects would occur within geologic units assigned this category. Stronger groundshaking (peak ground acceleration of about 0.5 g) would be required to cause liquefaction. Geologic map units within in this category include the basin deposits, various late Pleistocene deposits, and Pleistocene marine terrace deposits.
- *Very Low.* USGS estimates that about 2 percent of future liquefaction effects would occur within geologic units assigned this category. Stronger groundshaking (greater than peak ground acceleration of about 0.6 g) would be required to cause liquefaction. Geologic map units within in this category include Pleistocene deposits, pre-Quaternary deposits, and bedrock.

Liquefaction susceptibility at the project site is considered very high (USGS 2006; ABAG 2009). The site is mapped as a CGS Seismic Hazard Zone and is mapped for liquefaction susceptibility (CGS 2003). EBMUD's seismic evaluation program (refer to the discussion under *Groundshaking* above) identified loss of bearing strength due to liquefaction as the largest potential hazard at the MWWTP. The study estimated that post-earthquake settlement at the MWWTP due to liquefaction following the probable earthquake considered in the study could be 2.5 inches or more (EBMUD 1994).

3.7.2 Regulatory Framework

This section describes laws and regulations at the federal, state, and local level that may apply to the project.

Federal Policies and Regulations

Clean Water Act

The federal Clean Water Act (CWA) authorizes USEPA to implement pollution control programs, such as setting wastewater standards for industry to protect the waters of the United States. The CWA effectively prohibits discharges of stormwater from construction projects unless the discharge is in compliance with an National Pollutant Discharge Elimination System (NPDES) permit. In California, implementation and enforcement of the NPDES permit program is conducted through the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB).

In the project area, the construction stormwater NPDES permit is enforced by the San Francisco Bay RWQCB. SWRCB recently adopted an amended General Construction Permit (NPDES Order No.

CAS000002, Order No. 2009-0009-DWQ), which changed the waste discharge requirements for discharges of stormwater runoff associated with construction and land disturbance activities (previously Order 99-08-DWQ). Effective July 1, 2010, the amended General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). SWPPP must include a site map(s) showing the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the site. SWPPP must list Best Management Practices (BMPs) the discharger will use to protect stormwater runoff; a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

State Policies and Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the state geologist established regulatory zones, called “earthquake fault zones,” around the surface traces of active faults and has published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace because many active faults are complex and consist of more than one branch that may experience ground surface rupture (see **Figure 3.7-1** for proximity of the project site to the existing faults).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990, following the Loma Prieta earthquake, to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The Act directs the Department of Conservation to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified groundshaking. For structures intended for human occupancy, the act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy within the Zones of Required Investigation. CGS seismic hazards map for the North Oakland depicts the project site in liquefaction hazard zone (CGS 2003). In 2008, CGS published *Guidelines for Evaluating and Mitigating Seismic Hazards in California* (Special Publication 117), which contains guidelines for evaluating seismic hazards other than surface fault-rupture, and for recommending mitigation measures as required by PRC Section 2695(a).

California Building Code

The California Building Code (CBC), which is codified in CCR Title 24, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all building and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable.

The CBC is based on the International Building Code. The 2007 CBC is based on the 2006 International Building Code published by the International Code Conference. In addition, the CBC contains necessary California amendments that are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion in building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement,

and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC. Compliance with the CBC would be necessary for buildings and possibly for certain grading activities on the project site. In addition, EBMUD has its own seismic design standards that would apply to the proposed facilities.

Local Policies and Regulations

City of Oakland General Plan

The following policies in the City of Oakland General Plan, Safety Element (2004) would apply to the project:

- *Policy GE-1* – Develop and continue to enforce and carry out regulations and programs to reduce seismic hazards and hazards from seismically triggered phenomena.
- *Policy GE-2* – Continue to enforce ordinances and implement programs that seek specifically to reduce the landslide and erosion hazards.
- *Policy GE-3* – Continue, enhance or develop regulations and programs designed to minimize seismically related structural hazards from new and existing buildings.
- *Policy GE-4* – Work to reduce potential damage from earthquakes to “lifeline” utility and transportation systems.

City of Oakland Grading Ordinanace

The City of Oakland Grading Ordinance (Ordinance No. 10312) requires grading permits for earth moving activities under when specified volumes of earth would be moved, there are certain slope characteristics, and in areas where "land disturbance" or stability problems have been reported. To obtain a grading permit, a soils report, a grading plan, and an erosion and sedimentation control plan must be submitted to the Department of Public Works and approved.

City of Oakland Sedimentation and Erosion Control Ordinance

The City of Oakland Sedimentation and Erosion Control Ordinance (Ordinance No. 10446) requires any person who performs grading, clearing, and grubbing or other activities that disturb the existing soil to take appropriate preventative measures to control erosion; prevent sedimentation of eroded materials onto adjacent lands, public streets, or rights-of-way; and prevent carrying of eroded materials to any water course by any route.

City of Oakland Building Services Division

The City of Oakland Building Services Division requires compliance with building standards set forth in the 2007 CBC. In addition, the Division requires that an engineering analysis accompanied by detailed engineering drawings be submitted to the Division prior to excavation, grading, or construction activities on the project site. This is consistent with standard City of Oakland practices to ensure that all buildings are designed and built in conformance with the seismic requirements of the City of Oakland Building Code. An engineering analysis report and drawings and relevant grading or construction activities on a project site would be required to address constraints and incorporate recommendations identified in geotechnical investigations. These required submittals ensure that the buildings are designed and

constructed in conformance with the requirements of all applicable building code regulations, pursuant to standard City procedures.

3.7.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the facilities associated with the proposed project would result in significant impacts related to local geology, geologic hazards, existing soil conditions, or seismicity. The analysis is based on a review of various geologic maps and reports, including a geotechnical evaluation conducted by Ninyo and Moore (2008) at the EBMUD Digester Upgrade project site and the 1994 Seismic Evaluation Study conducted at the MWWTP site, and augmented by information available from state and local agencies.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* a geologic or seismic impact would be considered significant if the project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - 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;
  - Strong seismic groundshaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- 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 onsite or offsite landslide, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the 1994 Uniform Building Code (UBC), creating substantial risks to life or property; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Rupture of a Known Earthquake Fault* – The project site is not located within a Fault-Rupture Hazard Zone designated by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and there are no known active faults in the immediate vicinity (Hart 1997). The nearest active fault is the Hayward fault, located approximately four miles east of the project site. Since there are no known faults in the project vicinity, there would be no impact associated with the rupture of a known earthquake fault.
- *Landslides* – The study area is relatively flat and the project site is not located on or adjacent to a hillside, exposed rock face, or cliff. According to CGS, the nearest landslide hazard zone lies approximately one mile from the project site. Therefore, there would be no project impacts related to risk of loss, injury, or death involving landslides (Ninyo and Moore 2008).

- *Expansive Soils* – The project area is underlain with artificial fill, bay mud, clay, and sand. A geotechnical investigation performed at a site within the project area in 2008 included an expansion index test, standard procedure for a geotechnical evaluation. This test was performed in accordance with the UBC Standard 18-2. The results indicated a very low potential for expansive soils in the project site (Ninyo and Moore 2008). Although conditions could vary across the site, the likelihood that improvements would be located on unidentified expansive soils is very low considering the required geotechnical analysis and mitigations that are standard for the industry. Consequently, there are no impacts anticipated as a result of expansive soils.
- *Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems* – The project site is located at a wastewater treatment plant and the project would not involve use of septic systems or alternative wastewater disposal systems. Therefore, there would be no impacts related to such systems.

Impacts and Mitigation Measures

The MWWTP Land Use Master Plan is evaluated below at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level.

Impact GEO-1 Facility Damage And Exposure Of People To Hazards From Strong Seismic Groundshaking

According to the USGS Working Group on California Earthquake Probabilities, there is a 63 percent likelihood that an earthquake of 6.7 M or higher will occur in the Bay Area between 2007 and 2037 (USGS 2008). The Hayward and San Andreas faults are the most likely faults to experience a major earthquake.

All Land Use Master Plan Elements

Groundshaking is an unavoidable hazard for structures and associated infrastructure within the San Francisco Bay Area. Project-related improvements would likely experience at least one major earthquake (greater than M 6.7) sometime during the operational lifetime of the project components (USGS 2008). Most structures, including buildings, tanks, and associated appurtenances, are subject to damage from earthquakes. The intensity of such an event would depend on which fault the earthquake occurs, the distance of the epicenter from the project site and the duration of shaking. The proposed facilities would especially be subject to strong seismic groundshaking in the event of a major earthquake on the Hayward or San Andreas faults. Shaking Hazard Maps prepared by ABAG indicate that an earthquake of M 6.7 or greater on the Hayward fault could produce violent ground accelerations (MMI-IX) at the project site (ABAG 2009). According to the MMI scale, impacts at this level of shaking intensity could include considerable structural damage, even in well-designed structures. Impacts to people during strong groundshaking could include injury and loss of life.

As described in *Section 3.7.1, Environmental Setting*, after the 1989 Loma Prieta, EBMUD initiated a seismic evaluation program to identify seismic safety concerns of its wastewater system and develop facility improvements at MWWTP. Several structures at the MWWTP have been seismically retrofitted and others have been evaluated for future upgrades. Modern standard engineering and construction practices include design criteria to mitigate potential damage from an earthquake. With implementation of **Mitigation Measure GEO-1** this impact would be reduced to a less-than-significant level.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards

During the design phase for the biodiesel production facility, food waste preprocessing facility, and all other Land Use Master Plan elements that require ground-breaking activities, EBMUD will perform site-specific, design-level geotechnical evaluations to identify potential secondary ground failure hazards (i.e., seismically-induced settlement) associated with the expected level of seismic ground shaking. For specific Land Use Master Plan element sites within the MWWTP that have previously been subject to a geotechnical investigation, a geotechnical memorandum shall be prepared to update the previous investigation.

The geotechnical analysis will provide recommendations to mitigate those hazards in the final design and, if necessary, during construction. The design-level geotechnical evaluations, based on the site conditions, location, and professional opinion of the geotechnical engineer, may include subsurface drilling, soil testing, and analysis of site seismic response as needed. The geotechnical engineer will review the seismic design criteria of facilities to ensure that facilities are designed to withstand the highest expected peak acceleration, set forth by the CBC for each site. Recommendations resulting from findings of the geotechnical study will be incorporated into the design and construction of proposed facilities. Design and construction for buildings will be performed in accordance with EBMUD's seismic design standards, which meet or exceed applicable design standards of the International Building Code.

Significance after Mitigation

Less than significant.

Impact GEO-2 Facility Damage And Exposure Of People To Hazards From Liquefaction And Lateral Spreading

Liquefaction affects overlying structures or subsurface improvements, such as pipelines and utilities, where the structures may tip or become buoyant and "float" upwards during liquefaction. As discussed in *Section 3.7.1, Environmental Setting*, the site is located on artificial fill that overlies bay mud. Borings at a portion of the site show that below the pavement the depth of the fill ranges from three feet to 13 feet in thickness (Ninyo and Moore 2008). The geotechnical report on that area refers to the fill as undocumented, indicating that it is not engineered fill and was not placed in accordance with current engineering standards. The fill in the portion of the project site analyzed by Ninyo and Moore (2008) generally consists of very loose clayey and silt sand. Beneath the undocumented fill is bay mud ranging in depth from 7.5 to 15 feet. The deepest layer, beneath the bay mud, is characterized as alluvium, which generally consists of interlayered sands and silts. Both the undocumented fill and Bay Mud are considered susceptible to liquefaction hazards. As discussed in the *Environmental Setting*, ABAG, USGS, and CGS have categorized the project site as highly susceptible to liquefaction hazards, and EBMUD's Seismic Evaluation Program identified liquefaction as the key hazard posed by a major earthquake at the MWWTP.

All Land Use Master Plan Elements

The biodiesel production facility, food waste preprocessing facility, and other Land Use Master Plan elements would be constructed on materials that are highly susceptible to liquefaction. Implementation of **Mitigation Measure GEO-2** would reduce this impact to a less-than-significant level.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure GEO-2: Perform Design-Level Geotechnical Evaluations for Liquefaction and Other Geologic Hazards

During the design phase for the biodiesel production facility, food waste preprocessing facility, and all other Land Use Master Plan elements that require ground-breaking activities, EBMUD will perform site-specific design-level geotechnical evaluations to identify geologic hazards and provide recommendations to mitigate those hazards in the final design and during construction. For specific Land Use Master Plan element sites within the MWWTP that have previously been subject to a geotechnical investigation, a geotechnical memorandum shall be prepared to update the previous investigation.

The design-level geotechnical evaluations will include the collection of subsurface data for determining liquefaction potential, and appropriate feasible measures will be developed and incorporated into the project design. The performance standard to be used in the geotechnical evaluations for mitigating liquefaction hazards will be minimization of the hazards. Measures to minimize significant liquefaction hazards could include the following, unless the site-specific soils analyses dictate otherwise:

- Densification or dewatering of surface or subsurface soils;
- Construction of pile or pier foundations to support pipelines and/or buildings; and
- Removal of material that could undergo liquefaction in the event of an earthquake, and replacement with stable material.
- If soil needs to be imported, EBMUD would require that the contractor ensure that such imported soil complies with specifications that define the minimum geotechnical properties and analytical quality characteristics that must be met for use of fill material from off-site borrow sources.

Significance after Mitigation

Less than significant.

Impact GEO-3 Potential For Substantial Erosion Or Loss Of Top Soil

Project construction activities would include grading, excavation, trenching and soil stockpiling. Such activities, if not properly managed, have the potential to cause erosion and/or loss of top soil at the project site. Erosion could result in sedimentation and affect water quality in the nearby surface water bodies and storm drain systems; and reduction in capacity of agriculturally viable soils. Erosion may occur if excavated soils are not properly managed. Water bodies near the project site that could potentially be impacted by erosion include the San Francisco Bay. The study area is entirely industrialized and soils at the project site are classified as urban land by the National Resource Conservation Service. This designation signifies that native soils that may have been present at the site have now been subject to urban development. As discussed in *Section 3.7.1, Environmental Setting*, these soils have been reworked such that native soils are no longer present and have lost their agricultural values. As such, the potential for the loss of top soil which would possess agricultural value at the site is negligible.

All Land Use Master Plan Elements

Construction of the biodiesel production facility would require site grading to remove the existing asphalt surfaces and approximately 1,500 cubic yards (cy) of soil. Soil would be scraped to a level of 14 to 18 inches below grade prior to subsurface trenching. Construction of the food waste preprocessing facility would require site preparation such as grubbing and installation of footings, followed by site grading of up to two feet across half of the area and requiring up to 2,500 cy of soil or fill. Construction of all other Land Use Master Plan elements would require comparable site grading and preparation activities. As

discussed in *Chapter 2, Project Description*, soil removal would be handled in accordance with a soil management plan that would address existing soil contamination on the West End property. As discussed in *Section 3.10, Hydrology and Water Quality***,** in order to minimize erosion impacts, EBMUD would implement BMPs as required under the NPDES General Construction Permit for discharges of stormwater runoff associated with construction activity. In order to obtain the General Construction Permit, EBMUD will prepare a SWPPP for all construction phases of the project. BMPs are individual or combined measures that can be implemented in a practical and effective manner on the project site which, when applied, prevent or minimize the potential release of contaminants into surface waters and groundwater. BMPs include measures to prevent erosion and protect waterways from runoff and potential release of contaminants during construction into surface waters and groundwater. As discussed in *Chapter 2, Project Description*, EBMUD's Construction Specifications (013544-1.1(B)(1), (6), and (7)) consist of measures that EBMUD would implement onsite that include erosion control measures such as preventing soil and debris from being washed away during rainfall and ensuring drainage from the construction site, which would minimize erosion. With implementation of SWPPP and EBMUD's Construction Specifications, the potential for erosion impacts during construction of the Land Use Master Plan components would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

3.8 Greenhouse Gas Emissions

This section addresses greenhouse gas (GHG) emissions that could result from implementation of the proposed Land Use Master Plan, including the biodiesel production and food waste preprocessing projects. The latter are evaluated quantitatively, while the other Land Use Master Plan elements are discussed qualitatively because details of project construction and operation are not yet available. Greenhouse gases and their contribution to climate change are a global issue, but this analysis focuses on emissions associated with the project and their relationship to statewide policies for reduction in GHG emissions.

3.8.1 Greenhouse Gas Properties, Effects, and Sources

Gases that trap heat in the atmosphere are referred to as GHGs because they are transparent to solar radiation, but capture heat radiated by the earth back into the atmosphere, much like a greenhouse. The principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O).

The accumulation of GHGs has been implicated as a driving force for global climate change. Climate change is commonly used interchangeably with "global warming" and the "greenhouse effect." Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth's climate caused by natural fluctuations and anthropogenic activities that alter the composition and behavior of the global atmosphere.

While the primary GHGs in the atmosphere are naturally occurring, the presence of CO_2, CH_4, and N_2O is largely the result of human activities that have accelerated the rate at which these compounds occur within the earth's atmosphere. CO_2 is the "reference gas" for climate change, meaning that emissions of GHGs are typically reported in "carbon dioxide-equivalents" (CO_2e).[1] Emissions of CO_2 are largely byproducts of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Other GHGs with much greater heat-absorption potential than CO_2, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, are generated in certain industrial processes. There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to climate change, although there is uncertainty concerning the magnitude and rate of the warming. The effects of climate change on the natural environment in California may include, but are not limited to extreme heat conditions that could last longer and become more frequent, reduced snowpack, and more frequent occurrence of high ozone days, large forest fires and drought years. Secondary effects are likely to include a global rise in sea level, impacts on agriculture, changes in geographic occurrence of disease vectors, and loss of habitats and biodiversity.

CEC estimated that California produced 500 million metric tons (MMT) of CO_2e emissions in 2004. CEC found that transportation is the source of 38 percent of the state's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 23 percent and industrial sources at 13 percent (CEC 2006; 2007).

3.8.2 Environmental Setting

There is no environmental setting for GHGs within the study area.

[1] Every GHG has a global warming potential (GWP), a measurement of the impact that the particular gas has on "radiative forcing" (i.e., the additional heat/energy that is retained in the earth's troposphere through the addition of this gas during a defined time period). CO_2 equivalents provide a universal standard of measurement against which the effects of releasing (or avoiding the release of) different GHGs can be evaluated. CH_4 has a GWP of 21 and N_2O has a GWP of 310, meaning that their effect on global warming would be 21 and 310 times greater, respectively, than an equivalent amount of CO_2.

3.8.3 Regulatory Framework

Federal Policies and Regulations

The U.S. Supreme Court ruled on April 2, 2007 that CO_2 is an air pollutant as defined under the Clean Air Act, and that the United States Environmental Protection Agency (USEPA) has the authority to regulate GHG emissions. No federal regulations or policies regarding GHG emissions have been adopted that would be applicable to the proposed project. In late 2009, USEPA finalized an "endangerment finding" and a "cause and contribute finding" that state that anthropogenic GHGs contribute to global warming and that such warming endangers the public health of existing and future generations. These findings are expected to support adoption of federal GHG emission rules for light duty vehicles. Adoption of such rules would not directly affect the proposed project, and are not expected to become effective until project construction activities have been completed.

State Policies and Regulations

Executive Order S-3-05 (2005)

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger announced the following GHG emission reduction targets, as established through Executive Order S-3-05: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32 (2006)

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Section 38500, et seq.). It requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures to reduce statewide GHG emissions to 1990 levels by 2020 (representing a 25 percent reduction in emissions). The reduction would be accomplished through an enforceable statewide cap on global warming emissions and reduction measures that would be phased in starting by 2012, and through discrete early action measures that could be adopted as regulations and made effective by 2010. Some proposed early action measures will require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. AB 32 primarily establishes a time frame for CARB to adopt emissions limits, rules, and regulations, but the act does not provide thresholds or methodologies for analyzing a project's impacts on global climate change.

CARB Scoping Plan (2008)

CARB adopted the Scoping Plan in December 2008, which is the State's plan to achieve GHG reductions in California required by AB 32. The Scoping Plan contains the main strategies California will implement to achieve reduction of 169 MMT of CO_2e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario, and a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002 to 2004 average emissions.

The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reductions are expected to be achieved by implementing improved emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO_2e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and a renewable portfolio standard for electricity production (21.3 MMT CO_2e). CARB has not yet determined what amount of GHG reductions from local government operations will be recommended; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth

and the changing needs of their jurisdictions. CARB is also developing an additional protocol for community emissions. CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined (CARB, 2008). With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e reductions will be achieved associated with implementation of Senate Bill (SB) 375, which is discussed further below.

Other Bills and Executive Orders

There are several other senate bills and executive orders that have been passed over the past several years, and they relate to: reducing GHG emissions from electricity generation (SB 1078, 107, and 1368, Executive Order S-14-08**)**; establishing guidelines for mitigating GHG emissions or the effects of GHG emissions under CEQA by 2010 (SB 97**)**; aligning regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation through adoption of a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) (SB 375); establishing targets for reducing GHG emissions to the 2000 level by 2010 and to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050 (Executive Order S-3-05); providing land use planning guidance related to sea level rise and other climate change impacts (Executive Order S-13-08); and establishing a Low-Carbon Fuel Standard (LCFS) and coordinating actions of CEC, CARB, the University of California, and other agencies to develop and propose protocols for measuring the "lifecycle carbon intensity" of transportation fuels (Executive Order S-01-07).

Local Policies and Regulations

Bay Area Air Quality Management District Climate Protection Program

BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy—all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

EBMUD Mitigation Action Plan

To manage its effect on climate change, EBMUD voluntarily tracks its overall GHG emissions inventory following the California Climate Action Registry protocol. In addition, to comply with CARB requirements, EBMUD provides an annual, third-party verified, GHG emissions inventory for the MWWTP. EBMUD's long-term goal is to reduce GHG emissions to 90 percent of the year 2000 baseline emissions by the year 2015.

To achieve this goal, EBMUD has implemented an aggressive program to minimize energy use through careful management of facilities, off-peak pumping schedules, and use of renewable resources. EBMUD adopted a policy to encourage installation of renewable energy (such as photovoltaic systems) by establishing criteria for investments that are cost-neutral over the life of the project. EBMUD's Resource Recovery (R2) program uses available capacity at the MWWTP to convert trucked nonhazardous waste (such as food-processing waste and wastewater sludge) to digester gas, which is used to generate renewable energy. EBMUD's hydropower facilities also produce renewable energy from water supply operations in the Sierra Nevada Mountains. EBMUD has also reduced the use of fossil fuels by maintaining an all hybrid sedan fleet and implementing the Alternative Commute Program, which encourages EBMUD employees to use alternatives to single-occupancy vehicles (e.g., carpools, bike or walk to work, mass transit).

3.8.4 Impact Analysis

Methodology for Analysis

The GHG emissions analysis considers construction and operational impacts associated with the Land Use Master Plan. There were no GHG thresholds in the 1999 BAAQMD CEQA Guidelines. However, pursuant to SB 97, the CEQA Guidelines were amended to address GHG emissions and these changes became effective March 18, 2010. The amendments require determination of the significance of a project's direct and indirect GHG emissions based on any applicable threshold of significance, and whether a project's emissions would conflict with any applicable GHG reduction plans, policies, or regulations. These two criteria are listed below and considered under Impacts GHG-1 through GHG-3.

The 2010 BAAQMD thresholds of significance include a GHG threshold for operational emissions but none for construction (BAAQMD 2010b), although BAAQMD recommends a case-by-case consideration of construction GHG emissions and encourages lead agencies to incorporate Best Management Practices (BMPs) to reduce GHG emissions during construction, as feasible and applicable (BAAQMD 2010b). BMPs could include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using at least 10 percent local building materials; and recycling or reusing at least 50 percent of construction waste or demolition materials.

The impact analysis in this section calculates the quantity of GHGs that would be emitted during project construction and operation, and then compares them both to total GHG emissions in the Bay Area as well as 2010 BAAQMD operational significance thresholds (since project construction activities would occur over the next 20 to 30 years and there are no construction-related thresholds to apply). BAAQMD's significance thresholds for GHGs relevant to the project are 10,000 metric tons (MT) of CO_2e per year for stationary sources or 1,100 MT of CO_2e per year for mobile sources.

Thresholds of Significance

For the purposes of this analysis, GHG emissions would be significant if the Land Use Master Plan (including the biodiesel production and food waste preprocessing projects) would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impacts on the environment, based on any applicable threshold of significance; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Impacts and Mitigation Measures

This section discusses potential GHG emissions that could result in conjunction with construction and operation of the Land Use Master Plan. Mitigation measures are identified where appropriate.

Impact GHG-1 Greenhouse Gas Construction Emissions

Project construction activities are estimated to occur at various times over the next 30 years, and the resulting exhaust emissions from off-road equipment, on-road trucking, and construction worker commute traffic during this period are expected to contribute minimally to long-term regional increases in GHGs. No state or regional air quality agency has adopted a methodology or quantitative threshold that can be applied to a construction project to evaluate the significance of an individual project's construction-related contribution to GHG emissions, such as those that exist for criteria pollutants. The BAAQMD CEQA Guidelines also do not specify thresholds of significance for construction-related GHG emissions, but recommend quantification and disclosure of a project's construction-related GHG emissions. BAAQMD Guidelines also encourage incorporation of BMPs to reduce GHG emissions during construction, as applicable. BMPs may include, but are not limited to: using alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using local

building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials to reduce construction-related GHG emissions.

Biodiesel Production Facility

As indicated in **Table 3.8-1**, construction of the biodiesel production facility would generate up to approximately 243 MT per year of CO_2e. Emissions associated with project construction would represent approximately 2.4 x 10^{-4} (0.00024) percent of total GHG emissions estimated for the entire Bay Area.[2] The contribution of GHG emissions from the project would be extremely small in terms of Bay Area GHG emissions. When compared to BAAQMD's operational threshold of 1,100 MT of CO_2e per year for projects other than stationary sources, construction-related GHG emissions would be less than significant. Implementation of **Mitigation Measure AIR-1**, which include idling restrictions specified in CCR Title 13 Section 2485 would also limit criteria pollutant emissions, and this, in turn, would also reduce construction-related GHG emissions.

Food Waste Preprocessing Facility

Table 3.8-1 indicates that construction of the food waste preprocessing facility would generate up to approximately 304 MT per year of CO_2e. Emissions associated with project construction would represent approximately 3.0 x 10^{-4} (0.00030) percent of total GHG emissions estimated for the entire Bay Area. Similar to the proposed biodiesel production facility, the contribution of GHG emissions from the project would be extremely small in terms of the Bay Area GHG emissions. When compared to the BAAQMD's operational threshold of 1,100 MT of CO_2e per year for projects other than stationary sources, construction-related GHG emissions would be less than significant. Implementation of **Mitigation Measure AIR-1**, which include idling restrictions specified in CCR Title 13 Section 2485, would also limit criteria pollutant emissions, and this, in turn, would also reduce construction-related GHG emissions.

Other Land Use Master Plan Elements

Construction of short- and long-term Land Use Master Plan projects would contribute to increases in GHG emissions as a result of exhaust emissions from off-road construction equipment, on-road trucking, and construction worker commuting traffic. Construction-related daily and annual GHG emissions would depend on the timing of construction of each short- and long-term project. Based on planned implementation of Master Plan projects, it is estimated that approximately 58, 381, and 313 MT per year of CO_2e would be generated respectively in 2011, 2012, and 2013. From 2015 to 2030, approximately 213 MT per year of CO_2e would be generated (**Table 3.8-1**). As such, project-related GHG construction emissions would represent up to approximately 2.5 x 10^{-4} (0.00025) percent of total GHG emissions estimated for the entire Bay Area.[3] The contribution of GHG emissions from the project would be extremely small in terms of the Bay Area GHG emissions.

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[2] BAAQMD(2008) reported regional Bay Area GHGs emissions in 2007 at approximately 102.6 MMT CO_2e (95.5 MMT CO_2e were emitted within the Bay Area Air District and 7.1 MMT CO_2e were indirect emissions from imported electricity).

[3] Ibid.

Table 3.8-1: Greenhouse Gas Emissions Associated with Construction Activities

	Annual Emissions (MT per year)		Maximum Annual Emissions (MT per year)
	CO_2	CO_2e	CO_2e
Biodiesel Production Facility			
- Demolition/Grading (2011)	48	49	243
- Construction (2012)	235	243	
Food Waste Preprocessing Facility			
- Demolition/Grading (2012)	64	66	304
- Construction (2012-2013)	295	304	
Land Use Master Plan (Other Short-Term and Long-Term Projects)			
- Paving (2011)	56	58	58
- Grading (2012)	370	381	381
- Construction (2013)	303	313	313
- Construction (2015 – 2030)	303	313	313
Maximum Combined Master Plan and Project Emissions in 2011			107
Maximum Combined Master Plan and Project Emissions in 2012			624
Maximum Combined Master Plan and Project Emissions in 2013			616
1999 BAAQMD CEQA Significance Thresholds			None
2010 BAAQMD CEQA Significance Thresholds			None

NOTES: When CO_2 and non-CO_2 GHG emissions are considered together, they are referenced as CO_2e, which add approximately three percent to CO_2 emissions from diesel equipment exhaust (California Climate Action Registry 2007). Assumes construction emissions would occur on 260 workdays in a year. See **Table 3.3-3** for other construction assumptions.
Source: URBEMIS2007 Model, Output in Appendix B.

Combined Emissions

While neither the 1999 or 2010 BAAQMD guidelines include significance thresholds for construction-related GHG emissions, BAAQMD specifies that significance of a project's impact be based on the extent to which AB 32 GHG reduction goals are met (as required by the PRC, Section 21082.2). As indicated above, BAAQMD encourages incorporation of best management practices to reduce GHG emissions during construction, as applicable, and therefore, implementation of these measures (**Mitigation Measure GHG-1**) is considered to reduce this impact to less than significant. Implementation of these measures wherever feasible combined with **Mitigation Measure AIR-1**, which includes idling restrictions specified in CCR Title 13 Section 2485 would limit construction-related GHG emissions. Such reductions are considered to reduce the project's impact to less than significant since they would meet the AB 32 GHG reduction goals.

Although BAAQMD has not adopted GHG thresholds of significance for construction activities, these one-time construction-related GHG emissions can be compared to BAAQMD's operational threshold of 1,100 MT of CO_2e per year for projects other than stationary sources. When compared to this threshold (see **Table 3.8-1**), the one-time project-related GHG emissions (58 to 381 MT per year of CO_2e) and combined (overlapping) construction-related GHG emissions (107 to 624 MT per year of CO_2e) would not exceed this threshold, indicating a less-than-significant impact.[4]

[4] Another method of comparison used by other air districts is to average construction emissions over the life of the project by dividing the one-time emissions by 30 years. If such a comparison were made, average project-related and combined annual emissions would be even less and also would not exceed BAAQMD operational threshold for mobile sources.

Significance Determination before Mitigation

Less than significant, but BMPs are required.

Mitigation Measures

Mitigation Measure GHG-1: GHG Reduction Measures

EBMUD shall implement BAAQMD-recommended BMPs for GHG emissions where feasible, which include the following:

- At least 15 percent of the fleet should be alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment.
- At least 10 percent of building materials should be from local sources.
- At least 50 percent of construction waste or demolition materials should be recycled or reused.

See also **Mitigation Measure AIR-1: Criteria Air Pollutant and Precursor Reduction Measures** in *Section 3.3, Air Quality*.

Significance Determination after Mitigation

Less than significant.

Impact GHG-2 Greenhouse Gas Operational Emissions

Biodiesel Production Facility

GHG emissions associated with operation of the proposed biodiesel production facility are summarized in **Table 3.8-2**. Direct and indirect GHG emissions associated with operation of this project's stationary sources would result in a total of 8,860 MT of CO_2e per year. The 1999 BAAQMD CEQA Guidelines do not contain any GHG thresholds. However, the 2010 BAAQMD CEQA Guidelines include a significance threshold of 10,000 MT of CO_2e per year for GHGs from operation of stationary sources. Total CO_2e stationary source emissions associated with project operation would not exceed this threshold and therefore, project-related GHG emissions would be less than significant. Mobile source emissions associated with project operation would be 983 MT of CO_2e per year if truck transport is used or 470 of CO_2e per year if the rail spur option is used. The 1999 BAAQMD CEQA Guidelines do not contain any GHG thresholds. However, the 2010 BAAQMD CEQA Guidelines include a significance threshold of 1,100 MT of CO_2e per year for GHGs from mobile sources associated with operation of stationary sources. Both options would result in emissions below BAAQMD significance threshold. Therefore, this impact would be less than significant.

When considering the lifecycle GHG emissions[5] over a 30-year time horizon, GHG emissions associated with the use of biodiesel from waste fats, oils, and grease are 80 percent less than when petroleum-based diesel fuels are used, (USEPA, 2009)[6]. Therefore, the project's impact on global climate change would be less than the estimated 9,879 MT of CO_2e per year when lifecycle GHG emissions are considered. In addition, the glycerin byproduct from biodiesel would be conveyed to the digesters to increase biogas for renewable energy production, resulting in offsets for production of 1 MW of electricity (about 3,000 MT of CO_2e per year.

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[5] The term *lifecycle GHG emissions* means the aggregate quantity of GHG emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes) related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values of all GHGs are adjusted to account for their relative GWP.

[6] While there is scientific debate concerning the relative lifecycle GHG emissions of certain biofuels, CAPCOA (2008) reports that although biodiesel emits 10 percent more CO_2 than petroleum diesel at the tailpipe, overall lifecycle emissions of CO_2 from 100 percent biodiesel are 78 percent lower than those of petroleum diesel.

Table 3.8-2: Summary of Operational GHG Emissions - Biodiesel Production Facility

Source Location	Proposed Demand	Estimated CO_2e Emissions (MT per year)
Stationary Sources		
- Natural Gas-Fired Boiler	12 million BTUs per hour	5,100
- Electricity (indirect)	1,300 KW or 11,388 MWh per year	3,758
- Water	1.6 million gallons per year	2[1]
Total Stationary Source Emissions		8,860
1999 BAAQMD CEQA Significance Threshold		None
2010 BAAQMD CEQA Significance Threshold for Stationary Sources		10,000
Mobile Sources		
- Truck Transport Only	5,765 pounds per day of CO_2[2]	983
- Rail Spur Option	2,755 pounds per day of CO_2[2]	470
Offset for Electricity Generation from Glycerin Byproduct		-3,000
Offset for Biodiesel Use (30-year/ 100-year Horizons)[3]		-77,000/ -103,400
Total Net Change in Mobile Source Emissions – Truck Transport Only for 30-year/100-year Horizons		-75,500/ -101,800
Total Net Change in Mobile Source Emissions – Rail Spur Option for 30-year/100-year Horizons		-76,400/ -102,800
1999 BAAQMD CEQA Significance Threshold		None
2010 BAAQMD CEQA Significance Threshold for Mobile Sources		1,100

Notes:

[1] Based on California Energy Commission, Integrated Energy Policy Report, which estimated 12.7 MWh per million gallons conveyed, treated and disposed in Southern California.

[2] See URBEMIS Model output in Appendix B for mobile source emissions for CO_2.

[3] According to USEPA (2010), biofuel-induced land use change can produce significant near-term GHG emissions; however, displacement of petroleum by biofuels over subsequent years can "pay back" earlier land conversion impacts. Therefore, the time horizon over which emissions are analyzed and the application of a discount rate to value near-term versus longer-term emissions are critical factors. The 30-year time period for assessing future GHG emissions values equally all emission impacts, regardless of time of emission impact (i.e., 0 percent discount rate). With the 100-year time horizon, emissions impacts are assessed over a 100-year time period and future emissions are discounted at 2 percent annually. Using these rates, U.S. EPA estimates a lifecycle GHG reduction rate of 80 percent (30- and 100-year horizons) with waste grease biodiesel, while soy-based biodiesel would increase GHGs by 4 percent under the 30-year horizon, but reduce GHGs by -22 percent under the 100-year horizon. Offsets were estimated using these rates assuming 50 percent would be derived from waste grease and 50 percent would be soy-based and the biodiesel produced at this facility (20 million gallons per year) would be used within the SFBAAB.

Lifecycle emissions encompass the full fuel cycle, including all stages of fuel and feedstock production and distribution, from feedstock generation and extraction through distribution and delivery and use of the finished fuel. Therefore, inclusion of project-related mobile source GHG emissions in the above totals is conservative and essentially double-counts the project's GHG emissions. Therefore, total net mobile source emissions would be less.

Source: CH2MHILL (2010) for boiler emissions; Orion Environmental Associates (2010) for other source emissions.

Food Waste Preprocessing Facility

Since GHG emissions would be generated by food waste decomposition regardless of the proposed food waste preprocessing facility, this analysis focuses on the difference between emission rates under existing conditions versus project conditions. Again, the primary reduction in GHGs associated with the project would be the reduction in current GHG emissions resulting from the proposed diversion of approximately 335 tpd of food waste currently disposed at landfills (refer to **Table 3.3-9**). Approximately 40 to 60 percent of this food waste would be unsuitable for digestion and would be transported to composting

operations for further processing. This diversion would reduce uncontrolled biogenic emissions of methane at landfills and replace it with controlled CO_2 emissions at the MWWTP's power generating facilities.

The CO_2 that results from combustion of the food waste-derived biogas is considered biogenic, and therefore it does not contribute to a net increase in GHG concentration in the atmosphere on a lifecycle basis. Furthermore, generating electricity from biogas reduces the amount of electricity that must be generated from fossil fuel sources. The carbon intensity of electricity generation in the Western Electricity Coordinating Council California sub-grid is 724 pounds of CO_2 per MWh. Food waste-related projects at the MWWTP are estimated to produce approximately 2 MW or 18,000 MWh per year, which would result in a net reduction of 6,000 tons of CO_2 per year.

GHG emissions associated with operation of the proposed food waste preprocessing facility are summarized in **Table 3.8-3**. The increase in the GHG direct emissions associated with increased truck travel distances and indirect GHG emissions associated with project-related electricity and water demands are more than offset by the proposed diversion of waste for electricity generation. While the diversion of food waste from landfills to the MWWTP and composting operations would reduce GHG emissions in the region, project operations would generate an increase in GHG emissions locally from estimated increases in on- and off-road truck and worker traffic generated by the proposed facility. Based on the changes in vehicle miles traveled summarized in **Table 3.3-11** of *Section 3.3, Air Quality*, implementation of the food waste preprocessing facility would generate a total of 367 MT of CO_2e per year from stationary sources and 582 MT of CO_2e per year from mobile sources. Stationary sources would not exceed the 2010 BAAQMD GHG significance threshold of 10,000 MT of CO_2e per year, and mobile sources would not exceed the 2010 threshold of 1,100 MT of CO_2e per year. Therefore, project-related GHG emissions would be less than significant. It should also be noted this increase in GHG emissions would be more than offset by GHG emissions reductions associated with the renewable energy produced from the food waste (a net reduction of 6,000 tons of CO_2 would occur when comparing power produced from biogas versus fossil fuels).

Table 3.8-3: Summary of Operational GHG Emissions – Food Waste Preprocessing Facility

Source Location	Proposed Demand/Production	Estimated CO_2e Emissions (MT per year)
Stationary Sources		
- Electricity	1,110 megawatt hours per year	366
- Water	780,000 gallons per year	1
Total Stationary Source Emissions		367
1999 BAAQMD CEQA Significance Threshold		None
2010 BAAQMD CEQA Significance Threshold for Stationary Sources		10,000
Mobile Sources		
- Increase in Vehicle Miles Traveled	3,415 pounds per day of CO_2[1]	582
1999 BAAQMD CEQA Significance Threshold		None
2010 BAAQMD CEQA Significance Threshold for Mobile Sources		1,100
Electricity Production Offsets		-6,000
Total Net Increase in Stationary and Mobile Source Emissions		-5,051

Notes:
[1] See URBEMIS Model output in Appendix B for mobile source emissions for CO_2.
Source: CH2MHILL (2010) for boiler emissions; Orion Environmental Associates (2010) for other source emissions.

Other Land Use Master Plan Elements

There are eleven elements of the proposed Land Use Master Plan that would be developed over the next 30 years. As indicated in *Section 3.3, Air Quality*, under Impact AIR-4, these elements would generate an average of 23 additional truck trips per day, but an overall decrease in the vehicle miles traveled is expected to occur over the next 30 years. As indicated in **Table 3.3-12** (in *Section 3.,3, Air Quality*), this increase in truck traffic would not generate any additional trucks miles traveled and therefore, an increase in GHG emissions would not be expected. Other direct GHG emissions could also be associated with the proposed secondary treatment upgrade for nutrient removal, tertiary treatment facility, and digester expansion projects, but cannot be estimated until more detailed design information becomes available. Therefore, the significance of these GHG emissions cannot be determined at this time. Except for traffic-related GHG emissions, the proposed odor control, food waste processing project, emergency response equipment storage, possibly the household hazardous waste collection facility, San Francisco Bay stewardship exhibit/public education facility, and relocation of septage and R2 receiving stations are not expected to result in any other direct GHG emissions.

Some of these projects, such as the UV disinfection project could result in indirect GHG emissions from increased electricity demand. While UV disinfection is an energy intensive process, the increase in energy demand can be highly variable, depending on the quality of the effluent. Studies by PG&E (SBW Consulting, Inc. 2009) indicate that lifecycle energy demand may not increase significantly when compared to chlorine/hypochlorite disinfection and dechlorination. Since the MWWTP's PGS is intended to produce sufficient amounts of electricity on-site to eventually power all EBMUD facilities at the MWWTP, the indirect GHG emissions associated with all short- and long-term Land Use Master Plan projects would be attributable to a portion of the GHG emissions associated with PGS.[7] PGS would convert biogas (consisting primarily of CH_4 and CO_2, both GHGs) to biogenic CO_2, criteria pollutants and precursors: CO, NO_X, ROG/VOCs, PM_{10}, and SO_2. The PGS Renewable Energy Expansion Project Initial Study/Mitigated Negative Declaration (IS/MND) indicates that NO_X emissions would exceed the BAAQMD significance thresholds but this impact would be reduced to less than significant with emission offsets purchases that will be required by BAAQMD (EBMUD 2008a).

Combined Impacts

Stationary and mobile source GHG emissions from the biodiesel production and food waste preprocessing facilities are combined and presented in **Table 3.8-4**. GHG emissions associated with the other Master Plan projects are not included, as they cannot be estimated until more detailed design information becomes available.

When stationary source GHG emissions from the biodiesel production and food waste preprocessing facilities are considered together, they would not exceed 2010 BAAQMD significance thresholds of 10,000 MT per year for stationary sources and therefore, would be a less-than-significant combined impact. While the combined emissions do not account for GHG emissions that may occur with implementation of several of the other Master Plan projects, it is very likely that the combined emissions would still not exceed the 10,000 MT per year threshold because the offsets from the use of biodiesel instead of petroleum diesel and diversion of waste for electricity generation are so large (offsets listed in **Table 3.8-4**).

[7] The biodiesel production and food waste preprocessing facilities would receive their power from PG&E.

Table 3.8-4: Summary of Combined Operational GHG Emissions for Biodiesel Production and Food Waste Preprocessing Facilities

Source Location	Estimated CO_2e Emissions (MT per year)
Stationary Source Emissions	
Biodiesel Production Facility	8,860
Food Waste Preprocessing Facility	367
Combined Stationary Source Emissions	9,227
Food Waste Preprocessing Facility Electricity Production Offsets	-6,000
Total Combined Net Increase in Stationary Source Emissions	3,227
1999 BAAQMD CEQA Significance Threshold	None
2010 BAAQMD CEQA Significance Threshold for Stationary Sources	10,000
Mobile Source Emissions	
Biodiesel Production Facility	983
Food Waste Preprocessing Facility	582
Combined Mobile Source Emissions	1,565
Mobile Source Emissions Offsets with Biodiesel Use (30-/100-year Horizons)	-77,000/ -103,400
Total Combined Net Reduction in Mobile Source Emissions	-75,435/ -101,835
1999 BAAQMD CEQA Significance Threshold	None
2010 BAAQMD CEQA Significance Threshold for Mobile Sources	1,100

Notes:
[1] See URBEMIS Model output in Appendix B for mobile source emissions for CO_2.
Source: Tables 3.8-2 and 3.8-3.

While Master Plan projects would not contribute to increases in mobile source GHG emissions, the combined mobile source GHG emissions from the biodiesel production and food waste preprocessing facilities would exceed the 2010 BAAQMD significance thresholds of 1,100 MT per year for mobile sources. However, when offsets are considered, the combined increase in mobile source GHG emissions would not exceed the 2010 threshold for GHG. Additional GHG reductions would be achieved by decreased electricity demand from the grid (which provides power from fossil fuel power plants). The Scoping Plan (pursuant to AB 32) identifies Recycling and Waste (landfill methane capture) measures as one of the key measures that will reduce GHG emissions to meet AB 32 target reductions. Although the approved PGS Renewable Energy Expansion Project is not located at a landfill, it would be consistent with this measure to recycle waste. The PGS facility and the Land Use Master Plan's food waste-related projects would contribute to the diversion of organic waste from landfills and would facilitate the use of the resulting CH_4 emissions to generate electricity. PGS uses digester gas, which is approximately 60 percent CH_4, for electricity and heat generation and releases CO_2. Each molecule of CH_4 has 21 times the heat-trapping potential of CO_2. Therefore, the Land Use Master Plan projects that facilitate the capture and combustion of CH_4, instead of its fugitive escape from a landfill (occurring under existing conditions), would be consistent with AB 32 objectives. In addition, using biomass to generate electricity would displace the use of fossil fuels for electricity generation, which would result in a net decrease in lifecycle GHG emissions. Therefore, the Land Use Master Plan's contribution to GHG emissions (direct mobile sources and indirect sources) would be less than significant.

Significance Determination before Mitigation

Less than significant for stationary and mobile source emissions associated with the proposed biodiesel production and food waste preprocessing facilities, as well as for mobile source emissions associated with the other Land Use Master Plan elements. Assuming combined electricity demand from Master Plan

projects does not exceed on-site renewable power supply and process or recycled water is used for some of these projects, direct and indirect stationary source GHG emissions are expected to be less than significant. However, since direct stationary source GHG emissions associated with these Master Plan projects cannot be quantified at this time, they are conservatively considered to be potentially significant.

Mitigation Measures

The following measures would be applied to all short- and long-term Land Use Master Plan projects, as applicable, to reduce overall GHG emissions:

Mitigation Measure GHG-2a: Energy Efficiency Measures

Direct and indirect GHG emissions shall be estimated based on the final project design, and energy efficiency measures shall be incorporated into the project as necessary to meet the BAAQMD GHG significance threshold in effect at the time of project implementation.

Mitigation Measure GHG-2b: Water Conservation Measures for Land Use Master Plan Projects

Non-potable water shall be used wherever feasible for equipment and area wash down to minimize GHG emissions associated with increased water demand.

Significance Determination after Mitigation

Less than significant.

Impact GHG-3 Consistency With Applicable Greenhouse Gas Reduction Plans

Biodiesel Production Facility

GHG emissions from this project's stationary and mobile sources would not exceed the 2010 BAAQMD GHG significant thresholds for stationary and mobile sources. When GHG reductions associated with use of biodiesel (as opposed to the same amount of petroleum diesel) are considered, the less-than-significant increase in GHG emissions would result in a net reduction in GHG emissions (see Impact GHG-2). Therefore, this project's operational GHG emissions would be consistent with the state's goal of reducing GHG emissions to 1990 levels by 2020.

Food Waste Preprocessing Facility

Food waste that is diverted to the MWWTP would be used to produce biogas, which would then be utilized to create electricity and heat through biogas combustion, emitting carbon dioxide, a much less potent GHG than methane. The combined GHG emissions from both stationary and mobile sources associated with operation of the food waste preprocessing facility would not exceed the BAAQMD GHG significance thresholds (see Impact GHG-2). Therefore, this project's operational GHG emissions would not conflict with the state's goal of reducing GHG emissions to 1990 levels by 2020.

Other Land Use Master Plan Elements

Implementation of the proposed short- and long-term Land Use Master Plan components would expand R2, address future regulatory requirements intended to increase water quality by upgrading treatment and the disinfection processes, reduce odors, improve emergency response and safety, and provide community benefits. R2 facilities would help reduce GHG emissions by capturing these emissions in digesters and utilizing them for power generation in the MWWTP's power generation facilities.

No indirect emissions associated with mobile sources are expected to occur (see Impact GHG-1), and therefore, implementation of the Master Plan is not expected to conflict with the state's goal of reducing GHG emissions to 1990 levels by 2020. Direct stationary source GHG emissions associated with these Master Plan projects are considered potentially significant since they cannot be quantified at this time. With implementation of **Mitigation Measure GHG-2a** (energy efficiency measures) and **Mitigation**

Measure GHG-2b (water conservation measures), implementation of the Land Use Master Plan projects would not conflict with the state's goals of reducing GHG emissions to 1990 levels by 2020.

Combined Emissions

When stationary and mobile source GHG emissions from the biodiesel production and food waste preprocessing facilities are considered together, they would not exceed the 2010 BAAQMD significance threshold of 10,000 MT per year for stationary sources, but could exceed the 1,100 MT per year threshold for mobile sources. However, emissions reductions from the use of biodiesel (as opposed to petroleum diesel) and electricity production from diversion of food waste from landfills would result in a significant net decrease in GHG emissions (the lifecycle reduction is nearly 100 times larger the direct emissions). While the combined emissions do not include GHG emissions associated with the Master Plan projects, of which several have some potential for GHG emissions, it is likely that the combined emissions would not exceed the 10,000 MT per year threshold for stationary sources and 1,100 MT per year for mobile sources when offsets from biodiesel use and electricity production are included. Therefore, implementation of the biodiesel production and food waste preprocessing facilities as well as the short- and long-term Land Use Master Plan projects would not conflict with the state's goals of reducing GHG emissions to 1990 levels by 2020.

Significance Determination before Mitigation

Less than significant for biodiesel production and food waste preprocessing facilities. Potentially significant for other Land Use Master Plan elements.

Mitigation Measures

See **Mitigation Measure GHG-2a: Energy Efficiency Measures**, and **Mitigation Measure GHG-2b: Water Conservation Measures for Land Use Master Plan Projects** above.

Significance Determination after Mitigation

Less than significant.

3.9 Hazards and Hazardous Materials

Potential hazards addressed in this section include use of hazardous materials during operation, hazardous materials in soil and groundwater, hazardous building materials that could be present in buildings to be demolished, and releases of hazardous materials during construction.

3.9.1 Environmental Setting

The following sections describe the environmental setting for hazards and hazardous materials within the study area, which includes the project site and adjacent areas that could be affected by use or presence of hazardous materials.

Hazardous Materials in Soil and Groundwater

The potential for hazardous materials in soil and groundwater within the study area is based on an environmental database review conducted to identify environmental cases,[1] permitted hazardous materials uses,[2] and spill sites[3] at the MWWTP and in the vicinity (Environmental Data Resources [EDR] 2007) and environmental documents related to the investigation and remediation of the West End property.

Environmental Database Review

Based on an environmental database review conducted to identify hazardous materials conditions in the study area (EDR 2007), the existing MWWTP is not identified as an environmental case,[4] indicating that there has been no documented soil or groundwater contamination at the site. The former Heroic War Dead United States Army Reserve Center to the west of the existing MWWTP, acquired by EBMUD from the United States Army and referred to as the West End property, is identified as an environmental case, as is the former Baldwin Yard. These cases are discussed in the following section.

The former Oakland Army Base (OAB) to the southeast is undergoing cleanup under regulatory oversight by the California Department of Toxic Substances Control (DTSC), and remediation activities will continue as the former army base is developed in the future. However, OAB is located to the southwest of the MWWTP and would not likely affect soil quality in the proposed construction areas. Other environmental cases located within a mile of the plant are located to the north or east, across I-880 or I-580, and would not potentially affect soil or groundwater quality at the MWWTP.

West End Property (Former Heroic War Dead United States Army Reserve Center)

The Former Heroic War Dead United States Army Reserve Center, referred to below as the West End property, has been the subject of numerous site assessments and cleanups under the regulatory oversight of DTSC. Remediation conducted at the site has generally either removed identified soils containing chemical concentrations at concentrations above DTSC-approved cleanup levels, or included construction of engineering controls to prevent future exposure to chemicals left in place at concentrations that are greater than approved cleanup levels.

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1 Environmental cases are those sites that are suspected of releasing hazardous substances or have had cause for hazardous substances investigations and are identified on regulatory agency lists.

2 Permitted hazardous materials uses are facilities that use hazardous materials or handle hazardous wastes that operate under appropriate permits and comply with current hazardous materials and hazardous waste regulations.

3 Spill sites are locations where a spill has been reported to the State or federal regulatory agencies. Such spills do not always involve a release of hazardous materials.

4 Environmental cases are sites suspected of releasing hazardous substances or that have had cause for hazardous materials investigations and are identified on regulatory agency lists. These are sites where soil and/or groundwater contamination is known or suspected to have occurred.

Because the site has not been cleaned up to residential cleanup levels, DTSC and the United States Army entered into a Covenant to Restrict Use of Property, Environmental Restriction (deed restriction) for the property restricting future land uses and specifying procedures that must be followed when soil or groundwater are disturbed at the site (DTSC 2007a). The deed restriction was assigned to EBMUD in a Consent Agreement with DTSC (DTSC 2009), and requirements for activities that disturb soil or groundwater at the property are described in an operation and maintenance plan prepared for EBMUD (Geologica 2008a). The sections below describe the West End property, previous investigations and remediation conducted at various locations within the property, and the requirements of the operation and maintenance plan. Specific sampling and remediation areas discussed below are shown on **Figure 3.9-1**.

Site History and Description

The West End property is a 15.9-acre property that was largely intertidal mudflats until filling of the area began in the 1930s to reclaim the land for development (Geologica 2007a). The nature and source of the fill, as well as the timing of the fill placement used to create a land surface at the site and in the vicinity has not been identified, but some of the fill may consist of reworked Bay Mud (dredge spoil).

The project site is relatively flat with a mean elevation of approximately 10 feet above mean sea level. It is located approximately 500 feet south of San Francisco Bay and approximately 1,200 feet east of the Oakland Outer Harbor. As discussed in *Section 3.7, Geology, Soils, and Siesmicity*, the soil underlying the site consists of up to 13 feet of artificial fill underlain by Bay Mud, then Merrit Sand. Groundwater is encountered at a depth of approximately 4 to 6 feet below ground surface on the property, and flows in a northwesterly direction.

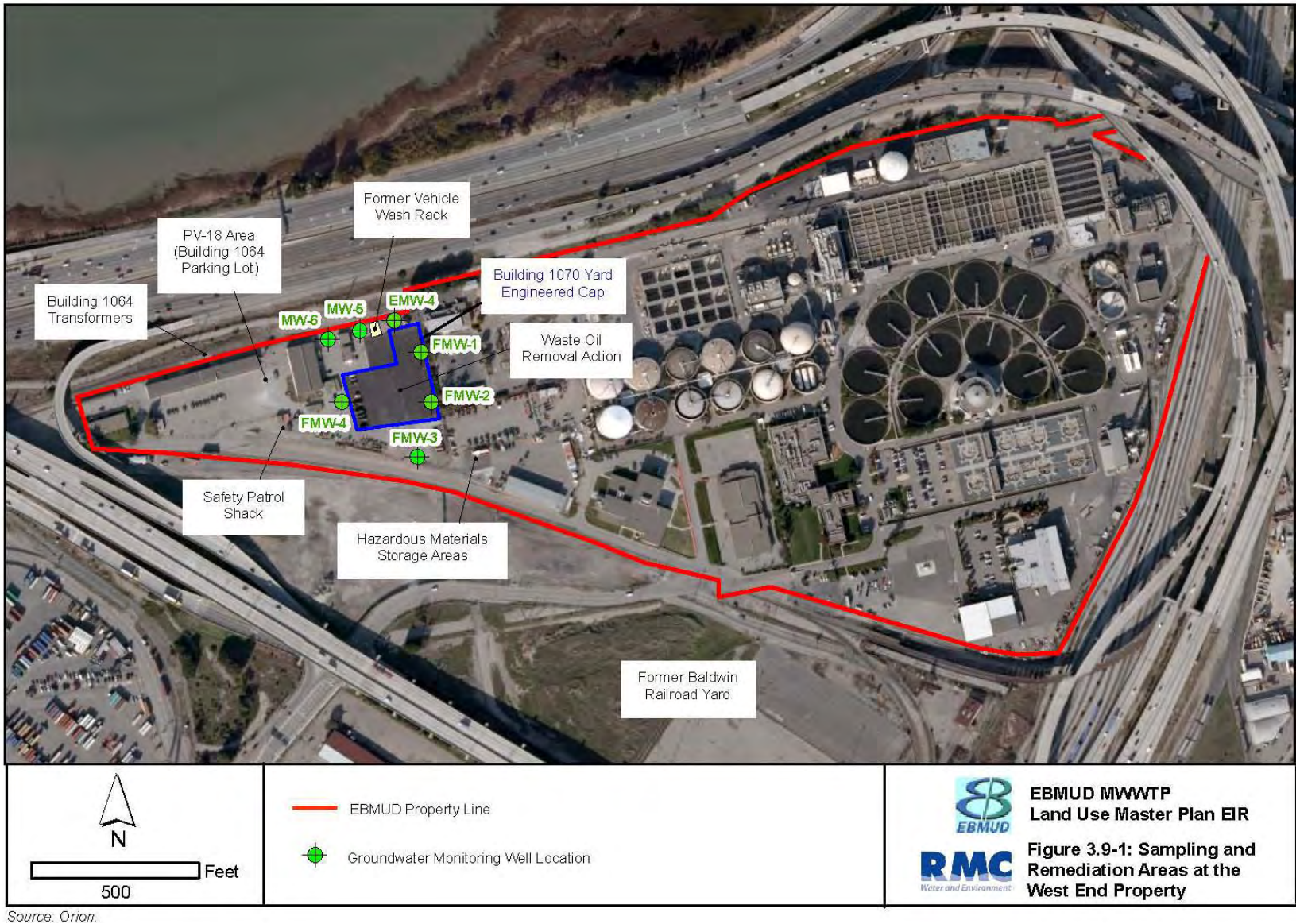
The United States Army reportedly developed the site during and after World War II (Geologica 2007a). Development of the property began prior to 1949 and was essentially complete by 1965. USAR reportedly took over the property sometime in the early 1970s.

Site Cleanup Levels

Previous investigations of the West End property focused on areas of the property suspected to contain hazardous materials in the soil or groundwater, and included analysis for the chemicals potentially present. To evaluate the need for further investigation and remediation, the analytical results of the investigations were compared to the following criteria:

- USEPA Region 9 industrial Preliminary Remediation Goals for polynuclear aromatic hydrocarbons (PAHs), metals, VOCs, and semivolatile organic compounds (SVOCs) in soil
- A benzo(a)pyrene toxic equivalent value of 1 milligram per kilogram (mg/kg) for carcinogenic PAH concentrations
- RWQCB commercial/industrial Environmental Screening Levels for petroleum hydrocarbons in soil
- RWQCB commercial/industrial Environmental Screening Levels for shallow soil gas
- RWQCB commercial/industrial Environmental Screening Levels for groundwater
- Background levels of arsenic

Preliminary Remediation Goals and Environmental Screening Levels are screening levels for chemical concentrations in soil and groundwater that are used by the USEPA and the San Francisco Bay RWQCB, and are discussed in *Section 3.9.2, Regulatory Framework*. For an industrial worker, these screening levels are conservative estimates of safe levels of a chemical that a worker could be exposed to in soil and groundwater. Industrial screening levels are generally higher than residential screening levels, and therefore cleanup of the site to industrial levels would allow safe use of the site for industrial purposes, but additional remediation could be required to reduce risks to an acceptable level for more sensitive land uses, such as residential land uses.



Source: Orion.

Figure 3.9-1: Sampling and Remediation Areas at the West End Property

The benzo(a)pyrene toxic equivalent value is computed as the toxicity-weighted sum of the concentrations of seven carcinogenic PAHs including benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

Background levels of arsenic were used because, although arsenic concentrations typically exceeded the Preliminary Remediation Goal of 0.25 mg/kg for arsenic, background levels of arsenic in the Bay Area typically exceed this level also, and the arsenic concentrations detected in the soil samples were generally within the range of background levels (Geologica 2007a).

Based on comparison to the above criteria, the principal chemicals of concern in the soil are lead and PAHs, with small areas affected by petroleum products and VOCs (Geologica 2007a). The primary chemicals of concern in groundwater are petroleum hydrocarbons, VOCs, and lead. Some of the lead in the soil is attributable to the fill that was used to reclaim the land, rather than due to site activities at the Former Heroic War Dead United States Army Reserve Center. Elevated levels of many metals in the groundwater are also attributed to dissolution from the fill materials used at the site.

Previous Sampling and Remediation Areas

Previous sampling has idenfied chemical concentrations above site cleanup levels in nine primary areas within the West End property shown on **Figure 3.9-1**. These areas and remedial activities conducted at each are summarized below, and described in more detail in **Appendix D**.

- **Building 1070 Yard:** After conducting a soil removal in 2005, soil remaining in place contained lead at concentrations greater than the Preliminary Remediation Goal of 800 mg/kg (Geologica 2007a). All of the lead detections that were greater than this concentration were at a depth of greater than two feet, and many were at a depth of greater than four feet. To prevent contact with this soil and infiltration of rainwater, a 55,000-square-foot engineered asphalt cap was constructed over lead affected soil on June 21, 2007 (Geologica 2007b). The surface of the cap is sloped to divert runoff to a stormwater collection system, and an additional 8,000-square-foot area is paved with a 3-inch-thick layer of asphalt to promote stormwater drainage from the northeastern part of the engineered cap. The capped area is demarcated with a 3-inch-wide traffic-grade yellow warning stripe around the perimeter, and posted with signs warning against cap intrusion. The cap is currently monitored for deterioration in accordance with the operation and maintenance plan described below, and seven groundwater water monitoring wells around the perimeter of the area are also monitored in accordance with the plan.
- **Former Vehicle Wash Rack, Building 1073:** The Building 1073 vehicle wash rack was formerly used to wash vehicles and engine components and may have been used for repainting vehicles. When the wash rack was in use, it consisted of a concrete pad on which vehicles were washed, with wash water drained to an oil/water separator. The concrete pad, oil/water separator, associated piping, and approximately 900 cubic yards (cy) of adjacent soil containing tetrachloroethylene, lead, PAHs, and total petroleum hydrocarbons at concentrations above site cleanup levels were removed from this site and transported off site for proper disposal in May 2003 (Geologica 2007a). However, a small area of the remaining soil contained tetrachloroethylene at 2.5 mg/kg, greater than the Preliminary Remediation Goal of 1.3 mg/kg. In 2005, the concentrations of vinyl chloride, copper, lead, mercury, nickel, vanadium, and silver exceeded Environmental Screening Levels in the groundwater. Although tetrachloroethylene, trichloroethene, and vinyl chloride have been detected in the soil vapors, they are unlikely to pose significant risk to future site workers.
- **Building 1064 Parking Lot:** Soil containing PAH at concentrations greater than cleanup levels was removed from one location within the Building 1064 Parking Lot in 2005. However, at the completion of excavation, benzo(a)pyrene was detected in soil from the excavated pit at concentrations of up to 1.1 mg/kg, in excess of the Preliminary Remediation Goal of 0.21 mg/kg

indicating that all of the soil containing chemical concentrations above preliminary remediation goals had not been removed (Geologica 2007a). Soil was also excavated at another location, referred to as PV-18, in May 2007 (Geologica 2007b). At the completion of excavation, carcinogenic PAH concentrations in the excavation bottom and sidewalls ranged from a benzo(a)pyrene equivalent of 0.2 to 7.7 mg/kg, many of which exceeded the cleanup level of 1 mg/kg. Because further excavation to remove all of the soil containing chemical concentrations above preliminary remediation goals was impractical, the excavation was backfilled with clean fill material and DTSC agreed to the implementation of institutional controls for the protection of human health and the environment. The institutional controls are specified in the deed restriction and the operation and maintenance plan for the site, described below. Total petroleum hydrocarbons as motor oil were detected at concentrations greater than the 1,000 mg/kg in two soil samples from a depth of 5 feet (Geologica 2008a). The detected concentration was 1,200 mg/kg in each sample. No further action was required regarding these detections.

- **Building 1064 Transformers:** Soil containing petroleum hydrocarbons and lead above screening levels was removed from this site and transported off site for proper disposal in November 2005 (Geologica 2007a).
- **Safety Patrol Shack:** The Safety Patrol Shed, located near the southern property boundary, is painted with lead-based paint that is flaking off of the structure (Geologica 2007a). Soils containing greater than 800 mg/kg of lead were removed from immediately south of the Safety Patrol Shack in 2005.
- **Hazardous Materials Storage Area:** Although carcinogenic PAH concentrations exceeded the benzo(a)pyrene toxic equivalent cleanup level of 1 mg/kg in one soil sample from a depth of one foot in 2004, additional sampling conducted to evaluate the extent of carcinogenic PAHs identified in the soil revealed substantially lower carcinogenic PAH concentrations, indicating that the previously identified level of carcinogenic PAHs was not indicative of bulk soil conditions. No additional soil sampling or excavation were conducted at this location. In 2004, several PAHs were detected at concentrations greater than their Environmental Screening Levels in grab groundwater samples from two soil borings at the hazardous materials storage area.
- **Waste Oil Removal Action:** A waste oil underground storage tank (UST) and affected soil were removed from the Building 1070 yard in 1995 (Geologica 2007a). The Alameda County Department of Environmental Health provided oversight for the UST removal and required no further action at this site.

Groundwater Monitoring Network

As of 2009, the existing monitoring well network consists of seven monitoring wells (MW-5, MW-6, FMW-1 through FMW-4, and EMW-4) located at the Building 1070 Yard, and shown on **Figure 3.9-1**.

Perimeter Groundwater Quality

Perimeter groundwater sampling conducted in 2004 indicated the following chemicals were present at concentrations exceeding Environmental Screening Levels (Geologica, 2007a):

- Several PAHs, including 2-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, naphthalene, and indeno(1,2,3-cd)pyrene were detected in at concentrations above their Environmental Screening Level in groundwater samples from perimeter groundwater monitoring wells located north of the railroad maintenance area on Engineers Road and near the west end of Building 1064.
- The metals antimony, barium, cadmium, cobalt, copper, lead, mercury, nickel, selenium, thallium, vanadium, and zinc exceeded their Environmental Screening Level in at least one groundwater sample.

Human Health Risk Assessment

A human health risk assessment for the entire West End property concluded that there is minimal risk to future industrial workers or construction workers based on the health risk criteria of the U.S. Army Center for Human Health Promotion and Preventative Medicine (Geologica 2007a). However, DTSC noted that the total carcinogenic risk posed by carcinogenic PAHs in the soil at the Building 1064 yard exceeded the 1×10^{-5} health risk threshold commonly employed by DTSC at commercial/industrial properties, and that use of higher exposure parameter values (consistent with California Environmental Protection Agency guidance), and lead concentrations more representative of hot spot areas (rather than a site-wide average) would result in higher predicted risk to human health than indicated by the analysis conducted by the U.S. Army Center for Human Health Promotion and Preventative Medicine. In addition, construction workers could be exposed to higher concentrations of lead than industrial workers because they are more likely to be exposed to the highest lead concentrations that are present in soil below 2 feet.

Ecological Risk Assessment

A limited ecological risk scoping assessment conducted on behalf of the United States Army Reserve (USAR) indicated minimal risk to sensitive ecological receptors from the constituents detected at the site (Geologica 2007a). However, future site activities would need to ensure that existing conditions do not change so as to threaten wildlife populations and vegetation communities as a result of exposure to chemicals remaining in the soil and groundwater at the West End property.

Operation and Maintenance Plan

Because the West End property has not been remediated to levels that are suitable for unrestricted land use, DTSC and U.S. Army recorded a Covenant to Restrict Use of Property, Environmental Restriction (deed restriction) with the Alameda County Assessor's Office on June 29, 2007 (DTSC 2007a). The deed restriction specifies soil and risk management procedures (environmental restrictions) that must be implemented to ensure safe management of soil and groundwater remaining at the site and to ensure that human health and the environment are protected during future activities at the site. The environmental restrictions of the deed restriction apply to successive owners of the property, and were assigned to EBMUD in a consent agreement entered into by DTSC and EBMUD in 2009 (DTSC 2009).

An Operation and Maintenance Plan describing the inspection, soil management, groundwater monitoring, annual reporting, and five year review requirements for the site, to be implemented in accordance with the deed restriction, has been prepared by EBMUD (Geologica 2008a). The plan has been approved by DTSC, and also specifies regulatory coordination that must occur when soil or groundwater is disturbed. For the entire West End property, the Operation and Maintenance Plan specifies that:

- Placement of any property soil outside of the property boundary is permitted only with written approval from DTSC.
- Excavation or disturbance of any soil deeper than 5 feet below ground surface is permitted only with the written approval of DTSC. However, in emergency situations, EBMUD may excavate or disturb soil without prior DTSC approval, provided that the soil management and risk management procedures of the operations and maintenance plan are followed, and that EBMUD notifies DTSC by phone or email of the soil excavation or disturbance within 24 hours of the onset or discovery of the emergency.
- Excavated soil must be appropriately characterized to determine if it is suitable for on-site reuse, or if it must be disposed of at an appropriately licensed off-site disposal facility. At a minimum, the soil must be analyzed for total petroleum hydrocarbons as gasoline, diesel, and motor oil; volatile organic compounds; and Title 22 metals (including analysis of soluble metals concentrations using the Waste Extraction Test [WET] or Toxic Characteristic Leaching Procedure [TCLP] method, as appropriate). Typically, one composite soil sample would be

required for each 1,000 cy of soil excavated. However, individual disposal facilities may require additional samples and/or analyses.

- On-site reuse of excavated soil is only permitted if the sample results indicate that the material is not a hazardous waste and is suitable for reuse at the site. Soil characterization for reuse can be completed prior to removal (in situ, which involves the installation of soil borings for collection of soil samples) or after excavation as described above, provided that a suitable controlled location is available for stockpiling that anticipated volume of soil. For on-site reuse, the soil should not contain constituents at concentrations greater than federal and state hazardous waste criteria, industrial Preliminary Remediation Goals, or commercial/industrial Environmental Screening Levels (petroleum hydrocarbons only), whichever is most conservative. To characterize the soil for on-site reuse, 1 sample per 250 cy of excavated soil is required for the first 1,000 cy of soils excavated, and 1 additional sample is required for each additional 500 cy of excavated soil.
- Soil that is unsuitable for on-site reuse and which will not be directly hauled to an off-site disposal facility at the time of excavation must be stockpiled in a manner that limits the potential for generation of dust and/or sediment-laden runoff. Soil shall be stockpiled on a minimum 6-mil plastic sheet of sufficient size to contain the entire stockpile and the entire stockpile shall be covered with a minimum 6-mil plastic sheet secured with sandbags at the close of each workday and at all times during inclement weather. All stockpiled soil shall be properly disposed of within 90 days of generation.
- Workers engaged in activities that will disturb or expose subsurface soil must be appropriately trained in and must follow the standard health and safety procedures described in Appendix A of the Operation and Maintenance Plan. Site and action-specific health and safety plans are required for all activities involving soil removal and/or disturbance.
- Appropriate measures shall be taken to minimize the generation of fugitive dust during soil excavation or disturbance activities in general accordance with the BAAQMD "Basic" and "Optional" PM_{10} (fugitive dust) control measures (see *Section 3.3, Air Quality*, for a description of the BAAQMD dust control measures).

For the engineered cap at the Building 1070 yard, the operations and maintenance plan specifies that:

- The cap must be visually inspected for signs of deterioration, cracking, or settlement twice per year. The location of any visible cracks, potholes, areas of differential settlement, and other deterioration must be recorded in a field inspection memorandum, and an asphalt paving contractor or comparably qualified EBMUD personnel must be engaged to repair the paving as needed.
- Intrusion of the cap and subsurface soil at the Building 1070 yard is permitted only with written approval from DTSC.

For the PV-18 Area in the Building 1064 Parking Lot, the operations and maintenance plan also requires written approval by DTSC prior to proceeding with any excavation or disturbance activities. Additional notification of DTSC is required as follows:

- During general maintenance activities, EBMUD shall notify DTSC of limited soil excavation or disturbance activities a minimum of five days in advance by email and phone.
- Excavation or soil disturbance associated with planned capital improvement construction activities requires written notification to DTSC a minimum of 15 days in advance and written approval from DTSC.

For groundwater and accumulated liquids, the operations and maintenance plan specifies that:

- The construction of groundwater monitoring wells and extraction of groundwater from new and/or existing wells for any purpose are permitted only with written approval from DTSC.
- Dewatering activities for any future construction are subject to all applicable local and state requirements, including those of the RWQCB, for disposing of liquids from dewatering activities.
- Groundwater and accumulated liquids produced during construction activities must be characterized in-situ prior to disposal or retained on site until characterized for appropriate disposal. Testing to characterize the groundwater or accumulated liquids must include analysis for total petroleum hydrocarbons as gasoline, diesel, and motor oil; VOCs; and Title 22 metals. Under no circumstances may site groundwater or accumulated liquid be discharged to a storm drainage system, ground surface, or any pathway (e.g. a drainage ditch) that might reasonably be expected to convey site groundwater and accumulated water off the property or to San Francisco Bay. Depending on the analytical results, and subject to approval from the EBMUD R2 Program, the groundwater or accumulated liquids may be transported to the MWWTP for disposal, although additional testing (e.g. chemical oxygen demand) may be required, depending on the volume of liquid requiring disposal. Groundwater and accumulated liquids found to contain metals or other analytes at concentrations greater than the Soluble Threshold Limit Concentration (STLC) or TCLP values must be treated and/or disposed of at a facility licensed to accept hazardous waste and the transport and disposal of this liquid must be conducted in accordance with all applicable state, federal, and local regulations.

In addition, the Operation and Maintenance Plan requires monitoring of the seven site groundwater monitoring wells twice per year. During each sampling event, a groundwater sample from each monitoring well shown on **Figure 3.9-1** must be sampled for lead, barium, arsenic, and total dissolved solids. If any of the groundwater monitoring wells require closure, permission for closure must be obtained from DTSC and be conducted in the following manner specified in the Operation and Maintenance Plan:

- obtain a depth to water measurement and confirm the total depth of the well;
- remove any obstructions encountered;
- use a tremmie pipe to grout the well from the bottom up to ground surface using nonpressurized methods with a neat Portland cement grout, and top off the well after the grout has settled;
- completely remove the surface completion and place asphalt, concrete, or natural soil at the surface.

If an obstruction cannot be removed, the well would need to be drilled out with a hollow-stem drilling rig, and the resulting borehole would need to be filled with neat Portland cement grout as described above.

The operations and monitoring plan also requires annual and five-year review reporting to DTSC. The annual reports must include:

- Results of the biannual inspection of the property to ensure compliance with the Covenant to Restrict Use of Property, Environmental Restriction.
- Results of the biannual inspection of the engineered asphalt cap and monitoring well at the Building 1070 yard and discussion of any repair or maintenance activities conducted during the year.
- A certification from EBMUD attesting to the compliance with the terms and conditions of the Covenant to Restrict Use of Property, Environmental Restriction.
- Discussion of any soil disturbance, soil removal, or dewatering activities.
- Final disposition of the soil and/or liquid, including copies of disposal manifests as appropriate.

- A summary of the biannual groundwater monitoring results with copies of corresponding analytical laboratory testing reports.
- Discussion of any violations of the Covenant to Restrict Use of Property, Environmental Restriction.

Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act, requires that remedial actions that result in any hazardous substances, pollutants, or contaminants remaining at the site be subject to a five-year review. The National Contingency Plan further requires five-year review for remedial actions that result in any hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure to ensure protection of human health and the environment. The purpose of the five-year review is to evaluate whether the implementation and performance of the selected remedy is sufficiently protective of human health and the environment. The operations and maintenance plan requires EBMUD to assist DTSC in the preparation of this five-year review report.

Former Baldwin Rail Yard

The Baldwin Rail Yard, formerly located south of the West End property, across Engineers Road (see **Figure 3.9-1**), was built prior to 1947, but the railyard and associated tracks were removed between 2002 and 2007. The property, now referred to as the Baldwin Yard, was previously used for a construction material recycling operation (Geologica 2007a) and is currently used for stockpiling of clean soil that will eventually be used as fill during the redevelopment of the OAB (Auletta, 2011).

The Former Baldwin Rail Yard historically used five 7,000-gallon aboveground storage tanks for the storage of fuel oil, and three 4,000-gallon aboveground storage tanks for the storage of asphalt in the eastern portion of the property, immediately south of Building 1086 at the West End property. The asphalt tanks were reportedly removed in 1958 and the fuel oil tanks were reportedly removed in 1968. Investigations at this site identified total petroleum hydrocarbons as diesel at concentrations of up to 2,440 mg/kg in the soil, and 1.81 milligram per liter (mg/L) in the groundwater. Six PAHs were identified at concentrations of up to 1.1 microgram per liter (µg/L) and arsenic and chromium were reportedly detected in groundwater at concentrations greater than "tap water Preliminary Remediation Goals."

Soil samples from near a locomotive maintenance area to the south of Building 1064 at the West End property reportedly contained ethylbenzene, toluene, and xylenes at concentrations of up to 740 microgram per kilogram (µg/kg). Organic compounds were not detected in a grab groundwater sample from this location. Based on the above information, conditions at the Former Baldwin RailYard would have a low potential to affect soil or groundwater quality at the West End property or existing MWWTP.

Existing Uses of Hazardous Materials

As required by law, EBMUD maintains a Hazardous Materials Business Plan for the MWWTP (EBMUD 2007). The hazardous materials used at the plant, listed in **Table 3.9-1**, include chemicals such as gaseous oxygen, liquid oxygen, sodium hypochlorite, sodium bisulfite, ferric chloride, and polymers for the treatment of wastewater. With the exception of gaseous oxygen, these materials are all stored in above ground tanks or vessels at various locations throughout the MWWTP. Oxygen is stored in a gaseous state in a below ground tank. Digester gas is produced in the digesters located in the western portion of the MWWTP and is conveyed to the existing PGS where it is beneficially used for the generation of electricity.

Diesel is stored in a 25,000-gallon underground storage tank that is used to operate the PGS, as well as in smaller above ground tanks for the operation of emergency generators and fueling EBMUD vehicles at the MWWTP. Unleaded gasoline is also stored in an aboveground tank west of the maintenance building,

and is used for fueling EBMUD vehicles. Waste oil is stored in two underground storage tanks with capacities of 2,500 gallons and 2,000 gallons, and in drums at several locations within the MWWTP. Transformer oil is contained within the electrical transformers at the plant. Various oils, paints, and compressed gasses are stored in smaller containers and are used for maintenance or laboratory activities at the MWWTP. Citric acid, sodium hydroxide, and magnesium hydroxide are used in the production of recycled water at the MWWTP.

Table 3.9-1: Form and Hazard Class of Chemicals Used at the MWWTP

Chemical Name	Maximum Volume Stored	Form	Hazard Class
Liquid Oxygen	44,000 gallons	Liquid	Oxidizer
Oxygen	2.81 million cubic feet	Gas	Oxidizer
Sodium Hypochlorite	230,800 gallons	Liquid	Class II Oxidizer
Ferric Chloride	23,500 gallons	Liquid	Corrosive
Sodium Bisulfite	45,600 gallons	Liquid	Corrosive, Irritant
Unleaded Gasoline	3,000 gallons	Liquid	Class Ia Flammable Liquid
Epoxy paint	225 gallons	Liquid	Class Ic Flammable Liquid
Diesel Fuel	26,955 gallons	Liquid	Class II Combustible Liquid
Various Oils	10,726 gallons	Liquid	Class II Combustible Liquid
Motor Oil	2,000 gallons	Liquid	Class II Combustible Liquid
Waste Oil	4,630 gallons	Liquid	Class II Combustible Liquid
Waste Paint Thinner	55 gallons	Liquid	Class II Combustible Liquid
Mineral Oil (transformer oil)	14,890 gallons	Liquid	Class IIIa Combustible Liquid, Irritant
Various Cleaners and Solvents	395 gallons	Liquid	Class II waste
Aqueous Parts Cleaner	70 gallons	Liquid	Nonflammable Liquid
Cationic Polymer	38,000 gallons	Liquid	Irritant
Dewatering Emulsion Polymer	26,000 gallons	Liquid	Irritant
Latex Paint	495 gallons	Liquid	Irritant
Acetylene	1,308 cubic feet	Gas	Flammable Gas
Digester Gas	174,550 cubic feet	Gas	Flammable Gas
Hydrogen	750 cubic feet	Gas	Flammable Gas
Argon	1,000 cubic feet	Gas	Nonflammable Gas
Argon Liquid	2,700 pounds	Gas	Nonflammable Gas
Carbon Dioxide	2,000 cubic feet	Gas	Nonflammable Gas
Compressed Air	4,100 cubic feet	Gas	Nonflammable Gas
Compressed Oxygen	3,690 cubic feet	Gas	Nonflammable Gas
Helium	4,000 cubic feet	Gas	Nonflammable Gas
Liquid Nitrogen	10,150 pounds	Liquid	Nonflammable Gas
Nitrogen	6,000 cubic feet	Gas	Nonflammable Gas
P5 (mixture of Argon and Methane)	750 cubic feet	Gas	Nonflammable Gas
Citric Acid	2,275 gallons	Liquid	Class 9 Irritant
Sodium Hydroxide	2,275 gallons	Liquid	Class 8 Corrosive
Magnesium Hydroxide	13,000 gallons	Liquid	Class 9 Irritant

Source: EBMUD 2009e

Hazardous Building Materials

General Description of Hazardous Building Materials

Hazardous building materials are included in this discussion because the structures that would be demolished at the West End property are known to contain hazardous building materials. Some building materials could present a public health or environmental risk if disturbed during an accident or during the demolition of a building. These materials include asbestos-containing materials, electrical equipment that contains polychlorinated biphenyls (PCBs) or di(2-ethylhexyl)phthalate (DEHP), fluorescent lights containing mercury vapors, and lead-based paints. If removed during building demolition, these materials would also require special disposal procedures.

Asbestos

Asbestos is a common name for a group of naturally occurring fibrous silicate minerals that are made up of thin but strong, durable fibers. Because of its physical properties, asbestos was commonly used until the 1970s as a building material, including use as insulation materials, shingles and siding, roofing felt, floor tiles, and acoustical ceiling material. Asbestos is a known carcinogen and presents a public health hazard if it is present in friable (easily crumbled) form. Long-term, chronic inhalation of high levels of asbestos can cause lung diseases such as asbestosis, mesothelioma, and/or lung cancer (Agency for Toxic Substances and Disease Registry 2010). Friable, finely divided and powdered waste containing greater than 1 percent asbestos is classified in the CCR as a hazardous waste that requires disposal at a licensed landfill (CCR Title 22 Section 66261.24). Wastes containing non-friable asbestos are not considered hazardous and are not subject to regulation under CCR Title 22 Section 66001.

Polychlorinated Biphenyls

PCBs are mixtures of synthetic organic chemicals with physical properties ranging from oily liquids to waxy solids. Because of their nonflammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including use in electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastic, and rubber compounds; in pigments, dyes, and carbonless copy paper; and many other applications. PCBs are a known human carcinogen; they are highly toxic substances that remain persistent in the environment, accumulate in biological systems, interfere with the reproductive system, and act as immuno-suppressants. Under Section 6(e) of the Toxic Substance Control Act (TSCA) (15 USC 2601, et seq.), Congress began regulating the use and manufacturing of PCBs in 1976, legislating “cradle to grave” (i.e., from manufacture to disposal) management of PCBs in the United States. Under the TSCA, USEPA began to impose bans on PCB manufacturing and sales and on most PCB uses in 1978. TSCA requires incineration or an alternative destruction method for oils containing PCB concentrations greater than 50 ppm and requires that free liquids be drained from electrical equipment prior to disposal, and that the liquids are appropriately disposed of. In California, solid PCB wastes are regulated as hazardous waste if the PCB concentration exceeds 50 ppm. Liquid PCB wastes, such as transformer oil, are regulated as a hazardous waste if the PCB concentration exceeds 5 ppm (CCR Title 22 Section 66261.24).

Lighting Wastes

Most fluorescent light ballasts manufactured before 1978 contain PCBs in their capacitor and potting material (a form of insulation). Ballasts manufactured after January 1, 1978, do not contain PCBs and should be labeled as such on the ballast. Approved disposal methods for PCB-containing ballasts depend on the condition of the ballast and the PCB content of the potting material and capacitor oil. If the PCB concentration of the potting material is less than 50 ppm and the ballast contains a small, intact, non-leaking capacitor, the ballast may be disposed of at a municipal landfill. In general, all leaking ballasts and ballasts containing potting material with PCB concentrations greater than or equal to 50 ppm must be incinerated or destroyed by alternative methods, disposed of in a hazardous waste landfill, or decontaminated using approved methods.

Between 1979 and the early 1990s, DEHP was used in place of PCB as a dielectric fluid in some fluorescent light ballasts and other electrical equipment (Green Lights Recycling 2010). DEHP is classified as a probable human carcinogen by the U.S. Department of Health and Human Services and as a hazardous substance by USEPA. Because of this, ballasts containing DEHP must be legally disposed of; ballast incineration or a combination of ballast recycling and incineration are recommended for complete destruction of DEHP.

Spent fluorescent lamps and tubes, which commonly contain mercury vapors, are considered a hazardous waste in California (CCR Title 22 Section 66261.50). In 2004, new regulations classified all fluorescent lamps and tubes in California as a hazardous waste because they contain mercury. When these lamps or tubes are placed in the trash and collected for disposal, they can be broken and release mercury to the environment. The mercury can be absorbed through the lungs into the bloodstream of people nearby and can be washed by rain into waterways. The mercury in urban storm water sediment results in part from improperly discarded fluorescent lamps and tubes (CIWMB 2010). Approximately 370 pounds of mercury were released in California in 2000 due to electric lamps and tubes breaking during storage and transportation. It is estimated that nearly 75 million waste fluorescent lamps and tubes are generated annually in California and these lamps and tubes contain more than 0.5 tons of mercury. Because they are considered a hazardous waste, all fluorescent lamps and tubes must be recycled or taken to a universal waste handler.

Lead-based Paint

Lead-based paint was commonly used prior to 1960 and is likely present in buildings constructed before 1960. Lead is toxic to humans, particularly young children, and can cause a range of human health effects, depending on the level of exposure. When adhered to the surface of the material on which it is painted, lead-based paint poses little health risk. Where the paint is delaminated or chipping, the paint can cause a potential threat to the health of young children or other building occupants who may ingest the paint. Lead dust could also present public health risks during demolition of a structure with lead-based paint. Lead-based paint that has separated from a structure may also contaminate nearby soil. Lead-based paint is defined in CCR Title 17 Section 35033 as paint containing lead at a concentration of 5,000 mg/kg (0.5 percent) or greater. Separated paint would be considered a hazardous waste if the lead concentration exceeds the total threshold limit of 1,000 mg/kg, or if the soluble lead concentration exceeds the soluble threshold limit concentration or the federal toxicity regulatory level of 5 mg/L (22 Section 66261.24; see *State Policies and Regulations* above for a description of waste classification criteria).

Hazardous Building Materials Identified in West End Property Buildings

The U.S. Army commissioned a survey of most of the buildings on the West End property for asbestos containing materials and for PCB content of electrical transformers in 2001 (ITI of South Florida, 2001a through 2001m) (see Figure 3.5-1 for locations of major structures on the West End property). As summarized in **Table 3.9-2**, all but one of the buildings surveyed either includes confirmed asbestos containing materials (confirmed by sampling), or suspect asbestos containing materials (assumed to contain asbestos based on known properties of the material, or similar materials). Typically, the confirmed asbestos-containing materials include floor tiles and mastic; wallboard; window putty; cement exterior siding; pipe insulation, fittings, and gaskets; boiler insulation; and cement asbestos flue pipe (transite). Fire doors, electrical panels and wires, and some roofing mastics beneath the roofing felt are assumed to contain asbestos.

EBMUD hired Geologica to perform an environmental site inspection of the West End property in 2005 prior to purchasing the site. The inspection includes a survey of lead containing materials on the site. (Geologica, 2005). As summarized in **Table 3.9-3**, all of the buildings surveyed either include lead containing materials (LCM, containing less than 5,000 mg/kg of lead) or lead based paint (containing 5,00 mg/kg or greater of lead). The lead content was determined from samples.

Table 3.9-2: Asbestos-Containing Materials Identified in West End Structures

Building Number	Date of Construction	Confirmed Asbestos Containing Materials	Suspect Asbestos Containing Materials
1060	Around 1942	• 1 foot by 1 foot mustard floor tile • Baseboard mastic • Wallboard • Pipe insulation • Pipe fittings • Cement asbestos flue pipe • Window putty	• Fire doors • Electrical panels and wires
1064	1945	• 9 inch by 9 inch tan floor tile • 9 inch by 9 inch light green floor tile and mastic • Pipe fittings • Pipe insulation • Boiler insulation (gasket) • Boiler insulation (exhaust) • Cement asbestos flue pipe	• Fire doors • Electrical panels and wires
1068	Unknown	• No visible or accessible asbestos-containing materials were observed	• Roofing mastics on roof deck, beneath felt
1070	Unknown	• Wallboard and joint compound • Cement exterior siding • Cement flue pipe • Red floor tile	• Roofing mastics on roof deck, beneath felt
1071	Unknown	• No visible or accessible asbestos-containing materials were observed	• Roofing mastics on roof deck, beneath felt
1072	Unknown	• No visible or accessible asbestos-containing materials were observed	• Roofing mastics on roof deck, beneath felt
1074	Unknown	• No visible or accessible asbestos-containing materials were observed	• Roofing mastics on roof deck, beneath felt
1076	Unknown	• No visible or accessible asbestos-containing materials were observed	• No visible or accessible asbestos-containing materials observed
1084	Unknown	• Pipe fitting insulation	• Roofing materials • Fire doors • Electrical panels and wires
1086	Around 1967	• Duct isolator/connector • Window putty	• Fire doors • Electrical panels and wires
1101 [a]	Unknown	• Pipe insulation • Pipe fitting insulation • Wallboard • 9 inch by 9 inch green floor tile • 9 inch by 9 inch light green floor tile • Window putty	• Fire doors • Electrical panels and wires • Roof mastic

[a] Building demolished in 2009

Source: ITI of South Florida, 2001a through 2001m.

Table 3.9-3: Lead Containing Materials Identified in West End Structures

Building Number	Date of Construction	Lead Containing Material[1]	Lead-based Paint[2]
1060	Around1942	• Interior white paint on cinderblock perimeter walls • Exterior white paint on cinderblock perimeter walls • Interior white paint on stucco perimeter walls • Beige paint on metal doors/frames	
1064	1945	• Interior green paint on cinderblock walls • Exterior white pain on cement perimeter walls	
1068	Unknown	• Burnt orange paint on exterior perimeter walls	
1070	Unknown	• Interior white paint on cinderblock perimeter walls • Exterior white paint on cement foundation walls	• Gray paint metal hand rails • Gray paint on wood doors/frames • Black paint on metal doors/frames
1071	Unknown	• Interior white paint on wood ceiling and walls	• Gray paint on wood perimeter walls
1072	Unknown		• Gray paint on metal doors
1074	Unknown	• Brown paint on metal supports	
1084	Unknown	• Untested paint on doors and window framing assumed to be LCM.	• Green paint on exterior door frames
1086	Around 1967	• Untested paint on doors and window framing assumed to be LCM.	
1101	Unknown	• Interior and exterior white paint • Gray paint on boiler	• Exterior gray paint on wood stairs, supports, and windows
Safety Patrol Shack		• White paint on interior wood walls, shelves, and doors	• Brown paint on wood windows • Brown paint on exterior wood walls

Source: Geologica, 2005.

[1] Lead containing materials are those that contain less than 5,000 mg/kg of lead.

[2] Lead-based paint contains 5,000 mg/kg or more of lead.

Transformers identified on the property included:

- One old rusty pole mounted transformer behind Building 1064.
- Three pole mounted transformers (two very old and one new) mounted on a platform between pole numbers 6995 and 6995A behind Building 1064. Two of the transformers had blue stickers indicating that they are less than one percent PCB containing. (removed in 2005)

- Three pole mounted transformers on pole number 6900 in the middle of the property. All of the transformers have blue stickers indicating that they are less than one percent PCB containing.
- One pole mounted transformer located within a locked parking lot on the property boundary. This transformer had a blue sticker indicating that it is less than one percent PCB containing.
- One pad mounted transformer (#x-65) serving Building 1101. This transformer contained 11 ppm PCBs. (removed during demolition of Building 1101)
- One pad transformer serving Building 1086.

The transformer serving Building 1101 was removed when the building was demolished. The three transformers mounted on a platform were removed in 2005 and replaced with a new transformer. Of the remaining transformers, two are not labeled to indicate their PCB content. These include an old rusty pole mounted transformer behind Building 1064 and the pad transformer serving Building 1086. Based on the age of the facility, these transformers should be assumed to contain PCB oil.

3.9.2 Regulatory Framework

Hazardous materials and wastes can result in public health hazards if released to soil, groundwater, or air. Hazardous materials as defined in Section 25501(o) of the California Health and Safety Code are materials that, because of their "quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment." Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as to a limited extent in residential areas.

A waste is any material that is relinquished, recycled, or inherently waste-like. CCR Title 22 Section 66261.1, et seq. contains regulations for the classification of hazardous wastes. Article 3 criteria classify waste as hazardous if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). Article 4 also lists specific hazardous wastes, while Article 5 identifies specific waste categories, including RCRA hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes. If improperly handled and released to soil, groundwater, or air (in the form of vapors, fumes, or dust), hazardous materials and wastes can result in public health hazards.

Hazardous materials and hazardous wastes are subject to numerous federal, state, and local laws and regulations intended to protect health, safety, and the environment. USEPA, DTSC, RWQCB, and BAAQMD are the primary agencies enforcing these regulations. Local regulatory agencies enforce many federal and State regulations through the Certified Unified Program Agency (CUPA) program. ACDEH is the lead agency for the investigation and cleanup of leaking underground storage tank sites, and for some groundwater contamination cases in Oakland. RWQCB is the lead agency for other groundwater cases. DTSC can be the lead agency for cases with no groundwater issues and is the lead agency for the investigation and remediation of the West End property.

Federal Policies and Regulations

Preliminary Remediation Goals

USEPA has published screening levels, referred to as Preliminary Remediation Goals, for the evaluation of chemicals commonly found in soil or groundwater where a release of hazardous materials has occurred (USEPA 2008a). For an industrial worker, these screening levels are conservative estimates of safe levels of a chemical that a worker could be exposed to in soil and groundwater. If the concentration of a chemical in the soil or groundwater is below the Preliminary Remediation Goal, then it can be assumed that the chemical would not pose a health risk to the worker. However, these screening levels are based on conservative exposure assumptions, and it is possible to conduct a more detailed risk assessment using project-specific exposure assumptions to develop a higher concentration that would be considered safe.

In addition, screening levels would generally be lower for industrial workers than construction workers because the industrial worker would be exposed to the soil and groundwater over a lifetime while the construction worker would only be exposed for the duration of construction. Therefore, safe levels of chemicals in soil and groundwater would generally be higher for construction workers than industrial workers.

The most recently published Preliminary Remediation Goals are dated 2008, however, site investigation and remediation activities at the West End property used Preliminary Remediation Goals published in 2004 as cleanup levels for the site as approved by DTSC. The 2004 Preliminary Remediation Goals were current at the time that the site investigation and remedial activities were completed at the West End property.

Hazardous Materials Worker Safety Requirements

The federal Occupational Safety and Health Administration (OSHA) is the federal agency responsible for ensuring worker safety. The federal regulations for worker safety are contained in CFR Title 29, as authorized in the Occupational Safety and Health Act of 1970; these regulations provide standards for safe workplaces and work practices, including those relating to hazardous materials handling.

State Policies and Regulations

Process Safety Management

Facilities that handle more than 10,000 pounds of a flammable liquid, or specific chemicals above threshold quantities, are subject to the Process Safety Management regulations specified in CCR Title 8 Subchapter 7 Group 16 Article 10 Section 5189. In accordance with these regulations, the facility operator must conduct a hazard analysis for each process, develop written operating procedures, provide employee training, establish and implement an emergency action plan, and conduct periodic audits of the process. The operator must also inform contractor employees of all hazards related to work involving the regulated process, require implementation of safe work practices by the contractor in accordance with written operating procedures, and explain the emergency action plan. Prior to starting up a new process, or after a major modification to an existing process, the operator must perform a pre-startup review to ensure that the construction and installed equipment are in accordance with design specifications; safety, operating, maintenance, and emergency procedures are in place and are adequate; and employees are appropriately trained. For maintenance, the operator must also provide written procedures to maintain the ongoing integrity of equipment required for the regulated process. A hot work permit is required for any hot work operations (such as welding) on or near a covered process, and must document that the appropriate fire prevention and protection measures are in place prior to beginning the hot work process. The state Process Safety Management Regulations incorporate the federal Process Safety Management regulations specified in CFR Title 29 Section 1910.119.

California Fire Code

The California Fire Code, Article 80, includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following design features to reduce the potential for a release of hazardous materials that could affect public health or the environment:

- Separation of incompatible materials with a noncombustible partition;
- Spill control in all storage, handling, and dispensing areas; and
- Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

The California Fire Code, Article 79, includes specific requirements for the safe storage and handling of flammable and combustible liquids. Specific requirements address fire protection; prevention and assessment of unauthorized discharges; labeling and signage; protection from sources of ignition; specifications for piping, valving, and fittings; maintenance of above ground tanks; requirements for storage vessels, vaults, and overfill protection; and requirements for dispensing, using, mixing, and handling of flammable and combustible liquids.

Transportation of Hazardous Wastes

Regulatory requirements for the transport of hazardous wastes in California are specified in 22 CCR Division 4.5 Chapters 13 and 29. In accordance with these regulations, all hazardous waste transporters must have identification numbers, which are used to identify the hazardous waste handler and to track the waste from its point of origin to its final disposal disposition (DTSC 2007b). This number, issued by either USEPA or DTSC, depends on whether the waste is classified as hazardous by federal regulations or only under California regulations. Hazardous waste transporters must comply with the California Vehicle Code, California Highway Patrol regulations (CCR Title 13); the California State Fire Marshal regulations (CCR Title 19); and U.S. Department of Transportation (DOT) regulations (CFR Title 49); and USEPA regulations (CFR Title 40). A hazardous waste manifest is required for transport of hazardous wastes. The hazardous waste manifest documents the legal transport and disposal of the waste, and is signed by the generator and transporter(s) of the waste as well as the disposal facility. California regulations specify specific cleanup actions that must be taken by a hazardous waste transporter in the event of a discharge or spill, and for the safe packaging and transport of hazardous wastes.

Household Hazardous Waste Collection Facilities

Household hazardous waste (HHW) is a hazardous waste generated incidental to owning or maintaining a place of residence, as defined in Section 25218.1 (e) of the California Health and Safety Code. Examples of common household hazardous wastes include antifreeze, household batteries, compressed gas cylinders, television/computer monitors, consumer electronic devices, home-generated sharps, oil-based paints, latex paints, motor oil, used oil filters, rodent poison, asbestos, gasoline, fluorescent lamps, partially used aerosol containers, and weed killers (CIWMB 2008). A HHW collection facility is a facility that is operated by a public agency or its contractor for the purposes of collecting, handling, treating, storing, recycling, or disposing of household hazardous wastes (Health and Safety Code Section 2518.1 (f)). A HHW collection facility may also accept wastes from small businesses that are conditionally exempt generators, defined as a small business that generates no more than 100 kilograms of hazardous waste per month.

In accordance with state law (CCR Title 22 Section 66270.60(d)(6)), the public agency or its contractor that plans to operate a permanent household hazardous waste facility must submit a Permanent Household Hazardous Waste Collection Facility Permit by Rule notification form to the Certified Unified Program Agency (CUPA) a minimum of 45 days prior to operation. The notification must include the operator and

facility name, a listing of all local and state permits required for operation of the facility, a copy of the written agreement between the property owner and facility operator, an indication of whether the facility will accept wastes from conditionally exempt generators, an indication of the types of wastes that will be consolidated at the facility, an estimate of the total quantity of waste expected to be brought to the facility in an average month, the design capacity of the storage units at the facility, the operating schedule of the facility, a narrative description of the facility and its operation, and a plot plan of the facility. CUPA must also be notified 45 days prior to implementing any change in operation of the facility.

Design and operation of a permanent HHW collection facility must also comply with the applicable sections of the state Standards Applicable to Generators of Hazardous waste (CCR Title 22 Division 4.5 Chapter 12) and Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, and Storage Facilities (CCR Title 22 Division 4.5 Chapter 15). The interim status standards include specific requirements for secondary containment, control of runoff and runon, spill control and response, emergency preparedness and prevention, contingency planning, and closure and post closure of the facility. The facility must also submit a Phase I environmental assessment to DTSC within one year of beginning operation.

A hazardous waste facilities permit is not required if the facility only accepts certain recyclable materials[5] for subsequent transport to an authorized recycling facility, provided that the no other hazardous wastes or materials are handled at the facility, materials are transported to the facility by the person who generated the material or an authorized curbside HHW program, the recyclable materials are stored at the facility or a maximum of 180 days (spent batteries may be stored up to one year if the volume is less than one ton), and the materials are managed in accordance with the hazardous waste labeling, containerization, emergency response, and personnel training requirements of Chapter 6.5 of the Health and Safety Code, Hazardous Waste Control.

HHW may be transported to an authorized collection facility by the individual or conditionally exempt small quantity generator who generated the waste, as well as by collection programs and services, and certified hazardous waste haulers. Health and Safety Code Section 25218.4 imposes limitations on the volumes of waste that may be delivered by each type of transporter and provides specifications for packaging of the wastes to ensure safe transport.

Waste Classification Criteria

In accordance with CCR Title 22 Section 66261.20, et seq., excavated soil would be classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity. A waste is considered toxic in accordance with CCR Title 22 Section 66261.24 if it contains:

- Total concentrations of certain substances at concentrations greater than the Total Threshold Limit Concentration (TTLC);
- Soluble concentrations greater than the STLC;
- Soluble concentrations of certain substances greater than federal toxicity regulatory levels using the TCLP; or
- Specified carcinogenic substances at a single or combined concentration of 0.001 percent.

A waste is considered hazardous by state and federal regulations if the soluble concentration exceeds the federal regulatory level as determined by the TCLP. Because the TCLP involves a 20-to-1 dilution of the sample, the total concentration of a substance in the soil would need to exceed 20 times the regulatory level for the soluble concentration to exceed the regulatory level in the extract. A waste is also

[5] Allowable recyclable materials include latex paint; used oil; used oil filters; antifreeze; spent lead-acid batteries; and nickel-cadmium, alkaline, carbon-zinc, or other small batteries; intact spent fluorescent lamps; and intact spent high-intensity discharge (HID) lamps.

considered hazardous under state regulations if the soluble contaminant concentration exceeds the STLC as determined by the WET method. Because the WET is performed using a 10-to-1 dilution of the sample, the total concentration of a substance would need to exceed 10 times the STLC for the soluble concentration to possibly exceed the STLC in the extract. A waste may also be classified as toxic if testing indicates toxicity greater than the specified criteria.

Environmental Screening Levels

The San Francisco Bay RWQCB has published Environmental Screening Levels for the evaluation of chemicals commonly found in soil or groundwater where a release of hazardous materials has occurred (San Francisco Bay RWQCB 2008). Similar to USEPA Preliminary Remediation Goals, these screening levels are conservative estimates of safe levels of a chemical that a worker could be exposed to in soil and groundwater. If the concentration of a chemical in the soil or groundwater is below the Environmental Screening Level, then it can be assumed that the chemical would not pose a health risk to the worker. However, these screening levels are based on conservative exposure assumptions, and it is possible to conduct a more detailed risk assessment using project-specific exposure assumptions to develop a higher concentration that would be considered safe. Also, as for Preliminary Remediation Goals, safe levels of chemicals in soil and groundwater would generally be higher for construction workers than industrial workers.

The most recently published Environmental Screening Levels are dated 2008; however, site investigation and remediation activities at the West End property used Environmental Screening Levels published in 2005 as cleanup levels for the site as approved by DTSC. The 2005 Environmental Screening Levels were current at the time that the site investigation and remedial activities were completed at the West End property.

Lead in Construction Standard

The California Occupational Safety and Health Administration (Cal/OSHA) Lead in Construction Standard (CCR Title 8 Section 1532.1) requires project proponents to develop and implement a lead compliance plan when lead-based paint would be disturbed during construction. The plan must describe activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA requires 24-hour notification if more than 100 square feet of lead-based paint would be disturbed.

Abatement of Asbestos

Section 19827.5 of the California Health and Safety Code, adopted January 1991, requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants in the Bay Area, including asbestos. BAAQMD is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and is to be notified 10 days in advance of any proposed demolition or abatement work.

Notification includes the names and addresses of operations and persons responsible; description and location of the structure to be demolished/altered including size, age, and prior use, and the approximate amount of friable asbestos; scheduled starting and completion dates of demolition or abatement; nature of planned work and methods to be employed; procedures to be employed to meet BAAQMD requirements; and the name and location of the waste disposal site to be used. BAAQMD randomly inspects asbestos removal operations. In addition, BAAQMD will inspect any removal operation that is the subject of a complaint.

Contractors who conduct asbestos-related work activities (including abatement) in buildings and structures must follow state regulations contained in CCR Title 8 Section 1529 and Sections 341.6 through 341.14 where the work would involve 100 square feet or more of asbestos-containing material.

Specifically, under CCR Title 8 Section 341.6, Cal/OSHA must be notified of asbestos-related work activities to be carried out. Contractors must be licensed as an Asbestos Qualified Contractor by the Contractors Licensing Board of the State of California, and registered as such with Cal/OSHA. In addition, a one-time report of the use of carcinogens must be made to Cal/OSHA under CCR Title 8 Chapter 4 Section 5203. The owner of the property where abatement is to occur must have a Hazardous Waste Generator Number assigned by and registered with DTSC. The contractor and hauler of the material are required to file a Hazardous Waste Manifest that details the hauling of the material from the site and its disposal.

Abatement of Lead-Based Paint

Federal regulations addressing lead-based paint are specified in USEPA's Residential Lead-Based Paint Hazard Reduction Act of 1992 – Title X; the U.S. Housing and Urban Development (U.S. HUD) document *Guidelines for the Evaluation and Control of Lead-Based Paint Hazardous in Housing* provides technical information and guidance for implementation of these regulations. State requirements for lead-based paint abatement in residential and public use buildings are specified in CCR Title 17Sections 35001 to 36000. However, current federal, State, and local regulations do not address the abatement of lead-based paint in nonresidential or nonpublic buildings.[6]

Disposal and/or Recycling of Fluorescent Light Tubes and PCB-Containing Equipment

Requirements for disposal and recycling of fluorescent light tubes containing mercury are specified in CCR Title 22 Section 66261.50 and requirements for disposal of PCB-containing equipment are specified in CCR Title 22 Section 66261.24 and Part 761 of CFR Title 40. The waste generator must determine whether ballasts containing DEHP are hazardous or not, and dispose of them properly. DTSC recommends these wastes be shipped to a light ballast recycling facility (DTSC 2003).

Hazardous Materials Worker Safety Requirements

The state regulations concerning the use of hazardous materials in the workplace are included in CCR Title 8, and include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information relating to hazardous substances and their handling, and preparation of health and safety plans to protect workers. Cal/OSHA standards are generally more stringent than federal OSHA regulations.

Local Policies and Regulations

The City of Oakland Fire Department (OFD) is the CUPA that coordinates and enforces local, state, and federal hazardous materials management and environmental protection programs in Oakland. As the CUPA, this agency administers the following programs:

- Hazardous Materials Business Plan Program
- Hazardous Waste Generator Program
- California Accidental Release Program (CalARP)
- Underground Storage Tank Program

[6] SB 460, passed in 2002, and effective as of January 1, 2003, added text to the California Health and Safety Code specifying that lead-based paint above certain quantities cannot be disturbed without providing containment, but does not address specific requirements for abatement or containment of lead-based paint. The requirements of this legislation are not enforceable through permit conditions. CCR Title 17 does include requirements for the abatement of lead-based paint, but these requirements apply only to residential and public-use buildings.

- Hazardous Waste Treatment/Tiered Permitting Program
- Aboveground Storage Tank Program
- Hazardous Materials Fire Code Requirements
- Redevelopment of Sites with Historical Contamination
- Industrial and Commercial Stormwater Protection

Hazardous Materials Business Plan Program

In accordance with the Hazardous Materials Business Plan Program (California Health and Safety Code, Section 25500, et seq., and the related regulations in CCR Title 19 Section 2620, et seq.), businesses that use, handle, or store hazardous materials in excess of threshold quantities are required to submit a Hazardous Materials Business Plan (HMBP) in accordance with community right-to-know laws. Threshold quantities are 500 pounds for solids, 55 gallons for liquids, and 200 cubic feet for compressed gases. The HMBP allows local agencies to plan appropriately for a chemical release, fire, or other incident. In Oakland, the HMBP must include the following:

- An inventory of hazardous materials and wastes with specific quantity data, storage or containment descriptions, ingredients of mixtures, and physical and health hazard information;
- A facility map with emergency response information, utility shutoffs, and storage locations for hazardous materials;
- Emergency response/contingency plan for a release or threatened release of hazardous materials;
- An employee training plan; and
- Procedures for release reporting.

The HMBP is filed with and administered by OFD, which ensures review by and distribution to other potentially affected agencies. The plan must be reviewed every three years to determine if any revision is needed, and must be updated within 30 days when there is a 100 percent or more increase in the quantity of previously disclosed hazardous materials, or when a facility begins storing a new hazardous material at or above threshold quantities.

Hazardous Waste Generator Program

In accordance with the Hazardous Waste Generator program, businesses that generate hazardous wastes must clearly label containers with hazardous waste; store liquids in enclosed or covered areas, in clean sealed containers, with secondary containment; maintain proper emergency equipment; maintain a current contingency plan; provide training to employees; limit on-site storage to no more than 90 days or as specified in hazardous waste regulations; whenever possible, eliminate, reduce, and recycle wastes; select appropriate treatment methods for wastes; keep accurate records; and prepare a source reduction plan or checklist. Generators of hazardous waste are required to use only authorized hazardous waste transporters and management facilities, and must keep records of proper hazardous waste disposition (manifests) for three years. OFD regularly inspects facilities that generate hazardous waste for compliance with the requirements of the hazardous waste generator program.

California Accidental Release Program

California Health and Safety Code, Section 25531, et seq., and CalARP regulate the registration and handling of regulated substances.[7] Regulated substances are any chemicals designated as an extremely hazardous substance by USEPA as part of its implementation of Superfund Amendments and

[7] The CARP incorporates the requirements of the Federal Risk Management Program, but is more stringent with respect to the threshold quantities of chemicals requiring risk management plans and includes more chemicals than the Federal Risk Management Program.

Reauthorization Act (SARA) Title III or by the State of California pursuant to Section 25532 of the Health and Safety Code. The requirements of California Health and Safety Code, Section 25531 overlap or duplicate some of the requirements of SARA and the Clean Air Act. Facilities handling or storing regulated substances at or above Threshold Planning Quantities must register with their local CUPA and prepare a Risk Management Plan (RMP). CalARP is found in CCR Title 19 Chapter 4.5. RMP is implemented by the business to prevent or mitigate releases of regulated substances that could have off-site consequences through hazard identification, planning, source reduction, maintenance, training, and engineering controls.

Sulfuric acid is identified as a regulated substance under the CalARP program, but only if it is concentrated with greater than 100 pounds of sulfur trioxide, if it meets the definition of oleum, or if it is stored in a container with flammable hydrocarbons. The sulfuric acid that would be used at the facility meets none of these criteria. Therefore, sulfuric acid is not subject to CalARP requirements.

Hazardous Waste Treatment/Tiered Permitting Program

Facilities that treat hazardous waste are required to have a permit for construction and operation of the treatment facility. In 1992, California established a five-tiered program for authorizing hazardous waste treatment facilities. The five tiers relate to the level of hazardous waste treatment that would occur at a facility and include (in descending order of regulatory oversight), the Full Permit, Standardized Permit, Permit by Rule, Conditional Authorization, and Conditional Exemption Tiers. As the CUPA, OFD enforces the permitting requirements for the Permit by Rule, Conditional Authorization, and Conditional Exemption Tiers. Permanent household hazardous waste collection facilities are subject to the Permit by Rule Tier.

Aboveground Storage Tank Program

Facilities with a single tank or cumulative aboveground storage capacity of 1,320 gallons or greater of petroleum are required to prepare a spill prevention, control, and countermeasure plan. The plan must identify appropriate spill containment or equipment for diverting spills from sensitive areas, and discuss facility-specific requirements for the storage system, inspections, record keeping, security, and personnel training. This act does not apply to the storage of biodiesel, provided that it contains no petroleum products.

For construction sites, a Spill Prevention, Control, and Countermeasure (SPCC) Plan is only required for a single tank of 20,000 gallons or larger, or an aggregate volume of 100,000 gallons or greater. As described in *Section 3.10, Hydrology and Water Quality*, the construction SWPPP that would be prepared for the project would address smaller temporary tanks used during construction, methods for controlling releases, and measures to clean up accidental releases and prevent degradation of water quality.

Hazardous Materials Fire Code Requirements

As the CUPA, OFD enforces the hazardous materials-related standards of the California Fire Code, including requirements for signage of hazardous materials storage areas, storage of flammable materials, secondary containment for storage containers, and separation of incompatible chemicals.

3.9.3 Impact Analysis

Methodology for Analysis

This analysis focuses on the effects of the use of hazardous materials, a potential release of hazardous substances in soil and groundwater, and a potential release of hazardous building materials on the public or the environment as a result of project implementation. Each potential impact is assessed in terms of the applicable regulatory measures and EBMUD construction specifications, and mitigation measures are identified for significant impacts.

Thresholds of Significance

For the purposes of this analysis, an impact to public health and hazards would be significant if the Land Use Master Plan would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- 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;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- 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;
- 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;
- 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;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- 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.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Use or Emissions of Hazardous Materials within 0.25 miles of a School* – there are no schools within 0.25 miles of the MWWTP. Therefore, there would be no impacts related to emissions or use of hazardous materials within 0.25 miles of a school.
- *Construction within 2-miles of a Public Airport or in the Vicinity of a Private Airstrip* – the MWWTP is located more than five miles from the Oakland International Airport and is not located within two miles of a private airstrip. Therefore, there would be no impacts related to construction or operation of the MWWTP within two miles of a public airport or in the vicinity of a private air strip.
- *Interference with an Adopted Emergency Response Plan or Emergency Evacuation Plan* – construction activities would be conducted entirely within the MWWTP, including the West End property acquired by EBMUD. The roadways in the MWWTP vicinity currently provide adequate emergency access within the area. Construction and operation of the proposed facilities under the Land Use Master Plan would have no impact on these access points. Additionally, EBMUD would work with the City of Oakland to ensure that unobstructed access points to the MWWTP are maintained during and after build out of any future development on the Subaru Lot and Baldwin Yard to the south. Therefore, the project would have no impact related to interference with an adopted emergency response plan or emergency evacuation plan.
- *Risks Involving Wildfire Hazards* – The project is located in a highly-urbanized area, bound on all sides by interstate highways, rail lines, and warehouses. The MWWTP has no adjacent wildlands

and is not located within a mapped area of high fire risk (CDFFP 2000). Therefore, the project would have no impact related to wildland fire hazards.

Impacts and Mitigation Measures

This section discusses potential hazards and hazardous materials impacts that could result in conjunction with construction and operation of the Land Use Master Plan. Mitigation measures are identified where appropriate.

Impact HAZ-1 Hazard To The Public Or The Environment Through The Routine Transport, Use, or Disposal of Hazardous Materials

Biodiesel Production Facility

The biodiesel production facility would use a number of hazardous materials, and operation of the facility could result in the production of hazardous wastes that if released, could potentially affect public health or the environment.

Hazardous Materials

As discussed in *Chapter 2, Project Description*, and summarized in **Table 3.9-4**, the biodiesel production facility would store 12,000 gallons of methanol and 8,000 gallons of sodium methoxide. Sulfuric acid may also be used for pretreatment, and up to 4,000 gallons may be stored on site. The facility would produce 14,400 gallons per day of glycerin, a byproduct of the biodiesel production process. The biodiesel facility would provide storage for up to 20,000 gallons of glycerin that would be conveyed to the MWWTP via truck or enclosed pipeline for anaerobic digestion for the production of renewable energy. The glycerin would likely contain some amount of methanol, soap, biodiesel, and possibly oil and water. It is assumed that up to 12,000 gallons of boiler fuel would be stored to provide heat for the biodiesel production process and up to 12,000 pounds of magnesium silicate would be stored for use as an adsorbent to remove impurities from the processed biodiesel.

Table 3.9-4: Planned Hazardous Materials at the Biodiesel Production Facility

Chemical Name	CAS Number	Maximum Quantity On Site	Hazard Class	Incompatibilities
Methanol	67-56-1	12,000 gallons	Class Ia Flammable Liquid	• Explosive reaction with chloroform plus sodium methoxide and diethyl zinc • Violent reaction with alkyl aluminum salts, acetyl bromide, chloroform plus sodium hydroxide, cyanuric chloride, nitric acid • Incompatible with beryllium dihydride, metals, oxidants • Can react vigorously with oxidizing materials
Sodium Methoxide	124-41-4	8,000 gallons	Corrosive	• Reactive with oxidizing agents, acids, moisture • Reacts violently with water to emit flammable, but not toxic vapors
Sulfuric Acid	7664-93-9	4,000 gallons	Corrosive	• Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, alkalis, and moisture
Magnesium Silicate	1343-88-0	12,000 pounds	None	• Information not available
Glycerin	56-81-5	20,000 gallons	None	• Highly reactive with oxidizing agents
Biodiesel	67784-80-9	690,000 gallons	None	• Avoid contact with strong oxidizing agents

Source: EBMUD 2009b

However the use and storage of these materials would comply with California Fire Code Articles 79 and 80 (discussed in *State Policies and Regulations*). Article 80 includes specific design requirements for the safe storage and handling of hazardous materials that could affect public health or the environment, including:

- Separation of incompatible materials with a noncombustible partition.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment would hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

The California Fire Code, Article 79, also includes specific requirements for the safe storage and handling of flammable and combustible liquids. In addition, the owner/operator for the biodiesel facility would file an HMBP with the OFD, Office of Emergency Services detailing hazardous materials uses at the facility and specifying emergency response procedures for chemical emergencies in accordance with City of Oakland requirements, and would also comply with legal requirements for the aboveground storage of petroleum products, including preparation of a spill prevention, control, and countermeasure plan, for the storage of boiler fuel.

Furthermore, the owner/operator for the facility would implement the requirements of the state Process Safety Management regulations for the storage and use of methanol, a flammable substance. Accordingly, the facility operator would conduct a hazard analysis for the process involving the use of methanol, develop written operating procedures, provide employee training, establish and implement an emergency action plan, and conduct periodic audits of the process. The operator would also implement the requirements for contractor employees, startup of the new process or subsequent modifications, maintenance of the process, and hot work permits.

Although an increased use of hazardous materials would increase hazardous material deliveries to the MWWTP, transport of hazardous materials would comply with local, state, and federal requirements and trucks would not be expected to utilize local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue.

Hazardous Wastes

Potential solid wastes produced as part of the biodiesel production process include spent absorbent which would be sent to a landfill and approximately 26,500 pounds per month of natural calcium bentonite (a byproduct of the production process) which would be disposed of in a landfill. Wastes containing methanol in concentrations greater than 24 percent by weight meet the definition of an ignitable hazardous waste (Terra Nitrogen Corporation 2001). Spent filter media from the biodiesel production process can also spontaneously combust if the oil or biodiesel content is sufficient, and could therefore potentially be determined to be a hazardous waste based on its ignitability (USEPA 2008b). If managed appropriately, the biodiesel production facility can be operated in a manner that would not generate ignitable waste. Such management measures include controlling the amount of methanol in the waste, recovering enough liquid from the waste to prevent it from becoming ignitable, or mixing the filter media with absorbents prior to the point of generation.

Although excess methanol would be used during the biodiesel production process, it is a closed loop system, and the methanol vapors would be sent to chillers and accumulators, then recycled back into the production process. With this system, the excess methanol would not be considered a hazardous waste.

Glycerin can be considered an ignitable hazardous waste with sufficient methanol levels, and a corrosive hazardous waste if the quantities of catalyst are sufficient to create a pH of greater than or equal to 12.5 or less than or equal to 2 (USEPA 2008b). In general, glycerin would not be ignitable if the methanol is recovered during the production process, as would occur under the project, however the facility operator would need to make the determination of whether the glycerin byproduct is hazardous or not. Because

the glycerin would be used as a product for anaerobic digestion for the production of renewable energy, it would not be considered a waste and should not be subject to hazardous waste management regulations.

In addition, digestion of glycerin would produce up to an additional 2 tons per day of biosolids, which would be dewatered and hauled off site for beneficial reuse as soil amendment on nonfood crop agricultural fields, or used as an alternative daily cover at landfills, consistent with existing operations at the MWWTP. These biosolids are not considered a hazardous waste.

Management of hazardous wastes at the biodiesel production facility would comply with applicable federal, state, and local requirements and disposal of these wastes would comply with the regulatory requirements discussed in *Section 3.9.2, Regulatory Framework*, including manifesting requirements that document legal transportation and disposal of the wastes. These wastes would also be included in the HMBP prepared for the biodiesel production facility.

By complying with the legal requirements described above, impacts related to the routine use, transport, and disposal of hazardous materials associated with the biodiesel production facility would be less than significant.

Food Waste Preprocessing Facility

Although hazardous materials such as diesel, lubricating oil, degreasers, and chemicals used for plant maintenance would be used at the food waste preprocessing facility, these materials are commonly used and are already in use at the MWWTP (see *Existing Hazardous Materials Uses* above). In addition, the diesel would be stored in a 5,000 gallon stationary above ground double-lined fuel tank and the owner/operator for the preprocessing facility would file an HMBP with the OFD, Office of Emergency Services detailing hazardous materials uses at the facility and specifying emergency response procedures for chemical emergencies in accordance with City of Oakland requirements. Also, transport of the hazardous materials would comply with local, state, and federal requirements and trucks would not be expected to utilize local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue.

Material delivered to the food waste preprocessing facility that is not suitable for digestion, which includes oversized material (greater than trommel screen openings) and other preprocessing rejects (e.g. plates, silverware, and plastic) would be trucked off site for further processing at a composting facility. Non-compostable materials would ultimately be landfilled. Wash water and residual liquids from the food wastes would be captured for transport to the R2 Receiving Station for anaerobic digestion or discharged directly to the MWWTP sanitary sewer system for treatment at the MWWTP. No hazardous wastes would be produced as a result of the food waste preprocessing.

By complying with the legal requirements for the use and transport of hazardous materials, impacts related to the routine use, transport, and disposal of hazardous materials as a result of implementation of the food waste preprocessing facility would be less than significant.

Other Land Use Master Plan Elements

Many of the projects proposed under the Land Use Master Plan (e.g., such as the secondary treatment upgrade for nutrient removal, ultraviolet disinfection, and tertiary treatment facility) could involve the use of hazardous materials, and some existing hazardous materials handling facilities such as the sodium hypochlorite tanks as well as the maintenance yard and fuel station could require relocation. An accidental release of new hazardous materials stored and used as a result of project implementation, or hazardous materials used and stored in the relocated facilities, could potentially affect public health or the environment. However, as for the biodiesel production facility discussed above, incorporation of the legal requirements of the California Fire Code, Articles 79 and 80 (discussed in *State Policies and Regulations*), would reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals at the Land Use Master Plan facilities.

Operation of the household hazardous waste collection facility would result in an increase in the volumes of hazardous waste managed at the MWWTP that if released could also potentially affect public health or the environment. However, in accordance with the regulatory requirements discussed in *Section 3.9.2, Regulatory Framework*, EBMUD would design and operate the collection facility in accordance with the applicable portions of the California Standards Applicable to Generators of Hazardous Waste (CCR Title 22 Division 4.5 Chapter 12) and Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, and Storage Facilities (CCR Title 22 Division 4.5 Chapter 15). These regulations include specific requirements for secondary containment, control of runoff and runon, spill control and response, emergency preparedness and prevention, contingency planning, and closure and post closure of the facility. EBMUD would also submit a Phase I environmental assessment to DTSC within one year of beginning operation.

At least 45 days prior to beginning operation, EBMUD or its contractor would submit a Permanent Household Hazardous Waste Collection Facility Permit by Rule notification form to OFD and would also provide the legally-required notification to the fire department 45 days prior to making any operational changes. Implementation of these legal requirements would reduce the potential for a release of hazardous wastes from the household hazardous waste collection facility.

In addition, as discussed in *Existing Uses of Hazardous Materials*, EBMUD has filed an HMBP with the OFD, Office of Emergency Services detailing hazardous materials uses at the MWWTP and specifying emergency response procedures for chemical emergencies. EBMUD would update this plan to reflect any changes in hazardous materials use under the Land Use Master Plan, including household hazardous wastes collected at the household hazardous waste collection facility.

Although an increased use of hazardous materials could increase hazardous materials deliveries to the MWWTP, transport of hazardous materials would comply with local, state, and federal requirements and trucks would not be expected to utilize local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue.

Hazardous wastes would be produced incidental to new water treatment processes and maintenance activities at the MWWTP, and hazardous wastes collected at the Household Hazardous Waste Collection Facility would require off-site disposal. However, disposal of these wastes would comply with the regulatory requirements discussed in *Section 3.9.2, Regulatory Framework*, including manifesting requirements that document legal transportation and disposal of the wastes. These wastes would also be included in the updated HMBP prepared for the MWWTP.

By complying with the legal requirements described above, impacts related to the routine use, transport, and disposal of hazardous materials as a result of projects implemented under the Land Use Master Plan in the short and long term would be less than significant. Furthermore, the household hazardous waste collection facility would provide a convenient facility for the legal disposal of many residential wastes that may be flushed down the drain or storm sewer. Collection at this facility would reduce the potential for household hazardous waste to cause water quality issues at the MWWTP and to the San Francisco Bay, a beneficial impact.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HAZ-2 Hazards To Public Health And The Environment Due To A Release of Hazardous Materials Present In The Soil And Groundwater

Much of the MWWTP and West End property are underlain by undocumented fill that could potentially contain hazardous materials. Although most of the proposed facilities would be supported on piers, construction of the project would require limited excavation for construction of new facilities, including ancillary features such as new pipelines, ductbanks, and underground utilities. In the absence of proper controls, a release of hazardous materials during excavation and soil handling could pose a health risk for the surrounding population, construction workers, or EBMUD employees. However, as discussed below, there are well established procedures for the management of excavation activities at the existing MWWTP and West End property that would reduce the potential for a release of hazardous materials present in the soil and groundwater.

Biodiesel Production Facility

The biodiesel production facility would be constructed in the northwest corner of the West End property. Limited soil excavation would be required for construction of the building to house offices as well as a laboratory, shop, and process area; biodiesel and chemical storage areas; and eventual rail spur to facilitate delivery of materials by rail and rail transport of the biodiesel; and trenching for the construction of new belowground utilities. As discussed in *Hazardous Materials in Soil and Groundwater* above, the West End property has been subject to several site investigations and remediation activities. Elevated levels of lead and PAHs are commonly found in the fill materials at the site, with smaller areas affected by petroleum hydrocarbons. Excavation would be required for construction of proposed biodiesel production facility, and could potentially encounter hazardous materials in the fill underlying the site. In the absence of proper controls, a release of hazardous materials during excavation and soil handling could pose a health risk for the surrounding population, construction workers, or EBMUD or owner/operator employees.

However, construction activities at the site would be conducted in accordance with the environmental restrictions specified in the deed restriction issued for the property. In accordance with these restrictions, described in the Operation and Maintenance Plan developed for EBMUD (Geologica 2008a), EBMUD or owner/operators selected for a short-term lease would be required to:

- Notify DTSC of the disturbance of any soil in the PV-18 area of the Building 1064 Parking Lot and any soil deeper than five feet in the remainder of the West End property, and obtain written approval from DTSC prior to commencing work;
- Develop a site and project-specific health and safety plan for the protection of worker safety;
- Sample the excavated soil to determine the appropriate disposition of the soil, including on-site reuse or off-site reuse, disposal, or recycling; and
- Appropriately manage any soil that is not directly off-hauled.

If groundwater dewatering or discharge of accumulated water is required for construction, EBMUD or the owner/operator would notify DTSC and conduct sampling to characterize the quality of the water. If the water is of appropriate quality, it would be discharged to the MWWTP head works. Water containing metals or other analytes at concentrations greater than STLC or TCLP values would be treated and/or disposed of in accordance with applicable federal, state, and local regulations.

If construction of improvements required the abandonment of existing groundwater monitoring wells, DTSC would be notified, and the wells would be abandoned in accordance with the procedures described in the Operation and Maintenance Plan, and replacement wells would be constructed as needed (determined through consultation with DTSC).

All excavation and soil management activities and well abandonment and construction activities would be conducted under the oversight of DTSC, and the need for additional actions for the protection of human health or the environment would determined in consultation with DTSC, and ultimately subject to approval by DTSC.

Implementation of these legal requirements would ensure that workers and the public are not exposed to unacceptable levels of hazardous materials in the soil and groundwater during construction or subsequent operation of the proposed biodiesel production facility, and that soil and groundwater are appropriately and legally disposed of or recycled during construction. With implementation of these requirements, impacts to public health and the environment due to a release of hazardous materials present in the soil and groundwater would be less than significant for the biodiesel production facility.

Food Waste Preprocessing Facility

The food waste preprocessing facility would be constructed partially on the existing MWWTP property and partially on the West End property. Limited soil excavation would be required for the food waste preprocessing building, office, and construction of below ground utilities. Although excavation could encounter hazardous materials in the soil and groundwater, EBMUD, the food waste preprocessing owner/operator, and the construction contractor would be required to implement the requirements of the Operation and Maintenance Plan (Geologica 2008a) for excavation activities on the West End property (described above for the biodiesel production facility) and EBMUD contract specifications for excavation activities on the existing MWWTP property.

As described in *Section 2.6, Environmental Commitments*, EBMUD would require the construction contractor to develop 1) a Project Safety and Health Plan (013524-1.3(B)) detailing measures to be taken to alleviate the identified risks, identifying appropriate health and safety requirements, and designating a contractor's project safety and health representative; 2) a Construction and Demolition Waste Disposal Plan (013544-1.3(C)) specifying how the contractor would remove, handle, transport and dispose of all material to be disposed of in a safe, appropriate, and lawful manner; and 3) a Water Control and Disposal Plan (013544-1.3(B)) that describes measures for containment, handling, and disposal of groundwater (if encountered), runoff of water used for dust control, stormwater runoff, wash water, and construction water (see also *Section 3.10, Hydrology and Water Quality*).

Sampling and testing of waste materials, including soil excavated during construction, would be required to determine the appropriate disposition of the waste. If it is determined that hazardous materials are present in the soils, the construction specifications require the contractor to dispose of contaminated materials in accordance with applicable laws and regulations. Prior to disposal of hazardous wastes, the contractor must submit copies of the waste manifests to EBMUD and provide documentation that the waste hauler is regulated by the state to transport hazardous wastes.

EBMUD would also contact DTSC and the San Francisco Bay RWQCB to identify a lead agency for regulatory oversight of the investigation and cleanup of hazardous materials in the soil or groundwater. Coordination and compliance with regulatory agency requirements for cleanup would ensure that contaminated soil and groundwater, if encountered, would be handled in a safe and environmentally sound manner.

Further, EBMUD General Conditions (Article 7.6.1) require that "Pursuant to Public Contract Code Section 7104, the Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of: (1) Material that the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is not indicated in the Contract Documents and that is required by law to be removed to a Class I, Class II, or Class III disposal site; (2) Subsurface or latent physical conditions at the site differing materially from those indicated in this contract; or (3) Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract."

Assessment of air and health impacts associated with excavation activities, as well as the risk of upset, would be addressed in the Project Safety and Health Plan described above. Any construction work associated with cleanup activities would be subject to the protocols identified in *Section 3.3, Air Quality* and *Section 3.12, Noise*. Implementation of these protocols would ensure that dust and noise impacts would be less than significant. Transportation impacts associated with cleanup activities would likely be temporary and of short duration, and consistent with other construction truck traffic associated with the project. Furthermore, off-hauling of materials would be required to comply with applicable regulations related to the transport of hazardous wastes.

With implementation of these requirements, impacts to public health and the environment due to a release of hazardous materials present in the soil and groundwater would be less than significant for the food waste preprocessing facility.

Other Land Use Master Plan Elements

Development on Existing MWWTP Property

Projects that could be implemented in the short term on the MWWTP property include construction of odor control facilities at the dewatering building, primary sedimentation tank, influent pump station, and R2 Receiving Station, as well as relocation of the EBMUD Food Processing Facility and construction of visitor and employee parking and a new security station. In the long term, secondary treatment upgrades (including two new secondary clarifiers), tertiary treatment facility (including a filter feed pump station), an ultraviolet disinfection facility, household hazardous waste collection facility, and public education facility could be constructed on the existing MWWTP property. The sodium hypochlorite storage tanks, fuel station, and maintenance yard would also require relocating to facilitate construction of new facilities.

Limited soil excavation required for construction of these projects and ancillary facilities could potentially encounter hazardous materials in the undocumented fill and groundwater (if encountered) underlying the site. In the absence of proper controls, a release of hazardous materials during excavation and soil and groundwater handling could pose a health risk for the surrounding population, construction workers, or EBMUD employees. However, EBMUD, owner/operators, and the construction contractor would be required to implement EBMUD contract specifications for excavation activities on the existing MWWTP property, described above for the food waste preprocessing facility. With implementation of these requirements, impacts to public health and the environment due to a release of hazardous materials present in the soil and groundwater would be less than significant for Land Use Master Plan components constructed on the existing MWWTP property.

Development on West End Property

Projects that could be implemented in the short term on the West End property include construction of employee parking, an emergency equipment storage facility and short-term land lease. In the long term, tertiary treatment facilities and new digesters could be constructed on the West End property, and the septage and R2 Receiving Stations would also be relocated to this property.

As discussed in *Hazardous Materials in Soil and Groundwater* above, the West End property has been subject to several site investigations and remediation activities. Elevated levels of lead and PAHs are commonly found in the fill materials at the site, with smaller areas affected by petroleum hydrocarbons. In addition, an engineered cap has been constructed in the Building 1070 yard to prevent exposure to elevated levels of lead identified in the soil. In the Building 1064 parking lot, soil containing PAH concentrations greater than approved cleanup levels remains in place in the PV-18 area because it could not be practically excavated due to the proximity of a large storm drain pipe and the shallow groundwater table.

Limited soil excavation would be required for construction of proposed land use master plan elements and ancillary facilities on this property, and excavation could potentially encounter hazardous materials in the

fill underlying the site. In the absence of proper controls, a release of hazardous materials during excavation and soil handling could pose a health risk for the surrounding population, construction workers, or EBMUD or owner/operator employees. In addition, the short-term land lease and tertiary filtration facility would be located on the engineered cap constructed in the Building 1070 yard, and abandonment of existing groundwater monitoring wells could be required for construction of proposed improvements.

However, construction activities at the site would be conducted in accordance with the environmental restrictions specified in the deed restriction issued for the property described above for the biodiesel production facility. In addition to the requirements described for the biodiesel production facility, EBMUD or owner/operators selected for a short-term lease would be required to notify DTSC of any planned intrusion of the cap at the Building 1070 yard, and obtain written approval from DTSC prior to commencing work.

All excavation and soil management activities, potential encroachment of the engineered cap in the Building 1070 yard, and well abandonment and construction activities would be conducted under the oversight of DTSC, and the need for additional actions for the protection of human health or the environment would determined in consultation with DTSC, and ultimately subject to approval by DTSC.

Implementation of these legal requirements would ensure that workers and the public are not exposed to unacceptable levels of hazardous materials in the soil and groundwater during construction or subsequent operation of the projects, and that soil and groundwater are appropriately and legally disposed of or recycled during construction. With implementation of these measures, impacts to public health and the environment due to a release of hazardous materials present in the soil and groundwater would be less than significant for Land Use Master Plan elements constructed on the West End property.

Significance Determination Before Mitigation

Less than significant

Mitigation Measures

No mitigation measures are required.

Impact HAZ-3 Hazards To Public Health And The Environment Due To A Release Of Hazardous Building Materials Present In The Buildings That Would Be Demolished

Biodiesel Production Facility

Construction of the biodiesel production facility would require demolition of Building 1064, which was built in the 1940s, potentially including removal of the existing transformers located behind Building 1064. Building 1060 may be reused as an administrative office, but this building may also eventually be demolished and replaced with a newer building. As discussed in *Hazardous Building Materials* above, both of these buildings contain known and suspected asbestos-containing materials and lead-containing materials. Based on their age, they may also include electrical equipment containing PCBs, fluorescent light tubes containing mercury, and fluorescent light ballasts containing PCBs or DEHP. In addition, the PCB content of the oil in one transformer located behind Building 1064 has not been determined, and based on the age of the facilities on the West End property, this transformer should be assumed to contain PCB oil until sampled to confirm the PCB content of the oil.

The disturbance of asbestos-containing materials during demolition of Building 1064, or occupancy of Building 1060 and ultimate demolition of this building, could result in exposing the public or construction workers to airborne asbestos fibers, unless proper asbestos abatement precautions are taken. Similarly, if lead-containing paint has delaminated or chipped from the surface of the building materials, there would be a potential for airborne particulates to be released unless proper abatement procedures are followed. If the buildings contain electrical equipment or lighting with PCBs, leakage could expose workers to

unacceptable levels of PCBs if not properly removed. Removal of fluorescent tubes could result in exposure to PCBs or DEHP in the light ballasts or to mercury vapors if the lights are broken. Without proper precautions, workers and the public could be exposed to PCBs potentially present in the oil during the removal of transformers behind Building 1064.

As described in *Section 3.9.2, Regulatory Framework*, there is an established regulatory framework for asbestos abatement. However, lead-based paint abatement regulations do not apply to nonresidential or nonpublic buildings. Although EBMUD contract specifications would require the contractor to prepare a Construction and Demolition Waste Disposal Plan identifying appropriate disposal methods for any hazardous building materials identified in these buildings, impacts related to a release of lead-based paint or other hazardous building materials (including oils potentially containing PCBs in the existing transformers), are considered potentially significant because the buildings on the West End property have not been surveyed for DEHP-containing ballasts or fluorescent light tubes; and the existing transformer has not been sampled to determine the PCB content of the oil. Workers and the public could be exposed to these materials if not adequately abated prior to demolition. This impact would be reduced to a less than significant level with implementation of **Mitigation Measure HAZ-3** requiring the owner/operator to and abate any lead-containing materials and other hazardous building materials identified prior to reuse or demolition of the structures and demolition of the existing transformers.

Food Waste Preprocessing Facility

Construction of the food waste preprocessing facility would require demolition of two existing structures on the MWWTP site, a small shed and a waste oil and equipment storage cage. The age of the structures and whether they have any asbestos-containing materials, lead-containing materials, electrical equipment containing PCBs, fluorescent light tubes containing mercury, or fluorescent light ballasts containing PCBs or DEHP, is not known.

The disturbance of asbestos-containing materials during demolition of the structures could result in exposing the public or construction workers to airborne asbestos fibers unless proper asbestos abatement precautions are taken. Similarly, if lead-containing paint has delaminated or chipped from the surface of the building materials, there would be a potential for airborne particulates to be released unless proper abatement procedures are followed. If the buildings contain electrical equipment or lighting with PCBs, leakage could expose workers to unacceptable levels of PCBs if not properly removed. Removal of fluorescent tubes could result in exposure to PCBs or DEHP in the light ballasts or to mercury vapors if the lights are broken.

As described in *Section 3.9.2, Regulatory Framework*, there is an established regulatory framework for asbestos abatement. However, lead-based paint abatement regulations do not apply to nonresidential or nonpublic buildings. Although EBMUD contract specifications would require the contractor to prepare a Construction and Demolition Waste Disposal Plan identifying appropriate disposal methods for any hazardous building materials identified in these buildings, impacts related to a release of lead-based paint or other hazardous building materials, are considered potentially significant because these structures have not been surveyed for DEHP-containing ballasts or fluorescent light tubes. Workers and the public could be exposed to these materials if not adequately abated prior to demolition. This impact would be reduced to a less than significant level with implementation of **Mitigation Measure HAZ-3** requiring the food waste preprocessing owner/operator to and abate any lead-containing materials and other hazardous building materials identified prior to demolition of the structures.

Other Land Use Master Plan Elements

Ultimately, implementation of the Land Use Master Plan could require demolition of all of the structures at the West End property for the construction of the proposed improvements and some facilities at the existing MWWTP may also require demolition. As discussed in *Hazardous Building Materials* above, all but one of the buildings on the West End Property include known or suspected asbestos containing

materials and/or lead-containing paint or lead-based paint which was commonly used until the 1960s. However, the buildings at the existing MWWTP have not been surveyed for these materials. Many of the buildings may also include electrical equipment containing PCBs, commonly used until the 1970s; fluorescent light tubes containing mercury (still in use today); and fluorescent light ballasts containing PCBs (used until 1978) or DEHP (used between 1979 and the early 1990s).

There are also two transformers on the West End property that are not labeled to indicate their PCB content and one transformer that is known to contain PCBs. One of the unlabeled transformers is located behind Building 1064 and the second is a pad mounted transformer serving Building 1086. Based on the age of the facilities on the West End property, these transformers should be assumed to contain PCB oil until sampled to confirm the PCB content of the oil. The transformer serving Building 1101 has been removed. Without proper precautions, workers and the public could be exposed to PCBs potentially present in the oil if the transformers are removed or replaced as a result of project implementation.

Similar to the biodiesel production facility, impacts related to a release of lead-based paint or other hazardous building materials are considered potentially significant because the buildings on the MWWTP property have not been surveyed for PCB-containing equipment, DEHP-containing ballasts, or fluorescent light tubes; and two of the existing transformers have not been sampled to determine the PCB content of the oil. Workers and the public could be exposed to these materials if not adequately abated prior to demolition. This impact would be reduced to a less than significant level with implementation of **Mitigation Measure HAZ-3** requiring EBMUD to conduct lead-based paint surveys for those structures that have not been surveyed. abate any lead-based paint and other hazardous building materials identified prior to demolition of the structure, and to sample and appropriately manage any transformers that would be removed.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HAZ-3: Hazardous Building Materials Surveys and Abatement

For any building not already surveyed for lead, a registered environmental assessor or a registered engineer would perform a lead-based paint survey for the structure prior to reuse or demolition. Adequate abatement practices for lead-containing materials, such as containment and/or removal, would be implemented prior to reuse or demolition of each structure that includes lead-containing materials or lead-based paint. For demolition, any PCB- or DEHP-containing equipment or fluorescent lights containing mercury vapors would also be removed and disposed of properly.

If removal of a transformer is required, EBMUD or the owner/operator would retain a qualified professional to determine the PCB content of the transformer oil. For removal, the transformer oil would be pumped out with a pump truck and appropriately recycled or disposed of off site. The drained transformer would be reused or disposed of in accordance with applicable regulations.

Significance Determination after Mitigation

Less than significant.

Impact HAZ-4 Hazards To Public Health And The Environment Due To A Release Of Hazardous Materials From Construction Equipment

All Land Use Master Plan Elements

During construction of all of the Land Use Master Plan components, diesel fuel and minor amounts of hazardous materials such as paints, fuels, solvents, and glues would be used. Inadvertent release of large quantities of these materials into the environment could adversely impact soil, downstream water bodies,

or groundwater quality. However, as described in *Section 3.10, Hydrology and Water Quality*, the existing MWWTP is served by an on-site storm drainage system, and stormwater conveyed to this system is treated at the MWWTP prior to discharge in accordance with the existing NPDES permit. Per EBMUD Construction Specifications, the construction contractor would also be required to prepare a Spill Prevention and Response Plan (013544-1.3(D)), which would detail the hazardous materials (including petroleum products) proposed for use or generated at the job site and also describe methods for controlling spills, monitoring hazardous materials, and providing immediate response to spills. Spill response measures would address notification of EBMUD, safety issues regarding construction personnel and public health, and methods for spill response and cleanup.

As described in *Section 3.10, Hydrology and Water Quality*, construction activities on the West End property would be subject to the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities. This permit requires preparation and implementation of a SWPPP and the use of BMPs to protect water quality during construction.

With implementation of EBMUD construction specifications as well as the SWPPP and specified best management practices, impacts related to degradation of soil and water quality due to a release of hazardous materials during construction would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

3.10 Hydrology and Water Quality

This section presents the physical and regulatory setting for hydrology and water quality at the MWWTP site. The impact analysis considers the potential for the Land Use Master Plan to result in excess surface runoff or flooding, exceed water quality standards, or interfere with groundwater recharge.

3.10.1 Environmental Setting

The study area for this impact analysis includes the project site and the surrounding drainage area. This section describes the environmental setting for hydrology and water quality within this study area.

Regional Hydrology

Bordering the East Bay shoreline of San Francisco Bay, Alameda County encompasses 738 square miles of land and has a total population of approximately 1.5 million. The county is a diverse combination of land types and forms: the western portion contains an urban corridor running between Berkeley and Fremont with a narrow fringe of marshlands along the Bay, and the eastern portion varies from gently rolling terraces and alluvial plains to the steep V-shaped upland areas. The population is concentrated in the highly urbanized Bay Plain and suburban sprawl east of the East Bay Hills (San Francisco Bay RWQCB 2004).

The MWWTP site is located on the western edge of the Alameda Watershed Management Area (WMA), due south of and across I-80 from the Bay shoreline (refer to **Figure 1-1**). The Alameda WMA, as defined by the San Francisco Bay Regional Water Quality Control Board (RWQCB), includes the Alameda Creek, San Leandro Creek, San Lorenzo Creek, and Temescal Creek watersheds, as well as small Bay-draining channels. There are five major reservoirs in the Alameda WMA: Calaveras Reservoir, San Antonio Reservoir, Lake Del Valle, Lake Chabot, and Upper San Leandro Reservoir. Southern and eastern Alameda County also rely on groundwater basins to augment surface water supplies. In addition, the largest constructed marsh in the region, Hayward Marsh, is located in the Alameda WMA (San Francisco Bay RWQCB 2004).

No streams, springs, or seeps occur on the MWWTP property.

Flooding

The most common flood hazards in Oakland are associated with excess stormwater runoff from heavy rain: the overtopping of stream banks, the failure of storm drains, and the erosion of creek banks from high-velocity water flows (City of Oakland 2004). While flooding is most often caused by excess runoff, earthquakes can create floods indirectly by generating tsunamis and seiches or damaging existing flood-control structures (i.e., levees or dams).

The Federal Emergency Management Agency (FEMA) defines special flood hazard areas for use by the National Flood Insurance Program (NFIP) and communities that adopt and enforce floodplain management ordinances. The City of Oakland participates in NFIP in order to provide its residents with federally-backed flood insurance. A special flood hazard area is defined as a 100-year floodplain, which, on average, is likely to flood once every 100 years. The MWWTP is currently located in Flood Hazard Zone C, which is defined as areas outside of the 100-year floodplain (FEMA Map # 065-0480015B.P). This designation could change if impacts of climate change result in a rise of sea level. Climate change is discussed further below.

Storm Drainage

The Alameda County Flood Control and Water Conservation District (ACFCWCD) was created in 1949 by the State Legislature to provide flood control services to Alameda County. ACFCWCD's flood control infrastructure includes hundreds of miles of pipelines, channels, creeks, erosion control measures, and pump stations. The City of Oakland and City of Emeryville are both within Zone 12, which contains

50 miles of closed conduit, 10 miles of earthen and concrete channels, and existing natural waterways that move stormwater to the San Francisco Bay (City of Oakland 2008b).

Stormwater runoff collected from the MWWTP site, however, is redirected for treatment to the headworks before discharge into San Francisco Bay approximately one mile offshore. Stormwater from the West End property is directed to the existing on-site storm drains and flows to the San Francisco Bay.

Surface Water Quality

As defined in RWQCB's Watershed Management Initiative (San Francisco Bay RWQCB 2004), significant water quality issues in the Alameda WMA include impairment from industrial and commercial site development, pesticide runoff, cattle grazing and rangeland management, reclaimed water projects, and quarry and mining activities. The Watershed Management Initiative also reports issues associated with wetland and stream alterations in hillside and Bay-adjacent development, as well as modification to creeks for flood-control maintenance.

Beneficial Uses

The purpose of the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is to identify and protect the region's beneficial uses from water quality degradation (San Francisco Bay RWQCB 2007b). The MWWTP site is located in the northernmost portion of the South Bay Basin (whose northern boundary is the San Francisco-Oakland Bay Bridge). The Basin Plan designates the following beneficial uses for Lower San Francisco Bay in the South Bay Basin:

- Industrial Service Supply
- Ocean, Commercial, and Sportfishing
- Shellfish Harvesting
- Estuarine Habitat
- Preservation of Rare and Endangered Species
- Fish Migration
- Fish Spawning
- Wildlife Habitat
- Water Contact Recreation
- Noncontact Water Recreation
- Navigation

The water quality objectives established in the Basin Plan are intended to protect San Francisco Bay from degradation so that it can continue to be used for the above beneficial uses.

Impaired Water Bodies

The San Francisco Bay RWQCB and U.S. Environmental Protection Agency (USEPA) have designated Lower San Francisco Bay as an impaired water body for the following pollutants/stressors: chlordane, dichloro diphenyl trichloroethane (DDT), dieldrin, dioxin compounds (including 2,3,7,8-TCDD), exotic species, furan compounds, mercury, polychlorinated biphenyls (PCBs), and dioxin-like PCBs (San Francisco Bay RWQCB 2007a).

The list of impaired water bodies is used by the San Francisco Bay RWQCB to develop Total Maximum Daily Loads (TMDLs) that examine water quality problems, identify sources of pollutants, and specify actions that create solutions. In February 2008, USEPA approved the San Francisco Bay RWQCB's proposed Basin Plan amendment incorporating a TMDL for mercury in San Francisco Bay (San Francisco Bay RWQCB 2010a). RWQCB is still awaiting USEPA approval of a proposed Basin Plan amendment incorporating a TMDL for PCBs in the Bay (San Francisco Bay RWQCB 2010b).

Groundwater

The MWWTP site is located within the Santa Clara Valley Groundwater Basin, East Bay Plain Subbasin (No. 2-9.04). The East Bay Plain Subbasin is a 122-square mile alluvial plain bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, on the south by the Niles Cone Groundwater Basin, and extending beneath San Francisco Bay to the west (Department of Water

Resources [DWR] 2004). The southern portion of the East Bay Plain Subbasin is comprised of multiple aquifer systems that are paired with their equivalent Niles Cone Groundwater Basin units. The Deep Aquifer, located over 400 feet below ground surface (bgs), consists of alluvial fan deposits interfingered with water body deposits. This confined aquifer is used by EBMUD for groundwater injection and extraction (EBMUD 2005). However, the unit is not substantially productive in the MWWTP project area.

According to a 2007 investigation conducted for the former Oakland Army Base (OAB) site (Geologica Inc. 2007), groundwater was encountered at depths of approximately 4 to 6 feet bgs. The study determined that two groundwater-bearing zones appear to be present within 20 feet of ground surface. A relatively fresh, shallow groundwater-bearing zone was encountered in fill soil perched on top of the Bay Mud (plastic clay) horizon. Total dissolved solids (TDS) concentrations in the upper groundwater-bearing zone ranged from 660 to 1,800 mg/L in December 2004. A deeper, more saline groundwater-bearing zone was encountered within relatively sandy marine deposits below the top of the Bay Mud (plastic clay) horizon. TDS concentrations in wells screened in the lower groundwater-bearing zone ranged from 15,000 to 21,000 mg/L in December 2004 (Geologica Inc. 2007). Water levels measured in site monitoring wells during high and low tides in San Francisco Bay indicated that groundwater levels in the both the upper and lower groundwater-bearing zones are relatively sensitive to precipitation recharge and insensitive to tidal fluctuations. Northwesterly groundwater flow was identified.

Groundwater Quality

The San Francisco Bay RWQCB has identified 13 distinct locations in the East Bay Plain Subbasin as areas of major groundwater pollution. These were identified as having plumes of contamination greater than 1,000 feet in length, primarily due to release of fuels and solvents. Most contamination appears to be restricted to the upper 50 feet of the subsurface (DWR 2004).

Groundwater in the shallow Newark Aquifer equivalent is more susceptible to contamination from surface sources and contains relatively high concentrations of TDS, chloride, nitrate, and sulfate. Groundwater from wells in this aquifer exceeds the maximum contaminant level (MCL) for nitrate and the secondary MCL for TDS, chloride, sulfate, iron, and manganese (EBMUD 2005). The Deep Aquifer is characterized by elevated concentrations of iron and manganese.

According to the 2007 investigation of the former OAB site (Geologica 2007a), principal contaminants of concern in groundwater are petroleum hydrocarbons and volatile organic compounds (VOCs) in limited areas, and lead. Additionally, high background concentrations of TDS, chloride, sulfate, and manganese make groundwater underlying the site and vicinity unusable without extensive treatment. Elevated concentrations of a number of metals are present in groundwater due to the slow dissolution of natural and anthropogenic materials in fill placed at the site and surrounding properties.

Beneficial Uses

The Basin Plan designates the following existing beneficial uses for the Santa Clara Valley Groundwater Basin, East Bay Plain Subbasin (San Francisco Bay RWQCB 2007b):

- Municipal and domestic water supply
- Industrial process water supply
- Industrial service water supply
- Agricultural water supply

Seiche/Tsunami

Tsunamis are sea waves or tidal waves caused by offshore earthquakes, landslides, or volcanic eruptions. Seiches are waves in an enclosed or semi-enclosed body of water such as a lake, reservoir, or harbor resulting from seismic activity. Past tsunamis have resulted in little damage around San Francisco Bay. Available data indicate that tsunami wave heights diminish by about half from the Golden Gate to the Richmond shoreline (City of Oakland 2004).

Tsunami runup heights for the probabilistic 100-year event range from 4.7 to 5.5 feet around the perimeter of the Oakland Harbor (EBMUD 2003). Flooding from a tsunami or seiche would affect low-lying areas along the Bay Plain. The City of Oakland General Plan (City of Oakland 2004) designates a small portion of the MWWTP's West End property as subject to potential tsunami runup.

Climate Change

In July 2006, DWR released a technical report titled "Progress on Incorporating Climate Change into Management of California's Water Resources" (DWR 2006). DWR concluded that future hydrologic conditions in California will likely change when compared to the patterns observed over the last century. Although a full understanding of water resources changes associated with climate change is not possible, there is a general consensus that the following effects are likely to occur within the next 50 to 100 years: 1) increases in air temperature; 2) changes in the timing, amount, and form of precipitation; 3) changes in runoff timing and volume; 4) sea level rise; 5) effects of sea level rise on Delta water quality; and 6) changes in irrigation volumes due to modified evapotranspiration rates (DWR 2006; International Panel on Climate Change [IPCC] 2007). These changes could have significant implications for water resources within California and the study area.

A major portion of California's annual water storage is held within the Sierra Nevada snowpack. DWR estimates that, by 2060, Sierra Nevada snowmelt runoff could be reduced by 36 percent (DWR 2006). These changes, along with anticipated changes in the timing of precipitation, could reduce both local and statewide reservoir refilling. In addition, computer models estimate that global climate change could lead to a sea level rise of 0.6 to 1.9 feet over the next 100 years (IPCC 2007). This rise in sea level would increase the negative effects of high tides in the southern San Francisco Bay and tributaries that experience tidal fluctuation. These changes could result in flooding hazards at the MWWTP site.

3.10.2 Regulatory Framework

Federal Policies and Regulations

Clean Water Act

Originally titled the Federal Water Pollution Control Act of 1972, the Clean Water Act (CWA) is administered by USEPA and the RWQCBs. The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. Because the Land Use Master Plan would not affect waters of the U.S., CWA Sections 401 and 404 are not triggered and are therefore not addressed further.

Section 303(d)

CWA Section 303(d) requires states to develop lists of water bodies that will not attain water quality standards after implementation of technology-based effluent limitations by point-source dischargers. Section 303(d) further requires states to develop a TMDL for each of the listed pollutants and water bodies. A TMDL is the amount of pollutant loading that the water body can receive and still meet water quality standards.

On June 28, 2007, the USEPA gave final approval to a revised list of impaired water bodies (hereinafter referred to as the 303(d) list) prepared by the State. San Francisco Bay is divided into subareas with the San Francisco-Oakland Bay Bridge serving as the boundary between the Central and Lower portions. Central and Lower San Francisco Bay are both listed as impaired for the following pollutants: chlordane, DDT, dieldrin, dioxin compounds (including 2,3,7,8-TCDD), exotic species, furan compounds, mercury, PCBs, and dioxin-like PCBs. Central San Francisco Bay is also listed for selenium (San Francisco Bay RWQCB 2007a).

On February 12, 2008, USEPA approved a Basin Plan amendment incorporating a TMDL for mercury in San Francisco Bay. The amendment was formally adopted by the San Francisco Bay RWQCB

(Resolution R2-2006-0052) and SWRCB (2007-0045). The San Francisco Bay RWQCB (Resolution R2-2008-012) and State Water Resources Control Board (SWRCB) (Resolution 2009-0076) have also approved a Basin Plan amendment incorporating a TMDL for PCBs in San Francisco Bay. The amendment will take effect following approval by USEPA.

Section 402

CWA Section 402 regulates stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, USEPA authorizes SWRCB to oversee the NPDES program through the RWQCBs. The MWWTP operates under an NPDES permit issued by the San Francisco Bay RWQCB (Permit No. CA0037702; Order No. R2-2010-0060), which strictly regulates the constituents in the MWWTP discharges. It regulates the sewage treated at the facility, as well as stormwater runoff generated at the facility, which is redirected back to the headworks for treatment before discharge into San Francisco Bay approximately one mile offshore.

RWQCBs, under the guidance of USEPA, further issue NPDES permits to any construction project over one acre that are not covered by an individual NPDES permit. SWRCB recently adopted an amended General Construction Permit (NPDES Order No. CAS000002, Order No. 2009-0009-DWQ), which changed the waste discharge requirements for discharges of stormwater runoff associated with construction and land disturbance activities (previously Order 99-08-DWQ). Effective July 1, 2010, the amended General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must include a site map(s) showing the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the site. The SWPPP must list Best Management Practices (BMPs) the discharger will use to protect stormwater runoff; a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

National Flood Insurance Program

NFIP was created to promote flood awareness and reduce flood losses of properties within Special Flood Hazard Areas. Drainage and related flooding hazards are managed in response to requirements established by the National Flood Insurance Act of 1986 and the Flood Disaster Protection Act of 1973, as amended. Requirements of the NFIP are included in the Building Code and through overall City and interagency programs for flood management. In implementing NFIP, FEMA requires that new construction in a flood hazard area meet minimum design standards to place occupied structures above flood hazard areas. As described above, the MWWTP is located in a Flood Hazard Zone C, which is defined as areas outside of the 100-year floodplain (FEMA Map # 065-0480015B.P).

State Policies and Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, also known as the California Water Code, is California's statutory authority for the protection of water quality. Under this act, the State must adopt water quality policies, plans, and objectives that protect the State's waters. The act sets forth the obligations of the SWRCB and RWQCBs pertaining to the adoption of Basin Plans and establishment of water quality objectives. Unlike the federal CWA, which regulates only surface water, the Porter-Cologne Act regulates both surface water and groundwater.

Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan)

The Basin Plan (San Francisco Bay RWQCB 2007b) is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan:

1) Designates beneficial uses for surface and ground waters;

2) Sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy;

3) Describes implementation programs to protect the beneficial uses of all waters in the Region; and

4) Describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code Sections 13240 thru 13244, Section 13050(j)].

The Basin Plan is used as the regulatory authority for water quality standards established in local NPDES permits and other RWQCB decisions.

Local Policies and Regulations

City of Oakland General Plan

The City of Oakland General Plan, Safety Element (City of Oakland 2004) includes the following policies addressing flooding and surface water quality:

- *Action FL-1.4* – Continue to enforce the grading, erosion, and sedimentation ordinance by prohibiting the discharge of concentrated stormwater flows by other than approved methods.
- *Action FL-1.5* – Continue to enforce provisions under the creek protection, stormwater management and discharge control ordinance designed to keep watercourses free of obstructions and protect drainage facilities.
- *Action FL-2.1* – Continue to repair and make structural improvements to storm drains to enable them to perform to their design capacity in handling water flows.

Oakland Municipal Code

The City's storm drainage standards are found in Chapter 13.14 of the Oakland Municipal Code. This section requires compliance with stormwater quality regulations issued in the Municipal Regional Stormwater NPDES Permit (Order No. R2-2009-0074). The creek protection, stormwater management and discharge control ordinance is found in Chapter 13.16 of the Municipal Code. This section requires that natural waterways be kept free of obstacles and that hydrology reports be obtained for development proposals within a creek floodway or riparian corridor, or near the top of a creek bank. The grading, excavation, and fill standards are found in Section 15.04.660 of Chapter 15.04. This section requires preparation of erosion control and sedimentation control plans, including measures necessary to prevent storm-induced flooding, with the issuance of grading permits.

California Government Code Section 53090 et seq., however, provides that EBMUD receives intergovernmental immunity from zoning and building laws of cities and counties for the construction or operation of its facilities. Local regulations may thus not be applicable to EBMUD, but are considered here for the purpose of determining significance of potential hydrologic and water quality impacts.

3.10.3 Impact Analysis

Methodology for Analysis

Potential impacts on hydrology and water quality are analyzed based on the potential for the Land Use Master Plan to result in physical hydrologic or hydrogeologic changes (e.g., flooding, erosion and siltation, changes in groundwater recharge) during construction or operation. Existing site conditions prior to construction of the proposed Land Use Master Plan elements are compared to site conditions both during construction activities and after the project facilities are operational.

Thresholds of Significance

For the purposes of this analysis, an impact to hydrology and water quality would be significant if the Land Use Master Plan would:

- Violate any water quality standards or waste discharge requirements;
- 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 which would not support existing land uses or planned uses for which permits have been granted);
- 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 erosion or siltation on or off site;
- 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 flooding on or off site;
- 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;
- Otherwise substantially degrade water quality (erosion potential);
- 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;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- 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; or
- Result in inundation by seiche, tsunami, or mudflow.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Place housing or structures which would impede or redirect flood flows within a 100-year flood hazard area* – The MWWTP is located in a Flood Hazard Zone C, which is defined as areas outside of the 100-year floodplain (FEMA Map # 065-0480015B.P). As such, the project would have no impacts related to placement of housing or structures within a 100-year flood zone which would impede or redirect flood flows.
- *Expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a levee or dam* – The MWWTP is not located within the inundation zone of a levee or dam, nor is it located adjacent to steep slopes that would result in mudflow hazards.

Impacts and Mitigation Measures

This EIR evaluates the MWWTP Land Use Master Plan at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level. Because project- and program-level impacts on hydrology and water quality are similar, they are discussed together below.

Impact HYD-1 Violation Of Water Quality Standards And/Or Waste Discharge Requirements

All Land Use Master Plan Elements

Construction

Because stormwater at the MWWTP is captured and conveyed to the headworks for treatment, construction of facilities within the existing MWWTP site would be covered by the existing NPDES Permit (*Reissuing Waste Discharge Requirements for East Bay Municipal Utility District, Special District No. 1, Water Pollution Control Plans, Oakland, Alameda County*; Permit No. CA0037702; Order No. R2-2010-0060). Stormwater runoff during construction would be captured and treated, and no additional permit coverage would be required. Stormwater at the West End property is captured and routed to existing storm drains. Construction of facilities on the West End property (including drainage improvements) may require coverage under the new General Construction Permit (*General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities*; Permit No. CAS000002; Order No. 2009-0009-DWQ), if the area of land disturbance totals 1 acre or more, and if storm drainage improvements to direct flows to the headworks have not yet been completed. For example, construction of the food waste preprocessing facility would occupy approximately 1.4 acres, partially on the West End property, and construction of the biodiesel production facility would disturb approximately 3 acres on the West End property; both facilities would require coverage under the General Construction Permit. Compliance with this General Construction Permit would include development of a SWPPP and implementation of construction-related BMPs. The SWPPP would address any small temporary tanks used during construction for storage of fuel or other construction materials.

Additionally, implementation of EBMUD's construction specifications – including requirements for a Spill Prevention and Response Plan (013544-1.3(D)), controls of site activities (013544-1.1(B)(1)), and Water Control and Disposal Plan (013544-1.3(B)) – would control erosion and ensure that no water quality standards are exceeded and no additional sources of polluted runoff are created. In addition, construction on the West End property would be done in accordance with the Operations and Maintenance Plan required by the deed restrictions placed on the property (Geologica 2008). This plan specifies measures that would be implemented during construction to protect surface and groundwater from potential spread of existing contaminants on the property. Refer to *Section 3.9, Hazards and Hazardous Materials*, for details of the Operation and Maintenance Plan for the West End property.

Operations

Typical stormwater runoff and wastewater generated by MWWTP operations, including equipment wash down, would be covered under the MWWTP NPDES permit issued by the San Francisco Bay RWQCB (*Reissuing Waste Discharge Requirements for East Bay Municipal Utility District, Special District No. 1, Water Pollution Control Plans, Oakland, Alameda County*; Permit No. CA0037702; Order No. R2-2010-0060). The permit regulates the combined sewage and stormwater runoff flows generated and treated at the MWWTP, which is ultimately discharged into San Francisco Bay approximately one mile offshore. In the short term, stormwater from the West End property would continue to drain to the existing storm drains, resulting in no increase in stormwater flows to either system. In the long term, when wastewater treatment facilities are developed on the West End property, the storm drain systems would be connected and all stormwater would be treated by the MWWTP. Additional stormwater and wastewater flows contributed by the Land Use Master Plan elements would not exceed or violate the MWWTP's existing water quality standards.

Operation of the food waste preprocessing facility would involve the use of standard oils and lubricants associated with the hoppers, shredders, trommel screens, grinders, and conveyor belts. Operation of the biodiesel production facility would involve the use of chemicals such as sodium methoxide, sulfuric acid, and methanol to produce biodiesel. Further, operation of the biodiesel production facility may also include heating and drying of feedstock. Operation of the other Land Use Master Plan elements would

involve the use of standard oils and lubricants, chemicals (such as coagulants and precipitants) necessary for wastewater treatment, and other flammable material. The household hazardous waste collection center would involve storage of household hazardous waste received from local residents. A spill of any hazardous materials in uncontained areas could conceivably violate water quality standards. However, in accordance with the Alameda County Department of Environmental Health Hazardous Materials/Waste Program, the MWWTP would prepare appropriate hazardous materials management, monitoring, and disposal plans for chemicals used during operations. A Hazardous Materials Business Plan, Risk Management Plan, and/or Spill Prevention Control and Countermeasure Plan would be prepared in accordance with State and federal regulations to prevent hazardous materials from reaching local surface waters. MWWTP operational staff are trained and certified to manage hazardous chemicals in accordance with SWRCB requirements, and operators of the food waste preprocessing and biodiesel facilities would also be trained to manage chemicals that would be used at those facilities.

The amount of wastewater associated with the food waste preprocessing and biodiesel facilities relative to the total wastewater treated at the MWWTP site would be minimal. This contribution of additional wastes to EBMUD's wastewater treatment processes would not cause a violation of waste discharge requirements at the MWWTP.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HYD-2 Depletion Of Groundwater Supplies Or Interference With Groundwater Recharge

All Land Use Master Plan Elements

Construction

Groundwater underlying the site is shallow and has been monitored on the adjacent OAB site at between 6 and 8 feet bgs (EBMUD 2003). Construction of the biodiesel production facility would require site grading to remove the existing asphalt surfaces and about 1,500 cy of soil. Soil would be scraped to a level of 14 to 18 inches below grade with subsurface trenching below that. Construction of the food waste preprocessing facility would involve site grading of up to 2 feet on half of the area (0.75 acres) requiring up to 2,500 cy of fill. Construction of the remaining Land Use Master Plan elements may require minor construction dewatering with excavation to depths of about five feet, as well as trenching for pipelines and ductbanks. Per EBMUD Construction Specifications, a Water Control and Disposal Plan (013544-1.3(B)) describing measures for containment, handling, and disposal of groundwater (if encountered) would be prepared. This Water Control and Disposal Plan would address handling of the dewatered groundwater to ensure that existing pollutants (e.g., petroleum hydrocarbons and VOCs) are not harmful to the construction workers. Additionally, any groundwater pumped from excavations during construction would be routed back to the MWWTP headworks for treatment in accordance with the NPDES permit (Permit No. CA0037702; Order No. R2-2010-0060).

The proposed project would not include significant groundwater withdrawals that would lower groundwater levels or substantially deplete groundwater resources. While minor construction dewatering may be necessary for about six months, the groundwater is shallow, of impaired quality, and any groundwater depletion would be localized and less than significant.

Operation

Operation of the other eleven short- and long-term Land Use Master Plan elements would not involve extraction of groundwater supplies. Due to the presence of the existing MWWTP and the Oakland Army Base development on the West End property (i.e., existing impermeable surfaces), buildout of the Land

Use Master Plan would not substantially affect surface permeability or groundwater recharge. As such, the program would not deplete groundwater resources or prevent groundwater recharge.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HYD-3 Alteration Of The Existing Drainage Pattern In A Manner Which Would Result In Flooding

All Land Use Master Plan Elements

Construction

As described above, construction of the Land Use Master Plan elements, including the 3-acre biodiesel production facility and the 1.4-acre food waste preprocessing facility, would involve periodic disturbance of areas within the MWWTP property boundaries. However, EBMUD's construction specifications require control of surface water flows and restoration of ground surfaces (013544-1.1(B)(6)) during construction activities. With implementation of these project controls, construction-related alteration of local drainage and associated flooding would be minor.

Operation

Operation of the Land Use Master Plan elements would not affect the drainage pattern at the MWWTP because the site is internally drained and all stormwater runoff from the site is collected and directed to the plant headworks for treatment. The existing stormwater facilities on the MWWTP site are sized to accommodate conveyance of on-site runoff to the plant headworks. In the short term, as land-lease facilities are developed on the West End property, there would be no change in stormwater flows, as they would continue to be collected and routed to existing storm drains. When wastewater treatment facilities are expanded onto the West End property, as shown in the long-term layout, the storm drain system would be connected to the storm drain system at the MWWTP and stormwater would be routed to the MWWTP headworks for treatment. Due to existence of the MWWTP complex at the site and previous development at the West End property (i.e., existing impermeable surfaces), buildout of the Land Use Master Plan would not increase the volume of stormwater flows on either site. However, once the two systems are connected, there would be an increase in stormwater flows through the existing EBMUD storm drain system, particularly during extreme wet weather events. These flows could exceed the capacity of the storm drain system. The existing drain system may need to be upgraded to accommodate these increased flows. In order to prevent potential flooding of the storm drain system or MWWTP headworks by surface runoff, a comprehensive drainage plan for the Land Use Master Plan (**Mitigation Measure HYD-3**) shall be prepared prior to connecting the West End property storm drain system to the existing MWWTP storm drain system. With implementation of this mitigation, operation of the Land Use Master Plan components would not alter local drainage in a manner that would cause flooding.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HYD-3: Prepare and Implement a Comprehensive Drainage Plan

Prior to expanding the stormwater collection system to treat runoff from the West End property, EBMUD shall prepare and implement a Comprehensive Drainage Plan for the Land Use Master Plan that incorporates measures to ensure that the storm drain system and treatment capacity are not exceeded during peak conditions. The drainage plan shall define operational controls necessary to prevent flooding of the MWWTP headworks and/or release of surface runoff off site.

Significance Determination after Mitigation

Less than significant.

Impact HYD-4 Alteration Of The Existing Drainage Pattern In A Manner Which Would Result In Substantial Erosion Or Siltation

All Land Use Master Plan Elements

Construction

Construction of the Land Use Master Plan elements, including the 3-acre biodiesel production facility and the 1.4-acre food waste preprocessing facility, would involve periodic disturbance of areas within the MWWTP and West End property boundaries. Although erosion or siltation may occur during construction, the construction contractor would be required to implement control measures in accordance with EBMUD's construction specifications, including control of construction materials (013544-1.1(B)(1)), control of surface water flows and restoration of ground surfaces (013544-1.1(B)(6)), and maintenance of construction sites to prevent erosion (013544-1.1(B)(7)). With implementation of these project controls, construction-related alteration of local drainage and associated erosion and siltation would be minor.

Operation

Operation of those Land Use Master Plan elements would not affect the drainage pattern at the MWWTP because the site is internally drained and all stormwater runoff from the site is collected and directed to the MWWTP headworks. New facilities at the West End property would continue to drain to the existing storm drain system until treatment facilities are expanded to that area and the storm drain system is connected to the storm drain system at the MWWTP. Existing and planned impermeable surfaces at the MWWTP site, including the West End property would eliminate the possibility of on-site erosion or sedimentation concerns.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact HYD-5 Inundation Due To A Catastrophic Tsunami Or Seiche

All Land Use Master Plan Elements

Because the City of Oakland (2004) reports that a small portion of the MWWTP site is subject to potential tsunami run-up, construction and operation of the Land Use Master Plan components may subject EBMUD employees, contractors, and owner/operators to possible tsunami inundation. Although the MWWTP site is generally protected from tidal or tsunami flooding by the interstate highway ramps and other surrounding infrastructure, a tsunami event may flood the MWWTP. As such, EBMUD shall prepare an emergency response plan for tsunami flooding (**Mitigation Measure HYD-5**) at the MWWTP site. Implementation of this mitigation measure would ensure that potential tsunami inundation impacts are reduced to less-than-significant levels.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure HYD-5: Prepare and Implement a Tsunami Response Plan

EBMUD shall prepare and implement a Tsunami Response Plan for the MWWTP site that defines emergency response and coordination procedures. The Tsunami Response Plan shall contain information specific to actions that may be necessary related to receipt of a tsunami watch, warning, or as a result of an actual tsunami along San Francisco Bay. The first priority of emergency management response shall be the protection of life and property.

Significance Determination after Mitigation

Less than significant.

3.11 Land Use and Recreation

This section presents the physical and regulatory setting for land use and recreation at the MWWTP site. The impact analysis considers the potential for the Land Use Master Plan to physically divide the community or conflict with adopted land use plans or policies.

3.11.1 Environmental Setting

This section describes the environmental setting for land use and recreation within the study area, which includes the project site and adjacent land uses and recreational facilities.

Regional Land Use

Bordering the East Bay shoreline of San Francisco Bay, Alameda County encompasses 738 square miles of land and has a total population of approximately 1.5 million. Highly-urbanized in the western portion, eastern Alameda County still has considerable agricultural and open space lands (although substantial land development is predicted during the next 10 years). Elevations range from sea level along the 36 miles of bay shoreline to 3,817 feet in the Diablo Mountain Range south of Livermore (San Francisco RWQCB 2004).

The MWWTP site is located within the City of Oakland, a highly urbanized community of 362,000 set between the East Bay Hills and the San Francisco Bay (U.S. Census Bureau 2010). Oakland's strengths include a diverse population, prime geographic location on the Bay, extensive transportation system, access to global markets (through port and airport), and redevelopment potential. Challenges facing the City include the need for economic development, support for its disadvantaged communities, and protection of its Bay environments (City of Oakland 1998). The City contains a diverse mix of land uses, with hillside residential and open space on the western slope of the East Bay Hills, single- and mixed-family residential on the alluvial plain, mixed use and community commercial along the major arterials, a strong central business district, mixed business and industrial generally west of I-880, and urban open space along the waterfront.

The MWWTP is located in an industrial area that is separated from nearby land uses by freeway ramps/approaches to the San Francisco-Oakland Bay Bridge (Bay Bridge) to the north, west, and east, and by vacant land, rail lines, and warehouse structures associated with the former OAB to the east and south. North of the Bay Bridge approach is the San Francisco Bay shoreline. The nearest residential land uses are 0.25 miles to the east of I-880 from the eastern boundary of the MWWTP (EBMUD 2003). The MWWTP site is designated General Industrial/Transportation in the City of Oakland General Plan and Industrial General (IG) on the City's Zoning Map (City of Oakland 2009c).

Parks and Recreation

Regional Parks

The East Bay Regional Park District (EBRPD) acquires and develops regional parks, open spaces, and trails throughout the East Bay. Spanning more than 100,000 acres in Alameda and Contra Costa counties, the EBRPD owns and maintains 65 parks and over 1,150 miles of trails (EBRPD 2010). EBRPD properties near the project area include:

- 1,854-acre Eastshore State Park, which is the closest park to the project site. The park is owned by the State of California and operated by EBRPD, and include uplands and tidelands north of the Bay Bridge along the waterfronts of Oakland, Emeryville, Berkeley, Albany, and Richmond; and
- 38-acre Middle Harbor Shoreline Park, which has more than two miles of pathways encircling Middle Harbor Basin, providing access to the shoreline with associated views of the bay, natural habitats and maritime activity.

Local Parks and Recreation

The City of Oakland Office of Parks and Recreation (OPR) provides recreational and cultural programs for residents of the City. OPR manages over 2,500 acres of open space, 100 parks and public grounds, and 25 recreation, community, and interpretive centers. OPR facilities also include seven community gardening locations, 59 outdoor tennis courts, three golf courses, 53 athletic fields (soccer, softball, baseball or football), and five swimming pools (City of Oakland 2010a). Maintenance of these facilities is provided by the Oakland Public Works Agency.

The City has a 10 acre per 1,000 residents park acreage goal and a 4 acre per 1,000 residents local-serving park acreage goal (includes parks with facilities that are not special purpose). There are an estimated 3,073 acres of total parkland in Oakland according to the General Plan OSCAR Element (City of Oakland 1996), which provides approximately 8.26 acres of parkland per 1,000 residents and 1.33 acres of local-serving park acreage per 1,000 residents. Because Oakland is predominantly developed, there are limited areas to develop additional parkland.

The nearest City of Oakland park, Raimondi Park, is located 0.25 miles from the site across I-880 along Wood Avenue. This heavily used 10.2-acre urban park contains multi-purpose sports fields.

San Francisco Bay Trail

The San Francisco Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. Led by ABAG, it will connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major toll bridges in the region. To date, approximately 290 miles of the alignment—over half the Bay Trail's ultimate length—have been completed (San Francisco Bay Trail Project 2010).

During the planning process, several different alignments for the Bay Trail were considered in the vicinity of the MWWTP. The proposed Bay Trail alignment would pass immediately along the northern boundaries of the MWWTP/West End property, along Maritime Street, West Grand Avenue, and the San Francisco-Oakland Bay Bridge (see **Figure 3.11-1**).

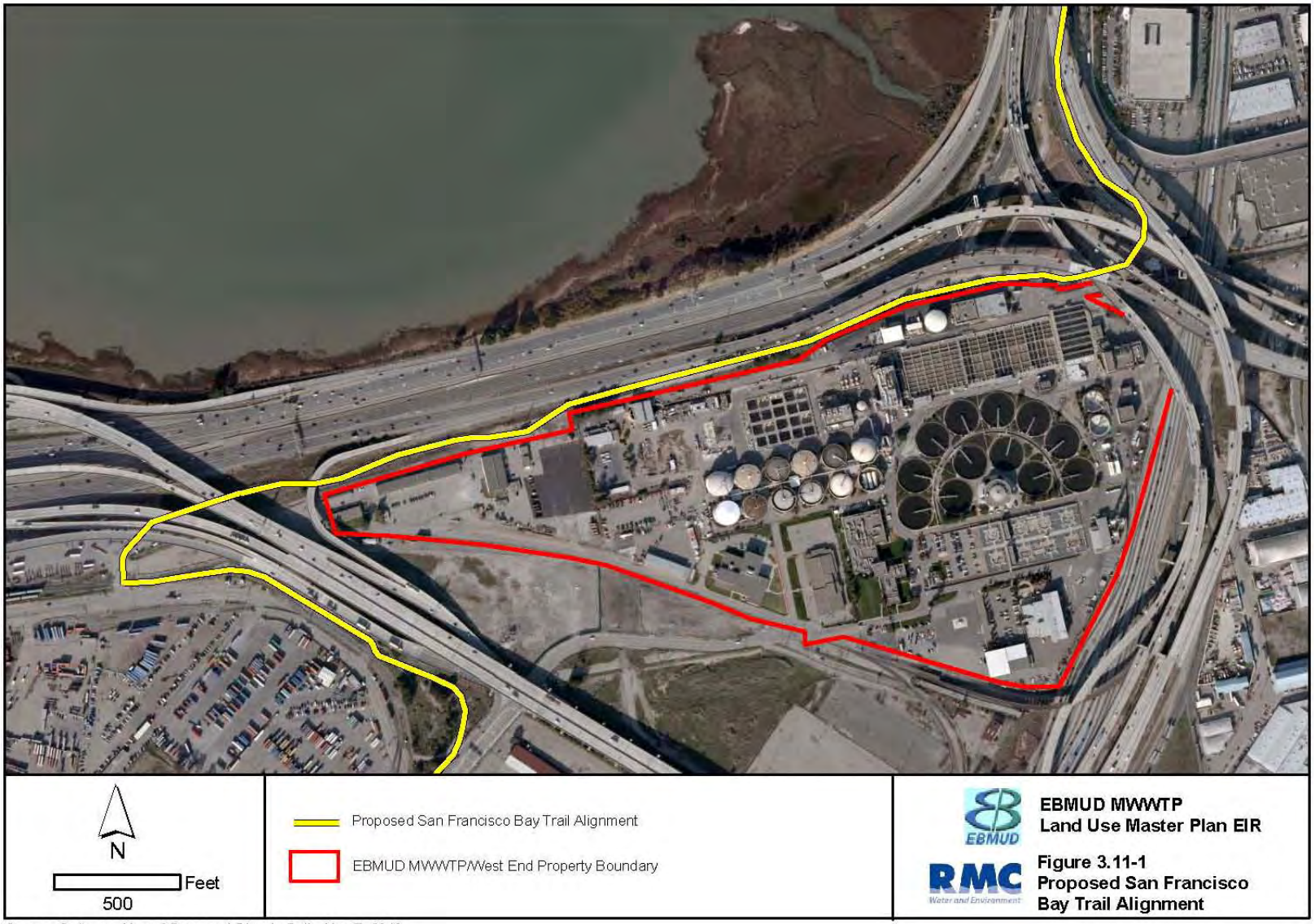
Gateway Park

The Metropolitan Transportation Commission (MTC) is leading development of Gateway Park, located on the Oakland shoreline adjacent to the new East Span of the Bay Bridge. The Gateway Park Working Group is made up of representatives from the Bay Area Toll Authority, Caltrans, BCDC, California Transportation Commission, EBRPD, City of Oakland, Port of Oakland, EBMUD, and ABAG's Bay Trail Project.

In addition to providing vistas of the Bay, Gateway Park will connect the bicycle/pedestrian path on the new East Span with the San Francisco Bay Trail and Eastshore State Park (MTC 2010). The Working Group has developed goals and target activities for the park, evaluated conceptual alternatives, held public meetings to receive input and developed a preferred project alternative. The Working Group is currently evaluating funding options and implementation approaches. Park construction is planned in coordination with completion of the Bay Bridge construction in 2013.

Environmental Justice

The California Government Code (Section 65040.12) defines environmental justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies."



Source: Caltrans, Map of Proposed Bicycle Path, May 7, 2010

Figure 3.11-1: Proposed San Francisco Bay Trail Alignment

The Equity Analysis and Environmental Justice Report for the 2001 Regional Transportation Plan (MTC 2001) defined environmental justice communities for the entire Bay Area region:

- Low-income populations were defined as communities with an annual median household income (MHI) at or below 200 percent of the U.S. Department of Health and Human Services Poverty Guidelines. A 200 percent figure was used to reflect the relatively high cost of living in the Bay Area.
- Minority populations were defined as communities with concentrations of 70 percent or greater minority populations (Asian, African American, Native American, or Hispanic origin).

The West Oakland neighborhoods surrounding the MWWTP site are considered both poverty and minority zones. The Report determined that the West and North Oakland areas contain the third-highest share of low-income residents (47.5 percent) in the region.

3.11.2 Regulatory Framework

There are no federal policies or programs regulating local land use and recreation.

State Policies and Regulations

SB 115 and SB 89

California Environmental Protection Agency (CalEPA) is charged with implementing SB 115 (Solis) and SB 89 (Escutia) to ensure "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies." SB 115 gives CalEPA broad responsibilities to include environmental justice in the design and implementation of programs, policies, and activities. SB 115 also established the Governor's Office of Planning and Research as the lead agency for implementation of environmental justice programs within the State. CalEPA developed the 2004 Inter-Agency Environmental Justice Strategy to serve as the overarching environmental justice vision document for the program.

Local Policies and Regulations

San Francisco Bay Plan

The McAteer-Petris Act of 1965 established the BCDC to prepare a San Francisco Bay Plan (first adopted in 1969) to preserve the Bay shoreline for priority uses. BCDC's jurisdiction extends over the Bay and a 100-foot shoreline band from approximately the mean high tide line. BCDC's responsibilities are focused on regulating filling and dredging in San Francisco Bay, and regulating new development within the first 100 feet inland from the Bay to ensure maximum feasible public access is provided. Although close to the San Francisco Bay, the project site is not within BCDC jurisdiction.

City of Oakland General Plan

The City of Oakland General Plan designates the MWWTP site as General Industrial/Transportation (City of Oakland 1998). This classification is intended to "recognize, preserve, and enhance areas of the City for a wide variety of businesses and related establishments that may have the potential to create off-site impacts such as noise, light/glare, truck traffic, and odor. These areas are characterized by sites with good freeway, rail, seaport, and/or airport access."

Land Use and Transportation Element

The City's General Plan, Land Use and Transportation Element (City of Oakland 1998) includes the following policies addressing industrial land uses:

- *Policy I/C4.1: Protecting Existing Activities* – Existing industrial, residential, and commercial activities and areas which are consistent with long term land use plans for the City should be protected from the intrusion of potentially incompatible land uses.

- *Policy I/C4.2: Minimizing Nuisances* – The potential for new or existing industrial or commercial uses, including seaport and airport activities, to create nuisance impacts on surrounding residential land uses should be minimized through appropriate siting and efficient implementation and enforcement of environmental and developmental controls.

The Land Use and Transportation Element also specifies the City's goal to "assure the fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development, implementation, and enforcement of laws, regulations, and policies."

Open Space, Conservation and Recreation (OSCAR) Element

The City's OSCAR Element (City of Oakland 1996) includes the following policies relative to parks and recreational facilities:

- *Policy REC-2.4: Off-Site Conflicts* – Manage park facilities and activities in a manner which minimizes negative impacts on adjacent residential, commercial, or industrial areas.
- *Policy REC-3.3: Park Location Factors* – Consider a range of factors when locating new parks or recreational facilities, including local recreational needs, projected operational and maintenance costs, budgetary constraints, surrounding land uses, citizen wishes, accessibility, the need to protect or enhance a historic resource, and site visibility.

Oakland Municipal Code

The City's Planning Code (Title 17) is intended to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of the City's residents and employees. The Code designates the MWWTP site as IG (Chapter 17.73), which implements the General Industrial/Transportation General Plan classification. This zone allows heavy industrial and manufacturing uses, transportation facilities, warehousing and distribution, and similar and related supporting uses. Uses that may inhibit such uses or the expansion thereof are prohibited. Wastewater treatment facilities – which are considered "extensive impact civic activities" (Section17.10.240) – are permitted in the IG zone with receipt of a conditional use permit.

California Government Code Section 53090 et seq., however, provides that EBMUD receives intergovernmental immunity from zoning and building laws of cities and counties for the construction or operation of its facilities. Local regulations may thus not be applicable to EBMUD, but are considered here for the purpose of determining significance of potential land use impacts.

3.11.3 Impact Analysis

Methodology for Analysis

Land use and planning impacts are assessed based upon the level of physical impact anticipated in the various environmental factors that can affect compatibility (e.g., air quality, noise, aesthetics). The analysis also includes an evaluation of the project's consistency with local and regional land use policies. Recreational impacts are assessed based on the project's level of physical impact on existing and planned parks and recreational facilities in the vicinity. Existing site conditions prior to construction of the proposed Land Use Master Plan components are compared to site conditions both during construction activities and after the project facilities are operational.

Thresholds of Significance

For the purposes of this analysis, an impact to land use and recreation would be significant if the Land Use Master Plan would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;

- Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan;
- 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;
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment;
- Impede the construction or expansion of planned recreational facilities; or
- Impede the achievement of environmental justice.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan*. There is no adopted Habitat Conservation Plan or Natural Community Conservation Plan for the study area. Therefore, there would be no impact.

Impacts and Mitigation Measures

The MWWTP Land Use Master Plan is evaluated below at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level. Because both project- and program-level impacts on Land Use and Recreation are similar, they are discussed together below.

Impact LUR-1 Physically Divide An Established Community

All Land Use Master Plan Elements

All of the proposed Land Use Master Plan elements, including the biodiesel production and food waste preprocessing facilities, would be constructed and operated within the existing MWWTP property and the newly-acquired adjacent West End property. Expansion of these resource recovery and wastewater treatment activities on the site would not physically divide the surrounding industrial and transportation-related land uses. Construction of these additional facilities would increase the density of activities on the MWWTP site, but would not physically divide an established community.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact LUR-2 Conflict With Any Applicable Land Use Plan, Policy, Or Regulation

All Land Use Master Plan Elements

The Land Use Master Plan, including the biodiesel production and food waste preprocessing facilities, would be consistent with the General Industrial/Transportation land use and IG zoning designations. Both the City's General Plan and Municipal Code acknowledge the need for "adequate public infrastructure" to serve the needs of local residents and businesses. Further, by expanding these resource recovery and wastewater treatment activities in an IG zone, they are protected from the intrusion of potentially incompatible land uses. Although EBMUD would not be required to obtain a conditional use permit from the City of Oakland for the Land Use Master Plan, the proposed facilities and improvements

are consistent with the City's plans and codes. Construction and operation of the Land Use Master Plan facilities would not conflict with applicable land use plans, policies, or regulations.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact LUR-3 Require The Construction Or Expansion Of Recreational Facilities

All Land Use Master Plan Elements

Construction and operation of the Land Use Master Plan elements, including biodiesel production and food waste preprocessing facilities, would not increase the use of existing parks and recreational facilities nor require the construction or expansion of recreational facilities. Although new technical and operational staff would join the MWWTP to operate those Master Plan facilities, the project would not include construction of housing or other structures that would increase population and associated recreational demands in the study area.

One key project element in the Land Use Master Plan would provide an exhibit and public education facility to showcase and educate the public on stewardship of San Francisco Bay. This planned 0.3-acre facility would further EBMUD's ongoing environmental stewardship effort. The facility would be located to provide convenient and safe public access. Provision of this new educational resource near the Bay would have a beneficial effect on recreational resources, particularly if sited in an area accessible to the planned San Francisco Bay Trail.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact LUR-4 Impede The Construction Or Expansion Of Planned Recreational Facilities

All Land Use Master Plan Elements

The proposed regional Bay Trail alignment follows the existing northern boundaries of the MWWTP/West End property (refer to **Figure 3.11-1**). Construction and operation of the Land Use Master Plan components, including the biodiesel production and food waste preprocessing facilities, may be seen and heard by users of the proposed regional Bay Trail system but the effects would not be significant in comparison to the existing experience at this location, currently. Pedestrian and bicycle access from the west would be provided under the elevated West Grand Avenue ramps and I-880/Bay Bridge interchange ramps along a Caltrans easement, and then follow the easement along the northern boundary of the MWWTP property. Pedestrian and bicycle access would again be provided under the elevated I-580/Bay Bridge and I-880/I-80/I-580 interchange ramps, where it would follow a Caltrans easement to the west of Shellmound Street. Construction and operation of the Land Use Master Plan elements would not impede development of the regional trail system.

Wastewater treatment and resource recovery facilities would be constructed within the existing MWWTP and West End property and would be consistent with the current character of the area. The increased density of human activity and truck/rail traffic on the site would not directly affect the recreational experience of future users of the Bay Trail. Increased truck traffic would not cross the Bay Trail expansion. Most of the existing MWWTP site is already screened from view by trees planted along the northern edge of the property, although landscaping along the northern end of the West End property is

sparse. Installation of visually attractive educational signs to inform users of the Bay Trail about operations at the MWWTP will provide a connection between the facility and the new recreational users. Additional site buffers (such as fencing, landscaping, and enclosed structures) could screen the MWWTP's industrial uses from passing recreational users.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact LUR-5 Impede The Achievement Of Environmental Justice

All Land Use Master Plan Elements

Construction and operation of the Land Use Master Plan elements, including the biodiesel production and food waste preprocessing facilities, would comply with all known environmental laws and policies applicable to wastewater treatment. In accordance with CEQA, this EIR has been prepared to consider, avoid, and/or mitigate any potential environmental impacts associated with implementation of the Land Use Master Plan.

Although the West Oakland community is considered both a poverty and minority zone, those neighborhoods are located at least 0.25 miles to the east of I-880 from the eastern boundary of the MWWTP. The plant site is located within an IG zone and is separated from sensitive uses by the highway corridor, which ensures that any potential nuisance impacts on residences from wastewater treatment activities are minimized. Construction and operation of the Land Use Master Plan components within the MWWTP site ensures that potential nuisance activities are separated from sensitive uses. Implementation of the Land Use Master Plan would not impede the achievement of environmental justice. In addition, there are potential benefits to the community associated with sale and use of biodiesel fuel by vehicles driving through West Oakland, which could reduce air quality emissions from transportation uses in the area.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

3.12 Noise

This section evaluates the potential noise impacts associated with constructing and operating the MWWTP Land Use Master Plan. It describes the existing noise environment, presents relevant noise regulations and standards, identifies sensitive noise receptors that could be affected by the project, and evaluates the potential effects of project construction and operation on these receptors.

3.12.1 Environmental Setting

The following sections describe the environmental setting for noise within the study area, which includes the project site and adjacent areas from which construction and operational noise would be audible.

Noise Descriptors

dB, DBA

Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound. The decibel (dB) scale is used to quantify sound pressure levels. Because sound can vary in amplitude by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound pressure numbers at a manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. The noise levels presented herein are expressed in terms of dBA, unless otherwise indicated. **Table 3.12-1** shows some representative noise sources and their corresponding noise levels in dBA.

Leq, CNEL, Ldn

Time variations in noise exposure are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement. Leq (24) is the steady-state energy level measured over a 24-hour period. L10 is the noise level that is exceeded 10 percent of the measurement period.

Because community receptors are more sensitive to unwanted noise during the evening and at night, an artificial dBA increment is added to quiet time noise levels, and the 24-hour noise descriptor with these added increments is called the day-night noise level (Ldn), which adds 10 dBA during the night hours (10 p.m. to 7 a.m.). Another 24-hour noise descriptor, called the Community Noise Equivalent Level (CNEL), is similar to Ldn, but adds 5 dBA during the evening hours (7 p.m. to 10 p.m.). While both add a 10 dBA penalty to all nighttime noise events between 10 p.m. and 7 a.m., Ldn does not add the evening 5 dBA penalty. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources. Ldn is the more commonly used measurement in local plans and is used below for comparison purposes.

Table 3.12-1: Typical Sound Levels Measured in the Environment

Examples of Common, Easily Recognized Sounds	Decibels (dBA)	Subjective Evaluations
Near Jet Engine	140	Deafening
Threshold of Pain	130	
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	Very Loud
Noisy Urban Street	90	
Noisy Factory	85[1]	
School Cafeteria with Untreated Surfaces	80	Loud
Gas Lawn Mower (at 100 feet away)	70[2]	
Near Freeway Auto Traffic	60[2]	Moderate
Average Office	50[2]	
Soft Radio Music in Apartment	40	Faint
Average Residence Without Stereo Playing	30	
Average Whisper	20	Very Faint
Rustle of Leaves in Wind	10	
Human Breathing	5	
Threshold of Audibility	0	

[1] Continuous exposure above 85 dBA is likely to degrade the hearing of most people.
[2] Range of speech is 50 to 70 dBA.
Source: U.S. Department of Housing and Urban Development (1985)

Characteristics of Noise

Noise attenuates as a function of the distance between the source and receptor. For sources of noise emanating from a single location (i.e., point sources), noise attenuates according to the inverse square law, i.e., at a rate of approximately 50 percent (6 dBA) for each doubling of distance. Assuming only this minimum attenuation without accounting for additional attenuation from other barriers and absorption by the ground surface, this approach underestimates attenuation in the real world and therefore, provides a "worst-case" estimate of noise at the receptor.

In general, increasing the level of steady, continuous noise by 3 dBA may be noticeable to most people with good hearing, assuming that the noise maintains the same character. A noise increase of 5 dBA is generally noticeable, and an increase of 8 to 10 dBA is often perceived as a doubling of the noise. However, changing the character of the noise is very perceptible, even if no increase in noise level occurs. For instance, the human ear may perceive the introduction of a tonal noise, even at 5 to 10 dBA below the existing ambient. Thus, tonal noise could cause annoyance to some people, even though it may have a lower noise level than the ambient.

Vibration Descriptors

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the ground. These energy waves generally dissipate with distance from the vibration source (e.g., pile driving or sheetpile driving). Because energy is lost during the transfer of energy from one particle to another, vibration is less perceptible with distance from the source. As discussed above for noise, vibration

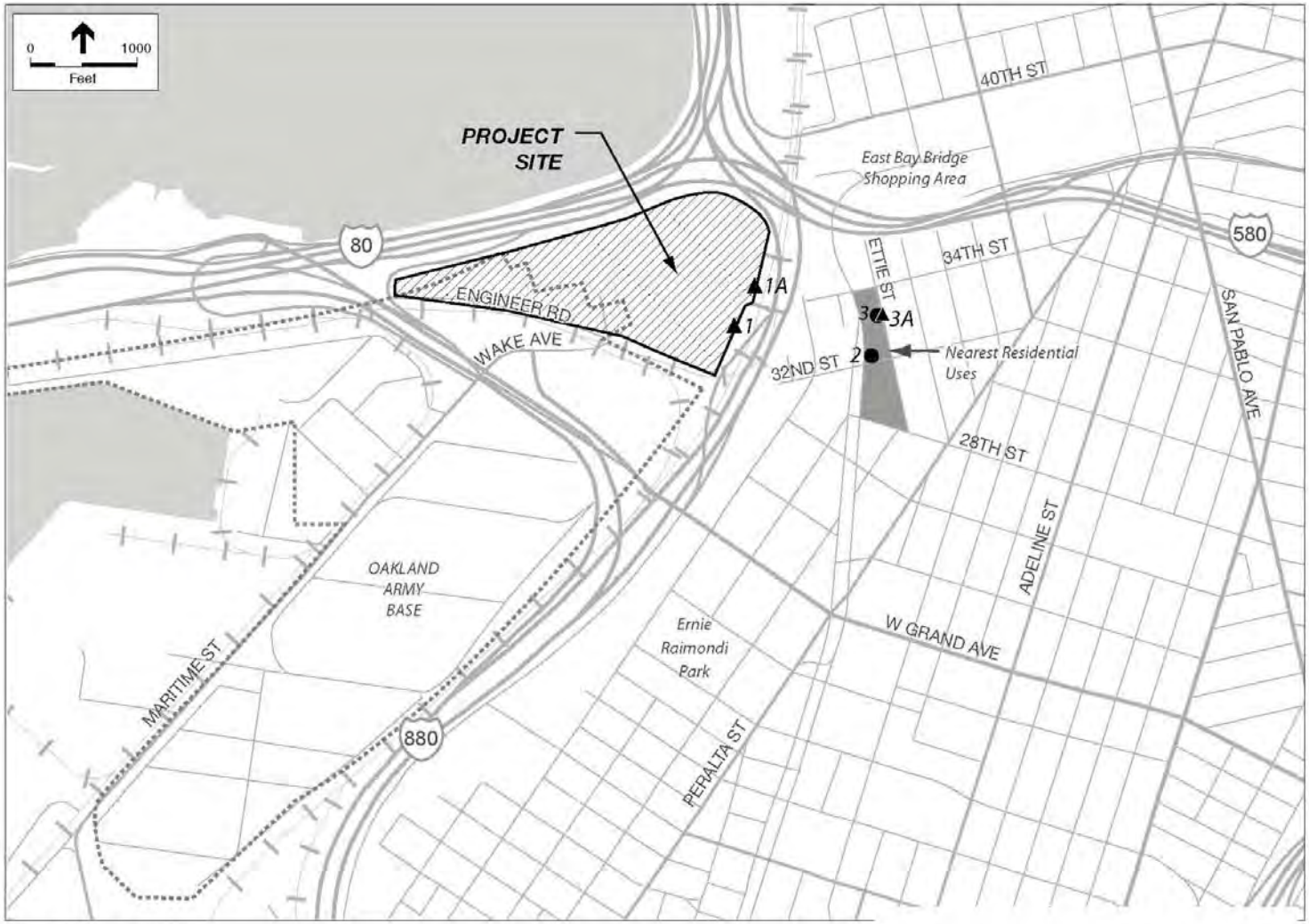
attenuates as a function of the distance between the source and receptor. For sources of vibration emanating from a single location (i.e., point sources), vibration attenuates according to the inverse square law, i.e., at a rate of approximately 50 percent for each doubling of distance from the source. As discussed above, assuming only attenuation due to distance, tends to underestimate attenuation and therefore provides a "worst-case" estimate of vibration at the receptor.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used in assessing the potential for damage to buildings and structures and is expressed in inches per second (in/sec). The responses of human receptors and structures are influenced by a combination of factors, including soil/rock type, distance, duration, and the number of perceived events. Energy transmitted through the ground as vibration can reach levels that cause structural damage; however, humans are very sensitive, and the vibration amplitudes that can be perceived by humans are well below the vibration that could potentially cause architectural or structural damage. A freight train passing at 100 feet can cause vibrations of 0.1 in/sec PPV, while a strong earthquake can produce vibration in the range of 10 in/sec PPV.

Existing Noise Environment

The project is located at the MWWTP, which is in a relatively noisy environment. The primary sources of noise are freeway traffic and railroad operations. The eastbound I-580 ramp is located immediately to the north, while the I-80/I-880 interchange southbound ramp (referred to as the I-880 southbound ramp) is located along the MWWTP's eastern boundary. The I-80/I-880 interchange northbound ramp (referred to as the I-880 northbound ramp) is also located east of the MWWTP. In addition, there are multiple Union Pacific and Burlington Northern Santa Fe (BNSF) railroad tracks abutting the eastern MWWTP boundary and various railroad switching and maintenance operations occur in this vicinity. The proximity of these noise sources to the site results in relatively high ambient noise levels.

In order to characterize the current noise environment in the project vicinity, noise measurements were taken along the eastern boundary of the MWWTP and the closest residential neighborhood to the east. These measurements were taken in late 2007 as part of the IS/MND for the EBMUD Power Generation Station Renewable Energy Expansion Project (EBMUD 2008a). Because no new operational noise sources have been added to the MWWTP since 2007, these measurements are expected to be representative of the existing noise environment. Noise measurement locations and results are presented in **Figure 3.12-1** and **Table 3.12-2**.



SOURCE: Thomas Brothers Maps

▲1 Long Term Noise Measurement Location

●2 Short Term Noise Measurement Location

Figure 3.12-1: Noise Measurement Locations

Table 3.12-2: Summary of Noise Measurement Results (dBA)

Time	Location 1[1] Eastern Project Boundary	Location 1A[2] Eastern Project Boundary	Location 2[3] 32nd Street, East of Mandela Parkway	Location 3[4] Ettie Street, North of 32nd Street	Location 3A[4] Ettie Street, North of 32nd Street
12:00–1:00 a.m.	61	66 - 68	-	-	57 - 67
1:00–2:00 a.m.	65	65 - 70	-	-	56 - 68
2:00–3:00 a.m.	62	66 - 71	-	-	55 - 59
3:00–4:00 a.m.	64	64 - 70	-	-	54 - 59
4:00–5:00 a.m.	65	66 - 71	-	-	53 - 61
5:00–6:00 a.m.	66	65 - 69	54 - 64[5]	53 - 63[5]	53 - 63
6:00–7:00 a.m.	66	67 - 70	-	-	55 - 64
7:00–8:00 a.m.	70	66 - 73	-	-	57 - 65
8:00–9:00 a.m.	67	66 - 73	-	-	60 - 66
9:00–10:00 a.m.	68	66 - 70	65	-	59 - 63
10:00–11:00 a.m.	72	67 - 71	-	-	59 - 63
11:00 a.m.–12:00 p.m.	68	66 - 68	-	-	60 - 65
12:00–1:00 p.m.	70	67 - 69	-	-	60 - 66
1:00–2:00 p.m.	68	67 - 71	-	-	63 - 67
2:00–3:00 p.m.	68	68 - 70	-	64	60 - 64
3:00–4:00 p.m.	65	68 - 68	-	-	60 - 63
4:00–5:00 p.m.	64	67 - 72	-	-	61 - 64
5:00–6:00 p.m.	65	67 - 71	-	-	60 - 64
6:00–7:00 p.m.	65	67 - 71	-	-	60 - 64
7:00–8:00 p.m.	65	67 - 68	-	-	60 - 64
8:00–9:00 p.m.	65	69 - 73	-	-	60 - 63
9:00–10:00 p.m.	64	66 - 72	60	59	59 - 62
10:00–11:00 p.m.	66	66 - 67	-	-	58 - 62
11:00 p.m.–12:00 a.m.	67	66 - 69	-	-	57 - 63
Day Leq (7 a.m. - 7 p.m.)	68	67 - 71	61 - 65[6]	60 - 64	60 - 64
Evening Leq (7 p.m. - 10 p.m.)	65	67 - 71	61 - 64[6]	60 - 63	60 - 63
Night Leq (10 p.m. - 7 a.m.)	65	65 - 70	56 - 65[6]	55 - 64	55 - 64
Ldn	**72**	**72 - 76**	**64 - 71[6]**	**63 - 70**	**63 - 70**

NOTES: A 24-hour measurement was taken by Orion Environmental Associates on Wednesday, September 12 from midnight to midnight at Location 1. Fifteen-minute measurements were taken at Locations 2 and 3 on Wednesday, September 12, 2007 (concurrent with the 24-hour measurement). Both sets of measurements were made using a Quest SoundPro DL sound level meter. Multi-day noise measurements were conducted from December 12 to 17, 2007 at Locations 1A and 3A, with repeat short-term measurements conducted at Locations 2 and 3. These measurements were made using Larson-Davis 812 Type I sound level meters.

1 Location 1 is on the eastern project boundary, approximately 110 feet west of the Union Pacific Railroad tracks centerline (eight tracks wide), 115 feet west of the elevated I-880 freeway southbound ramp, and 315 feet west of the elevated I-880 freeway northbound ramp.

2 Location 1A is similarly located on the eastern project boundary. The range of values indicates the minimum and maximum measurements during this time period over the 6 day monitoring period.

3 Location 2 is just north of 32nd Street, approximately 130 feet east of the Mandela Parkway, 900 feet east of the elevated I-880 freeway northbound ramp, and 1,100 feet east of the Union Pacific Railroad tracks centerline. This location is comparable to the backyard environments of the homes on the west side of Ettie – See Locations 3 and 3A.

4 Location 3 and Location 3A are on the west side of Ettie Street, approximately 230 feet east of Mandela Parkway, 800 feet east of the elevated I-880 freeway northbound ramp, and 1,000 feet east of the Union Pacific Railroad tracks centerline. This area is somewhat shielded from traffic noise by the buildings on the west side of Ettie. These locations are essentially the same, acoustically.

5 The 54 dBA (Leq) represents the minimum nighttime ambient noise level at the closest receiving property line (west property line) of the closest residential receptors (early Sunday morning), while the top of the range (64 dBA, Leq) represents the environment more typical during the week. The 53 dBA (Leq) represents the minimum nighttime ambient noise level at the farthest property line of these receptors (east property line).

6 Leq and Ldn noise levels at Location 2 is estimated based on the 1 dBA difference between the simultaneous measurements at Locations 3/3A and 2.

Leq = steady-state energy level representing the acoustical energy of a given measurement; Ldn = day-night noise level that adds a 10-dBA penalty to all nighttime noise events between 10 p.m. and 7 a.m.

Source: Orion Environmental Associates (2008)

Noise levels at the eastern boundary of the MWWTP were measured at 72 to 76 dBA (Ldn) with daytime and evening levels ranging between 65 and 71 dBA (Leq). Noise measurements indicate that ambient noise levels at the closest residential receptors to the east (east of Mandela Parkway near 32nd Street) currently range between 63 and 71 dBA (Ldn) with daytime and evening levels ranging between 60 and 65 dBA (Leq, 7 a.m. to 10 p.m.) and nighttime levels ranging between 55 and 65 dBA (Leq, 10 p.m. to 7 a.m.).

The Subaru Lot and Baldwin Yard are located contiguous to the MWWTP southern boundary. It is expected that existing ambient noise levels along the southern property boundary, near the Subaru Lot and Baldwin Yard would be similar to the 67 to 71 dBA (Leq) daytime noise level that was measured at the eastern MWWTP boundary.

Noise-Sensitive Land Uses

Certain land uses, such as residences, schools, childcare centers, churches, hospitals, and nursing homes, are generally more sensitive to noise impacts. The only sensitive noise receptors in the project vicinity are residential uses. The closest residential uses are located east of Mandela Parkway on the west side of Ettie Street (north of 32nd Street) with additional residential uses further south (between 28th and 32nd Streets). These residences are located a minimum of approximately 1,200 feet from the eastern MWWTP Land Use Master Plan boundary, 3,000 feet from the proposed food waste preprocessing facility site, and 3,600 feet from the proposed biodiesel production facility site.

3.12.2 Regulatory Framework

There are no federal or State standards, policies, or regulations related to noise that apply to this project.

Local Policies and Regulations

At the local level, noise is addressed through the implementation of General Plan policies, including noise and land use compatibility guidelines, and through enforcement of noise ordinances. General Plan policies provide guidelines for determining whether a noise environment is appropriate for a proposed or planned land use. Noise ordinances regulate sources (such as mechanical equipment and amplified sounds), as well as prescribe hours of heavy equipment operation (such as for construction). CEQA requires that environmental analyses consider local noise ordinances and standards in determining the significance of noise impacts. However, California Government Code Section 53090 et seq. provides that EBMUD receives intergovernmental immunity from zoning and building laws of cities and counties for the construction or operation of its facilities. Local regulations may thus not be applicable to EBMUD, but are considered here for the purpose of determining significance of potential noise impacts.

City of Oakland General Plan

The City of Oakland General Plan, Noise Element (2005) contains a Noise-Land Use Compatibility Matrix. For utilities, this matrix indicates the following:

- Noise levels up to 70 dBA (Ldn or CNEL) are Normally Acceptable;
- Noise levels between 70 and 80 dBA (Ldn or CNEL) are Conditionally Acceptable (new construction should be undertaken only after a detailed noise analysis is completed); and
- Noise levels above 80 dBA (Ldn or CNEL) are Normally Unacceptable (new construction should be generally discouraged, but if it does proceed, a detailed noise analysis must be completed).

The Noise Element also contains the following noise policies that are relevant to the project:

- *Policy 1* – Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses but also with their surrounding noise environment.

- *Policy 2* – Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.

As indicated above, existing noise levels at the MWWTP site are 72 to 76 dBA (Ldn) at the eastern property boundary. Noise levels on the MWWTP site decrease with distance from the freeways and railroad tracks located adjacent to the northern and eastern MWWTP boundaries. Therefore, the ambient noise environment in the vicinity of buildings at the MWWTP (where employees are located) is less than 75 dBA (Ldn). When compared to the City's Noise-Land Use Compatibility Matrix for utilities, such noise levels are considered "Conditionally Acceptable" because they would not exceed 80 dBA (Ldn).

Oakland Noise Ordinance

The City of Oakland Noise Ordinance (Title 17, Chapter 17.120, Section 17.120.050, Noise, of the Oakland Planning Code) specifies maximum allowable noise levels for various land uses. The first set of standards applies to temporary exposure to short- and long-term construction noise and is presented in **Table 3.12-3**.

Table 3.12-3: City of Oakland Construction Noise Standards at Receiving Property Line (dBA)[1]

Receiving Land Use	Weekdays (7 a.m.-7 p.m.)	Weekends (9 a.m.-8 p.m.)
Less than 10 days		
Residential	80	65
Commercial, Industrial	85	70
More than 10 days		
Residential	65	55
Commercial, Industrial	70	60

[1] If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.
Source: City of Oakland (2008)

The second set of standards applies to long-term noise exposure of various land uses including residential, school, child care, health care/nursing home, and public open space uses and is presented in **Table 3.12-4**. These standards would apply to construction noise occurring outside the above time limits and noise generated by project operation.

This second set of standards can also be represented with an equivalent hourly limit of 67.5 (68) dBA (Leq) between 7 a.m. and 10 p.m. and 52.5 (53) dBA (Leq) between 10 p.m. and 7 a.m. for residential and civic uses, and 73 dBA (Leq) anytime for commercial uses. However, when the existing ambient noise level exceeds these standards, the City of Oakland Noise Ordinance specifies that the noise limit be adjusted to equal the ambient noise level at the receiving property line.

Table 3.12-4: City of Oakland Operational Noise Standards at Receiving Property Line (dBA)[1]

Receiving Land Use	Cumulative Number of Minutes in a One-Hour Period[2]	Maximum Allowable Noise Level (dBA)	
		Daytime (7 a.m.-10 p.m.)	Nighttime (10 p.m.-7 a.m.)
Residential and Civic[3]	20 (L_{33})	60	45
	10 ($L_{16.7}$)	65	50
	5 ($L_{8.3}$)	70	55
	1 ($L_{1.7}$)	75	60
	0 (L_{max})	80	65
		Anytime	
Commercial	20 (L_{33})	65	
	10 ($L_{16.7}$)	70	
	5 ($L_{8.3}$)	75	
	1 ($L_{1.7}$)	80	
	0 (L_{max})	85	
Manufacturing	20 (L_{33})	70	
	10 ($L_{16.7}$)	75	
	5 ($L_{8.3}$)	80	
	1 ($L_{1.7}$)	85	
	0 (L_{max})	90	

1 These standards are reduced 5 dBA for simple tone noise, noise consisting primarily of speech or music, or recurring impact noise. If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.
2 Lx represents the noise level that is exceeded X percent of a given period. Lmax is the maximum instantaneous noise level.
3 Legal residences, schools and childcare facilities, health care or nursing home, public open space, or similarly sensitive land uses.
Source: City of Oakland (2008)

3.12.3 Impact Analysis

Methodology for Analysis

The noise impact assessment evaluates short-term (temporary) impacts associated with the construction of project facilities, as well as long-term (permanent) impacts resulting from project operation. For construction noise, the potential for impacts was assessed by considering several factors, including the proximity of project-related noise sources to sensitive receptors, typical noise levels associated with construction equipment, the potential for construction noise levels to interfere with daytime and nighttime activities, the duration that sensitive receptors would be affected, and whether proposed activities would occur outside the construction time limits specified in local ordinances. For operational noise, the potential for impacts was assessed by evaluating the noise generation potential of project facilities; if the project would introduce a new source of noise, the evaluation considered the proximity to sensitive receptors and the potential for operational noise to be consistent with noise ordinance limits at the nearest receptors.

Project grading and facility construction would cause vibration that could disturb nearby residents or cause cosmetic damage to buildings, structures, or the adjacent freeway structures. The impact assessment for vibration assesses whether construction would result in excessive groundborne vibration. The vibration impact analysis uses standard analytical methodologies, such as estimating vibration levels at sensitive receptors for a given vibration source and setback distance, comparing the estimated vibration level to recommended limits or significance thresholds, determining potentially significant impacts on nearby sensitive receptors, and providing mitigation where applicable.

Thresholds of Significance

For the purposes of this analysis, an impact to noise would be significant if the Land Use Master Plan would:

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels;
- For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels; or
- Be substantially affected by existing noise levels.

In addition to the above criteria, this EIR considers that the Land Use Master Plan would have a significant vibration impact if the project were to:

- Result in the potential for building damage, including cosmetic damage; or
- Result in the exposure of people to vibration that would have the potential for sleep disturbance or interruption of normal living activity.

To address the CEQA significance criterion regarding "substantial temporary or periodic noise increases in ambient noise levels" for the analysis of construction noise, a "substantial" noise increase is defined as an increase in noise to a level that causes interference with activities during the day and/or night. This noise impact assessment estimates noise levels associated with project construction and compares construction noise levels against a speech interference threshold where daytime construction would occur and against a sleep interference threshold if nighttime construction could occur. Temporary exposure to noise from construction activities during the daytime above these thresholds (two weeks or less) is considered to result in a less-than-significant impact. This analysis uses the following criteria to define potential "substantial" noise impacts:

- *Speech Interference*. Speech interference is an indicator of impact on typical daytime and evening activities. A speech interference threshold, in the context of impact duration and time of day, is used to identify substantial increases in noise from temporary construction activities. Noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the building exceeds 45 to 60 dBA. A typical building can reduce noise levels by 25 dBA with the windows closed (USEPA 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 70 dBA (Leq) at receptors would maintain an acceptable interior noise environment of 45 dBA. With windows open, exterior noise levels of 70 dBA (Leq) would be reduced to 55 dBA, which would still provide acceptable interior noise levels but could cause occasional speech interference effects. It should be noted that such noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction

process. For this analysis, noise levels above the 70-dBA speech interference threshold that occur on consecutive workdays for longer than two weeks[1] is considered a significant noise impact.

- *Sleep Interference*. Based on available sleep criteria data, an interior nighttime level of 35 dBA is considered acceptable (USEPA 1974). Assuming a 25-dBA reduction with the windows closed, an exterior noise level of 60 dBA at receptors would maintain an acceptable interior noise environment of 35 dBA. Since a 15-dBA reduction would occur with windows open, an exterior noise level of 50 dBA (Leq) would be required to maintain an acceptable interior noise environment of 35 dBA. If any construction work were to occur during the nighttime hours, residential receptors located to the east could be adversely affected.

To address the CEQA significance criterion regarding "noise levels in excess of standards established in the local general plan or noise ordinance," this EIR compares project-related noise levels to the standards in the City of Oakland Noise Ordinance.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Expose People Residing Or Working In The Area To Excessive Noise Levels Near Airports or Airstrips* – The two airport-related significance criteria are not applicable to the MWWTP Land Use Master Plan, Food Waste Preprocessing Facility, and Biodiesel Production Facility. There are no airports or private airstrips within two miles of the project vicinity. Therefore, plan and project implementation would not result in the long-term exposure of workers to excessive airport-related noise levels, and no further discussion of these criteria is presented.
- *Be Substantially Affected by Existing Noise Levels* – The MWWTP Land Use Master Plan, Food Waste Preprocessing Facility, and Biodiesel Production Facility are utility projects and would not be affected by existing noise levels. Since the project is not a noise-sensitive land use, the last criterion would not apply to the Master Plan or these two facility projects, and no further discussion is presented.

Impacts and Mitigation Measures

This section discusses potential impacts to noise that could result from construction and operation of the Land Use Master Plan. Mitigation measures are identified where appropriate.

Impact NOI-1 Disturbance From Temporary, Construction-Related Noise Increases In Excess Of Noise Ordinance

Project-related construction activities would result in temporary noise increases at sensitive receptors located to the east of the EBMUD MWWTP. Construction noise levels would vary at any given receptor depending on the type of construction activity, construction phase, equipment type and duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor. Typical construction equipment generates noise levels ranging from about 76 to 88 dBA at a distance of 50 feet from the source, with higher levels of about 86 to 98 dBA for certain types of earthmoving and impact equipment (e.g., jack hammers, pavement breakers, rock drills). Pile drivers can generate maximum noise levels of approximately 101 dBA at 50 feet. The rate of attenuation or reduction

[1] Since construction would occur during warm weather (summer and fall), a maximum duration of two weeks at a time is applied for closed windows (needed to maintain an interior noise environment that allows for normal conversation), since residents without air conditioning would need to open windows for ventilation during warm weather.

is about 6 dBA for every doubling of distance from a point source. **Table 3.12-5** lists noise levels for typical construction equipment at 100 feet from the noise source.

Table 3.12-5. Construction Equipment Noise at Closest Residential Receptors (dBA)

Equipment	Reference Noise Level at 50 Feet	Noise Level at 1,200 Feet from Eastern MWWTP Boundary	Noise Level at 3,000 Feet from Food Waste Pre-Processing Site	Noise Level at 3,600 Feet from Biodiesel Production Site	Noise Ordinance Daytime Weekday/ Weekend Limit[1]
Earthmoving					
Loaders, Graders, Excavators, Dozers	85	57	49	NA	65/59
Backhoes	80	52	44	42	65/59
Trucks	88	**60**	52	50	65/59
Materials Handling					
Concrete Mixers	85	57	49	47	65/59
Concrete Pumps	82	54	46	44	65/59
Cranes	83	55	47	45	65/59
Compactor, Paver	83	55	47	45	65/59
Stationary					
Pumps	76	48	40	38	65/59
Generators	81	53	NA	NA	65/59
Compressors	81	53	NA	NA	65/59
Impact					
Pile Drivers-Impact	101	**73**	NA	**63**	65[2]/59
Pile Drivers-Sonic	96	**68**	NA	58	65[2]/59
Jack Hammers	88	**60**	NA	NA	65/59
Pneumatic Tools	86	58	NA	NA	65/59
Other					
Saws	78	50	45	43	65/59
Vibrators	76	48	43	41	65/59

NOTES: Noise levels in ***bold italics*** exceed the weekday and weekend noise ordinance limits, while noise levels in **bold** exceed the weekend noise ordinance limit only. Estimated noise levels are considered to be worst case because they do not account for intervening buildings or barriers that would reduce noise levels.

[1] This noise ordinance daytime limit applies to residential uses on weekdays (7 a.m. to 7 p.m.) / weekends (9 a.m. to 8 p.m.) when construction activities occur for more than 10 days. Since daytime weekend noise was measured to exceed the 55-dBA weekend limit specified in the noise ordinance, this limit was increased to 59 dBA, which is the lowest average weekend noise level measured between 9 a.m. and 8 p.m. (see Table 3.12-2). For commercial uses, the ordinance noise limit is 5 dBA higher: 70 dBA on weekdays and 60 on weekends.

[2] If pile drivers or rock drills are required and are operated for less than 10 days, the noise ordinance daytime limit increases to 80 dBA on weekdays and 65 dBA on weekends at residential uses, 85 dBA on weekdays and 70 dBA on weekends at commercial uses.

Source: U.S. Federal Transit Administration (2006); U.S. Environmental Protection Agency (1971)

For construction noise, a "substantial" noise increase is defined as short-term interference with activities during the day and night. One indicator that construction noise could interfere with daytime activities would be speech interference, and an indicator that construction noise could interfere with nighttime activities would be sleep interference. The threshold used to determine the significance of construction-related noise increases during the daytime and evening hours (7 a.m. to 10 p.m.) would be the 70-dBA speech interference threshold. While no nighttime construction is specifically proposed at this time, the

significance threshold for construction-related noise increases during the nighttime hours (10 p.m. to 7 a.m.) would be the 50-dBA sleep interference threshold.

Another threshold used to determine significance is consistency with the City of Oakland Noise Ordinance construction time and noise limits. Since most if not all facility construction would occur for longer than 10 days, the ordinance noise limit is 65 dBA (Leq) during the day (7 a.m. to 7 p.m.) and 54 dBA[2] (Leq) during the night (7 p.m. to 7 a.m.). EBMUD's Construction Specifications 013544-3.4 would require compliance with the City of Oakland Noise Ordinance and contractors constructing the various Master Plan projects will be responsible for taking appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other mitigations as needed to bring construction noise into compliance.

All Land Use Master Plan Elements

Construction of future facilities under the proposed Land Use Master Plan, including the biodiesel production and food waste preprocessing facilities, would temporarily increase noise levels in the project vicinity due to operation of heavy equipment. **Table 3.12-5** shows maximum equipment noise levels that would be associated with construction of proposed short- and long-term projects near the MWWTP's eastern boundary, which is approximately 1,200 feet from the closest residential receptors to the east. Short-term projects near the eastern boundary would include the IPS odor control and primary sedimentation tank odor control projects. Long-term projects near the eastern boundary include the secondary treatment upgrades and new secondary clarifiers. Construction of other short- and long-term Master Plan projects located farther west on the MWWTP property (Short-term: solids dewatering building odor control, security station, food waste processing facility, food waste preprocessing facility, and biodiesel production facility. Long-term: public education facility, ultraviolet disinfection, filter feed pump station, and new digesters) would be farther from the closest residential receptors and, therefore, construction-related noise levels associated with these projects would generate lower noise levels than those listed in this table.

As indicated in **Table 3.12-5**, daytime (7 a.m. to 7 p.m.) construction activities would not exceed the Noise Ordinance weekday noise limit except if pile drivers or rock drills are operated for longer than 10 days. If pile driving or rock drilling occurs for fewer than 10 days, associated noise would not exceed the Noise Ordinance weekday noise limit. Since construction noise would meet daytime noise limits at the closest residential receptors, and construction activities are anticipated to be restricted to weekdays and the daytime hours specified in the Noise Ordinance, short-term noise impacts due to construction of Master Plan projects would be *less than significant* with three possible exceptions:

1. If pile drivers are operated longer than 10 days during construction of any of the Master Plan projects, construction-related noise increases would exceed the Noise Ordinance noise limit and would be a potentially significant impact.
2. If construction activities occur on weekends, operation of trucks, jackhammers, and pile drivers would have the potential to exceed the weekend noise limit, and this would also be a potentially significant impact.
3. If multiple construction projects were to overlap and pile driving activities also overlapped, the combined noise impact could also be potentially significant.

[2] Ambient nighttime noise levels in the project area are slightly higher than the Oakland Noise Ordinance nighttime noise limit of 53 dBA (Leq). Therefore, the nighttime limit is based on the lowest hourly Leq noise level measured at the eastern facility boundary, then adjusted to reflect the limit at the property boundary of the closest receiving residential receptor based on measurements taken at the closest residential uses.

EBMUD's Construction Specifications will require contractors to take appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other mitigations, as needed to bring construction noise into compliance with the City of Oakland Noise Ordinance. Therefore, measures such as those specified in **Mitigation Measure NOI-1** should be employed to meet ordinance limits (per EBMUD Construction Specifications 013544-3.4, see *Chapter 2, Project Description, Section 2.6, Environmental Commitments*), and reduce these potentially significant impacts to a less-than-significant level.

If construction constraints are posed by a particular Master Plan project that requires construction to occur during the evening and nighttime hours (7 p.m. to 7 a.m.), these activities would have to meet the Noise Ordinance nighttime noise limit of 54 dBA (Leq, weekdays or weekends). As indicated in **Table 3.12-5**, estimated noise levels at 1,200 feet would have the potential to exceed the 54-dBA nighttime noise limit,[3] particularly if pile drivers are operated. The potential to exceed the nighttime noise limit would depend on the location of the construction project and the types of construction equipment that would be operated during the night. EBMUD's Construction Specifications will require contractors to take appropriate measures as needed to bring construction noise into compliance. Therefore, measures such as those specified in **Mitigation Measure NOI-1** should be employed to meet the 54-dBA nighttime ordinance limit (per EBMUD Construction Specifications 013544-3.4), and would reduce these potential impacts to a less-than-significant level.

Project construction is not expected to adversely affect any potential future commercial use of the area immediately south of the MWWTP. The potential for project-related construction noise impacts would vary depending on the timing of Master Plan projects and any future development project on that property, as well as the proximity of the Master Plan projects to any future use on that site. Specifically, completion of the biodiesel production and food waste preprocessing facilities are expected by fall of 2013. Given that there are no specific projects currently proposed for the Subaru Lot and Baldwin Yard, it is unlikely that any future development on the site would be completed prior to project completion. Construction-related noise impacts on any future use of that site is expected to be less than significant given the high ambient noise levels on that site, the higher Noise Ordinance noise limits for commercial uses (5 dBA higher than for residential uses), and EBMUD's commitment to comply with the City of Oakland Noise Ordinance (Construction Specification 013544-3.4). The contractor will be responsible for taking appropriate measures as needed to ensure that construction noise complies with the ordinance time and noise limits.

Truck traffic for off-hauling, equipment deliveries, and materials deliveries for all Master Plan projects is proposed to access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. Since project-related truck traffic would not occur on local streets in the project vicinity, noise increases associated with construction-related truck traffic is not expected to adversely affect any residential receptors in the project vicinity. This is considered a less-than-significant impact.

Significance Determination before Mitigation

Potentially significant in three cases: (1) if pile driving is required for any Master Plan projects and drivers are operated near the eastern project boundary (weekdays or weekends); (2) if pile drivers or rock

[3] The equivalent Oakland Noise Ordinance nighttime noise limit for receiving residential uses is 53 Leq between 10 p.m. and 7 a.m. However, since ambient noise levels at the closest residences were measured to be higher than the nighttime limit, this noise limit was adjusted to equal ambient noise levels as specified in the Oakland Planning Code Section 17.120.050 (see **Table 3.12-2**). Therefore, the nighttime standard applied at the property boundary of the closest residential receptors would be the minimum nighttime Leq at the receiving property line, or 54 Leq, respectively.

drills are operated on weekends elsewhere on the MWWTP site (including the biodiesel production facility); or (3) if multiple construction projects and pile driving activities were to overlap.

Mitigation Measures

EBMUD's Construction Specifications 013544-3.4 will require compliance with the City of Oakland Noise Ordinance and contractors will be required to take appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other mitigations as needed to bring construction noise into compliance. Measures that could be implemented to meet these requirements are outlined as follows:

Mitigation Measure NOI-1: Implement Noise Controls

EBMUD's Construction Specifications (013544-3.4) require compliance with local noise ordinances, and measures that shall be employed to meet applicable City of Oakland Noise Ordinance noise limits include the following:

- Pile driving activities and operation of other types of impact equipment such as jackhammers should be limited to the daytime hours (7 a.m. to 7 p.m. on weekdays);
- If impact pile drivers must be used near the eastern MWWTP boundary, they should not be operated for longer than 10 days to the extent feasible. If pile driving must occur for longer than 10 days near this boundary, sonic or vibratory pile drivers should be used if feasible;
- "Quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration) should be employed where feasible (where geotechnical and structural requirements allow);
- Pile driving activities with all construction projects at the MWWTP should be coordinated to ensure that these activities do not overlap;
- Best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks as necessary; and
- If any construction activities must occur during the nighttime hours (7 p.m. to 7 a.m. on weekdays, 8 p.m. to 9 a.m. on weekends), operation of noisier types of equipment should be prohibited as necessary to meet ordinance noise limits.

Significance Determination after Mitigation

Less than significant.

Impact NOI-2 Temporary Disturbance Due To Construction-Related Vibration

The Federal Transit Administration recommends a vibration threshold of 0.2 in/sec PPV for fragile buildings (Federal Transit Administration 2006) and this threshold is appropriate to apply to any construction activities occurring during the daytime hours. At or above these levels, vibration could cause cosmetic damage to fragile buildings.

Table 3.12-6 lists a variety of construction activities and vibration levels generated at 25 feet. The vibration levels in this table indicate that operation of heavy construction equipment would not generate vibration levels that could cause threshold (cosmetic) damage to fragile buildings. However, pile driving activities have the potential to generate vibration that could result in cosmetic damage to any nearby fragile structures. Vibration measurements taken for other Bay Area projects that involved pile driving through artificial fill over Bay mud (conditions that could be similar to the site) indicate vibration would

be less than 0.1 in/sec PPV at 200 feet (EBMUD 2008a). At such distances, vibration generated by pile driving activities is not expected to cause cosmetic damage to fragile structures.

Table 3.12-6: Vibration Levels for Construction Equipment

Equipment	Peak Particle Velocity (PPV) (in/sec) at 25 Feet
Pile Driver (Impact)	
Upper Range	1.518
Typical	0.644
Pile Driver (Sonic or Vibratory)	
Upper Range	0.734
Typical	0.170
Large Bulldozer	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Source: U.S. Federal Transit Administration (2006)

Biodiesel Production Facility

Pile driving would be required for construction of the biodiesel production facility, and the northern boundary of this facility site is located within 200 feet of the I-80/I-580/I-880 freeway. Depending on proximity of project-related pile to the freeway, it is possible that the 0.2 in/sec PPV threshold could be exceeded, a potentially significant vibration impact. Implementation of **Mitigation Measure NOI-2** would require any future pile driving activities associated with Master Plan projects to not exceed the 0.2 in/sec PPV threshold, which would ensure that adjacent freeway structures are not subject to cosmetic damage and reduce potential vibration impacts to a less-than-significant level.

The southern boundary of the biodiesel production facility is also located within 200 feet of the Subaru Lot and Baldwin Yard to the south, where future commercial uses could be developed. However, with completion of the biodiesel production facility project expected by fall of 2012, it is unlikely that any future development on that site would be completed prior to project completion. Therefore, project-related vibration effects are not expected to adversely affect any future use on that site.

Food Waste Preprocessing Facility

Pile driving may be required for construction of the food waste preprocessing facility, and the northern boundary of this facility site is located within 200 feet of the I-80/I-580/I-880 freeway. Depending on proximity of project-related pile to the freeway, it is possible that the 0.2 in/sec PPV threshold could be exceeded, a potentially significant vibration impact. Implementation of **Mitigation Measure NOI-2** would require any future pile driving activities associated with Master Plan projects to not exceed the 0.2 in/sec PPV threshold, which would ensure that adjacent freeway structures are not subject to cosmetic damage and reduce potential vibration impacts to a less-than-significant level.

The southern boundary of the food waste preprocessing facility is also located within 200 feet of the Subaru Lot and Baldwin Yard to the south, where future commercial uses could be developed. However, with completion of the food waste preprocessing facility expected in 2013, it is less likely that any future development on that site would be completed prior to project completion. Therefore, project-related vibration effects are not expected to adversely affect any future use on that site. If pile driving is required and piles are located within 200 feet of future commercial uses on the property to the south, construction-related vibration could exceed the 0.2 in/sec PPV threshold, a potentially significant vibration impact.

Other Land Use Master Plan Elements

Construction of other Master Plan facilities could require pile driving and sections of the I-80/I-580/I-880 freeway structures are located closer than 100 feet from some short- and long-term Master Plan project sites located along the northern and eastern MWWTP boundaries. All other off-site structures are located more than 200 feet of the MWWTP boundary.

Short-term Master Plan projects located within 200 feet of the I-80/I-580/I-880 freeway structures include the IPS odor control project. If pile driving is required for this project, construction-related vibration could exceed the 0.2 in/sec PPV threshold since this project site is located within approximately 50 feet of the I-880 freeway structure, a potentially significant vibration impact. All of the other short-term Master Plan elements (not including the biodiesel production and food waste preprocessing facilities) would be located more than 200 feet from the I-80/I-580/I-880 freeway structures and the undeveloped property to the south where future commercial uses could be developed.

Long-term Master Plan projects located within 200 feet of the I-80/I-580/I-880 freeway structures include the tertiary treatment facility (including the associated filter feed pump station) and ultraviolet disinfection projects. The fuel station relocation site could also be located within 200 feet of the I-880 freeway structure. If pile driving is required for any of these projects and piles are located within 200 feet of the I-80/I-580/I-880 freeway structures, construction-related vibration could exceed the 0.2 in/sec PPV threshold, a potentially significant vibration impact.

Long-term Master Plan projects located within 200 feet of the Subaru Lot and Baldwin Yard to the south (where future commercial uses could be developed) include the tertiary treatment facility, public education facility, and new secondary clarifiers. The R2 and Septage Receiving Station relocation site could also be located within 200 feet of the future commercial uses to the south. If pile driving is required for any of these projects and piles are located within 200 feet of future commercial uses on the property to the south, construction-related vibration could exceed the 0.2 in/sec PPV threshold, a potentially significant vibration impact.

Implementation of **Mitigation Measure NOI-2** would require any future pile driving activities associated with short- and long-term Master Plan projects to not exceed the 0.2 in/sec PPV threshold, which would ensure that adjacent freeway structures and any future commercial uses to the south are not subject to cosmetic damage and reduce potential vibration impacts to a less-than-significant level.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure NOI-2: Implement Vibration Controls

To ensure that adjacent freeway structures and future commercial structures to the south are not subject to cosmetic damage, EBMUD shall ensure that any future pile driving activities associated with Master Plan projects do not exceed the 0.2 in/sec PPV threshold at these structures. Measures that could be employed to meet this performance standard include using sonic or vibratory pile drivers where feasible or pre-drilling pile holes.

Significance Determination after Mitigation

Less than significant.

Impact NOI-3 Increases In Ambient Noise Levels Due To Operational Noise and Vibration

Implementation of the proposed Land Use Master Plan would introduce new sources of noise as new facilities are developed at the MWWTP. As presented in **Table 3.12-4**, the City of Oakland Noise Ordinance specifies noise limits for operation of project facilities. The closest noise-sensitive receptors are residential uses located east of the MWWTP. Noise Ordinance limits for these residential uses can be represented with an equivalent hourly limit of 67.5 (68) dBA (Leq) between 7 a.m. and 10 p.m. and 52.5 (53) dBA (Leq) between 10 p.m. and 7 a.m. at the property boundaries of receiving residential receptors. However, if the existing ambient noise level exceeds these standards, the Noise Ordinance specifies that the noise limit be adjusted to equal the ambient noise level at the receiving property line. The daytime ambient noise level at the nearest residential property line is estimated to be between 61 and 65 dBA (Leq), and therefore the Noise Ordinance limit of 68 dBA (Leq) would apply to daytime noise. The minimum nighttime ambient noise level determined at the nearest property boundary (between 10 p.m. and 7 a.m.) was 54 dBA (Leq) which exceeds the Noise Ordinance limit of 53 dBA (Leq). Therefore, the adjusted nighttime limit for the project is 54 dBA (Leq).

Future commercial uses are planned for the Subaru Lot and Baldwin Yard located immediately south of the MWWTP. Therefore, Noise Ordinance noise limits for commercial uses are applied to the southern property boundary. Noise Ordinance limits for commercial uses can be represented with an equivalent hourly limit of 73 dBA (Leq) anytime at the property boundaries of receiving commercial receptors.

Operational characteristics of proposed Land Use Master Plan facilities would be similar to existing facilities, and are not expected to generate vibration levels that could affect adjacent structures. Given the low vibration potential of project facilities, combined with the large setbacks from adjacent structures (most facilities are located more than 200 feet away), vibration effects associated with project operation would be less than significant and are not discussed below.

Biodiesel Production Facility

The proposed biodiesel production facility would involve operation of over 20 pumps, an esterification reactor, and various tanks to move oil materials through a series of tanks to produce biodiesel from oil and grease feedstocks. These feedstocks would be delivered to the proposed facility by truck or rail. This equipment would be located in a pre-engineered, corrugated metal building. Although noise generation characteristics of proposed process equipment would vary by size and manufacturer, the noise generation potential of this facility was estimated using standard reference noise levels for these types of equipment. Adjusting reference noise levels for building reflection and attenuation effects, as well as for distance between the noise source and closest residential receptors, noise levels generated by operation of the proposed facility were estimated and results are presented in **Table 3.12-7**.

While noise levels immediately outside the proposed facility could reach noise levels of 76 dBA (Leq), similar to the freeway noise environment in this vicinity, project-related noise levels would be substantially lower at the eastern MWWTP boundary, located 2,500 feet to the east, and the closest residential receptors to the east, located at least 3,600 feet away. While project-related noise levels are estimated to be well below the ordinance limits at 36 dBA (Leq) at the eastern MWWTP boundary and 33 dBA (Leq) at the closest residential receptors to the east, these noise estimates are conservatively high because noise attenuation effects of intervening structures have not been included in these estimates. Since the proposed facility would be located within approximately 100 feet of the southern MWTTP boundary, project-related noise levels would be higher at this boundary, and could reach 64 dBA (Leq) at this boundary. As indicated in this table, estimated noise levels at these boundaries would remain well below the applicable City of Oakland Noise Ordinance noise limits for residential and commercial uses. Therefore, operational noise increases associated with the biodiesel production facility would be less than significant, and no noise mitigation would be required. In addition, since EBMUD's Construction

Table 3.12-7: Biodiesel Production Facility Operational Noise Levels

Equipment (Inside Building Enclosure)	Number	Reference Noise Level at 25 Feet	Combined Leq	Interior Noise Reflection Factor	Building Attenuation	Leq at Building Exterior	Leq Noise Level at Eastern MWWTP Boundary (2,500 feet away)	Leq Noise Level at Closest Residential Receptor (3,600 feet away)	Noise Ordinance Day/Night Residential Limits [1]	Leq Noise Level at Southern MWWTP Boundary (100 feet away)	Noise Ordinance Day/Night Commercial Limits
Pumps	22	75	88	3	-20	71	31	28	68/54	59	73/73
Esterification Reactor	1	70	70	3	-20	53	13	10	68/54	41	73/73
Vacuum Pump	1	75	75	3	-20	58	18	15	68/54	46	73/73
Mixing Tank	1	75	75	3	-20	58	18	15	68/54	46	73/73
Methanol Pump	1	75	75	3	-20	58	18	15	68/54	46	73/73
Screw Conveyor	1	80	80	3	-20	63	23	20	68/54	51	73/73
Pumps	8	75	84	3	-20	67	27	24	68/54	55	73/73
HVAC blowers	4	80	86	3	-20	69	29	26	68/54	57	73/73
COMBINED NOISE LEVEL			**92**	3	-20	**75**	**35**	**32**	68/54	**63**	73/73

1 The equivalent Oakland Noise Ordinance noise limits for receiving residential uses are 68 dBA (Leq) between 7 a.m. and 10 p.m. and 53 dBA (Leq) between 10 p.m. and 7 a.m. However, since ambient noise levels at the closest residences were measured to be higher than this nighttime limit, the noise limit was adjusted to equal ambient noise levels as specified in the Oakland Planning Code Section 17.120.050 (see Table 3.12-2). Therefore, the nighttime standard applied at the property boundary of the closest residential receptors would be the minimum nighttime Leq at the receiving property line, or 54 dBA (Leq).

Source for Reference Noise Levels: Orion Environmental Associates (2010)

Specifications 013544-3.4 would require compliance with the City of Oakland Noise Ordinance, contractors constructing the various Master Plan projects would be required to take appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other mitigations as needed to comply with specified noise limits.

Food Waste Preprocessing Facility

The proposed food waste preprocessing facility would involve operation of stationary equipment such as trommel screens, grinders, and conveyors to perform initial sorting and grinding of food waste. Stationary equipment would be located within the food waste preprocessing building, which would help reduce noise levels associated with equipment operation. Mobile equipment (loader and excavator) would also be used inside the preprocessing building to move raw food waste to the preprocessing equipment and to transfer processed food waste to trucks for transport to the adjacent EBMUD Food Waste Facility[4] or to trucks for off-hauling to composting operations. Since all food waste receipt, processing, and loading for disposal would be done inside the building (trucks would unload and load inside), the project's noise generation potential at the MWWTP boundary would be minimized. Adjusting reference noise levels for building reflection and attenuation effects, as well as for distance between the noise source and closest residential receptors, noise levels generated by operation of the proposed facility were estimated and results are presented in **Table 3.12-8**.

As indicated in this table, noise levels immediately outside the proposed facility could reach noise levels of 72 dBA (Leq), similar to the freeway noise environment in this vicinity. However, project-related noise levels would be substantially lower at the eastern MWWTP boundary, located 2,000 feet to the east, and the closest residential receptors to the east, located at least 3,000 feet away. While noise generated by stationary equipment is estimated to be well below the ordinance limits at 34 dBA (Leq) at the eastern MWWTP boundary and 31 dBA (Leq) at the closest residential receptors to the east, these noise estimates are conservatively high because noise attenuation effects of intervening structures have not been included in these estimates.

Noise increases associated with end-dump truck traffic outside the proposed building would generate higher noise levels of 47 dBA (Leq) at the eastern MWTTP boundary and 44 dBA (Leq) at the closest residential receptors to the east. At the southern MWTTP boundary (about 450 feet away from the location where end-dump trucks would travel), noise levels would be higher, 60 dBA (Leq) when trucks are outside the building. These exterior noise levels would all remain below the applicable City of Oakland Noise Ordinance limits. Therefore, operational noise associated with the proposed food waste preprocessing facility would be less than significant.

Other Land Use Master Plan Elements

Noise generation characteristics of identified short- and long-term Land Use Master Plan projects have not yet been determined. Similar to existing MWWTP facilities, Master Plan-related facilities could operate for any duration during any given hour (day or night), and up to seven days per week. Based on noise evaluations completed for other facilities proposed at the MWWTP,[5] it is expected that operational noise levels associated with short- and long-term Master Plan projects would have the potential to exceed ordinance noise limits at the eastern or southern MWWTP boundaries or at the closest residential receptors to the east, a potentially significant impact. These other noise evaluations indicated that

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[4] While there are two other means (mechanical conveyor or pipeline) that could be employed to convey material to the EBMUD Food Waste Facility, this analysis assumes that trucks are used because they would generate the highest noise levels because they would operate outside the building.

[5] Noise evaluations have been completed for a transformer proposed at the eastern MWWTP boundary, a power generation facility proposed in the north-central part of the MWWTP, and an expansion of the food waste processing facility (EBMUD 2008a; 2009).

Table 3.12-8: Food Waste Preprocessing Facility Operational Noise Levels

Equipment	Number	Reference Noise Level at 25 Feet	Combined Leq	Interior Noise Reflection Factor	Building Attenuation	Leq at Building Exterior	Leq Noise Level at Eastern MWWTP Boundary (2,000 feet away)	Leq Noise Level at Closest Residential Receptor (3,000 feet away)	Noise Ordinance Day/Night Residential Limits [1]	Leq Noise Level at Southern MWWTP Boundary (150 feet away)	Noise Ordinance Day/Night Commercial Limits
Equipment Inside Building Enclosure											
Trommel screen with bulk feeder and collection conveyor	1	80	80	3	-20	63	25	21	68/54	47	73/73
Grinder infeed conveyor with overhead permanent magnet	1	80	80	3	-20	63	25	21	68/54	47	73/73
Food Waste Grinders	2	80	83	3	-20	66	28	24	68/54	50	73/73
Grinder Discharge Conveyors	2	80	83	3	-20	66	28	24	68/54	50	73/73
Overs Conveyor	1	80	80	3	-20	63	25	21	68/54	47	73/73
Interior Ventilation Fans	4	70	76	3	-15	64	26	22	68/54	48	73/73
COMBINED NOISE LEVEL			**89**	3	-20	**72**	**34**	**31**	68/54	**57**	73/73
Mobile Equipment Outside Building Enclosure											
Loader	2	78	81	NA	NA	NA	43	39	68/54	65	73/73
Excavator	1	78	78	NA	NA	NA	40	36	68/54	62	73/73
End-dump Trucks[2]	2	79	82	NA	NA	NA	44	40	68/54	66	73/73
COMBINED NOISE LEVEL			**85**				**47**	**44**	68/54	**70**	73/73

1 The equivalent Oakland Noise Ordinance noise limits for receiving residential uses are 68 dBA (Leq) between 7 a.m. and 10 p.m. and 53 dBA (Leq) between 10 p.m. and 7 a.m. However, since ambient noise levels at the closest residences were measured to be higher than this nighttime limit, the noise limit was adjusted to equal ambient noise levels as specified in the Oakland Planning Code Section 17.120.050 (see **Table 3.12-2**). Therefore, the nighttime standard applied at the property boundary of the closest residential receptors would be the minimum nighttime Leq at the receiving property line, or 54 dBA (Leq).

2 Reference noise level accounts for operation of motor when dump truck is lifting bed to unload (two minutes in any given hour), which is the noisiest activity associated with truck operations. These noise levels would occur adjacent to the Food Waste Facility, which is located approximately 450 feet from the southern MWWTP boundary. Otherwise, noise levels generated by end-dump trucks operations as close as 150 feet from the southern boundary would be less than the freeway-dominated ambient noise levels along this boundary, and combined noise levels would not exceed applicable City of Oakland Noise Ordinance limits for commercial uses.

Source for Reference Noise Levels: EBMUD (2010c)

appropriate design (choosing quieter equipment) and attenuation measures (using enclosures and barriers) could be implemented as necessary to meet applicable City of Oakland Noise Ordinance noise limits.

Use of quieter equipment or implementation of feasible noise controls as specified in **Mitigation Measure NOI-3** would reduce this potential impact to a less-than-significant level by ensuring that operational noise levels associated with future Master Plan projects comply with applicable ordinance daytime and nighttime noise limits.

It should be noted that the noise environment is currently dominated by vehicle and rail traffic noise sources. Because the existing noise environment already includes contributions from the EBMUD facilities and other commercial sound sources (e.g., generators at commercial businesses west of Mandela Gateway), it is not expected that new noise sources associated with Master Plan projects would be identifiable or distinct from the existing ambient noise environment.

Significance Determination before Mitigation

Less than significant for biodiesel production and food waste preprocessing facilities. Potentially significant for other Land Use Master Plan elements.

Mitigation Measures

The following measure shall be applied to all Master Plan elements:

Mitigation Measure NOI-3: Employ Noise Controls for Stationary Equipment

EBMUD shall use best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) as necessary on stationary equipment associated with all Master Plan projects in order to comply with applicable City of Oakland Noise Ordinance noise limits, adjusted to reflect ambient noise levels occurring at the time of project implementation (under 2010 conditions, the nighttime noise limit is 54 dBA [Leq] at receiving residential uses to the east and 73 dBA [Leq] at future receiving commercial uses to the south).

Significance Determination after Mitigation

Less than significant.

Impact NOI-4 Traffic-Related Noise Increases Along Truck And Rail Routes

Truck traffic generated by all Master Plan projects would access the project site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. All project-related trucks and autos would use Wake Avenue (north of West Grand Avenue) to access the MWWTP site. For vehicles traveling to and from the north or west, the I-880 and I-80 freeways would be accessed from freeway ramps on West Grand Avenue. For vehicles traveling to and from the south, either Maritime Avenue or the Frontage Road to West Grand Avenue and Wake Avenue can be used to access the MWTTP site from the I-880 freeway interchange at 7th Street. The closest residential uses to the east are located approximately 700 feet or more from the Frontage Road. Since project-related truck and worker traffic would not use local residential streets and the closest street that would be used would be the Frontage Road (south of West Grand Avenue), noise increases associated with construction-related truck traffic are not expected to directly affect any residential receptors in the project vicinity, a less-than-significant impact.

Biodiesel Production Facility

Operation of the proposed biodiesel production facility would generate average truck volumes of up to 172 trips per day (59 truck and 113 worker trip ends). As described in *Section 3.14, Transportation*, project-generated traffic would increase existing and future traffic volumes along the Frontage Road (south of West Grand Avenue) by less than 1 percent. Such a small traffic increase would result in a noise increase well below 1 dBA, and therefore, would be less than significant.

If materials to and from the biodiesel production facility were to occur by rail instead of trucks, the existing BNSF railroad tracks that extends along the south side of Engineers Road would be used to pick up and deliver materials via a spur track that would extend onto the West End property within the biodiesel production site. At present, there is an average of 1 rail operation per day on the BNSF tracks. If a rail spur is obtained, operation of the biodiesel production facility would generate two railcars per day for delivery of feedstock, three for off-take of biodiesel product, and one to two per month for delivery of other chemicals. The small number of additional rail operations along the spur track and BNSF tracks generated by these deliveries and off-takes would not significantly alter daily noise levels on the Subaru Lot and Baldwin Yard property located immediately south of the MWWTP or at the closest residential receptors to the east. The City of Oakland Noise Ordinance noise limit for future commercial uses on the property to the south of the MWWTP is 73 dBA (Leq) and it is expected that if rail operations increased to five railcars per day, that railroad-related noise levels would remain below this limit. Therefore, potential noise increases associated with increased rail operations would be less than significant.

Food Waste Preprocessing Facility

Operation of the proposed food waste preprocessing facility would generate average truck volumes of up to 170 trips per day (132 truck and 38 worker trip ends). As described in *Section 3.14, Transportation*, project-generated traffic would increase existing and future traffic volumes along Frontage Road (south of West Grand Avenue) by less than 1 percent. Such a small traffic increase would result in a noise increase well below 1 dBA, and therefore, would be less than significant.

Other Land Use Master Plan Elements

Implementation of the identified short- and long-term Land Use Master Plan projects would generate incremental average daily traffic increases of up to 46 truck trip ends per day over the next 30 years (see **Table 3.14-7**, *Section 3.14, Transportation*). Master Plan-generated traffic would increase existing and future traffic volumes along Frontage Road (south of West Grand Avenue) by less than 1 percent. Such a small traffic increase would result in noise increase well below 1 dBA and would be less than significant.

Combined Noise Increases

When the proposed biodiesel production facility, food waste preprocessing facility, and short- and long-term Land Use Master Plan projects are considered together, combined traffic increases would increase existing and future volumes along Frontage Road (south of West Grand Avenue) by approximately 1 percent. Such a small traffic increase would result in a noise increase well below 1 dBA, and therefore, would be less than significant. In addition, given the high ambient noise levels in this vicinity and high volume of traffic already occurring on freeways, freeway ramps, and Frontage Road, combined project-related traffic increases would not perceptibly increase noise levels along these roadways. As a general rule, a 25 percent increase in traffic results in a 1-dBA noise increase.

Implementation of short- and long-term Land Use Master Plan projects would result in combined noise increases along Wake Avenue, which bisects the Subaru Lot and Baldwin Yard to the south (where future commercial uses could be developed). Since there is currently no specific development proposal for this site, the effect of these noise increases on future development cannot be determined at this time, though it would be expected to be minor. However, if and when future commercial development occurs on the

Subaru Lot and Baldwin Yard, traffic noise along Wake Avenue, as well as all other surrounding roadways and freeways, will need to be considered in the environmental review for the future development.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

3.13 Public Services

This section presents the physical and regulatory setting for public services at the MWWTP site. The impact analysis considers the potential for the Land Use Master Plan to exceed the existing capacity of police and fire services.

3.13.1 Environmental Setting

The study area for the analysis of public services is the City of Oakland (City), which provides police and fire service to the project site. The following sections describe the environmental setting for public services within the study area.

Police Services

Police services are provided in the study area by the Oakland Police Department (OPD). OPD dispatches patrol officers to both emergency and non-emergency calls for service, conducts preliminary and follow-up criminal investigations, has primary traffic enforcement jurisdiction on all public roadways within the City (except freeways), maintains preventative patrols, and supports community policing efforts. Police headquarters are located at 455 7th Street, Oakland, CA.

Over 790 career peace officers are sworn to serve the City of Oakland. OPD is comprised of three police service areas that are divided into 57 police beats. The MWWTP site is within Beat 7X, Area 1 (City of Oakland 2010b). The primary law enforcement concerns within this beat are robberies, burglaries, domestic violence, and drug trafficking.

Fire Protection

Fire protection services are provided by the Oakland Fire Department (OFD), which serves the City of Oakland and has mutual response agreements with the cities of Berkeley, Piedmont, and Alameda, Alameda County and Contra Costa County Fire Departments, and the East Bay Regional Park District. In addition to fire suppression and emergency medical services (EMS), OFD conducts fire-safety inspections and plan checks of buildings and businesses, conducts vegetation-management inspections, responds to hazardous materials spills, oversees the Oakland Office of Emergency Services, and teaches basic personal fire-safety and fire prevention (City of Oakland 2004). Approximately 80 percent of calls to OFD for emergency services are medical emergencies. At least one paramedic staffs each fire station and firefighters are certified as emergency medical technicians. OFD headquarters is located at 150 Frank Ogawa Plaza, Suite 3354, Oakland, CA.

OFD operates from 25 fire stations throughout the City, employing 500 uniformed personnel. OFD's fleet includes 25 type-1 engines, four type-3 engines, seven aerial ladders, eight brush patrols, a fireboat, a heavy-rescue vehicle, two foam units, six airport rescue rigs, and four hose tenders (City of Oakland 2004). OFD has a standard response time goal of seven minutes from dispatch to time of arrival 90 percent of the time (City of Oakland 2004). Service areas within 1.5 miles of a fire station are generally served within the standard response time. Fire Station 5, located at 934 34th Street, and Fire Station 3, located at 1445 14th Street, are both situated approximately 1.0 mile from the MWWTP site, which would thus be expected to be served within OFD's standard response time for fire suppression and EMS.

3.13.2 Regulatory Framework

Federal Policies and Regulations

Hazardous Materials Worker Safety Requirements

The federal Occupational Safety and Health Administration (OSHA) is the federal agency responsible for ensuring worker safety. The federal regulations for worker safety are contained in Title 29 of the Code of Federal Regulations (CFR), as authorized in the Occupational Safety and Health Act of 1970; these

regulations provide standards for safe workplaces and work practices, including those relating to hazardous materials handling.

State Policies and Regulations

Process Safety Management

Facilities that handle more than 10,000 pounds of a flammable liquid, or specific chemicals above threshold quantities, are subject to the Process Safety Management regulations specified in Title 8 of the California Code of Regulations (CCR), Subchapter 7 Group 16 Article 10 Section 5189. In accordance with these regulations, the facility operator must conduct a hazard analysis for each process, develop written operating procedures, provide employee training, establish and implement an emergency action plan, and conduct periodic audits of the process. The operator must also inform contractor employees of all hazards related to work involving the regulated process, require implementation of safe work practices by the contractor in accordance with written operating procedures, and explain the emergency action plan. A hot work permit is required for any hot work operations (such as welding) on or near a covered process, and must document that the appropriate fire prevention and protection measures are in place prior to beginning the hot work process. The state Process Safety Management Regulations incorporate the federal Process Safety Management regulations specified in CFR Title 29 Section 1910.119.

California Fire Code

The California Fire Code, Article 80, includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following design features to reduce the potential for a release of hazardous materials that could affect public health or the environment.

The California Fire Code, Article 79, includes specific requirements for the safe storage and handling of flammable and combustible liquids. Specific requirements address fire protection; prevention and assessment of unauthorized discharges; labeling and signage; protection from sources of ignition; specifications for piping, valving, and fittings; maintenance of above ground tanks; requirements for storage vessels, vaults, and overfill protection; and requirements for dispensing, using, mixing, and handling of flammable and combustible liquids.

Hazardous Materials Worker Safety Requirements

The state regulations concerning the use of hazardous materials in the workplace are included in CCR Title 8, and include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. California Occupational Safety and Health Administration (Cal/OSHA) also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information relating to hazardous substances and their handling, and preparation of health and safety plans to protect workers. Cal/OSHA standards are generally more stringent than federal OSHA regulations.

Local Policies and Regulations

Oakland Municipal Code

The California Fire Code and amendments made by OFD are located in Chapter 15.12 of the Oakland Municipal Code. Chapter 15.04 contains the City's amendments to the California Building, Electrical, Mechanical, and Plumbing Codes, some of which impact provision of services.

Hazardous Materials Business Plan Program

In accordance with the Hazardous Materials Business Plan Program (California Health and Safety Code, Section 25500, et seq., and the related regulations in CCR Title 19 Section 2620, et seq.), businesses that use, handle, or store hazardous materials in excess of threshold quantities are required to submit a Hazardous Materials Business Plan (HMBP) in accordance with community right-to-know laws. Threshold quantities are 500 pounds for solids, 55 gallons for liquids, and 200 cubic feet for compressed gases. The HMBP allows local agencies to plan appropriately for a chemical release, fire, or other incident.

The HMBP is filed with and administered by the OFD, which ensures review by and distribution to other potentially affected agencies. The plan must be reviewed every three years to determine if any revision is needed, and must be updated within 30 days when there is a 100 percent or more increase in the quantity of previously disclosed hazardous materials, or when a facility begins storing a new hazardous material at or above threshold quantities.

3.13.3 Impact Analysis

Methodology for Analysis

Potential impacts on public services are analyzed based on the potential for the Land Use Master Plan to affect the services described above in *Section 3.13.1, Environmental Setting* during construction or operation.

Thresholds of Significance

For the purposes of this analysis, an impact to public services would be significant if the Land Use Master Plan would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police, fire, schools, parks, or other public services; or
- Result in disruption of services.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Result in Substantial Adverse Physical Impacts Associated With the Provision of New or Physically Altered Schools, Parks, or Other Public Facilities* – the improvements associated with the Land Use Master Plan would not generate substantial population growth or associated demand for new schools, parks, or other public facilities (e.g., libraries). The project thus would not generate need for new or physically altered governmental facilities to maintain performance objectives.

Impacts and Mitigation Measures

This EIR evaluates the MWWTP Land Use Master Plan at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level. Where impacts of project level and program level facilities are similar, the discussion is combined.

Impact PUB-1 Substantial Adverse Physical Impacts Associated With the Provision of Police or Fire Protection

Biodiesel Production Facility

Construction

Construction of the biodiesel production facility would have minimal effect on police or fire protection services provided by the City of Oakland. Standard construction equipment would be equipped with spark arrestors. As described in *Section 2.6.3, Environmental Commitments*, EBMUD would be required to prepare a Project Safety and Health Plan (013524-1.3(B)) and a Spill Prevention and Response Plan (013544-1.3(D)) that would detail measures to be taken to manage hazardous materials, spills, and responses. With these controls, potential impacts associated with police and fire protection services would be less than significant.

Operation

Operation of the biodiesel production facility would involve the use of chemicals such as sodium methoxide, sulfuric acid, and methanol to produce the reaction that creates biodiesel. As discussed in *Chapter 2, Project Description* and *Section 3-9, Hazards and Hazardous Materials*, the biodiesel production facility would store 12,000 gallons of methanol, 8,000 gallons of sodium methoxide, and 4,000 gallons of sulfuric acid. These chemicals could pose serious risks to the operator or to the environment, unless the proper precautions are taken for storage, process safety, handling, ventilation, and use. Methanol (a flammable, toxic alcohol) presents a serious fire risk; its vapors are heavier than air and can travel a substantial distance to find an ignition source with subsequent flashback to the processing unit or methanol storage tank. Further, operation of the biodiesel production facility would include heating and drying processes, as well as transesterification under pressure. Each of these components of the biodiesel production process would present potential fire risks and subsequent need for emergency response.

As described in *Section 3-9, Hazards and Hazardous Materials*, the use and storage of these materials would comply with California Fire Code Articles 79 and 80 (discussed in *State Policies and Regulations*). In addition, the vendor for the biodiesel production facility would file an HMBP with the OFD, Office of Emergency Services detailing hazardous materials uses at the facility and specifying emergency response procedures for chemical emergencies in accordance with City of Oakland requirements. Furthermore, the vendor for the biodiesel production facility would implement the requirements of the state Process Safety Management regulations for the storage and use of methanol. Accordingly, the facility operator would conduct a hazard analysis for the process involving the use of methanol, develop written operating procedures, provide employee training, establish and implement an emergency action plan, and conduct periodic audits of the process. Regular safety and regulatory inspections would ensure that pressurized processing units are maintained appropriately. Each facility would be equipped with fire extinguishers and other fire suppression systems as required by the Fire Marshall so potential risks would be minimized.

Operation of the biodiesel production facility would require additional precautions and emergency response planning in order to ensure safe storage, handling, and use of multiple hazardous and flammable materials. All of these precautions would be implemented in compliance with the federal, State, and local regulations described above. Given that the facility would be located within the existing MWWTP site, which is located within an urban setting and accessible to existing fire and police personnel, the project would not require any new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police or fire protection.

Food Waste Preprocessing Facility and Other Land Use Master Plan Elements

Construction

Construction of the Land Use Master Plan components, including the food waste preprocessing facility, would have minimal effect on police or fire protection services offered by the City of Oakland. Standard construction equipment would be equipped with spark arrestors. As described in *Section 2.6.3*, EBMUD would be required to prepare a Project Safety and Health Plan (013524-1.3(B)) and a Spill Prevention and Response Plan (013544-1.3(D)) that would detail measures to be taken to manage hazardous materials, spills, and responses. With these controls, potential impacts associated with police and fire protection services would be less than significant.

Operation

Because all new activities would be located at the existing MWWTP/West End property site, no substantial additional demand would be placed on the police and fire protection services offered by the City of Oakland. Operation of the food waste preprocessing facility would involve the use of standard oils and lubricants associated with operation of the hoppers, shredders, trommel screens, grinders, and conveyor belts. Operation of the remaining Land Use Master Plan components would involve the use of standard oils and lubricants, chemicals (such as coagulants and precipitants) necessary for wastewater treatment, and other flammable materials, as well as the handling of household hazardous waste disposed by local residents. Use, storage, and disposal of hazardous materials does pose a fire hazard for the MWWTP; however, this risk already exists and is managed by on-site EBMUD staff using standard chemical management techniques. MWWTP operational staff are trained and certified to manage hazardous chemicals in accordance with SWRCB requirements. Further, each facility would be required to meet hazardous material-related standards of the California Fire Code and would be equipped with fire extinguishers and other fire suppression systems as required by the Fire Marshall so potential risks would be minimized.

The Land Use Master Plan and food waste preprocessing facilities would require additional staffing to operate the new or expanded facilities. The secondary treatment upgrade, tertiary treatment facility, digester expansion, and household hazardous waste collection facility would all require additional precautions and emergency planning to ensure safe storage, handling, and use of hazardous and flammable materials. All of these precautions would be implemented in compliance with the federal, State, and local regulations described above. Because the Land Use Master Plan includes build-out of the existing MWWTP and West End property site, which are located within an urban setting and accessible to existing fire and police personnel, the project would not require any new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police or fire protection. Neither expansion of facilities nor increase in employees is expected to require new or expanded police or fire facilities.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

3.14 Transportation

This section describes the transportation and circulation conditions, including transit services and pedestrian and bicycle facilities in the vicinity of the project site, and provides an assessment of the project's potential impacts to these conditions and facilities. The analysis evaluates the traffic-related impacts of the project during both the weekday morning and evening peak hours. The analysis was based on recent traffic data collected at the MWWTP site, a review of the City of Oakland's *OAB Auto Mall Draft Supplemental EIR* (City of Oakland 2006), the Alameda County Congestion Management Agency (ACCMA) *Level of Service Monitoring Report on the Congestion Management Program Roadway Network* (ACCMA 2008), the ACCMA's *Countywide Travel Demand Model – Output Printouts* (ACCMA 2010), and information available from state and local agencies. The transportation analysis describes the operational characteristics of the existing circulation system, the circulation system needs based on future transportation demand, and summarizes the potential circulation impacts associated with the development of the project.

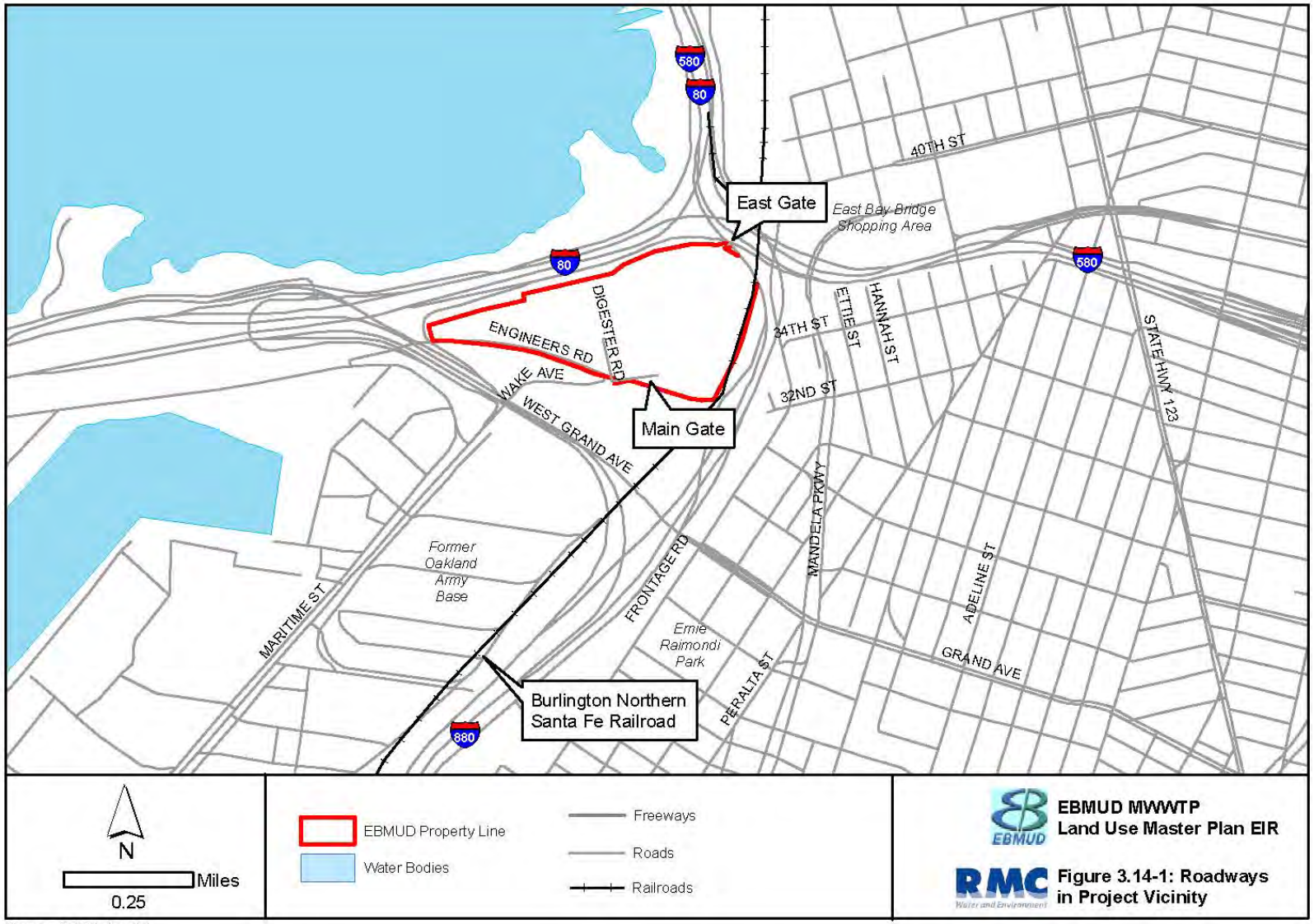
3.14.1 Environmental Setting

This section describes the street network in the study area, which includes the local roadways and freeways that serve the project site, as well as existing transit service, rail, bicycle and pedestrian facilities, and on- and off-street parking in the vicinity of the project site. Current traffic conditions at the MWWTP are described and assessed. Local roadway, freeway and freeway ramp operations are defined, and current traffic conditions in the project vicinity are summarized.

Regional Access

The MWWTP and West End property are located in an industrialized area of the western portion of the City of Oakland near the convergence of three interstate freeways (I-80, I-580, and I-880) in Alameda County (see **Figure 3.14-1**). A brief description of the regional roadway network serving the project site is provided below. Average daily traffic (ADT) volumes were obtained from Caltrans' database of Traffic Volumes on California State Highways (Caltrans 2009a).

- **Interstate 80 (I-80)** is a regional freeway extending west to San Francisco via the San Francisco-Oakland Bay Bridge (Bay Bridge), and east through Berkeley, Sacramento, and into Nevada. Four or five lanes are generally provided in each direction on this freeway in the vicinity of the project site. Project site access to and from I-80 is provided via the West Grand Avenue ramps. ADT consists of about 247,000 vehicles on the Bay Bridge and about 288,000 vehicles north of the I-580 junction.
- **Interstate 580 (I-580)** is a regional freeway located north and east of the project site, extending from U.S. 101 in Marin County to I-5 south of Tracy. I-580 joins I-80 along the segment north of the project site, splitting off farther north near Richmond. Project site access to and from I-580 is provided via I-80 and the West Grand Avenue ramps. ADT on I-580 east of the project site consists of about 216,000 vehicles.
- **Interstate 880 (I-880)** is a regional freeway located east and south of the project site, extending between I-80 in Emeryville and I-280 in San Jose. Four lanes are generally provided in each direction on this freeway near the study area. Project site access to and from I-880 is provided via ramps at Frontage Road near West Grand Avenue (to/from the north) and 7th Street (to/from the south). ADT in the vicinity of the MWWTP on I-880 consists of approximately 106,000 vehicles.



Source: CASIL (roads).

Figure 3.14-1: Roadways in Project Vicinity

- **Interstate 980 (I-980)** (see **Figure 1-1** in *Chapter 1, Introduction*) is a regional freeway east of the project site extending from I-880 to I-580 (I-980 becomes State Route 24 (SR 24)at the I-580 interchange), with three lanes in each direction. ADT on I-980 consists of approximately 75,000 vehicles at the interchange with I-880, and about 105,000 vehicles at the interchange with I-580.
- **State Route 24 (SR 24)** (see **Figure 1-1** in *Chapter 1, Introduction*) is a regional freeway between Walnut Creek to the east and Downtown Oakland to the west. SR 24 becomes I-980 at the I-580 interchange. Three lanes are generally provided in each direction. ADT on SR 24 just east of the I-580 / I-980 / SR 24 interchange consists of about 129,000 vehicles.

Freeway Conditions

The ACCMA (2008) monitors congestion on freeways in the region by measuring the average travel speed during the afternoon peak period (4:00 to 6:00 p.m). Congestion on some freeways is also monitored during the morning peak period (7:00 to 9:00 a.m). Freeway traffic conditions are then described in terms of level of service (LOS), which is a measure of driving conditions and vehicle delay, and which range from LOS A (the best) to LOS F (the poorest), generally as follows:

- LOS A, B, and C indicate conditions where traffic can move relatively freely.
- LOS D describes conditions where delay is more noticeable.
- LOS E describes conditions where traffic volumes are at, or close to, capacity, resulting in substantial delays.
- LOS F characterizes conditions where traffic demand exceeds the available capacity, with very slow speeds (stop-and-go), long delays, and average travel speeds that are less than half of the uncongested or free-flow speed.

The Congestion Management Program (CMP) statute requires that a level of service standard be established for roadways on the designated CMP network. The basic LOS standard for CMP monitoring purposes is LOS E. An exception is made for roadways that operated at LOS F in the 1991 "baseline" conditions; those roadways were "grandfathered" at LOS F, meaning they are exempt from LOS standards.

According to the ACCMA, traffic speeds of 49 miles per hour (mph) or higher on the freeway indicate LOS A through C. At LOS D, traffic operating conditions become unstable and speeds can drop as low as 41 mph. At LOS E, there are virtually no usable gaps in the traffic stream, and speeds can drop as low as 30 mph. Below 30 mph, stop-and-go traffic operations often occur, and conditions are LOS F.

As shown in **Table 3.14-1**, in 2008 during the afternoon peak hour, traffic congestion occurred on most routes leading toward and away from the major employment centers (westbound and eastbound) and was worst (LOS F, shown in bold in the table) leading away from employment centers (eastbound). During the afternoon peak hour, I-80 is congested in both directions. During this same time period, eastbound I-580 and northbound I-880 are congested. During the morning peak hour, bottlenecks occurred on many of the freeways leading to the major employment centers. Congestion regularly occurs on westbound I-80 at the I-580 split and on the approach to the Bay Bridge toll plaza. I-880 is congested northbound north of I-980.

The I-580 eastbound segment from I-80 to west of I-980, operated at LOS F during the initial ACCMA data collection effort in 1991, and is therefore exempt from LOS standards.

Table 3.14-1: Existing Freeway Operations

	Morning Peak Hour		Afternoon Peak Hour	
Freeway Segment	LOS	Speed (mph)	LOS	Speed (mph)
I-80 at the Bay Bridge				
Eastbound	B	57.8	C	54.2
Westbound	**F**	10.9	E	32.0
I-80 East of I-80/580 Split				
Eastbound	B	58.1	**F**	28.6
Westbound	**F**	4.6	E	40.4
I-580 East of I-980/SR 24				
Eastbound	A	60.0	D	41.0
Westbound	D	48.7	C	53.4
I-580 West of I-980/SR 24				
Eastbound	A	63.0	**F**	27.3
Westbound	**F**	20.7	B	56.5
I-880 South of I-980				
Northbound	D	45.7	C	54.6
Southbound	B	57.4	C	50.1
I-880 North of I-980				
Northbound	A	63.3	E	31.3
Southbound	A	65.5	A	61.1

Source: ACCMA 2008

Local Access

The following roadways provide local access to the MWWTP/West End site:

- **West Grand Avenue** is a six-lane arterial with a raised center median and numerous signalized intersections from Maritime Street in West Oakland to the Oakland north-central business district. West Grand Avenue is connected to I-80 and I-580 via ramps at Maritime Street, and to I-880 via ramps to Frontage Road at West Grand Avenue (to/from the north) and at 7th Street (to/from the south).
- **Maritime Street** is a four-lane arterial with a center two-way left-turn lane. It is heavily used by trucks and other traffic accessing the Port's Outer Harbor terminal and the Port of Oakland and Union Pacific intermodal yards. It is a primary access route to the Port of Oakland. The north end of Maritime Street connects to West Grand Avenue, where freeway ramps provide access to I-80 and I-580. To the south (near the intermodal yards), Maritime Street connects to 7th Street, which provides access to I-880 to and from the south.
- **Wake Avenue** forms the north leg of the intersection at West Grand Avenue and Maritime Street. It provides access into the MWWTP at the Main Gate and at Digester Road (a private north-south road on the MWWTP site). Wake Avenue is a two-lane, two-way collector street with a 40-foot-wide paved right-of way. The roadway crosses an at-grade Burlington Northern Santa Fe (BNSF) railroad track that runs along the southern boundary of the MWWTP south of Engineers Road**.**
- **Engineers Road** is a paved, two-way, undivided collector street with a roughly 30-foot-wide paved right-of-way that forms the southern boundary of the MWWTP site. This road forms a T-intersection with Wake Avenue. Engineers Road is currently blocked to traffic at its western terminus where it becomes Burma Road.

- **7th Street** is a four-lane arterial that provides access to the Middle Harbor marine terminals and Port View Park and serves local and cross-town traffic for West Oakland. Freeway ramps connect 7th Street to I-880 south. This street carries a substantial amount of truck traffic and is designated as a local transit arterial.

Burlington Northern Santa Fe Railroad. A BNSF railroad track extends along the south shoulder of Engineers Road and is approximately 100 feet west of the Main Gate where it crosses Wake Avenue. This track, which extends from the main tracks adjacent to I-880, is active, but lightly used and currently serves primarily as a storage area for train engines.

MWWTP Current Traffic Volumes

Daily directional traffic counts were conducted at three access roads to the MWWTP: (1) the Main Gate at Engineers Road, (2) Digester Road (a private north-south two-lane driveway), located off Engineers Road and just west of the Main Gate (refer to **Figure 3.14-1**), and (3) a gated access road located in the northeast quadrant of the site (referred to herein as the East Gate access) that provides a connection to Mandela Parkway. Digester Road is adjacent to the proposed Truck Queue Area identified in **Figure 2-1** in *Chapter 2, Project Description*. The East Gate (rear) access is used exclusively by employees. All of the high- and low-strength trucks queue along Wake Avenue while waiting to check in at the Main Gate security station and then enter the MWWTP through either Digester Road or the Main Gate. In January and February 2010, daily machine counts were collected over a two-week period, and vehicle classification counts were conducted by on-site observers during the morning and afternoon peak (commute) periods.[1] The results of the counts are described below, and presented in **Tables 3.14-2** and **3.14-3**.

Table 3.14-2 shows the current midweek ADT and morning and evening commute period peak-hour traffic volumes associated with the MWWTP operations. The peak hour for traffic at the site during the morning commute peak period (7:00 to 9:00 a.m.) occurs between 7:00 a.m. and 8:00 a.m., which is generally the same for local area background traffic. The peak hour for site traffic during the evening commute peak period (4:00 to 6:00 p.m.) occurs between 4:00 p.m. and 5:00 p.m., which is about an hour earlier than the local commute background traffic. The earlier evening peak hour for site-generated traffic is primarily due to the departure of employees during that time period.

Table 3.14-3 provides a breakdown of MWWTP vehicles by type during the time periods shown in **Table 3.14-2**. Passenger cars (employees and visitors) account for the highest percentage of daily and peak-hour traffic at the site. These vehicles can account for multiple trips during the day (trips to/from work, lunch/errand or business travel), whereas trucks typically account for one inbound trip and one outbound trip per day. Based on the classification count data, heavy trucks (e.g., transfer, tanker, and haul trucks) account for about nine percent of daily vehicle trips to and from the site. The MWWTP is accessible 24 hours per day, though the majority of daily traffic activity occurs between 6:00 a.m. and 4:00 p.m. on weekdays. Of note, the absolute peak hour of traffic activity at the site occurs before the area commute periods (i.e., weekdays in the morning between 6:00 and 7:00 a.m. [122 vehicles], and between 3:00 and 4:00 p.m. [96 vehicles]).

[1] Daily directional counts were conducted on January 26 – February 1, 2010 and February 5-11, 2010. Peak commute period classification counts were conducted on January 27, 2010 and February 10, 2010 (both days 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6:00 p.m.).

Table 3.14-2: MWWTP Existing Weekday Traffic Volumes

MWWTP Access	Average Daily Traffic (ADT)	Morning Peak Hour (7:00 a.m. – 8:00 a.m.)			Afternoon Peak Hour (4:00 p.m. – 5:00 p.m.)		
		In	Out	Total	In	Out	Total
Main Gate (Wake Avenue)	819	41	23	64	11	58	69
Digester Road (Wake Avenue)	207	4	3	7	5	6	11
East Gate (Mandela Parkway)	127	2	11	13	8	1	9
Total Vehicles	**1,152**	**47**	**37**	**84**	**24**	**65**	**89**

Traffic volumes based on average of mid-week 24-hour counts. ADT volumes represent total traffic (inbound and outbound).
Source: ESA 2010.

Table 3.14-3: MWWTP Average Weekday Vehicle Classification

Vehicle Type	Average Daily Traffic (ADT)	Percent of ADT	Morning Peak Hour	Percent of ADT	Afternoon Peak Hour	Percent of ADT
Passenger Cars	566	49%	52	4.6%	60	5.2%
2-Axle-Light Trucks	345	30%	23	2.0%	22	1.9%
3-4 Axle-Medium Trucks	67	6%	4	0.3%	3	0.2%
5-6-Axle Heavy Trucks	105	9%	5	0.4%	4	0.4%
Not Classified	69	6%	0	0%	0	0%
Totals	**1,152**	**100%**	**84**	**7.3%**	**89**	**7.7%**

2-Axle – Light trucks include large pick-up trucks and vans.
Source: ESA 2010.

Local Intersection Conditions

The operation of a roadway intersection is commonly evaluated using the LOS methodology. As described previously, LOS is a measure of driving conditions and vehicle delay, using a six-level scale ranging from LOS A (indicating free flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long queues and delays). The LOS methodology applies to both signalized and unsignalized intersections and the LOS definitions are summarized in **Table 3.14-4**. Based on the travel patterns of existing and future traffic generated at the project site, the key intersections considered for this analysis are the signalized intersections on West Grand Avenue at Maritime Street and at Frontage Road. Most of the truck traffic to and from the MWWTP property uses the freeway ramps on West Grand Avenue at Maritime Street and at Frontage Road near West Grand Avenue. A smaller percent of truck traffic travels on Frontage Road in order to access I-880 to and from the south via ramps at 7th Street. The employees at the MWWTP also use the freeway ramps at West Grand Avenue, and the East Gate access road to Mandela Parkway and West Grand Avenue east of I-880.

Table 3.14-5 shows existing peak-hour intersection operating conditions that were obtained from the City of Oakland's *OAB Auto Mall – Draft Supplemental EIR* (2006). As shown, both intersections operated at LOS C during both morning and afternoon peak hours. For the current project, peak-hour traffic operations were observed in January and February 2010 at both signalized intersections, and conditions

were found to be in the LOS C or better range for both morning and evening peak hours, corroborating the calculated LOS results shown in **Table 3.14-5**.

Table 3.14-4: Definitions For Intersection Level Of Service

Unsignalized Intersections		LOS Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Insignificant delays: No approach phase is fully utilized and no vehicle waits longer than one red indication.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Minimal delays: An occasional approach phase is fully utilized. Drivers begin to feel restricted
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Acceptable delays: Major approach phase may become fully utilized. Most drivers feel somewhat restricted.
Operations with some delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Tolerable delays: Drivers may wait through more than one red indication. Queues may develop but dissipate rapidly, without excessive delays.
Operations with high delays and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Significant delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues form upstream.
Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Excessive delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.

Source: Transportation Research Board 2000.

Table 3.14-5: Existing Morning and Afternoon Peak Hour Intersection Levels of Service

Intersection (Signalized)	Morning Peak Hour		Afternoon Peak Hour	
	LOS	Delay (Seconds)	LOS	Delay (Seconds)
West Grand Ave. / Wake Ave. – Maritime St.	C	32.4	C	33.2
West Grand Avenue / Frontage Road	C	29.8	C	28.7

Source: City of Oakland, 2006

Existing Transit Conditions

Public transit service in the study area is provided by the Alameda-Contra Costa Transit District (AC Transit) and Bay Area Rapid Transit (BART) District. The MWTTP site is not directly served by public transit.

AC Transit provides local and regional bus service. In the vicinity of the project, AC Transit Line 31 provides local service within Oakland (AC Transit, 2010). The closest Line 31 bus stop is on Peralta Street at West Grand Avenue, just under one mile east of the MWWTP. This bus route provides connections to the West Oakland and 12th Street BART Stations.

Line NL provides Transbay service from Eastmont Transit Center in Oakland to the Transbay Terminal in San Francisco; the nearest bus stop is on West Grand Avenue at Mandela Parkway, just under one mile east of the MWWTP.

The BART system provides the West Oakland area with direct links to San Francisco and the metropolitan areas of Contra Costa and Alameda counties. The West Oakland BART station is the closest to the MWWTP, approximately two miles southeast of the project site. AC Transit Line 31 connects with the West Oakland BART station; as stated above, the closest Line 31 bus stop is about one mile from the MWWTP.

Amtrak uses Union Pacific's northern route through the study area (adjacent to the eastern MWWTP boundary) to operate twelve daily round-trip "Capitol" and four daily "San Joaquin" passenger trains between the Bay Area and Sacramento and the Central Valley. The closest Amtrak station is located in Emeryville at Landregan Street near 59th Street. An Amtrak maintenance facility is located in the study area near the 7th Street/Maritime Street intersection.

Existing Bicycle and Pedestrian Conditions

Sidewalk Conditions

Sidewalks are available along the south side of West Grand Avenue and both sides of Maritime Street but not north of West Grand Avenue along Wake Avenue or Engineers Road. Pedestrian signals and painted crosswalks are provided at the West Grand Avenue intersections with Maritime Street and Frontage Road, which parallels I-880. No pedestrian activity was observed north of West Grand Avenue along Wake Avenue during visits to the project site during peak and off-peak periods.

Bicycle Conditions

Bikeways are typically classified as Class 1, Class 2, and Class 3 facilities, depending primarily on the level of separation from vehicular traffic:

- **Class 1 bicycle facility**: Also known as a bicycle path, this is a dedicated path for bicyclists and pedestrians that does not permit motorized travel. Bicycle paths create a relaxed environment for non-motorized travel and reduce the risk of potential conflict between vehicles and bicyclists. An existing Class 1 bicycle path extends west along 7th Street from Willow Street and connects Middle Harbor Shoreline Park with Portview Park.
- **Class 2 bicycle facility**: Also known as a bicycle lane, this is a portion of the roadway network that has been striped and signed for bicycle use. Implementation of Class 2 facilities requires sufficient right-of-way between the vehicle stream and the curb or curbside parking. Bicycle lanes exist on Mandela Parkway between 40th Street and 8th Street, and on 8th Street between Wood Street and Market Street.
- **Class 3 bicycle facility**: Also known as a bicycle route, this is a bikeway that primarily serves to connect other facilities and destinations in the bikeway network but provides a lower level of service than Class 1 or Class 2 bikeway facilities. These routes include signage, but do not have roadway markings or striping to indicate reserved space for the bicyclist. There are no designated bicycle routes currently in the study area.

San Francisco Bay Trail

Bicycle and pedestrian access to the waterfront has been improved in the area, but remains discontinuous and unimproved in places. Middle Harbor Road and 7th Street provide connections to the San Francisco Bay Trail shared-use path that links Portview Park and the Middle Harbor Shoreline Park. 7th Street provides segments of on-street and off-street paths to the waterfront path, and Middle Harbor Road is currently designated as an on-street unimproved path between 3rd Street and Middle Harbor Shoreline Park. Mandela Parkway provides an on-street Bay Trail link between I-580 and 7th Street in the area. The portion of the Bay Trail in the vicinity of the MWWTP, planned as part of the regional expansion of the Trail to provide continuous and improved access, is discussed under Impact TRA-6.

Existing Rail Crossings

In the immediate vicinity of the project there is one at-grade rail crossing, at the intersection of Wake Avenue and the railroad track adjacent to Engineers Road. As noted above, the BNSF track is active, but infrequently used. The crossing does not provide signage or automated arm gates.

3.14.2 Regulatory Framework

This section describes relevant policies and regulations for the project and the governing agencies. There are no federal policies and regulations that affect the project.

State Policies and Regulations

California Department of Transportation (Caltrans)

Caltrans is responsible for planning, design, construction, and maintenance of all state highways. Caltrans jurisdictional interest extends to improvements to roadways at the interchange ramps serving area freeways, including the interstate highway system. Requests for encroachment permits within the state rights-of-way would be subject to review by Caltrans staff.

California Public Utilities Commission (CPUC)

CPUC regulates privately-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. CPUC has oversight for rail crossing safety throughout the state.

Local Policies and Regulations

Alameda County Congestion Management Agency (ACCMA)

ACCMA is responsible for ensuring local government conformance with the CMP. ACCMA has review responsibility for proposed development actions expected to generate 100 or more new afternoon peak-hour trips, and reviews the adequacy of CEQA transportation impact analyses and measures proposed to mitigate significant impacts. ACCMA maintains a Countywide Transportation Model, and has approval authority for the use of any local or subarea transportation models.

3.14.3 Impact Analysis

Methodology for Analysis

This section evaluates whether construction and operation of the project would result in significant impacts related to traffic operations at local intersections and freeway segments; local pedestrian and bicycle circulation; traffic hazards due to design features; emergency access; or conflict with adopted policies, plans, or programs supporting alternative transportation. The analysis is based on recent traffic data collected at the MWWTP site, a review of the City of Oakland's *OAB Auto Mall – Draft Supplemental EIR* (2006), the *ACCMA Level of Service Monitoring Report* (2008), the ACCMA *Countywide Travel Demand Model* output (2010), and information available from state and local agencies. The project-related truck trips are calculated and described below followed by the impact discussions.

Trip Generation

Project trip generation refers to the estimate of vehicular traffic a project would add to the surrounding roadway system. The process of estimating project trip generation involved estimating the total amount of traffic entering and exiting the project driveways (average weekday) and creating separate estimates for the peak one-hour period during the morning and evening commute periods when traffic volumes on the surrounding streets are highest. The vehicle trip generation for the project was developed in part based on existing traffic activity at the MWWTP discussed in *Section 3.14.1, Environmental Setting*. All vehicles arriving and departing the MWWTP were counted and categorized by size and general type. This information was used to develop a profile of average weekday facility trips that provided inbound and outbound traffic volumes by time and vehicle type under the existing, or baseline, conditions.

The project would involve implementation in two phases (initial and build-out) of the food waste preprocessing and biodiesel production projects (evaluated at the project level), and the build-out over 30 years of the Land Use Master Plan (evaluated at the programmatic level). The initial phase of the food waste preprocessing facility project would have the capacity to receive up to 300 tons per day (tpd) of food waste, and the build-out phase would receive up to 600 tpd, maximum with an annual (365-day) average of 500 tpd (based on the expected range of 400 to 600 tpd). The initial phase (5 million gallons per day [mgy]) of the biodiesel production facility would produce up to 13,900 gallons of biodiesel per day at maximum capacity, and the build-out phase (20 mgy) would produce up to 68,000 gpd at maximum capacity with an average of 48,000 gpd. The food waste preprocessing and biodiesel production projects would share a number of characteristics with current MWWTP operations in terms of operating hours, workforce requirements, delivery schedules and product shipments. Therefore, existing MWWTP traffic levels and long-term project operational traffic such as deliveries and shipping and daily workforce requirements were used to provide a reasonable basis of future traffic conditions for the project-level analysis. This section provides the estimates of the long-term operations-related traffic levels. Short-term construction-related traffic is described as part of Impact 3.14-1 below.

Employee Vehicle Trips

The estimated new employees for the two individual projects would be as follows:

- Food Waste Preprocessing Facility: 5 workers for the initial operation and 15 workers at build-out capacity.
- Biodiesel Production Facility: 20 workers for the initial operation and 45 workers at build-out.

Based on observations of the current MWWTP employee commute activity and on traffic count data collected at the site, the following assumptions were used to calculate the daily and peak-hour project employee trips:

- All employees drive (or are driven) to the site.
- Estimated average daily passenger vehicle occupancy rate at 1.2 persons per vehicle.
- Estimated average daily employee vehicle trip ends (i.e., one-way trips) at three per vehicle.

The assumption that all employees would drive to work is roughly based on the existing daily passenger vehicle trips to and from the site and the number of existing daily employees. The project site is not served directly by transit, and bicycle and pedestrian facilities are discontinuous or absent in the vicinity of the MWWTP. No pedestrians or bicyclists were observed on West Grand Avenue near Maritime Street or north of West Grand Avenue on Wake Avenue during the weekday site visits. The vehicle occupancy rate was estimated based on weekday morning and evening peak period observations at the Main Gate. Passenger vehicle daily trips were based on daily inbound and outbound passenger car count data.

Project Truck Capacities and Vehicle Trip Generation

The different types and sizes of trucks that currently serve the MWWTP are anticipated to continue to deliver and haul materials to and from the project site. Project truck sizes and classifications are as follows:

- Tanker truck (6,000-gallon capacity) used to deliver fats and oils and to haul biodiesel product.
- Tanker truck (2,200-gallon capacity) also used to serve biodiesel facility.
- Transfer truck (20-ton capacity) used to deliver food waste.
- Direct haul (8-ton capacity) used to deliver food waste.
- Haul truck (16-ton capacity) used to haul "overs" to composting and landfill facilities.
- Transporter (25-ton capacity) used to haul ground food waste within the MWWTP site.
- Standard delivery truck (16-ton capacity) used for delivery of chemicals, equipment, supplies.

Table 3.14-6 shows the estimated daily and monthly vehicle trip ends (inbound/outbound[2]) for the biodiesel and food waste project operations based on truck trip information provided by EBMUD; the quantities of expected incoming and outgoing materials for the two projects is also shown. Under build-out conditions at maximum capacity utilization, the combined biodiesel and food waste preprocessing operations would generate about 342 net new daily trip ends. Under the initial conditions at maximum capacity utilization, the combined projects would generate about 150 net new daily trip ends. Under full build-out, employee and visitor passenger vehicle trips would account for 42 to 44 percent of total traffic when operating at maximum capacity and approximately 50 percent of the total traffic when operating under average conditions, which is comparable to current MWWTP conditions.

Project-level trip generation for weekday and morning and afternoon peak-hour operations is shown in **Table 3.14-7**, which shows trips to external to the project site. As shown, the biodiesel and food waste preprocessing projects would not be expected to generate substantial traffic volumes during the peak hours of background traffic (i.e., fewer than 30 new vehicle trips).

Program-level Vehicle Trips

Some program-level components of the Land Use Master Plan could result in increased traffic to the site over the next 30 years. Specifically, continued growth in the Resource Recovery program may result in increased truck deliveries of low- and high-strength waste. It is estimated that truck deliveries could increase by approximately 0.7 percent per year, resulting in an additional 23 trucks per day on weekdays in 30 years.

[2] Trip ends count both the inbound and outbound legs of a delivery, so one truck delivering materials would result in two trip ends.

Table 3.14-6: Summary of Biodiesel Production and Food Waste Preprocessing Project Operations and Vehicle Trip Ends

		Project Operations						Project Vehicle Trip Ends					
	Units	5 mgy [a]		20 mgy		20 mgy		5 ,mgy		20 mgy		20 mgy	
		Maximum [b]		Average [b]		Maximum [b]		Maximum		Average		Maximum	
		Month [c]	Day	Month [c]	Day	Month [c]	Day	Month	Day	Month	Day	Month	Day
Biodiesel Production Facility													
Inputs													
Fats/oils	gallons	516,970	17,000	1,459,680	48,000	2,067,880	68,000	487	16	669	22	1,034	34
Methanol	gallons	62,550	2,398	175,140	6,715	250,200	9,594	21	1	63	2	83	3
Boiler Fuel	gallons	10,425	400	29,190	1,119	41,700	1,599	3	0	9	0	14	<1
Other Chemicals – liquid	gallons	6,775	260	18,975	728	27,105	1,039	2	0	6	0	9	<1
Other Chemicals – solid	pounds	19,245	738	53,885	2,066	76,980	2,952	6	0	17	1	26	1
Outputs													
Biodiesel	gallons	422,699	13,900	1,094,760	36,000	1,690,796	55,600	122	4	394	13	608	20
Glycerin Biosolids	pounds	46,983	1,545	121,640	4,000	187,934	6,180	2	0	5	0	8	0
Calcium Bentonite	pounds	9,475	312	26,535	873	37,910	1,247	1	0	2	0	2	0
Biodiesel Truck Trip Ends								643	21	1,164	38	1,784	59
Employees			20		45		45	1,304	50	2,934	113	2,934	113
Biodiesel Total Trip Ends								1,947	71	4,098	151	4,718	172
	Units	**300 tpd [d]**		**500 tpd**		**600 tpd**		**300 tpd**		**500 tpd**		**600 tpd**	
		Maximum [b]		**Average [b]**		**Maximum [b]**		**Maximum**		**Average**		**Maximum**	
		Month [c]	**Day**	**Month [c]**	**Day**	**Month [c]**	**Day**	**Month**	**Day**	**Month**	**Day**	**Month**	**Day**
Food Waste Preprocessing Facility													
Food Waste Incoming	tons	9,123	300	15,205	500	18,246	600	1,395	46	2,326	77	2,791	92
Oversized Outbound	tons	5,291	174	8,819	290	10,644	350	607	20	1,011	33	1,213	36
Internal – MWWTP	tons	3,832	126	6,386	210	7,603	250	n/a	n/a	n/a	n/a	n/a	n/a
Food Waste Truck Trip Ends								2002	66	3,337	110	4,004	132
Employees			5		15		15	326	13	978	38	978	38
Food Waste Total Trip Ends								2,328	79	4,315	148	4,982	170
Total Project Trip Ends								**4,275**	**150**	**8,413**	**299**	**9,700**	**342**

[a] mgy = Million Gallons per Year
b Maximum = 100% of capacity operations; Average (biodiesel operations) = Roughly 70% of capacity operations; Average (food waste preprocessing operations) = 500 TPD.
[c] Biodiesel Production and Food Waste Preprocessing Month = 30 days ; Biodiesel Chemical and Boiler Fuel Delivery Month = 26 days.
[d] tpd = Tons per Day
Note: Table shows total vehicle trip ends (inbound/outbound). All persons, materials and products are assumed to be transported via passenger vehicle or truck (no rail shipments calculated).
Sources: EBMUD 2009b; ESA 2010

Table 3.14-7: Project Weekday and Peak Hour Vehicle Trip Generation

Project Phase	Biodiesel Production Facility Gallons/Day	Food Waste Preprocessing Facility Tons/Day	Daily Vehicle Trip Ends	Morning Peak Hour Trips [a]			Afternoon Peak Hour Trips [a]		
				In	Out	Total	In	Out	Total
Initial (Maximum)	13,900	300	150	6	5	11	3	9	12
Build-out (Average)	36,000	500	298	12	10	22	6	17	23
Build-out (Maximum)	55,600	600	342	14	11	25	7	19	26

[a] Peak hour percent of daily vehicle trip ends based on current MWWTP operations – Morning peak hour = 7.3 percent of daily MWWTP traffic.
Afternoon peak hour = 7.7 percent of daily traffic.
Sources: EBMUD 2009b; ESA 2010

Based on the existing temporal distribution of traffic discussed above, 46 additional trip ends would generate three new trips during the morning peak hour and 4 new trips during the afternoon peak hour.

Trip Distribution

Trucks

The distribution of project truck trips is based on EBMUD's estimates of current and future waste source truck routes and the locations of the composting facilities to which food waste overs and other organic materials or residuals not used at the project site would be hauled. The distribution for the biodiesel product is unknown, but would be market-driven and likely would access larger population centers in the Bay Area. Trucks accessing the MWWTP would not be expected to use local streets because they would access the I-80, I-880, and I-580 freeways via West Grand Avenue. The estimated project truck distribution is as follows:

- I-80 East 30 percent
- I-80 West 23 percent
- I-880 South 8 percent
- I-880 Local 10 percent
- I-580 East 4 percent
- I-580 Local 15 percent
- SR 24 10 percent

Passenger Vehicles

Employee and visitor trips would primarily use the freeway system from West Grand Avenue. Daily traffic counts taken at the project site found that 22 percent of all daily passenger vehicle trips at the MWWTP used the East Gate access (which connects to Mandela Parkway). A smaller portion of employee vehicle trips (less than five percent) would use West Grand Avenue east of I-880, and a comparable percent would travel on Frontage Road between West Grand Avenue and 7th Street to and from the I-880 south ramps.

Thresholds of Significance

For the purposes of this analysis and consistent with Appendix G of the CEQA Guidelines, the project would have a significant impact related to transportation and traffic if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. Project impacts would be considered significant for intersection operations in the City of Oakland if they caused LOS E or F conditions (or an increase in delay of four or more seconds if conditions were already at LOS E, and two or more seconds if already at LOS F), and for freeway operations if they caused LOS F conditions (or a three percent increase in volume-to-capacity ratio if LOS F conditions already exist);
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- 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;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with the reason further consideration is unnecessary and a "no impact" determination is appropriate.

- *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* – The proposed Land Use Master Plan would not be located within a two-mile range of an active airport or an established flight path and would not construct structures of sufficient height or create glare conditions that would result in a change to air traffic patterns or substantial safety risks.

Impacts and Mitigation Measures

This section discusses potential transportation-related impacts that could result from the construction and operation of the Land Use Master Plan. Mitigation measures are identified where appropriate.

Impact TRA-1 Temporary Construction-Related Increase In Traffic

Construction of the project would involve activities such as site grading, excavation, and construction and building of the biodiesel production and food waste preprocessing facilities and other improvements proposed in the Land Use Master Plan. Those activities would temporarily affect traffic flow on segments of the roadway network in the study area by increasing traffic volumes on roads that provide access to the site. Traffic-generating construction activities related to the project would consist of the daily arrival and departure of construction workers; trucks hauling equipment and materials; and trucks hauling excavated spoil from and importing new fill to the work site. This would be a temporary impact over the duration of construction. The typical crew size would consist of approximately 12 to 16 workers

Biodiesel Production Facility and Food Waste Preprocessing Facility

Construction of the proposed biodiesel production facility is expected to begin in the fall of 2011 and would require up to one year to complete. Construction staging and worker parking would occur at the western end of the proposed site. As stated in *Chapter 2, Project Description, Section 2.3.5*, construction

would require site grading to remove the existing asphalt surfaces and about 1,500 cubic yards (cy) of soil, requiring up to 75 trucks (150 one-way truck trips). About 16 workers would be employed on site during construction.

Construction of the food waste preprocessing facility is expected to begin by the spring or summer of 2012, and would take 14 to 16 months to complete. Staging and construction parking would occur adjacent to the proposed site. As stated in *Chapter 2, Project Description, Section 2.4.5*, construction may involve site grading of up to two feet on half of the area (0.75 acres) and is expected to require up to 2,500 cy of fill, which would be brought in by approximately 130 trucks (260 one-way truck trips). About 12 workers would be employed on site during construction.

Truck traffic for off-hauling, equipment deliveries, and materials deliveries would access the MWWTP site via the I-80, I-880, and I-580 freeways, exiting at West Grand Avenue and continuing to the MWWTP via Wake Avenue. During the construction period, temporary and intermittent transportation impacts would result from truck movements, as well as construction worker vehicles traveling to and from the project site. The construction-related traffic would temporarily reduce the capacities of the project area streets because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. Truck traffic that occurs during the peak commute hours (7:00 a.m. to 9:00 a.m., and 4:00 p.m. to 6:00 p.m.) could result in worse levels of service and higher delays at local intersections than during off-peak hours. Implementation of **Mitigation Measure TRA-1**, below, would ensure that construction-related traffic impacts are reduced to less-than-significant levels.

Other Land Use Master Plan Elements

Potential impacts from construction of program-level components of the Land Use Master Plan would be similar to those discussed above for the biodiesel production and food waste preprocessing facilities. Construction of Master Plan components, including the planned widening of Engineers Road (to be implemented within approximately the next 10 years), would result in temporary and intermittent transportation impacts from truck movements as well as construction worker vehicles traveling to and from the project site. The timing, duration, and magnitude of impact would depend on the specific master plan element or elements being implemented, but in any case the impact would temporary. To ensure that construction-related traffic impacts remain low during Master Plan activities, **Mitigation Measure TRA-1** shall be implemented.

Significance Determination Before Mitigation

Potentially significant.

Mitigation Measures

Measure TRA-1: Construction Traffic Management Plan

EBMUD would implement the following measures during project construction at the local intersections outside the MWWTP property:

EBMUD and the construction contractor would coordinate with the appropriate City of Oakland agencies to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion during construction of this project and other nearby projects that could be simultaneously under construction. EBMUD would develop a construction management plan for submittal to the Planning and Zoning Division, the Building Services Division, and the Transportation Services Division. The plan would include at least the following items and requirements:

a. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours and designated construction access routes;

b. Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries would occur; and

c. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem.

Significance Determination After Mitigation

Less than significant.

Impact TRA-2 Traffic Delay On Intersection Operations

Biodiesel Production Facility and Food Waste Preprocessing Facility

The initial phases of the food waste preprocessing facility (i.e., processing of up to 300 tpd food waste) and the biodiesel facility (i.e., producing up to 5 mgy biodiesel) would increase traffic at the study area intersections, but would not substantially affect access or the traffic load and capacity of the street system. As shown in **Table 3.14-7**, operation of the initial project phases (5 mgy for the biodiesel production facility and 300 tpd for the food waste preprocessing facility) would generate 11 new trips during the morning peak hour and 12 new trips during the afternoon peak hour; that level of added traffic at the study intersections would not degrade the existing acceptable LOS C conditions to worse than an acceptable LOS D. As shown in **Table 3.14-7**, operations at build-out of the biodiesel production facility and food waste preprocessing facility projects would generate a maximum of 25 to 26 peak-hour trips. That level of added peak-hour traffic at the study intersections would not be enough to cause the existing LOS C to degrade to worse than LOS D. As neither the initial phase nor the project at build-out would cause the LOS to degrade to worse than LOS D, the project impact on intersection operations would be less than significant.

Other Land Use Master Plan Elements

As discussed in the *Trip Generation* section above, increased traffic resulting from build-out of program-level components of the Land Use Master Plan over the next 30 years would add three new truck trips during the morning peak hour and four new trips under the afternoon peak hour. This level of added traffic at the study intersections by itself would not degrade the existing acceptable LOS C conditions to worse than an acceptable LOS D.

Other proposed relocated and/or improved facilities would either generate no new project trips or a small number of project trips during off-peak hours. The program-level household hazardous waste collection facility, public education facility, and land lease components would not be expected to generate measurable levels of traffic during weekday peak hours due to off-peak operating hours and low intensity land uses.

As discussed above and shown in **Table 3.14-7**, build-out of the biodiesel and food waste preprocessing projects would generate 25 morning peak-hour trips and 26 afternoon peak-hour trips. Thus, the combined project-level and program-level components of the Master Plan would result in 28 morning peak-hour trips and 30 afternoon peak-hour trips. This level of added peak-hour trips would not degrade the existing acceptable LOS C conditions to worse than an acceptable LOS D.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact TRA-3 Traffic Delay On Freeway Operations

Biodiesel Production Facility and Food Waste Preprocessing Facility

Implementation of the initial project would increase traffic on the study area freeway segments, but would not substantially affect traffic operations and levels of service of the freeway system. This is a less-than-significant impact.

As discussed in the *Trip Generation* section above and **Tables 3.14-6** and **3.14-7**, the initial project would generate 11 new trips during the morning peak hour, and 12 new trips during the afternoon peak hour. That level of added traffic on freeway segments in the project site would not cause significant impacts because, as applicable for different road segments, the service levels would remain at an acceptable LOS E or better, or the volume-to-capacity ratio would increase by less than three percent for a freeway segment that operates at LOS F without the project. As shown in **Table 3.14-7**, operations of the biodiesel production and food waste preprocessing facilities at build-out would generate up to 25 new trips during the morning peak hour and 26 new trips during the afternoon peak hour. That level of new trips would not cause significant impacts because, as applicable for different road segments, the service levels would remain at an acceptable LOS E or better, or the volume-to-capacity ratio would increase by less than three percent for a freeway segment that operates at LOS F without the project**.**

Other Land Use Master Plan Elements

Potential impacts for build-out of the program-level elements of the Master Plan would result in three new trips during the morning peak hour and four new trips during the afternoon peak hour. That level of added traffic on freeway segments in the project area would not cause significant impacts because, as applicable for different road segments, the service levels would remain at an acceptable LOS E or better, or the volume-to-capacity ratio would increase by less than three percent for a freeway segment that operates at LOS F without the project. The combined project-level and program-level elements of the Land Use Master Plan would result in 28 morning peak-hour trips and 30 afternoon peak-hour trips. That level of added traffic on freeway segments in the project site would not cause significant impacts because, as applicable for different road segments, the service levels would remain at an acceptable LOS E or better, or the volume-to-capacity ratio would increase by less than three percent for a freeway segment that operates at LOS F without the project.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact TRA-4 Operational Increase In Local Traffic

Biodiesel Production Facility and Food Waste Preprocessing Facility

Implementation of the project would increase truck traffic at the site. Operation of the biodiesel production facility would increase the daily traffic by up to 59 trucks trip ends and 113 employee vehicles trip ends per day. Operation of the food waste preprocessing facility would increase the daily trip ends by up to 132 (trucks) and 38 (employee vehicles) per day. These vehicles would drive up Wake Avenue and make a left onto Engineers Road and then turn right to enter their facility. These trucks would proceed directly to their respective facility entrance, with no need to check in at the MWWTP security station.

Other Land Use Master Plan Elements

Implementation of the Master Plan would add more truck traffic over the next 30 years. Ultimately, daily truck traffic at the site would increase by about 46 trip ends. As shown in **Figure 2-1** of *Chapter 2*,

Project Description, the short-term layout for the Master Plan includes construction of a truck queue area along the east shoulder of Digester Road and installation of a security check-in station toward the north end of this road, which would expedite the check-in process and improve truck access to the site.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact TRA-5 Impacts To Emergency Access

All Land Use Master Plan Elements

Project construction and implementation would not affect emergency access to and from the project site. Implementation of the initial project, the initial project at build-out, and the Land Use Master Plan (both short-term and long-term layouts) would maintain the official MWWTP entrance at 2020 Wake Avenue. In addition, there is a gated access road in the northeast quadrant of the site, which connects to Mandela Parkway. Currently used exclusively by employees, the East Gate access road could be used by emergency vehicles in the event of an emergency. Due to the location of the project site at the terminus of Wake Avenue, project construction and implementation would not interfere with emergency access to other sites or neighborhoods in the vicinity.

Based on the project truck trips generated as discussed in the *Trip Generation* section above and **Tables 3.14-6** and **3.14-7**, project-related traffic during the initial phase would add 11 to 12 vehicles during peak morning and afternoon hours, respectively, and at build-out the project components would contribute up to 25 to 26 vehicles during the two peak hours. Implementation of the program level components of the Land Use Master Plan would contribute an additional three to four vehicles during both the morning and afternoon peak hours, as discussed above in the *Trip Generation* section. That level of increased traffic would not substantially affect emergency access in the vicinity of the project site. Emergency access to and from the project site would be not be affected by the project. Therefore, the project impact on emergency access would be less than significant.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact TRA-6 Conflicts With Alternative Transportation

All Land Use Master Plan Elements

As discussed in *Section 3.14-1, Environmental Setting*, current employees use private vehicles to access the site. Due to the distance of the site from the nearest bus stops and BART station, these systems are not likely to be used by project employees. Therefore, the project would not generate additional public transit ridership.

The San Francisco Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. To date, about 290 miles of the Bay Trail have been completed (San Francisco Bay Trail Project 2010). Planning for this project is being overseen by the Association for Bay Area Governments (ABAG) in collaboration with Caltrans, East Bay Regional Park District (EBRPD), Metropolitan Transportation Commission (MTC), City of Oakland, and other local agency and public groups.

The project would not conflict with the planned Caltrans Segment 2 Bikeway, which will extend the Bay Trail bike/pedestrian path along the northern boundary of the MWWTP property to ultimately reach the East Span of the San Francisco-Oakland Bay Bridge (refer to **Figure 3.11-1**). Because project construction activities potentially could coincide with the construction of the proposed Bay Trail segment along the northern boundary of the MWWTP, EBMUD would communicate and coordinate with the appropriate agencies such as ABAG and EBRPD to ensure that potential conflicts during construction of the Land Use Master Plan (including the biodiesel production and food waste preprocessing facilities) and future Bay Trail facilities in the area are identified and addressed.

Significance Determination Before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact TRA-7 Safety Hazards Due To Conflicts With Rail Transport

Biodiesel Production Facility

Implementation of the initial project may include construction of a rail spur to the EBMUD site so that both delivery of materials and conveyance of biodiesel produced at the site could occur by rail. Two tracks with capacity for four rail cars each would be constructed between the biodiesel facility and the existing rail line parallel to Engineers Road. The rail spur would be approximately 150 feet in length and connect with the BNSF tracks along Engineers Road. As discussed in the setting section above, this track currently is active but only lightly used. The spur would be used by approximately five railcars per day. The rail spur would require an encroachment permit from the BNSF for work within their right-of-way.

The rail spur would cross Engineers Road to connect with the BNSF tracks. This would increase the potential for safety hazards associated with conflicts between on-road vehicles and rail traffic. **Mitigation Measure TRA-7a** would reduce this impact to a less-than-significant level. Further, the connection to the existing track itself would be designed to rail engineering operational and safety standards. As such, **Mitigation Measure TRA-7b** would assure that the connection of the spur to the main line met engineering standards.

As described in *Chapter 2, Project Description*, the use of five railcars per day for biodiesel production facility feedstock and biodiesel product would replace approximately 19 trucks per day that would otherwise deliver these materials. Delivery of one or two railcars per month of other chemicals used in the biodiesel production would replace one or two truck trips per day. Therefore, use of the proposed railroad as an alternative to trucking for some of the project shipping would to some extent reduce project impacts on area roadways.

Food Waste Preprocessing Facility and Other Land Use Master Plan Elements

Although vehicles associated with the food waste preprocessing facility and other Land Use Master Plan elements could cross the rail spur, most would not need to, as they would enter the property through Digester Road or the Main Gate. In addition, if the rail spur is not constructed to serve the biodiesel production facility, there would be no conflict. However, trucks and passenger cars would continue to cross the existing rail line near the intersection of Engineers Road and Wake Avenue in order to enter the MWWTP and West End property. In order to ensure that safety is maintained at this existing railroad crossing, EBMUD will implement traffic circulation improvements within its property in order to maintain adequate sightlines for drivers to see rail traffic approaching the crossing. Improvements, such as those shown in the short- and long-term layouts (**Figures 2-1 and 2-2**), would achieve adequate sightlines by making the rail crossing occur at a less acute angle relative to the existing alignment of Engineers Road and make this impact less than significant.

Significance Determination Before Mitigation

Potentially significant for biodiesel production facility. Less than significant for food waste preprocessing facility and other Land Use Master Plan elements.

Mitigation Measures

Measure TRA-7a: Railroad Crossing Safety for New Rail Spur

EBMUD shall install pavement markings and warning signs along Engineers Road where the new rail spur would cross to enter the internal driveway for the biodiesel production facility. Pavement markings and warning signs shall conform to standards set forth in the *California Manual on Uniform Transportation Devices* (Caltrans 2010c).

Measure TRA-7b: Coordination with Burlington Northern Santa Fe (BNSF)

EBMUD and its rail contractor(s) shall work with BNSF during the design phase to obtain the necessary permits and construction approvals for the rail spur and connection with the existing BNSF rail line.

Significance Determination After Mitigation

Less than significant.

3.15 Utilities

This section presents the physical and regulatory setting for utilities at the MWWTP site. The impact analysis considers the potential for the Land Use Master Plan to exceed the existing capacity of wastewater, water, storm drainage, solid waste, and electrical services.

3.15.1 Environmental Setting

The following sections describe the environmental setting for utilities within the study area. The study area differs for each utility. For water supply and wastewater services the study area is the EBMUD service area. For stormwater conveyance capacity the study area includes the MWWTP, which currently accepts all stormwater drainage from the facility and the City of Oakland because stormwater flows from the West End property are currently directed to the City of Oakland stormwater collection system. For landfill capacity, the geographic scope includes the greater San Francisco Bay Area, where the project is located and disposal of waste could occur. For disruption of utilities, the study area is limited to the project vicinity, where utilities could require relocation and services could be disrupted.

Water Supply

The project site is served by existing water supplies, treatment facilities, and distribution systems operated by EBMUD. Water supply needed for MWWTP processes is provided through a combination of potable water supplied by EBMUD and recycled water generated at the MWWTP.

Water Supply

EBMUD provides potable water to approximately 1.3 million people throughout portions of Alameda and Contra Costa counties, including the City of Oakland. EBMUD obtains approximately 90 percent of its water from the Mokelumne River watershed and 10 percent from surface runoff in the protected watershed lands in the East Bay (EBMUD 2005). The water supply system consists of a network of reservoirs, aqueducts, water treatment plants, pumping plants, and distribution facilities. Raw (untreated) water from Pardee Reservoir is transported approximately 91 miles through the Pardee Tunnel, the Mokelumne Aqueducts, and the Lafayette Aqueducts to treatment plants and terminal reservoirs. EBMUD operates five terminal reservoirs within its water service area: Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro reservoirs.

Average daily water demand within the EBMUD service area was 214 mgd in 2005. The Water Supply Management Program 2040 (EBMUD 2009d) projects that water demand will increase to 221 mgd by 2020 and 229 mgd by 2030. This demand is adjusted for conservation and recycled water program savings.

Water Treatment Facilities

There are six water treatment plants in the EBMUD water supply and distribution system: Walnut Creek, San Pablo, Lafayette, Moraga, Sobrante, and Upper San Leandro. Combined, the six plants have a treatment capacity of over 375 mgd. The Orinda Water Treatment Plant (WTP) supplies water to portions of Oakland, including the project site. The Orinda WTP has the largest output of EBMUD's treatment plants, with a peak capacity of 200 mgd (EBMUD 2010a). At the treatment plant, water is subject to aeration, coagulation, flocculation, sedimentation, filtration, disinfection, ozonation, fluoridation, and corrosion control processes prior to being distributed to the public.

Wastewater

The project site is served by existing wastewater treatment facilities and collection systems operated and managed by EBMUD. Wastewater generated at the MWWTP site is treated and a portion is recycled for distribution to recycled water users, including in-plant processes.

Wastewater Treatment

EBMUD provides wastewater services to approximately 650,000 people in Alameda and Contra Costa counties. Wastewater collected by interceptors in the EBMUD service area, which includes the City of Oakland, flows to the MWWTP. The City of Oakland (and others) own and operate the collection systems, consisting of five sewer interceptors (29 miles of reinforced concrete pipes) and 15 pumping stations, which convey wastewater to the MWWTP. EBMUD owns and operates the collection system within the MWWTP. Additionally, EBMUD has two wet weather wastewater treatment facilities (WWF) in Oakland, the San Antonio Creek WWF and the Oakport WWF, as well as one in Richmond, the Point Isabel WWF.

The MWWTP provides both primary and secondary treatment of wastewater. Primary treatment involves the removal of floating materials, oil and grease, sand and silt, and organic solids sufficiently heavy to settle in water. Secondary treatment involves the biological removal of suspended and dissolved organic and chemical impurities (EBMUD 2005).

The MWWTP has a primary treatment capacity of 320 mgd and a secondary treatment capacity of 168 mgd. The dry weather design capacity is 120 mgd. The average annual daily flow into the MWWTP is approximately 65 mgd. EBMUD's wastewater service area is essentially built-out, such that flows are not expected to increase appreciably in the future.

Treated secondary effluent is disinfected, dechlorinated, and discharged through a deep-water outfall one mile off the East Bay shoreline into San Francisco Bay. A portion of the secondary effluent receives tertiary treatment and is recycled.

Water Recycling

EBMUD has been utilizing treated wastewater, or "process water," for equipment wash down, cooling water, and landscape irrigation at its MWWTP since 1971. Recycled water is suitable for activities that do not require potable water sources, such as golf courses, industrial uses, and in-plant processes. Since 2008, EBMUD has produced tertiary treated recycled waste at the MWWTP for in-plant uses and for customers in Alameda, Albany, Berkeley, Emeryville, and Oakland. During fiscal year 2009, EBMUD produced almost 9 mgd of recycled water for external customers, as well as another 6.6 mgd of process water for in-plant uses (EBMUD 2010b). EBMUD has a goal to recycle 20 mgd by 2040 (EBMUD 2009d). Incentives used by EBMUD to encourage customers to utilize recycled water include rate discounts on recycled water.

In January 2002, the City of Oakland adopted a dual plumbing ordinance, which requires new development to use recycled water provided by EBMUD and to install a dual plumbing system if recycled water is anticipated to be available. The multi-phased East Bayshore Recycled Water Project will supply up to 2.2 mgd of recycled water to portions of Alameda, Albany, Berkeley, Emeryville, and Oakland. The San Ramon Valley Recycled Water Program will serve about 2.4 mgd of recycled water to EBMUD irrigation customers in portions of Blackhawk, Danville, and San Ramon (EBMUD 2010b).

Stormwater

Stormwater runoff from facilities within the existing MWWTP site is collected and routed to the plant headworks for treatment in accordance with the existing NPDES permit for the plant. Stormwater runoff at the West End property is collected and routed to the existing City of Oakland storm drain system.

Solid Waste

Solid waste, recyclables, and yard trimmings within the City of Oakland are collected by Waste Management of Alameda County (WMAC). WMAC currently collects waste and recycling generated in EBMUD offices. These materials are taken to the Davis Street Transfer Station in San Leandro. The 53-acre Transfer Station, which has a maximum allowable capacity of 5,600 tons of waste per day, received

an average of 3,028 tons per day (tpd) in 2003 (Alameda County Waste Management Authority [ACWMA] 2003). Recovery operations at the Davis Street Transfer Station include: 1) receiving, shredding, and haulout of source-separated green waste from curbside programs and self-haul loads; and 2) processing of curbside recyclables. From the waste delivered to the site, additional materials are recovered primarily from small construction and demolition waste, paper sorting line, and clean loads of wood, dirt, and concrete.

After undergoing processing, waste from the Transfer Station is delivered to the Altamont Landfill and Resource Recovery Facility in eastern Alameda County. The landfill is a Class II facility comprising approximately 2,170 acres (480 acres of permitted landfill area). It has a permitted maximum daily disposal capacity of 11,150 tpd and maximum annual disposal of 1.6 million tons per year. Actual input averaged 7,505 tpd (ACWMA 2003). The landfill is projected to have sufficient capacity to operate until at least 2031 and potential to operate through 2071, depending on waste generation and waste reduction measures (ACWMA 2003).

Both WMAC and California Waste Solutions (CWS) provide curbside recycling within the City. Curbside recycling includes the following materials: glass, aluminum and tin, motor oil, cardboard, magazines and newsprint, and plastic. Collection is source-separated into three streams. Organic diversion is provided by WMAC for both residential yard waste and commercial food waste.

EBMUD uses hauling contracts for handling the beneficial reuse of biosolids. Currently, biosolids are hauled by contractors to either land application sites (for use as a soil amendment) or to area landfills, including Portrero Hills Landfill, Newby Island Sanitary Landfill, and the Vasco Road Sanitary Landfill, where they are used for alternative daily cover (ADC). Other wastes generated as part of the wastewater treatment process, such as the scum that is skimmed from the primary sedimentation tanks, is also handled by a contractor and disposed of at area landfills including Keller Canyon Landfill. According to the California Department of Resources Recycling and Recovery (CalRecycle), the aforementioned facilities are anticipated to have permitted capacity until 2011, 2025, 2019, and 2030 respectively. The Potrero Hills Landfill is currently undergoing efforts to obtain a revised permit for expansion of the landfill, which would potentially render the facility viable for 35 additional years.[1] **Table 3.15-1** outlines the specific permitted maximum disposal capacity, total estimated capacity used, remaining estimated capacity, and current estimated closure dates of these area landfills.

EBMUD has a process by which it approves sites for treatment and/or disposal of various types of waste products. EBMUD sends waste materials associated with construction, demolition, and various operational activities to these pre-approved landfills. There are currently 42 approved landfills in California, Nevada, Washington, Arizona, and Texas where EBMUD waste products are sent. EBMUD approves of these sites on an ongoing basis, so it is possible that additional facilities will be added to this list in the future.

The landfills that would potentially serve this project, Altamont, Potrero Hills, Newby Island, Vasco Road, Keller Canyon, and other approved landfills, are collectively referred to as “area landfills.”

[1] http://www.baaqmd.gov/Divisions/Engineering/Title-V-Permit-Programs/Title-V-Permits/Solano/A2039/Potrero-Hills-Landfill-Inc.aspx

Table 3.15-1: Examples of Area Landfills

Facility Name	Facility Location	Permitted Maximum Disposal Capacity (cubic yards)	Total Estimated Capacity Used (cubic yards)	Remaining Estimated Capacity (cubic yards)	Current Estimated Closure Date (without expansion)
Potrero Hills Landfill	Suisun City	21,500,000	7,628,000	13,872,000	2011
Newby Island Sanitary Landfill	Milpitas	50,800,000	32,525,047	18,274,953	2025
Vasco Road Sanitary Landfill	Livermore	32,970,000	23,099,296	9,870,704	2019
Keller Canyon Landfill	Pittsburg	75,018,280	11,609,870	63,408,410	2030

Sources: CalRecycle. 2000a. Active Landfills Profile for Potrero Hills Landfill.
CalRecycle. 2000b. Active Landfills Profile for Newby Island Sanitary Landfill.
CalRecycle. 2000c. Active Landfills Profile for Vasco Road Sanitary Landfill.
CalRecycle. 2000d. Active Landfills Profile for Keller Canyon Landfill.

Diversion Rate

Alameda County's countywide waste diversion goal is an ambitious 75 percent. Through expansion of both resource recovery and source reduction programs, the City of Oakland's waste diversion rate has increased from 52 percent in 2000 to 59 percent in 2006 (CIWMB 2010).

Energy

The Pacific Gas & Electric Company (PG&E) provides electricity and natural gas service to the City of Oakland. The MWWTP purchases power from the Western Area Power Administration (WAPA) that is conveyed through PG&E transmission lines. The MWWTP purchases natural gas from PG&E and sells excess power generated to PG&E. Most of Oakland's electrical power is delivered via 12-kilovolt (kV) transmission lines from PG&E Substation L. Substation L receives 155 kV and distributes power to upper downtown Oakland and West Oakland. Local electric and gas distribution lines are located within the project site. PG&E charges connection and user fees for all new development in addition to sliding rates for electrical and natural gas service based on use (City of Oakland 2008). EBMUD also operates a 6.5-megawatt (MW) capacity cogeneration plant (Power Generation Station [PGS]) at the MWWTP site, which uses biogas produced through solids digestion to provide approximately 90 percent of the power to operate the MWWTP. EBMUD is currently expanding PGS to have a combined capacity of 11 MW.

3.15.2 Regulatory Framework

Federal Policies and Regulations

National Energy Policy

The National Energy Policy was established by the National Energy Policy Development Group (NEPDG) in 2001 to help the private sector and, as appropriate, State and local governments promote dependable, affordable, and environmentally sound production and distribution of energy for the future (NEPDG 2001). Modernizing energy conservation and energy infrastructure, increasing energy supplies, increasing energy security, and protecting the environment are all goals of the policy.

State Policies and Regulations

The MWWTP is within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), which governs many of the regulations associated with water supply, wastewater, and storm drainage. RWQCBs administer regulations related to discharges under the Federal Water Pollution Control Act of 1972 as amended (the Clean Water Act [CWA]) and the Porter-Cologne Water Quality

Control Act. Additional discussion of these regulations is provided in *Section 3.10, Hydrology and Water Quality*.

California Department of Public Health

Recycled water regulations are administered by both San Francisco Bay RWQCB and the California Department of Public Health (CDPH). The regulations governing recycled water are found in a combination of sources, including the Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations (CCR). Issues related to the treatment and distribution of recycled water are generally under the permitting authority of RWQCB, while issues related to use and quality of recycled water are the responsibility of CDPH.

California Integrated Waste Management Act

The California Integrated Waste Management Act of 1989 (Assembly Bill 939) established an integrated waste management framework that consists of the following order of importance: source reduction, recycling, composting, and land disposal of solid waste. Each county is required to prepare and submit an Integrated Waste Management Plan for expected solid waste generation within the county to the California Integrated Waste Management Board (CIWMB). The Act also requires each city to prepare a Source Reduction and Recycling Element for achieving a solid waste diversion goal of 25 percent by January 1, 1995, and 50 percent by January 1, 2000. The City of Oakland met this requirement by diverting 50 percent or greater of its waste from 2000 through 2008 (CIWMB 2010).

CalRecycle (formerly California Integrated Waste Management Board)

CalRecycle governs solid waste regulations on the state level, delegating local permitting, enforcement, and inspection responsibilities to Local Enforcement Agencies (LEA). Regulations authored by CalRecycle (Title 14) were integrated with related regulations adopted by the State Water Resources Control Board (SWRCB) pertaining to landfills (Title 23, Chapter 15) to form CCR Title 27.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates Investor-Owned Utilities, including those that offer electric, natural gas, steam, and petroleum service to consumers. CPUC regulates both electric and natural gas rates and services provided by these utilities, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Natural gas regulations are found in General Orders 58, 94, 96, and 112, while electrical distribution regulations are found in General Orders 95, 128, 131, 165, and 166.

California Energy Commission

Buildings constructed after June 30, 1977 must comply with standards identified in Title 24 of the California Code of Regulations (CCR). Title 24, established by California Energy Commission (CEC) in 1978, requires the inclusion of state-of-the-art energy conservation features in building design and construction including the incorporation of specific energy conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget.

Local Policies and Regulations

Alameda County Waste Management Authority (ACWMA)

ACWMA produced the Alameda County Integrated Waste Management Plan (ACWMA 2003) which outlines regional waste management programs. The Alameda County Department of Environmental Health (ACDEH) is the LEA for solid waste regulations and has local permitting, enforcement, and inspection responsibilities. The proposed food waste preprocessing facility may be subject to a solid waste permit if it cannot operate under EBMUD's current authorization for the existing food waste

processing facility. The existing food waste facility operates under the Notification Tier, Solid Waste Information System (SWIS) No. 01-11-0299.

Alameda County Integrated Waste Management Plan – Countywide Element

The Alameda County Integrated Waste Management Plan (ACWMA 2003) is a primary tool for designing waste reduction programs that are countywide in scope and addresses the county's landfill needs in a comprehensive way. Waste reduction and disposal facilities that require Solid Waste Facility Permits must conform with the policies contained in this Plan. The Plan contains the following objectives and policies regarding waste reduction that are applicable to the proposed food waste preprocessing and existing food waste processing facilities at the MWWTP:

- *Objective 2.1* – Achieve countywide waste reduction of 75 percent by 2010.
- *Objective 2.4* – To achieve by composting, 180,000 tons of countywide diversion of food waste and contaminated paper by 2010.
- *Objective 2.5* – Avoid or limit waste reduction by technologies that convert waste into energy.
  - *Policy 2.5.1* – The Authority shall support safe transformation for separated materials, such as wood chips, if it is demonstrated that alternative markets for the material are not available.
- *Objective 2.6* – To strive to ensure that adequate markets or other beneficial uses are available for all materials recovered from the wastestream.
  - *Policy 2.6.1* – The Authority shall promote market development for recycled materials and compost.
  - *Policy 2.6.2* – The Authority shall promote contingency plans for recycled materials facilities and compost facilities in Alameda County.

City of Oakland General Plan

Land Use and Transportation Element

The City of Oakland General Plan, Land Use and Transportation Element (City of Oakland 1998b) includes the following policy addressing public infrastructure:

- *Policy I/C1.8, Locating Industrial and Commercial Area Infrastructure* – Adequate public infrastructure should be ensured within existing and proposed industrial and commercial areas to retain viable existing uses, improve the marketability of existing vacant or underutilized sites, and encourage future use and development of these areas with activities consistent with the goals of this Plan.

Oakland Municipal Code

Chapter 15.34 of the Oakland Municipal Code requires building permit applications for new construction, demolition, or alterations to be accompanied by an approved Waste Reduction and Recycling Plan (WRRP). The WRRP is required to document the ways that the applicant will reduce the quantity of construction and demolition debris disposed at landfills by 65 percent or more.

3.15.3 Impact Analysis

Methodology for Analysis

Potential impacts on utilities are analyzed based on the potential for the Land Use Master Plan to affect the facilities described above in *Section 3.15.1, Environmental Setting* during construction or operation.

Thresholds of Significance

For the purposes of this analysis, an impact to utilities would be significant if the Land Use Master Plan would:

- Exceed wastewater treatment requirements of the applicable RWQCB;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, thus requiring new or expanded entitlements;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;
- Not comply with federal, state, and local statutes and regulations related to solid waste; or
- Result in disruption of utilities.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Land Use Master Plan are identified below along with a supporting rationale as to why further consideration is unnecessary and a no impact determination is appropriate.

- *Result in Substantial Adverse Physical Impacts Associated With the Provision of New or Physically Altered Schools, Parks, or Other Public Facilities* – the improvements associated with the Land Use Master Plan would not generate substantial population growth or associated demand for new schools, parks, or other public facilities (e.g., libraries). The project thus would not generate need for new or physically altered governmental facilities to maintain performance objectives.

Impacts and Mitigation Measures

The MWWTP Land Use Master Plan is evaluated below at a programmatic level of detail, while the biodiesel production facility and food waste preprocessing facility are both evaluated at a project level. Where impacts of project level and program level facilities are similar, the discussion is combined.

Impact UTIL-1 Exceed Wastewater Treatment Requirements Of The San Francisco Bay Regional Water Quality Control Board

Biodiesel Production Facility and Food Waste Preprocessing Facility

Construction

Construction of the biodiesel production and food waste preprocessing facilities would have minimal effect on the MWWTP's NPDES permit. In accordance with EBMUD's construction specifications, construction wash water would be contained and disposed of in accordance with a Water Control and Disposal Plan (013544-1.3(B)). As such, the potential for exceedance of wastewater treatment requirements is less than significant.

Operation

The quantity of wastewater produced at the biodiesel production facility and treated by MWWTP is estimated at 7,000 gpd. Process water, which may contain trace elements of oil, methanol (50 to 150 ppm), and sulfuric acid, and wastewater removed from the waste cooking oil feedstock during the pretreatment process would be sent through the sanitary sewer to the MWWTP headworks. Wastewater produced at the food waste preprocessing facility and treated by MWWTP would include wash water

used to clean the equipment. Altogether, this is a very small increase in wastewater, approximately 0.01 percent of the average dry weather flow, and can be accommodated within the MWWTP's permitted treatment capacity. This contribution of additional volume to the wastewater treatment process would not cause a violation of EBMUD's NPDES permit. As noted above, stormwater from the West End property has the potential to exceed wet weather plant capacity, but **Mitigation Measure HYD-3** would ensure that the storm drain system and treatment capacity are not exceeded during peak flow conditions. Because the discharge would be accommodated within existing MWWTP capacity and would meet discharge requirements from RWQCB, impacts related to the wastewater treatment would be less than significant.

Other Land Use Master Plan Elements

Construction and operation of the Land Use Master Plan would capitalize on the existing capacity of the MWWTP site to grow successful resource recovery programs and expand treatment capabilities as required by new regulations. The Master Plan elements would result in minor increases in wastewater treatment flows within the plant due to additional wash water, process water, sewer flows, and, in the long term, additional stormwater flows from the West End property. Wastewater flows would not exceed the design capacity of the MWWTP. However, the addition of new stormwater flows, particularly during extreme wet weather events could exceed wet weather plant capacity. **Mitigation Measure HYD-3** would require implementation of a comprehensive drainage plan that would ensure that the storm drain system and treatment capacity are not exceeded during peak flow conditions. Projected increased flows thus would not result in the need for new or additional wastewater treatment facilities (beyond those in the Land Use Master Plan) or exceed wastewater treatment requirements established by the San Francisco Bay RWQCB. With implementation of mitigation the project would not be expected to exceed wastewater treatment requirements and this impact would be less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

See **Mitigation Measure HYD-3, Prepare and Implement a Comprehensive Drainage Plan** in *Section 3.10, Hydrology and Water Quality*.

Significance Determination after Mitigation

Less than significant.

Impact UTIL-2 Have Sufficient Water Supplies Available To Serve The Project

Biodiesel Production Facility and Food Waste Preprocessing Facility

Construction

Construction of the biodiesel production and food waste preprocessing facilities would have minimal effect on potable and recycled water supplies. Additional water demand during construction of the two near-term facilities would be only a small, temporary increment as compared to existing water usage. As water supplier for the plant site, EBMUD has accounted for construction-related water demands associated with the Land Use Master Plan.

Operation

Potable water supplies would be needed for operation of the biodiesel production and food waste preprocessing facilities. Potable water use at the biodiesel production facility would not exceed 4,500 gpd (based on the very conservative estimate that a total of 45 employees and visitors would consume 100 gallons per person per day) at build-out. An additional minimal supply would be required for washdown of the facilities and equipment. Potable water use at the food waste preprocessing facility would not exceed 1,500 gpd (based on the very conservative estimate that 15 employees plus visitors would

consume 100 gallons per person per day). An additional 2,500 gpd would be required for facility and equipment washdown, in order to clean up any free liquids associated with the receipt and processing of incoming food wastes as well to keep equipment clean and sanitary. If possible and cost-effective, non-potable water (i.e., recycled water produced by EBMUD) would be used for washdown of both facilities.

As water supplier for the plant site, EBMUD has accounted for operational water demands associated with the Land Use Master Plan in its water supply planning. Because EBMUD has planned for long-term expansion of MWWTP facilities, the project would have no impacts related to available water supplies or require construction or expansion of potable water treatment facilities to serve the MWWTP.

Other Land Use Master Plan Elements

Construction and operation of the Land Use Master Plan components would require use of both potable and recycled water supplies. Potable water supplies would be available for human use (such as restrooms and eye wash areas) within the facilities, while recycled water may be used for process water. Because EBMUD is the water supplier for the plant site, any minor increases in demand associated with the Land Use Master Plan have been accounted for in EBMUD's water supply planning. These minor increases would not impact water supply availability.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTIL-3 Require Construction of New Stormwater Drainage Facilities or Expansion of Existing Facilities

Biodiesel Production Facility and Food Waste Preprocessing Facility

Construction

Construction of the biodiesel production and food waste preprocessing facilities would have minimal effect on the plant's stormwater drainage facilities. In accordance with EBMUD's construction specifications, stormwater runoff would be contained and disposed of in accordance with a Water Control and Disposal Plan (013544-1.3(B)). Described in *Section 2.6.3*, these controls would prevent surface waters and runoff from flowing through the work area and transporting soil or pollutants off site. Implementation of these standard measures at the biodiesel production and food waste preprocessing sites would reduce the potential for excess stormwater drainage or the need for new off-site stormwater drainage facilities.

Operation

There would be no change to existing stormwater collection in the near term. The biodiesel production facility, which is located on the West End property, would utilize the existing storm drain system. Since the land is already covered with impervious surfaces, the volume of stormwater is not expected to change. The food waste preprocessing facility, which is partially located on the West End property and partially located within the existing MWWTP footprint, would have a split flow of stormwater, such that the volume of stormwater to the MWWTP and to the existing storm drains would remain unchanged as well.

Other Land Use Master Plan Elements

In the short term, as land-lease facilities are developed on the West End property, there would be no change in stormwater flows, as they would continue to be collected and routed to existing storm drains. When wastewater treatment facilities are expanded onto the West End property, as shown in the long-term layout, the storm drain system would be connected to the storm drain system at the MWWTP and stormwater would be routed to the MWWTP headworks for treatment. Design and engineering for the

long-term element of the Land Use Master Plan that pertain to expansion of the wastewater treatment process onto the West End property would include sizing of appropriate stormwater drainage facilities for those structures, which would collect and drain runoff to the plant headworks for treatment. The existing stormwater collection system on the MWWTP site was sized to accommodate all runoff from existing and proposed impervious surfaces within the original site boundaries. However, the addition of stormwater flows from the West End property to the existing EBMUD storm drain system and MWWTP headworks, particularly during extreme wet weather events, would increase stormwater volumes. This could exceed the capacity of the storm drain system and/or exceed wet weather treatment capacity. **Mitigation Measure HYD-3** would ensure that storm drain system is designed to accommodate increased flows without exceeding conveyance or treatment capacity during peak flow conditions. No additional or expanded stormwater drainage facilities would be needed off site.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

See **Mitigation Measure HYD-3, Prepare and Implement a Comprehensive Drainage Plan** in *Section 3.10, Hydrology and Water Quality*.

Significance Determination after Mitigation

Less than significant.

Impact UTIL-4 Be Served By A Landfill With Sufficient Permitted Capacity To Accommodate The Project's Solid Waste Disposal Needs

Biodiesel Production Facility

Construction

Construction of the biodiesel production facility would generate limited amounts of solid waste, including approximately 1,500 cubic yards (cy) of soil from excavation and removal of existing asphalt surfaces. Soil removal would be handled in accordance with a Soil Management Plan, which would address existing soil contamination on the West End property. EBMUD's construction specifications also require a Construction and Demolition Waste Disposal Plan (013544-1.3(C)) specifying how the contractor would remove, handle, transport, recycle, and dispose of all material in a safe, appropriate, and lawful manner. For example, some of the construction wastes may be recycled as backfill. Because solid waste would be handled in accordance with the Waste Disposal Plan, and would only be sent to EBMUD-approved facilities with available capacity, construction of the biodiesel production facility would not exceed the permitted capacity of the area landfills.

Operation

The biodiesel production process would generate glycerin as a byproduct, which would likely contain some amount of methanol, soap, biodiesel, and possibly oil and water. These byproducts would be conveyed to the MWWTP for digestion to increase biogas for renewable energy production. Potential waste streams may include spent adsorbent, which would be sent to a landfill. However, this minimal amount of spent adsorbent would not exceed the operating capacity of the area landfills that would serve the project; particularly given that other components of the Land Use Master Plan, such as the food waste preprocessing facility, would reduce the total amount of materials sent to landfill.

Food Waste Preprocessing Facility

Construction

Construction of the food waste preprocessing facility would generate limited amounts of solid waste. EBMUD's construction specifications also require a Construction and Demolition Waste Disposal Plan (013544-1.3(C)) specifying how the contractor would remove, handle, transport, recycle, and dispose of

all material in a safe, appropriate, and lawful manner. For example, some of the construction wastes may be recycled as backfill. Because it would be in accordance with the Waste Disposal Plan, and would only be sent to EBMUD-approved facilities with available capacity, construction of the food waste preprocessing facility would not exceed the permitted capacity of the area landfills.

Operation

Operation of the food waste preprocessing facility would enable a higher and more consistent quality of food waste to be generated for use at the existing EBMUD Food Waste Facility. Food waste digestion is an important component of EBMUD's renewable energy generation program and reduces the overall volume of materials deposited at area landfills. Although some non-compostable material would get routed off-site (following the preprocessing), operation of the food waste preprocessing facility would substantially reduce the volume of materials deposited at area landfills.

Digestion of food waste assists local Bay Area cities and counties to meet waste diversion goals by turning food waste into electricity rather than being landfilled, where it would degrade and release methane (a highly potent greenhouse gas) in a less controlled and contained environment than at the MWWTP, where methane produced through anaerobic digestion is instead fully captured and contained, and used for electricity production. Overall, operation of the food waste preprocessing facility would reduce solid waste disposal volumes at the area landfills and result in beneficial environmental impacts.

Other Land Use Master Plan Elements

Construction

Construction of the Land Use Master Plan elements would generate a substantial amount of solid waste, including debris from demolition of the existing structures and asphalt pads, as well as soil from excavation and grading activities. In accordance with EBMUD's Construction Specifications, construction wastes would be managed and disposed of compliant with a Construction and Demolition Waste Disposal Plan (013544-1.3(C)). Described in *Section 2.6.3*, the Waste Disposal Plan requires identification of each type of waste material to be reused, recycled, or disposed of. As such, much of the construction waste generated by Land Use master Plan improvements would be recycled and the potential for exceeding landfill capacity due to construction wastes is less than significant.

Operation

Although there would be some small increase in grit, scum, and biosolids that are hauled off-site, continued expansion of resource recovery facilities under the Land Use Master Plan would reduce the total mass of material transported to landfills in the region. Therefore, operation of the Land Use Master Plan components would slow solid waste disposal volumes at the area landfills and result in beneficial environmental impacts.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTIL-5 Compliance With Federal, State, And Local Statutes And Regulations Related To Solid Waste

The MWWTP currently operates under the Notification Tier, Solid Waste Information System No. 01-AA-0299 per CalRecycle (formerly CIWMB). This is a non-permit tier that involves notification and description of facilities only.

Biodiesel Production Facility

The biodiesel production facility is not expected to require a solid waste permit, but is still expected to maintain minimum operating standards as established in CCR, Title 14, Section 18100-18105.11. The biodiesel production facility would therefore have a less-than-significant impact on solid waste statutes and regulations.

Food Waste Preprocessing Facility

The MWWTP is currently not identified in the Alameda County Integrated Waste Management Plan (ACWMA 2003) as a solid waste facility. However, the proposed food waste preprocessing facilities would likely require a solid waste permit from the ACDEH, the LEA for solid waste management laws. As such, it may be necessary to amend the siting element of the Alameda County Integrated Waste Management Plan to include the MWWTP.

CalRecycle (formerly CIWMB) has been evaluating permitting requirements for Publicly Owned Treatment Works, such as the MWWTP, that operate anaerobic digestion systems that treat biosolids, green waste, food waste, and fats, oils and grease. At this point it is not clear what type of a solid waste permit, if any, may be required if EBMUD implements dedicated digestion of green waste, food waste and other trucked waste. However, EBMUD or the owner/operator of the food waste preprocessing facility would determine and obtain any necessary solid waste permits.

Food waste processing is consistent with Alameda County waste reduction goals and the objective to divert food waste from landfills. It provides a market for beneficial reuse of waste, and is thus consistent with County policies. Although the Plan does not encourage conversion of waste to energy, it appears that this objective is intended to discourage incineration of waste, which is not proposed as part of the project. The proposed capture of biogas that is produced during decomposition of food waste is thus not deemed to be inconsistent with objectives of the Alameda County Integrated Waste Management Plan.

Given that any required permits would be obtained, the food waste preprocessing facility would be expected to be consistent with the Alameda County Integrated Waste Management Plan, and this impact would be less than significant. The project is beneficial in that it would contribute to meeting both State and county waste diversion goals.

Other Land Use Master Plan Elements

None of the other components of the Land Use Master Plan are expected to require a solid waste permit, but are still expected to maintain minimum operating standards as established in CCR, Title 14, Section 18100-18105.11. The Land Use Master Plan would therefore have a less than significant impact on solid waste statues and regulations.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation measures are required.

Impact UTIL-6 Temporary Disruption of Utilities or Services Due to Construction-Related Activities

All Land Use Master Plan Elements

Construction of the Land Use Master Plan components, including the biodiesel production and food waste preprocessing facilities, could potentially conflict with existing utilities located on the MWWTP site and West End property, particularly underground utility and/or overhead lines. Temporary disruption of utility services (i.e., electricity, water, gas, sewers, and stormwater conveyance) is possible and must be

mitigated to ensure that existing treatment facilities and processes at the MWWTP site are not impacted. **Mitigation Measure UTIL-6** would reduce this potential disruption impact to less than significant.

Significance Determination before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure UTIL-6: Coordinate Relocation and Interruptions of Service with Utility Providers During Construction

The construction contractor will be required to verify the nature and location of underground utilities before the start of any construction that would require excavation. The contractor will be required to notify and coordinate with public and private utility providers at least 48 hours before the commencement of work adjacent to any utility. The contractor will be required to notify the service provider in advance of service interruptions to allow the service provider sufficient time to notify customers. The contractor will be required to coordinate timing of interruptions with the service providers to minimize the frequency and duration of interruptions.

Significance Determination after Mitigation

Less than significant.

Chapter 4 Other CEQA Considerations

4.1 Introduction

CEQA contains statutory requirements that require EBMUD to consider the growth-inducing impacts of a project (CEQA Guidelines 15126.2(d)); the cumulative impacts of the Land Use Master Plan (CEQA Guidelines 15130); the significant irreversible environmental changes resulting from the Land Use Master Plan (CEQA Guidelines 15126.2(c)); and significant environmental effects which cannot be avoided if the Land Use Master Plan is implemented (CEQA Guidelines 15126.2(b)).

4.2 Growth-Inducing Impacts

4.2.1 Approach to Growth-Inducing Analysis

The environmental impacts associated with growth include secondary, or indirect, physical effects including increased traffic, degradation of air and/or water quality, loss of sensitive biological resources and habitats, increased demand on public services and infrastructure, and changes in land use. Projects are considered to have growth-inducing implications when economic, housing, or population growth would be stimulated, either directly or indirectly.

4.2.2 Growth-Inducing Analysis

The proposed Land Use Master Plan addresses the need for EBMUD to plan for use of the newly-acquired West End property to meet future regulatory requirements for wastewater treatment. The Master Plan also includes elements to enhance revenues to maintain reasonable rates and increase renewable energy production. None of the projects included in the Land Use Master Plan would increase the wastewater treatment capacity of the MWWTP, so the new facilities would not accommodate growth in the EBMUD wastewater service area.

The Land Use Master Plan facilities would be entirely constructed within the site of the MWWTP (as enlarged by the acquisition of the West End property). The proposed short-term and long-term Land Use Master Plan projects would be operated by existing EBMUD personnel with minimal additional staffing required. Although the biodiesel production facility and food waste preprocessing facility would require 60 employees, it is expected that these employees would be drawn from the existing local work force and that no additional demand for housing would result. The Land Use Master Plan is thus not expected to have growth-inducing impacts.

4.3 Cumulative Effects

As discussed in *Chapter 3, Environmental Analysis*, a majority of the potentially significant environmental effects associated with the Land Use Master Plan are related to facility construction as opposed to long-term operation. However, a majority of these effects would be mitigated by the design of the Land Use Master Plan improvements and by the mitigation measures described in *Chapter 3*.

4.3.1 CEQA Analysis Requirements

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable

when viewed in connection with effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).

- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not be as detailed as it is for the effects attributable to the project alone.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is described in each subsection that follows.

4.3.2 Approach to Cumulative Analysis

Two approaches to a cumulative impact analysis are discussed in the CEQA Guidelines Section 15130(b)(1): (a) the analysis can be based on a list of past, present, and probable future projects producing related or cumulative impacts, or (b) a summary of projections contained in a general plan or related planning document, or in an adopted or certified environmental document that described or evaluated regional or area-wide conditions contributing to the cumulative impact can be used to determine cumulative impacts. For the purposes of this EIR, the analysis employs the list-based approach. The following factors were used to determine an appropriate list of projects to be considered in this cumulative analysis:

- *Similar Environmental Impacts* – a relevant project contributes effects on resources also affected by the Land Use Master Plan projects. A relevant future project is defined as one that is "reasonably foreseeable," such as one that has approved funding or for which an application has been filed with the approving agency.
- *Geographic Scope and Location* – a relevant project is located within a defined geographic scope for the cumulative effect.
- *Timing and Duration of Implementation* – effects associated with activities for a relevant project (e.g., short-term construction or demolition, or long-term operations) would likely coincide in timing with effects of the Land Use Master Plan projects.

Similar Environmental Impacts

Projects that are relevant to the cumulative analysis include those that could contribute incremental effects on the same environmental resources and would have similar environmental impacts to those discussed in this EIR. The cumulative impact discussions below analyze the potential cumulative impacts that could occur when the impacts of the Land Use Master Plan projects are considered in combination with the impacts of other past, present, and reasonably foreseeable future projects that are generally subject to independent environmental review and consideration by the approving agencies. Consequently, it is possible that some of the reasonably foreseeable future projects will not be approved, or will be modified prior to approval (e.g., as a result of the CEQA alternatives analysis process). For the purposes of assessing worst-case cumulative impacts, however, the cumulative impact analysis is premised on the approval and construction of all of the reasonably foreseeable projects identified in this analysis.

Geographic Scope and Location

The geographic scope of cumulative projects is dependent on the resource area affected and is specifically described under each topical section below. In general, the geographic scope includes the areas within and adjacent to the project site. However, for some resource topics, the geographic scope can extend farther such as the regional air basin.

Timing and Duration of Implementation

Construction of the proposed biodiesel production facility would begin in the fall of 2011 and be complete by the fall of 2012. Construction of the proposed food waste preprocessing facility would begin in the summer or fall of 2012 and would take 14 to 16 months to complete, with start up in fall or winter of 2013. While the specific construction dates for the remaining Land Use Master Plan projects have not been identified, the short-term projects would be constructed over the next 10 years and the long-term projects would be constructed within the next 30 years. Cumulative effects could occur if the construction of other projects overlapped with the construction of the proposed Land Use Master Plan projects, and could also occur when all projects are under operation.

4.3.3 List of Relevant Projects

Table 4-1 lists the past, present, and reasonably foreseeable projects and activities within and near the project area and provides a brief description of the projects and their expected schedule. The Table also identifies the areas of potential cumulative effects associated with each of the cumulative projects. **Figure 4-1** shows the general location of the cumulative projects listed. The cumulative impact analysis is presented under each resource topic in the subsections that follow. Those projects listed in **Table 4-1** include projects proposed by EBMUD and other parties that could potentially contribute to cumulative impacts when considered together with the Land Use Master Plan projects. Information regarding projects proposed by other parties was obtained from published CEQA documents as well as proposed development information obtained from the City of Oakland and Port of Oakland.

As indicated in **Table 4-1**, five projects are planned or under construction by EBMUD at the MWWTP. These projects are:

1. The EBMUD Digester Upgrade Project – Phase II (Project 1) is being constructed at the MWWTP to rehabilitate four existing digesters by replacing the floating covers with fixed covers and adding internal mixers to help improve process performance and efficiency. To enhance the overall consistency of the organic feed stream, a sludge blending tank is being constructed on the West End property to mix and preheat primary sludge, secondary sludge, and high-strength wastes, prior to feeding to the digesters. The fats, oils, and grease receiving area is also being relocated adjacent to the sludge blending tank facility. Construction is expected to be completed by 2012.
2. The EBMUD Power Generation Station (PGS) Renewable Energy Expansion Project (Project 2) will increase EBMUD's renewable energy production capacity at the MWWTP to minimize flaring of excess methane gas and maximize recovery of electricity and heat. This project will also provide a new gas conditioning system to improve operation of the existing and expanded PGS. To reduce hydrogen sulfide production in the digesters, a ferric chloride storage and feed system will be installed at the primary sedimentation tanks. The expansion project is being conducted in two phases. Phase I, currently under construction, includes the construction of one 4.5-megawatt (MW) turbine, and will increase the power generating capability of PGS to 11 MW. This phase of construction is expected to be complete by 2011. Phase II includes construction of a second 4.5-MW turbine which would increase the power generating capability of PGS to 15.5 MW. The implementation schedule for Phase II has not been determined.

Table 4-1: Cumulative Project List

Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
1	Digester Upgrade Project - Phase II (EBMUD, 2008b)	EBMUD	EBMUD is constructing the Digester Upgrade Project - Phase II to rehabilitate four digesters. Rehabilitation includes replacing floating covers with fixed covers, adding mixers, adding a feed loop to the sludge feed system, and adding a feed/blend tank to preheat solids before feeding to the digesters. In addition, the project will relocate EBMUD's existing fats, oils and grease receiving station to the feed/blend tank location. Odor control facilities will be provided at the feed/blend tank facility.	Located at the project site. Aesthetics, public health and hazards, hydrology and water quality, air quality, noise, transportation, utilities and service systems	2009-2012 Under construction
2	Power Generation Station Renewable Energy Expansion (EBMUD, 2008a; EBMUD 2009c)	EBMUD	EBMUD is constructing the Power Generation Station Renewable Energy Expansion Project to increase the production of renewable energy at the MWWTP. The project includes installation of gas conditioning units (for siloxane removal), gas compression equipment, electrical transformers and substations, as well as Power Generation Station 2. Power Generation Station 2 could ultimately include construction of two, 4.5-MW turbines, air handling and heat recovery units, and ancillary equipment, but construction of only one turbine is scheduled as of March 2010.	Located at the project site. Aesthetics, public health and hazards, hydrology and water quality, air quality, noise, transportation, utilities and service systems	2009-2011 (one turbine) Under construction To be determined (additional turbine)
3	Food Waste Facility Phase 2 (EBMUD, 2009)	EBMUD	EBMUD is constructing the Food Waste Facility Phase 2 Project as part of the existing Resource Recovery Program at the MWWTP. The project will expand EBMUD's capacity to accept and treat food waste from 100 tons per day to 250 tons per day and will reduce the amount of food waste disposed of at area landfills. Use of biogas generated by the project will increase renewable energy generation at the MWWTP and biosolids will be beneficially reused as a soil amendment at non-edible crop sites or alternative daily cover at a landfill. New facilities include new food waste screening and pulping equipment; new pumps and mixers; and a new storage area for bins which may include a building and a new truck loading area for bin removal.	Located at the project site. Aesthetics, public health and hazards, hydrology and water quality, air quality, noise, transportation, utilities and service systems	2009-2011 Under construction
4	K2 Brine Project (City of Pittsburg, 2009)	EBMUD/K2 Pure Solutions	EBMUD and K2 Pure Solutions are constructing a facility at the MWWTP to store and discharge a brine solution into the MWWTP effluent channel for discharge to the Bay. The brine solution is a byproduct from the production of bleach at the K2 Pure Solutions facility in the City of Pittsburg, The facility at the MWWTP will consist of one or two tanks for storage of brine as wells as piping to direct the brine to the effluent channel.	Located at the project site Aesthetics, water quality, transportation	2011 In planning stages

Table 4-1: Cumulative Project List (Cont'd)

Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
5	Billboard Installation	EBMUD/Clear Channel Outdoor, Inc.	EBMUD and Clear Channel Outdoor are constructing a static billboard on the northwestern end of the MWWTP boundary, facing I-80, for commercial use. They will also convert an existing billboard on the MWWTP for commercial use.	Located at the project site Aesthetics	2010 In construction, lease will last for 20 years
6	San Francisco/ Oakland Bay Bridge Seismic Safety Projects (Caltrans 2010d)	California Department of Transportation	Seismic improvements to the San Francisco-Oakland Bay Bridge (Bay Bridge) are being constructed under several projects. Improvements between San Francisco and Yerba Buena Island have been constructed and include construction of a new approach and seismic improvements to the west span of the bridge. The two-mile long east span is being completely rebuilt and includes a self-anchored suspension span, connected to a pier-supported skyway that gradually slopes downward towards the Oakland Shoreline via the Oakland Touchdown. A new transition structure will also be built on Yerba Buena Island to connect the new east span to the Yerba Buena Island tunnel. The 2,047-foot long self-anchored suspension span will be supported on a single tower. The 1.2-mile long skyway will elevate the bridge above the Oakland mudflats and is supported by 14 sets of piers driven into the deep bay mud. The Oakland Touchdown will connect the bridge to I-80. This segment of work will require construction of a new electrical substation and extensive relocation of underground utilities. Much of the construction work for the east span is being conducted from barges on the Bay. This project includes construction of five stormwater detention ponds beneath the MacArthur maze for collection and treatment of stormwater from the existing Caltrans right-of-way at the Oakland Touchdown.	0.5 miles west of project site Hydrology and water quality, air quality, noise, transportation, utilities and service systems	West span seismic improvements completed in 2004. West approach completed in 2009 Skyway completed in 2007 Construction is underway for the self-anchored suspension span, Oakland Touchdown, and transition structure, and is expected to be completed by 2013
7	Gateway Park (Gateway Park, Working Group, 2010; BCDC, 2001)	East Bay Regional Park District/ Caltrans	Construction of a waterfront park at the foot of the new Bay Bridge East Span is intended to provide a memorable gateway to Oakland. Representatives of nine agencies are working together to bring about the new park, including the Bay Area Toll Authority, Caltrans, San Francisco Bay Conservation and Development Commission, California Transportation Commission, East Bay Regional Park District, City of Oakland, Port of Oakland, East Bay Municipal Utility District, and the Association of Bay Area Governments Bay Trail Project. Public outreach is ongoing to receive community input on the design of the park. As part of the public access requirements of the BCDC permit issued for the San Francisco/Oakland Bay Bridge Seismic Safety Project, a 4.2-acre area at the Oakland Touchdown is being incorporated into Gateway Park	0.1 mile Aesthetics, recreation, hydrology and water quality, air quality, noise, transportation, utilities and service systems	In planning stages, construction after completion of San Francisco/ Oakland Bay Bridge Seismic Safety Projects (2013+)

Table 4-1: Cumulative Project List (Cont'd)

Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
			to the extent that Caltrans is legally able to do so. Use of this land would be subject to the existing and future operational and maintenance needs of Caltrans such as providing stormwater best management practices to treat stormwater runoff, installing and maintaining needed utilities, and providing access to maintain the new East Span and at-grade roadways. New utilities and stormwater facilities would be designed to be consistent with recreation and public access uses in the area. Approximately 0.37 acres of this area will be used for temporary parking and a crosswalk that will eventually become part of the proposed Gateway Park.		
8	San Francisco Bay Trail (San Francisco Bay Trail Project, 2010; Caltrans 2009b; BCDC, 2001; BCDC, 2009)	Association of Bay Area Governments	The Bay Trail is a planned recreational corridor that, when complete, will encircle the entire Bay Area with a continuous 400-mile network of bicycling and hiking trails. It will connect the shoreline of all nine Bay Area Counties, link 47 cities, and cross the major toll bridges in the region. In the vicinity of the MWWTP, improvements will include a pedestrian and bicycle pathway system through the MacArthur Maze that links to Maritime Street as well as bicycle spur trail connection to the Bay Bridge take-off point public access parking. The pathway system will increase the accessibility of the East Bay Shoreline and parks within the Port of Oakland. A portion of the proposed improvements border the northern property boundary of the MWWTP. Portions of this trail and connector paths are being completed or funded by Caltrans as part of the public access requirements of BCDC permits issued for the Cypress Freeway Reconstruction Project and San Francisco/Oakland Bay Bridge Seismic Safety Project.	Adjacent to northern property boundary Aesthetics, recreation, hydrology and water quality, air quality, noise, transportation, utilities and service systems	In planning stages, construction schedule not determined.
9	Former Oakland Army Base - Auto Mall (City of Oakland, 2006)	City of Oakland	Construct four to five automobile dealerships, extend utilities to the property, and provide new roads to the dealerships and the MWWTP. As part of this project, utility infrastructure improvements could be completed and Wake Avenue could be abandoned. Maritime Avenue could be extended north of West Grand Avenue and an east and west access road could be constructed. A supplemental EIR would be required to address traffic and sewer issues at the Auto Mall and the MWWTP before the project can be approved. Although development of an Auto Mall is uncertain at this time, it is likely that there will be some future use at this site.	Adjacent to project site, across Engineers Road to the south Hydrology and water quality, air quality, noise, transportation, utilities and service systems	Project is on hold
10	Former Oakland Army Base – Gateway Development Area (City of Oakland, 2002; Port of	City of Oakland	The City of Oakland has selected a master developer for 108 acres of the Former Oakland Army Base referred to as the Gateway Area. This area consists of three adjacent parcels: the Central Gateway (60 acres), East Gateway (14 acres), and West Gateway (34 acres, of which 17.5 acres are developable for mixed uses and 16.5 acres are waterfront property reserved for public open space and related uses). A 14-acre site in the East Gateway Area has been committed for the development of a truck	400 feet Hydrology and water quality, air quality, transportation, utilities and service systems	In planning stages, construction schedule not determined.

Table 4-1: Cumulative Project List (Cont'd)

Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
	Oakland, 2009a)		depot to reduce trucking activity in the residential neighborhoods of West Oakland. The remainder of the development area is open for consideration for its best and highest uses, including uses such as retail, maritime industrial, research and development of green technologies, office, and other commercial uses. Development in this area could include realignment of Maritime Street above 7th Street and would require improvements to utilities and demolition or deconstruction of most existing structures. The developer would be responsible for environmental compliance required for the proposed development, and remediation of contaminated sites within the development area.		
11	Central Gateway Aggregate Recycling and Fill Project (City of Oakland, 2009d)	City of Oakland	The Central Gateway Aggregate Recycling and Fill Project is located within a 40-acre portion of the Central Gateway Development Area of the former Oakland Army Base, plus a 12-acre freeway parcel located between I-80 and Burma Road. The proposed project is a concrete crushing and asphalt recycling facility that will store the resulting crushed concrete and recycled asphalt for use as fill in the Central Gateway Development Area or in off-site locations for use in sidewalk construction and repair projects by Caltrans, the City of Oakland, or other entities. The project will operate for five years. At the end of operations, all recycling facilities will be removed and the site will be regraded to facilitate future development under the Oakland Army Base Redevelopment Plan and Reuse Plan, including research and development facilities, light industrial uses, retail uses, and flexible office space.	0.25 miles southwest of project site Hydrology and water quality, air quality, noise, transportation, utilities and service systems	In planning stages, construction schedule not determined.
12	Former Oakland Army Base – Port Development Area (City of Oakland, 2002; Port of Oakland, 2009)	Port of Oakland	The Port of Oakland is in the process of selecting a master developer for 168 acres of the Former Oakland Army Base. Planned uses for this portion of the former army base must support and enhance maritime activities at the Port of Oakland, and could include cargo/marine terminal throughput, intermodal rail, trade and logistics businesses, and ancillary maritime support facilities. Development in this area could include realignment and an extension of Maritime Street below 7th Street and would require improvements to utilities and demolition or deconstruction of most existing structures. The developer would be responsible for environmental compliance required for the proposed development and remediation of contaminated sites within the development area.	Adjacent to project site, to the south Hydrology and water quality, air quality, transportation, utilities and service systems	In planning stages, construction schedule not determined.
13	New Berth 21 (City of Oakland, 2002)	Port of Oakland	The Port of Oakland proposes to replace existing Outer Harbor Berths 8, 9, 10, 20, and 21 with a "New Berth 21". A portion of the Outer Harbor shoreline would be reconfigured through filling and excavation to create and efficient terminal and berth geometry. Approximately 3 acres of new Bay surface would be created by excavation, and 29 acres of new land would be created by fill.	0.3 miles Hydrology and water quality, air quality, transportation, utilities and service systems	In planning stages, construction schedule not determined.

Table 4-1: Cumulative Project List (Cont'd)

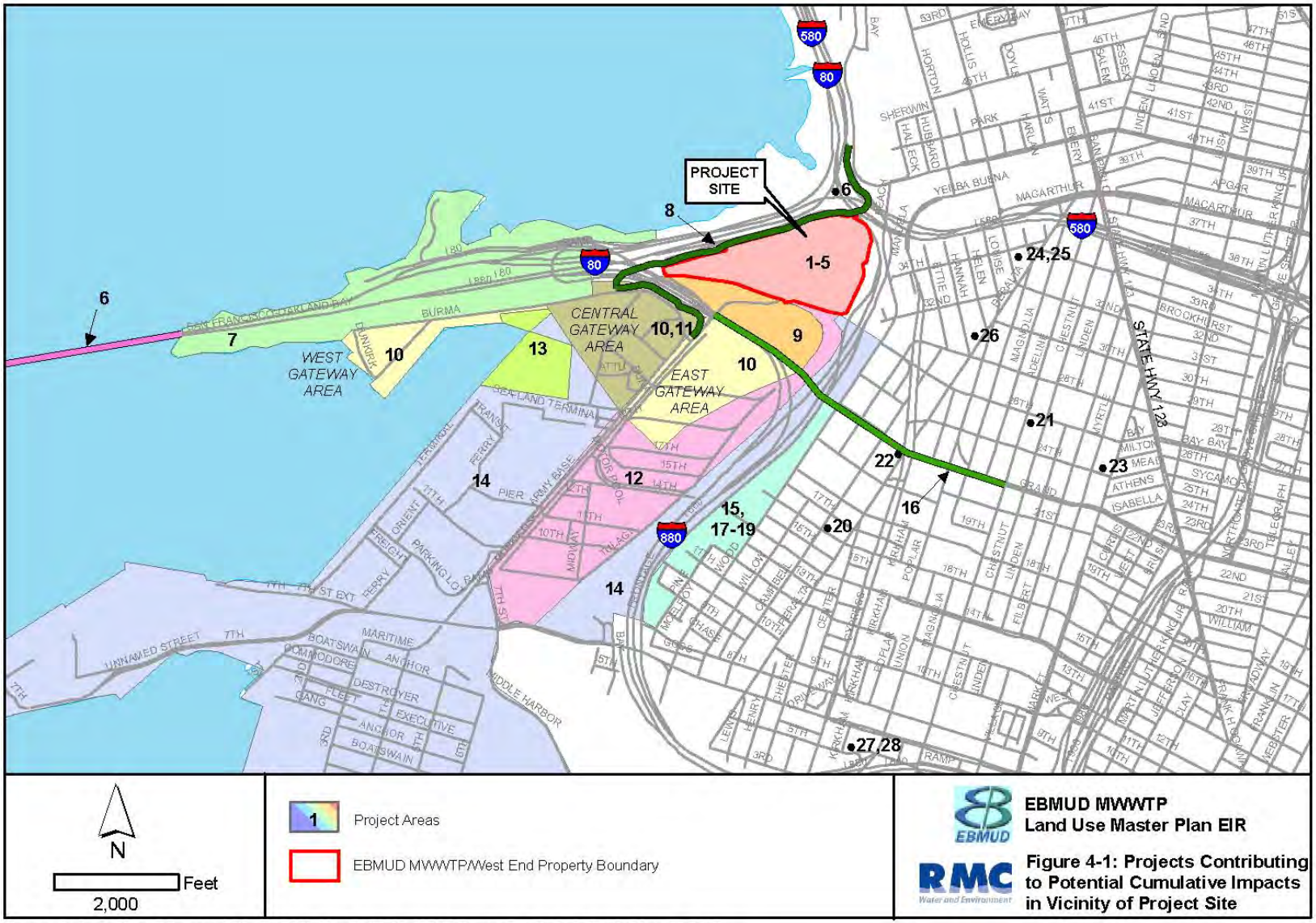
Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
14	Former Oakland Army Base – Maritime Subdistrict (including Outer Harbor Terminal Area) (City of Oakland, 2002; Port of Oakland, 2009; Port of Oakland, 2010)	Port of Oakland	The Outer Harbor Terminal Area consists of Berths 20 through 26 and is currently operated as two separate container terminals located along the deep-water Oakland Outer Harbor Channel. The Transbay Container Terminal is located at Berths 24 through 26 and comprises approximately 72 acres. Berths 20 through 23 comprise approximately 105 acres. The Port of Oakland is working with a developer to prepare plans for the reconfiguration of the Outer Harbor. Plans will include regrading of the outer harbor area and some facilities may be demolished and reconstructed. Utilities and electrical service systems will also be upgraded. Any changes in cargo shipments would be accommodated within the projections contained in the Oakland Army Base.	0.3 miles Hydrology and water quality, air quality, transportation	In planning stages, construction schedule not determined.
15	Former Oakland Army Base – 16th/Wood Subdistrict (City of Oakland, 2002; City of Oakland 2004b)	City of Oakland	Redevelopment of approximately 41 acres of the Former Oakland Army Base to replace existing industrial uses (some that are in derelict condition) with new pedestrian-oriented, mixed-use, residential, live/work, and commercial developments. Development in this area would require improvements to utilities and demolition or deconstruction of most existing structures. Individual project sponsors will be responsible for development within the project area on individual timelines according to new Wood Street Zoning Regulations developed for the project. Over 1,000 residential units would be constructed and the historic Amtrak train station and nearby signal tower would be rehabilitated. A portion of the train tracks would be demolished and the remainder would be reused.	0.25 miles Hydrology and water quality, air quality, transportation, utilities and service systems	In planning stages, construction schedule not determined.
16	West Grand Avenue Class II Bicycle Lane (City of Oakland, 2007)	City of Oakland	Construction of a Class II bicycle lane on West Grand Avenue, between Maritime Street and Market Street.	0.1 miles Transportation, hydrology and water quality, air quality	In planning stages, construction schedule not determined.
17	Zephyr Gate Wood Street (City of Oakland, 2009b)	Private	This project is a component of Project 13 - Former Oakland Army Base – 16th/Wood Subdistrict 130 residential condominium units	0.25 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Units are built after they are sold and completion date depends on rate of sale 98 units have been sold and 97 have been completed

Table 4-1: Cumulative Project List (Cont'd)

Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
18	Wood Street Mixed Use Project (City of Oakland, 2009b)	Private	This project is a component of Project 13 - Former Oakland Army Base – 16th/Wood Subdistrict 1557 residential units 13,000 square feet commercial uses 1.39 acres public open space 2.82 acres private open space Renovation of train station	0.25 miles Hydrology and water quality, air quality, transportation, utilities and service systems	In planning stages, no construction is anticipated for at least 5 years.
19	HFH Apartments 1401 – 1405 Wood Street (City of Oakland, 2009b)	Private	This project is a component of Project 13 - Former Oakland Army Base – 16th/Wood Subdistrict Phase 1 – 159 apartments Phase 2 – 142 apartments	0.25 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Phase I – projected start May, 2011 Phase II – projected start May, 2016
20	1614 Campbell St. (City of Oakland, 2009b)	Private	92 live/work units	Greater than 0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Undergoing site cleanup
21	2501 Chestnut St. (City of Oakland, 2009b)	Bridge Housing	50 live/work units	Greater than 0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Undergoing site cleanup
22	Mandela/ Grand Mixed Use Project (City of Oakland, 2009b)	Private	1557 residential units Approximately 300,000 square feet non-residential uses	0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive
23	Emerald Parc 2400 Filbert St. (City of Oakland, 2009b)	Private	55 townhomes	Greater than 0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive
24	Hollis 34 3241 Hollis St. (City of Oakland, 2009b)	Private	124 live/work units	0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive

Table 4-1: Cumulative Project List (Cont'd)

Project No.	Project Name	Project Sponsor(s)	Project Description	Distance from Project Site and Potential Cumulative Impact	Estimated Schedule/ Status
25	3250 Hollis St. (City of Oakland, 2009b)	Private	46 live/work units 74 residential units	0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive
26	2847 Peralta St. (City of Oakland, 2009b)	Private	76 dwelling units 24 live/work units	0.5 miles Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive
27	Mandela Transit Village 1357 5th St. (City of Oakland, 2009b)	Private	120 residential units 38,500 square feet commercial uses	Greater than 1 mile Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive
28	Red Star 1396 5th St. (City of Oakland, 2009b)	National Affordable Communities	119 affordable senior units 3,300 square feet commercial uses	Greater than 1 mile Hydrology and water quality, air quality, transportation, utilities and service systems	Inactive



Source: Caltrans Map of Proposed Bicycle Path (May 7, 2010), LUMP Cumulative Projects Table (May 17, 2010).

Figure 4-1: Projects Contributing to Potential Cumulative Impacts in Vicinity of Project Site

3. Expansion of EBMUD's existing Food Waste Facility (Project 3) includes construction of new food waste screening and pulping equipment; new pumps and mixers; a new storage area for bins, which may include a building; and a new truck loading area for bin removal. Expansion of the Food Waste Facility is under construction and is expected to be complete by 2011. Operation of this project is expected to increase biogas production by up to 900 standard cubic feet per minute, enough to increase power production at PGS by 2.6 MW.
4. Construction of the K2 Brine Project (Project 4) includes construction of new facilities at the MWWTP to discharge brine solution that would be a byproduct from the K2 Pure Solutions Bleach Plant in Pittsburg, California, currently under construction. The bleach plant in Pittsburg will produce approximately 50,000 to 70,000 gallons per day (gpd) of brine solution that will be delivered to the MWWTP via tanker truck. The K2 Brine Project includes construction of the storage and discharge facilities at the MWWTWP to discharge the brine waste into the MWWTP effluent channel, downstream of EBMUD's East Bayshore Recycled Water Plant's intake to avoid increasing the salt content in EBMUD's recycled water supply. The maximum total dissolved solids concentration of the brine solution would be 200,000 milligrams per liter and the discharge would be blended with the EBMUD wastewater treatment effluent. EBMUD would ensure compliance with the discharge limitations of its NPDES permit.
5. The Billboard Installation Project (Project 5) includes constructing a new billboard in the northwest corner of the MWWTP with 1,344 square feet of advertising space for commercial use and repurposing an existing billboard with 672 feet of advertising space on EBMUD land, east of the Bay Bridge Toll Plaza. The new billboard will have two facings. The work will be conducted in accordance with a relocation agreement with the City of Oakland that also specifies that Clear Channel Outdoor will remove at least 16 billboards with a total of at least 4,116 square feet of advertising space from various locations throughout the city. The City of Oakland adopted a resolution approving the relocation agreement on December 16, 2009.

The San Francisco/Oakland Bay Bridge Seismic Safety Projects (Project 6) includes construction of a new two-mile-long east span for the Bay Bridge. This project includes construction of bridge piers within San Francisco Bay and Oakland mudflats, and construction of the bridge above the Bay. Five stormwater detention ponds would be constructed beneath the MacArthur maze. Construction of this project is expected to be complete by 2013.

Planned recreational facilities in the project vicinity include Gateway Park (Project 7) and the San Francisco Bay Trail (Project 8). Gateway Park will be constructed at the foot of the new Bay Bridge East Span to provide a memorable gateway to Oakland. The preferred alignment for the San Francisco Bay Trail is adjacent to the northern property boundary of the MWWTP, and completion of this segment of the trail will help complete the trail that will connect all nine Bay Area counties. Construction dates for these projects are uncertain, although Gateway Park will not be constructed until the San Francisco/Oakland Bay Bridge project is completed in 2013. A Class II Bicycle Lane (Project 16) is also planned on West Grand Avenue, though the construction date for this project is not certain.

An EIR has been prepared for redevelopment of the 1,800-acre Oakland Army Base (OAB) Redevelopment Area (City of Oakland, 2002) and a supplemental EIR has been prepared for the construction of an auto mall on a portion of the former army base (City of Oakland, 2006). Although redevelopment activities are currently on hold, the proposed redevelopment would occur primarily in five areas including the former auto mall site at the Subaru Lot and Baldwin Yard (Project 9), Gateway Development Area (Project 10), Port Development Area (Project 12), Maritime Subdistrict (Project 14), and 16th/Wood Subdistrict (Project 15). Under full build out, the redevelopment projects would include 799,000 square feet of light industrial uses, 2,965,000 square feet of office and research and development uses, 26,300 square feet of retail uses, and 390,000 square feet of auto dealerships; 375 live-work units would also be provided in the 16th/Wood Subdistrict. A total of 307 acres would be dedicated for new or

reconfigured terminals and maritime support, and 165 acres would be dedicated to rail uses. The Central Gateway Aggregate Recycling and Fill and New Berth 21 projects (Projects 11 and 13) would be constructed within the OAB Redevelopment Area.

Other projects included in **Table 4-1** include smaller development projects planned in the general vicinity of the MWWTP.

4.3.4 Cumulative Impacts Analysis

Aesthetics

The geographic scope of potential aesthetic impacts encompasses the project site and immediate vicinity, including areas that are also visible from the eastbound I-80 exit from the Bay Bridge, MacArthur Maze, elevated portions of West Grand Avenue and the westbound link between I-880 and the Bay Bridge to the southwest, and the elevated portions of I-880 to the east.

Long-term cumulative aesthetic impacts could occur if the proposed project and the cumulative projects listed in **Table 4-1** adversely altered views of the project area, or were located within the same viewsheds and involved the construction of new facilities, removal of trees, or new sources of light or glare that would affect the same visual resources. For these projects, temporary cumulative aesthetics impacts could also occur if the construction schedules overlapped.

Implementation of the San Francisco/Oakland Bay Bridge Seismic Safety Project (Project 6) would increase the visibility of the MWWTP, West End property, and vicinity from I-80 with the realignment of the eastern span of the Bay Bridge (currently under construction) due to more direct lines of sight from the bridge to the MWWTP site. Gateway Park (Project 7) also includes construction of a waterfront park at the foot of the new Bay Bridge East Span to provide a memorable gateway to Oakland, and enhance views from the realigned eastern span. The proposed project and other development projects, including projects at the MWWTP (Projects 1 through 5), the OAB Auto Mall (Project 9), Former OAB Gateway Development Area (Project 10), Central Gateway Aggregate Recycling and Fill Project (Project 11), Former OAB Port Development Area (Project 12), New Berth 21 (Project 13), Former OAB Maritime Subdistrict (Project 14), and OAB 16th/Wood Subdistrict (Project 15) would all be visible from one or more of the same viewpoints as the MWWTP. In addition, the planned San Francisco Bay Trail (Project 8) would border the northern boundary of the MWWTP and West End property, and improvements under the proposed Land Use Master Plan could be visible to trail users, along with other improvements at the MWWTP (Projects 1 through 5). The Billboard Installation Project (Project 5) would also include the installation of a new billboard and repurposing of an existing billboard that would be visible from I-80.

Although implementation of the San Francisco/Oakland Bay Bridge Seismic Safety Project (Project 6) and Gateway Park (Project 7) would increase the visual prominence of the project site, the project would not degrade the visual character of the area and the project's contribution to this potential cumulative impact would not be cumulatively considerable. This is because, as described in *Section 3.2, Aesthetics*, landscaping trees that would be removed under the Land Use Master Plan would not qualify as substantial scenic resources and structures that would be constructed under the Land Use Master Plan would not be visually dissimilar to existing facilities found at the MWWTP site in terms of their scale and general appearance; would blend with their surroundings; would include new lighting that is consistent with existing lighting and would be shielded and directed to the interior of the site; and would be painted in low reflective paint consistent with existing structures at the MWWTP.

The project could temporarily obstruct some foreground views along I-80 to the north of the MWWTP and West End property and construction of other projects could also obstruct the same views if construction occurred at the same time. However, the project's contribution to this cumulative impact would not be cumulatively considerable because construction contractors retained by EBMUD would be required to implement EBMUD Construction Specifications requiring removal of excess materials and

debris from the work area at the completion of construction, and all construction contractors would be required to implement **Mitigation Measure AES-2a** requiring the contractor to keep the construction site clean of rubbish and debris from construction activities.

The new and repurposed billboards constructed under Project 5 would be visible from I-80, and implementation of this project could result in cumulative impacts related to alteration of the existing character and views at the MWWTP and new sources of light and glare. However, EBMUD would implement **Mitigation Measure AES-2b** ensuring that the Land Use Mater Plan projects are designed to be visually consistent with the existing facilities at the MWWTP and **Mitigation Measure AES-3** requiring that any new lighting is consistent with existing lighting at the MWWTP and is shielded and directed towards the interior of the plant.

With implementation of the project features described above, EBMUD Construction Specifications, and **Mitigation Measures AES-2a, AES-2b, and AES-3**, the Land Use Master Plan projects would not adversely affect views from the roadways, substantially degrade the existing visual character or quality of the site and its surroundings, or introduce a substantial new source of light and glare during project construction or operation. Therefore, the project's contribution to this cumulative impact would not be cumulatively considerable.

Air Quality

Potential impacts related to air quality are evaluated on a regional (air basin) basis.

When the proposed biodiesel production facility, food waste preprocessing facility, and short- and long-term Land Use Master Plan projects are considered in combination with 28 proposed projects in the West Oakland area (listed in **Table 4-1**), cumulative increases in emissions of criteria pollutants and precursors, community risks and hazards would have the potential to significantly affect local and regional air quality.

Criteria Pollutants and Precursors

To address cumulative impacts on regional air quality, the Bay Area Air Quality Management District (BAAQMD) has established thresholds of significance for construction-related and operational criteria pollutants and precursor emissions. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to San Francisco Bay Area Air Basin's existing air quality conditions. If daily average or annual emissions exceed these thresholds, the project would result in a cumulatively significant impact.

As indicated in *Chapter 3.3, Air Quality*, Impact AIR-1 the construction-related criteria pollutant and precursor emissions associated with the proposed biodiesel production facility, food waste preprocessing facility, and Land Use Master Plan projects were each compared to applicable BAAQMD significance thresholds and each project was determined to be less than significant for all criteria pollutants. Construction of the biodiesel production facility is expected to start in fall 2011 and be completed in fall 2012. Construction of the food waste preprocessing facility would begin in spring or summer 2012 and would be completed in summer or fall of 2013. Construction of the two projects is not expected to occur simultaneously. No specific construction timeframe is specified for the remaining short- and long-term Land Use Master Plan projects, but for purposes of this analysis, they are conservatively assumed to occur over the next 20 years. Because construction phases and overall construction time frames are not expected to overlap, and since each project's individual construction emissions would not exceed BAAQMD emissions thresholds, the project's contribution to this cumulative impact would not be cumulatively considerable.

As discussed in Impact AIR-4, the operational emissions from each project's mobile sources would not exceed BAAQMD significance thresholds for criteria pollutants. Thus, each project's residual contribution to emissions would not be cumulatively considerable, a less-than-significant cumulative

impact. In addition, these projects would have beneficial air quality impacts that would further offset each project's mobile source impacts. For mobile source emissions associated with the biodiesel production facility, production and use of biodiesel as opposed to petroleum-based diesel fuel would reduce criteria pollutant emissions. The proposed food waste preprocessing facility would increase diversion of food waste from landfills and reduce uncontrolled biogenic emissions at landfills, a beneficial impact. Therefore, air quality benefits associated with lifecycle-related reductions would further offset the air quality impacts associated with these two projects' mobile source emissions. Also, when all other proposed short- and long-term Land Use Master Plan projects are implemented over the next 20 years, they will be required to meet applicable BAAQMD significance thresholds, which would ensure that these projects' future criteria pollutant contributions to regional air quality would be less than significant.

Community Risks and Hazards

To address cumulative impacts on local air quality conditions due to toxic air contaminant (TAC) emissions, BAAQMD recommends assessing impacts within 1,000 feet of the proposed project, taking into account both individual and nearby cumulative sources (i.e., proposed project plus existing and foreseeable future projects). BAAQMD has established the following cumulative thresholds of significance that should be applied to the project in combination with all identified sources within this 1,000-foot radius and they are presented in **Table 4-2.**

Table 4-2: Summary of 1999 and 2010 BAAQMD Cumulative Risks and Hazards Operational Significance Thresholds

Pollutant	Operational Thresholds	1999 Guidelines	2010 Guidelines
Risks and Hazards – TACs & $PM_{2.5}$ (Cumulative – Source or Receptor)	Increased cancer risk:	--	>100 in a million (from all local sources)
	Increased non-cancer risk:	--	>10.0 Hazard Index (from all local sources) (Chronic)
	Ambient $PM_{2.5}$ increase:	--	>0.8 $\mu g/m^3$ annual average (from all local sources)
	Zone of Influence:	--	1,000-foot radius from property line of source or receptor

NOTES: "--" no standard; $\mu g/m^3$ = micrograms per cubic meter.

All permitted stationary and major roadway sources of TACs and $PM_{2.5}$ are identified in **Table 4-3**. When existing sources within a 1,000-foot radius of the MWWTP site are considered, the existing excess cancer risk and $PM_{2.5}$ levels at the closest sensitive receptors in the project vicinity already exceed BAAQMD cumulative significance thresholds for cancer risk (excess cancer risk is 489 in a million) and $PM_{2.5}$ (27 $\mu g/m^3$). The exceedance for excess cancer risk is attributable to existing roadway emissions from the I-880 and I-80/I-580 freeways and proximity of receptors to these freeways. The exceedance for $PM_{2.5}$ emissions shown in **Table 4-3** is primarily due to one stationary source (Sierra Pacific).

Table 4-3: Screening Table for Existing Permitted Stationary Sources and Roadways

Site #	Facility Name	Street Address	City	Excess Cancer Risk in a Million	Chronic Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
591	East Bay Municipal Utility District, Multi-Fuel Cogeneration Engine	2020 Wake Avenue	Oakland	8[1]	0.06[1]	- -[1]
9008	East Bay Municipal Utility District, Gas Dispensing Facility	2020 Wake Avenue	Oakland	0	0	0
17822	Berkeley Repertory Theatre	2526 Wood Street	Oakland	0	0	0
18373	Ps Print LLC	2861 Mandela Pkwy	Oakland	0	0	0
18268	Sierra Pacific	3213 Wood Street	Oakland	0	0	21.3
15740	California Waste Solutions -Wood Street	3300 Wood Street	Oakland	0	0	0.149
17114	Alameda County Public Works Agency, Emergency Genset - Ettie St. Pump Station	3455 Ettie Street	Oakland	3.86	0.00137	0.00687
Cumulative – Stationary Sources				**12**	**0.06**	**21.5**
I-880 Freeway (East of MWWTP) at 700 feet, which is the distance to the closest sensitive receptors located to the east			Oakland	173	0.03	0.40
I-580 Freeway (East of MWWTP) at 100 feet, which is the distance to the closest sensitive receptors located to the south			Oakland	304	0.07	0.80
Cumulative – Roadway Sources				**477**	**0.10**	**1.2**
Cumulative – Both Sources				**489**	**0.16**	**22.7**
BAAQMD Cumulative Significance Thresholds				100	10.0	0.8

[1] BAAQMD permitted sources records (for screening purposes only) indicate the following levels: excess cancer risk of 890 in a million, chronic hazard index of 10.2, and $PM_{2.5}$ level of 46.0 $\mu g/m^3$. These health risk impacts were calculated by the BAAQMD using very conservative assumptions of exposure concentrations and do not include source-specific exhaust information, and do not account for the distances to actual receptors (i.e., actual exposure at receptor locations). When values exceed the BAAQMD's screening thresholds, the BAAQMD recommends that a site-specific health risk analysis be performed using source-specific exhaust parameters and distances to receptors, which would result in substantially lower health risk values. For the MWWTP, a site-specific health risk assessment was prepared in 1991 and results are listed in this table. However, the BAAQMD notes that there have subsequently been a number of permit applications submitted for sources not reflected in the 1991 HRA. In addition, there are currently more compounds that have been identified as TACs than there were in 1991. Therefore, actual health risks associated with the MWWTP are higher than the levels indicated in this table.

Source: BAAQMD, 2010b, 2010c, 2010d.

The BAAQMD Community Air Risk Evaluation (CARE) program identified West Oakland as an Impacted Community, due to the combination of higher levels of diesel particulate matter (DPM) (due to on-road heavy-duty trucks, as well as ships, harbor craft, locomotives, and cargo handling equipment) and proximity of sensitive populations. BAAQMD indicates that these communities are often faced with other environmental and socio-economic hardships that further stress their residents and result in poor health outcomes. According to findings of the CARE program, DPM, mostly from on- and off-road mobile sources, accounts for over 80 percent of the inhalation cancer risk from TACs. BAAQMD recommends that Community Risk Reduction Plans be adopted in impacted communities. Although such a plan has not been conducted for West Oakland, there has been extensive study of the effects of Port of Oakland activities on West Oakland neighborhoods. CARB has adopted numerous regulations to reduce DPM emissions and these rules will significantly reduce cancer and non-cancer risk in West Oakland (BAAQMD 2010a). In June 2009, the Port of Oakland adopted the Maritime Comprehensive Truck

Management Program. This program sets forth a comprehensive set of actions and plans in support of various regulations, including CARB's Drayage Truck Regulation, which requires drayage truck owners to ensure that their trucks meet certain emission standards to reduce DPM emissions by 85 percent (Port of Oakland 2009). Enforcement of these emission standards by the Port will also reduce DPM emissions in the MWWTP vicinity because Port-related trucks travel on the I-880 freeway, which is one of the primary contributors to the cumulative exceedance of BAAQMD threshold for excess cancer risks listed in **Table 4-3**.

While the Port's Maritime Comprehensive Truck Management Program will help to reduce baseline community risks and hazards conditions in the MWWTP vicinity by reducing DPM emissions on freeways and roadways in the MWWTP vicinity, it is likely that the BAAQMD cumulative significance thresholds would continue to be exceeded in the MWWTP vicinity due to the proximity of sensitive receptors to freeways. When stationary and mobile source emissions from operation of the biodiesel production facility and mobile sources from operation of the food waste preprocessing project and Land Use Master Plan projects are considered together, the combined cancer and hazard exposure risks at the closest sensitive receptor would be 18.5 excess cancer cases in a million,[1] 0.017 chronic hazard risk index, and $PM_{2.5}$ emissions of 0.05 $\mu g/m^3$. When the combined project emissions are added to the existing sources in Table 4-3 cumulative risks and hazards would not exceed BAAQMD CEQA significance thresholds of 10.0 chronic hazard index, but would exceed the BAAQMD threshold of 100 excess cancer cases in a million and $PM_{2.5}$ emissions of 0.8 $\mu g/m^3$ (see Impact AIR-5 for more detailed discussion). However, the project's contribution to this potential cumulative impact would not be cumulatively considerable with implementation of **Mitigation Measure AIR-5** requiring use of diesel particulate filters on all on-site rolling stock and trucks that operate solely within the MWWTP and West End property under the control of EBMUD.

In addition, EBMUD also has existing programs to reduce emissions associated with mobile sources at the treatment plant site. EBMUD implements restrictions on engine idling and employs best management practices to reduce emissions. District Procedure 709, Fleet Management, mandates that drivers operate vehicles to maximize fuel economy (e.g., ensure the tires are properly inflated, accelerate smoothly, drive the speed limit, and minimize engine idling). Idling is limited to no more than five minutes. EBMUD also maintains a passenger fleet of alternative fuel vehicles, which reduces emissions.

The biodiesel production facility would also make biodiesel fuel available in the region, which would contribute to reduction in DPM emissions. Depending on the percentage of biodiesel in the fuel, emissions of DPM can be reduced by up to 40 percent (USEPA 2010). Thus the biodiesel element of the Land Use Master Plan would contribute to reductions in emissions in the region.

Despite the reduction in project emissions to below the BAAQMD significance threshold for excess cancer risk and $PM_{2.5}$, this risk would contribute incrementally to the already impacted condition in the MWWTP vicinity. Therefore, this project's incremental increase is considered to be cumulatively significant. EBMUD considered other mitigation that could reduce diesel particulate emissions, but the only other major source of emissions would be diesel trucks making deliveries to the MWWTP. These vehicles are not controlled by EBMUD. While emissions from on-road diesel trucks are expected to be reduced over time as newer Tier 3 diesel engines come into service, it is not considered feasible for EBMUD to impose engine requirements on outside vehicles traveling to and from the MWWTP. Even

[1] Excess cancer risk accounts for age-adjusted exposure over 70 years (increased sensitivity of women in the third trimester of pregnancy, infants and youths age 2 to 16). The calculated excess cancer risk is estimated to be 25 in a million. However, the CARB has recently indicated that the URBEMIS Model over predicts DPM emissions by a factor of around 3 because of lower load factors, fewer hours of actual use, and newer equipment than assumed in the model (CARB 2010). Therefore, with the adjusted excess cancer risk for on-site truck and rolling stock emissions is estimated to be approximately one-third or 8.5 cases in a million.

with controls it would not be possible to completely eliminate all TAC emissions. Since there is no additional project-related mitigation that could completely eliminate residual TAC emissions, they would be considered significant and unavoidable, due to the already impacted condition in the MWWTP vicinity.

Biological Resources

The project could result in potentially significant impacts related to protection of nesting birds that are protected under state and federal law and removal of trees that are protected under the City of Oakland Tree Preservation and Removal Ordinance. Therefore, the geographic scope of potential cumulative impacts on biological resources encompasses the City of Oakland.

Although there is very limited suitable nesting substrate within the project area or vicinity because the area is predominantly developed, all of the projects listed in **Table 4-1** could contribute to cumulative impacts to biological resources if they adversely affected protected nesting birds or involved removal of protected trees. However, the project's contribution to this potential cumulative impact would not be cumulatively considerable with implementation of **Mitigation Measure BIO-1** requiring tree removal outside of the nesting season, or implementation of protective measures if removal outside of the nesting season is not feasible, and implementation of **Mitigation Measure BIO-2** requiring replacement of trees that would be considered protected under the City of Oakland Tree Preservation and Removal Ordinance.

Cultural Resources

The geographic scope of potential cumulative impacts on cultural resources encompasses the project site and immediate vicinity. The project would contribute to cumulative impacts on archaeological resources, paleontological resources, and human remains if the proposed project and other projects in **Table 4-1** were to adversely affect cultural resources within the project vicinity.

As discussed in *Section 3.5, Cultural Resources*, the project area is underlain by artificial fill above San Francisco Bay estuarine deposits. There is no indication of archaeological deposits, unique archaeological resources, paleontological resources, or Native American human remains within the project site or immediate vicinity. However, in the unlikely event that these resources were encountered, the project's contribution to this potential cumulative impact would not be cumulatively considerable with implementation of **Mitigation Measure CUL-1**, which requires recovery and appropriate management of buried cultural materials; **Mitigation Measure CUL-2**, which requires recovery and appropriate management of paleontological resources; and **Mitigation Measure CUL-3**, which requires recovery of human remains and appropriate management of Native American human remains.

Energy

The geographic scope of potential cumulative impacts related to energy resources consists of the PG&E service area and all of the State of California.

The proposed project, in combination with all of the projects listed in **Table 4-1** and statewide projects, could contribute to inefficient, wasteful, or unnecessary consumption of fuels or other energy resources. However, the project's contribution to this potential cumulative impact would not be cumulatively considerable because, as discussed in *Section 3.6, Energy*, none of the Land Use Master Plan projects would use energy in a wasteful or unnecessary manner and all of the Land Use Master Plan projects would incorporate energy efficiency measures during construction and operation in accordance with **Mitigation Measure AIR-2**.

Furthermore, the Food Waste Facility Phase 2 Project (Project 3) and the proposed biodiesel production facility would produce enough biogas to increase the renewable energy production capacity at the expanded PGS by 3.4 MW, or up to 29,800 MW hours per year. Although the Food Waste Facility Phase 2, Digester Upgrade Project - Phase II, and K2 Brine Project (Projects, 1, 3, and 4) would use part of this renewable energy, the remaining renewable energy would potentially be enough to provide electricity for

the other Land Use Master Plan elements, and possibly result in sale of excess renewable energy to PG&E. In addition, as discussed in *Section 3.6, Energy*, the biodiesel production facility would provide 20 million gallons per year of biodiesel which would help meet the state's goal of using 9 percent alternative fuels by 2012, and would provide approximately 1 percent of the state's goal of using 1.6 billion gallons of alternative fuel by 2020, a beneficial impact of the project.

Geology, Soils, and Seismicity

The geographic scope of potential cumulative impacts related to geology, seismicity, and soils encompasses the project site and immediate vicinity. Although many of the cumulative projects listed in **Table 4-1** could have similar geologic impacts to the proposed project, geologic and soils impacts are generally site-specific and depend on local geologic and soil conditions. Although the project could result in potentially significant impacts related to seismically induced groundshaking and ground failures (liquefaction), these impacts would be less than significant with implementation of **Mitigation Measures GEO-1 and GEO-2** requiring geotechnical evaluations for these seismic hazards. None of the projects listed in **Table 4-1** would contribute to cumulative geologic, soils, or seismic impacts in connection with implementation of the project.

Greenhouse Gas Emissions

Greenhouse gas (GHG) emissions and their contribution to climate change is a global issue. The scope of this analysis includes lifecycle and global contributions to greenhouse gas emissions. Because GHG emissions affect global climate change, evaluation of cumulative impacts is not based on adding emissions of all reasonably foreseeable projects (which would not be feasible on a global basis). BAAQMD CEQA Guidelines approach for cumulative GHG analysis establishes an individual project threshold that addresses whether the project would result in cumulatively considerable emissions. To address global climate change, BAAQMD has established emissions of 10,000 metric tons of carbon dioxide equivalents (CO_2e) per year as the threshold of significance for operational GHG emissions, but BAAQMD has not established a threshold of significance for construction-related GHG emissions as discussed in Impacts GHG-1 and GHG-2. If a project's operational GHG emissions exceed the operational threshold, the project is considered to result in a cumulatively considerable contribution of GHG emissions and have a cumulatively significant impact on global climate change.

As indicated in *Section 3.8, Greenhouse Gas Emissions* (Impact GHG-1), the construction-related GHG emissions associated with the proposed biodiesel production facility, food waste preprocessing facility, and Land Use Master Plan projects were determined to be less than significant. Since construction of the biodiesel production facility is scheduled for fall of 2011, while the construction of the food waste preprocessing facility is scheduled for spring or summer of 2012, the construction phases when heavy equipment would be operated for each project are not expected to overlap. The other Land Use Master Plan elements would be constructed sometime over the next 30 years, and therefore, are also not expected to overlap with these two projects. Therefore, cumulative effects from any overlap in construction are not expected.

Operational emissions associated with these projects were each compared to the applicable BAAQMD significance threshold for GHG emissions in Impact GHG-2 and determined to be less than significant for both the biodiesel production facility and food waste preprocessing facility and other Land Use Master Plan elements. In fact, with reductions in GHG emissions that would result from use of biodiesel fuel, the project would have an overall beneficial effect on GHG emissions. Therefore, GHG emissions associated with all three projects are not considered to be cumulatively considerable. Lifecycle GHG benefits associated with the production and use of biodiesel, combined with GHG reductions associated with renewable energy generation that is facilitated by the proposed food waste preprocessing facility, would help to reduce cumulative GHG emissions.

Hazards and Hazardous Materials

The geographic scope of potential cumulative impacts associated with hazards and hazardous materials encompasses the project site and immediate vicinity. With respect to the use of hazardous materials and hazardous materials in the environment, effects are generally limited to site-specific conditions. For cumulative effects on emergency response plans, the effects can extend to regional roadways that could be affected by construction-related traffic.

As discussed in Impact HAZ-1 (see *Section 3.9, Hazards and Hazardous Materials*), the biodiesel production facility, food waste preprocessing facility, and other Land Use Master Plan elements would increase the use of hazardous materials at the MWWTP. Three of the five EBMUD projects planned at the MWWTP (Projects 1 through 3) would also likely include the use of some hazardous materials. However, EBMUD and the owner/operators of the biodiesel production facility and food waste preprocessing facility would be required to design, build, and operate all hazardous materials handling facilities in accordance with applicable laws and regulations, including preparation of a Hazardous Materials Business Plan. With implementation of the legal requirements discussed in Impact HAZ-1, cumulative impacts related to the transport, use, and disposal of hazardous materials would be less than significant.

Cumulative impacts related to the presence of hazardous materials in the soil or groundwater and exposure to hazardous building materials could occur where projects with overlapping construction schedules would be implemented in the same area. Construction of the biodiesel production facility and food waste preprocessing facility could overlap with four of the five projects planned at the MWWTP (Projects 1 through 4), and construction of the other Land Use Master Plan elements could overlap. However, the project's contribution to these cumulative impacts would not be cumulatively considerable with preparation of a health and safety plan and other measures required by the EBMUD construction specifications and the Operation and Maintenance Plan for the West End property, and implementation of **Mitigation Measure HAZ-3** requiring survey and abatement of hazardous building materials (see Impacts HAZ-2 and HAZ-3). Cumulative impacts would not occur with the Billboard Installation project on the MWWTP property (Project 5) because construction of this project is underway and will be completed before construction of the biodiesel production facility, food waste preprocessing facility, and Land Use Master Plan projects begins.

Although site cleanups and hazardous building material abatement would be required for implementation of development projects on the former OAB (Projects 9 through 15), these projects are not located at the MWWTP, and would not contribute to cumulative impacts related to the presence of hazardous materials in the soil or groundwater and exposure to hazardous building materials at the MWWTP and West End property.

Cumulative impacts related to interference with implementation of an adopted emergency response plan or emergency evacuation plan could result if the proposed project, in combination with the projects listed in **Table 4-1**, obstructed or caused unacceptable traffic delays on an adopted emergency evacuation or response route. All of the proposed improvements would be constructed on the MWWTP property and would not obstruct an emergency response or evacuation route. The project would not cause unacceptable delays because, as discussed in *Section 3.14, Transportation*, traffic would not be expected to use local streets and would instead access the I-80, I-880, and I-580 freeways via West Grand Avenue, and because increased traffic associated with project operations would not cause a substantial delay at area intersections. Therefore, the project's contribution to this impact would not be cumulatively considerable.

Hydrology and Water Quality

The proposed Land Use Master Plan facilities would be developed within an urban industrial area and would avoid direct impacts to local waterways because stormwater and construction-related discharges

would be discharged to San Francisco Bay via the wastewater treatment system at the MWWTP and the the City of Oakland storm sewer system on the West End property in accordance with applicable NPDES permits. Therefore, the geographic scope of potential cumulative surface water hydrology and water quality impacts encompasses the area served by the MWWTP wastewater treatment system, the City of Oakland, and ultimately San Francisco Bay.

As discussed in *Section 3.10, Hydrology and Water Quality* the Land Use Master Plan projects on the MWWTP property would discharge stormwater to the wastewater treatment system at the MWWTP and projects on the West End property would discharge stormwater to the City of Oakland stormwater collection system. The five EBMUD projects listed in **Table 4-1** (Projects 1 through 5) would also discharge to these systems while the remaining cumulative projects in **Table 4-1** would discharge stormwater to the City of Oakland or Port of Oakland storm drain systems. There would be no change in volume of stormwater, because all of the project site is already covered by impermeable surface. However, all of these projects could potentially contribute to cumulative impacts related to degradation of water quality in the Bay because the City of Oakland and Port of Oakland storm drain systems and the MWWTP wastewater system discharge to the Bay. In addition, construction of the San Francisco/Oakland Bay Bridge Seismic Safety Projects (Project 6) includes construction within and above San Francisco Bay, and contributes to stormwater runoff. Degradation of water quality could occur as a result of construction activities in the Bay, and also as a result of soil erosion, stormwater discharges, and accidental discharges of hazardous materials during both construction and operation. However, the project's contribution to this cumulative impact would not be cumulatively considerable because stormwater discharges from projects located on the West End property would be subject to the new General Construction Permit (*General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities*; Permit No. CAS000002; Order No. 2009-0009-DWQ) and City of Oakland stormwater permitting requirements, stormwater discharges from the projects listed in **Table 4-1** that are located outside of the MWWTP and construction activities in the Bay would be subject to similar RWQCB NPDES and local permitting requirements (which would also be protective of water quality), and discharges from the MWWTP would be subject to the plant's NPDES permit (and compliance with the effluent and receiving water limitations as well as monitoring requirements specified in the permit would ensure that adverse water quality effects would not occur).

Land Use and Recreation

The geographic scope of potential cumulative land use and recreational impacts consists of the project site and West Oakland community. Although the project site is close to the Port of Oakland, the MWWTP is outside the Port Area and cumulative land use impacts are not expected to extend to the Port Area.

Implementation of the Land Use Master Plan projects, in conjunction with the projects listed in **Table 4-1**, would not create long-term cumulative land use conflicts. Because the MWWTP is located within an existing industrial zone, the long-term implementation of Master Plan facilities would not incrementally add to inconsistencies with the General Plan or other local plans that could otherwise lead to significant cumulative environmental effects.

At a regional scale, the Land Use Master Plan would not impede future development of the San Francisco Bay Trail. *Section 3.11, Land Use and Recreation* describes the proposed Bay Trail alignment, which follows the existing northern boundary of the MWWTP and West End property. The project's contribution to this potential cumulative impact would not be cumulatively considerable.

Noise

For noise and vibration, the geographic scope of potential cumulative impacts is limited to the immediate project vicinity as well as areas adjacent to any routes designated for access and hauling.

Portions of the Former OAB Subaru Lot and Baldwin Yard and Gateway Development Area (Projects 9 and 10), and the northernmost Former OAB Port Development Area (Project 12) would be constructed near the MWWTP or adjacent to West Grand Avenue or Wake Avenue. Although the construction schedules for these projects has not been determined, the project's contribution to construction-related and operational noise increases would not be cumulatively considerable with implementation of **Mitigation Measure NOI-1** requiring noise controls during construction and **Mitigation Measure NOI-3** requiring use of best available noise control technologies for stationary equipment. These site-specific mitigation measures require each Land Use Master Plan project to meet City of Oakland Noise Ordinance limits or ordinance limits adjusted to account for ambient noise levels (if ambient noise levels already exceed the limit). Further, the potential cumulative projects would also be subject to applicable standards and limits specified in the City of Oakland Noise Ordinance based on noise levels occurring at the time each project is constructed, which would ensure that adjacent uses would not be adversely affected by cumulative construction and operational noise increases.

Implementation of the proposed Land Use Master Plan projects, in conjunction with other proposed projects at the MWWTP and in the vicinity (listed in **Table 4-1**), would result in cumulative traffic noise increases on roadways in the project vicinity. The project would contribute to cumulative traffic noise increases on Wake Avenue, freeway ramps in the MWWTP vicinity, Maritime Avenue, West Grand Avenue (west of Frontage Road), and Frontage Road (between West Grand Avenue and 7th Street). However, since the project's traffic would comprise less than 1 percent of existing and future traffic volumes on these roadways, the project's contribution to cumulative traffic noise increases would not be cumulatively considerable.

Future planned residential uses to the east of Frontage Road, including the Zephyr Gate development (Project 17), Wood Street Mixed Use Project (Project 18), and HFH Apartments (Project 19) would be subject to cumulative traffic noise increases on Frontage Road. The design of these proposed mixed-use and residential developments would need to consider future noise levels from the freeway (which dominates the local noise environment) and Frontage Road to ensure acceptable noise levels are maintained for these future residential uses.

Public Services

The geographic scope of potential cumulative impacts to police and fire services is within the City of Oakland. As discussed in *Section 3.13, Public Services*, the project would not be expected to require additional police or fire protection services, and would not be expected to require new or physically altered governmental facilities to maintain acceptable service ratios, response times, or other performance objectives for police or fire protection. This impact would thus not be cumulatively considerable.

Transportation

The geographic scope of potential cumulative impacts related to transportation is the roadway network in the MWWTP vicinity, including the I-80, I-880, and I-580 freeways and associated on- and off-ramps; Wake Avenue; Maritime Street; West Grand Avenue (west of Frontage Road); and Frontage Road (between West Grand Avenue and 7th Street). All of the projects listed in **Table 4-1** could contribute traffic to these roadways during construction, and many would increase traffic once constructed, potentially resulting in unacceptable traffic delays at nearby intersections or increases in traffic on the regional freeway system.

However, when operating at full capacity at full build out (within 30 years), the proposed Land Use Master Plan projects (including food waste preprocessing, biodiesel, and other Land Use Master Plan elements) are forecast to generate approximately 28 net new vehicle trips during the morning peak hour for background commute traffic and approximately 30 net new vehicle trips for the afternoon peak hour of background commute traffic (refer to *Section 3.14, Transportation*). This level of peak-hour traffic

would not result in cumulatively considerable effects at the study intersections or freeway segments as described below.

The *OAB Auto Mall Draft Supplemental EIR Traffic Analysis* (City of Oakland, 2006) found that the intersections of West Grand Avenue / Maritime Street and West Grand Avenue / Frontage Road would operate at LOS F during the morning and afternoon peak hours under baseline (no Auto Mall project) cumulative conditions.[2] However, the proposed project's increase in traffic volumes would not cause the average delay to increase by two or more seconds, the threshold of significance discussed in *Section 3.14, Transportation*, and therefore would not be cumulatively considerable.

The project's contribution to the increase in the volume-to-capacity ratio for freeway segments that operate at LOS F would be less than 1 percent. This is less than the 3 percent threshold described in *Section 3.14, Transportation*, and therefore would not be cumulatively considerable.

Utilities

The geographic scope of potential cumulative impacts related to wastewater treatment capacity includes the EBMUD wastewater service area. For water supply, the geographic scope includes the EBMUD service area. The geographic scope for stormwater conveyance capacity includes the MWWTP, which currently accepts all stormwater drainage from the facility and the City of Oakland because stormwater flows from the West End property are directed to the City of Oakland stormwater collection system. For landfill capacity, the geographic scope includes the Bay Area, where disposal of construction-related waste could occur. For disruption of utilities, the geographic scope is limited to the project vicinity, where utilities could require relocation and services could be disrupted.

As discussed in *Section 3.15, Utilities*, average daily wastewater flow generated within the EBMUD service area is 65 million gallons per day (mgd). EBMUD's wastewater service area is essentially built-out, such that flows are not expected to increase appreciably in the future. Increased wastewater flows from the Land Use Master Plan projects would include 7,000 gpd from the biodiesel production facility and small amounts of wastewater flows from the remaining master plan projects. The wastewater produced by the project would be approximately 0.01 percent of the total projected flows, and would not be cumulatively considerable.

Of the projects listed in **Table 4-1**, redevelopment of the former OAB Redevelopment area represents the largest increase in potable water demand (Projects 9 through 15). Redevelopment of the former army base would increase potable water demand by approximately 516,500 gpd (City of Oakland 2002), and when considered in combination with the proposed project's demand of 8,500 gpd the water demand could potentially exceed existing EBMUD water entitlements. However, EBMUD conducted a Water Supply Assessment for the redevelopment project and concluded that the EBMUD has sufficient water supplies to meet the projected demands in years of normal rainfall, although water rationing could be required in drought years to meet all customer demands. Further, certain redevelopment projects within the former army base would be required to plumb landscape areas for irrigation with recycled water; install dual plumbing for both potable and recycled water; and be designed to facilitate the use of recycled water (City of Oakland 2002). Because EBMUD has already accounted for the redevelopment projects in their water demands, and increased water demands of the Land Use Master Plan projects have been

[2] The traffic forecasts for the proposed Auto Mall were based on the 2004 version of the Alameda Countywide Model, which provided forecasts of travel demand for 2010 and 2025 based on ABAG Projections 2002 socioeconomic forecasts. ACCMA updated countywide travel demand model (ACCMA 2010) incorporates the ABAG Projections 2007 forecasts. Review of this updated model indicates that the annual rates of growth developed for the Supplemental EIR analysis are roughly consistent with the updated model forecast for the project area.

accounted for in the EBMUD's water supply planning, cumulative impacts related to an insufficient water supply are less than significant.

The EBMUD Digester Upgrade Project, PGS Renewable Energy Expansion Project, Food Waste Facility Phase 2 Project, K2 Brine Project, and Billboard Installation (Projects 1 through 5) would not increase stormwater flows, even with the creation of new impervious surfaces, because the existing ground surface at the MWWTP and West End property is generally hardpacked soil and gravel that are relatively impervious to the infiltration of stormwater. Land Use Master Plan projects constructed on the West End property would discharge stormwater runoff to the City of Oakland's stormwater collection system along with other projects listed in **Table 4-1** until the stormwater drainage system on this portion of the property is connected to MWWTP stormwater collection system. However, the contribution of the Land Use Master Plan projects to cumulative impacts related to increased stormwater flows would not be cumulatively considerable because these facilities would not contribute to an increase in stormwater flows to the City's stormwater collection system. Further, all of the projects constructed on the MWWTP property would discharge stormwater to the MWWTP stormwater collection system, and none of the projects listed in **Table 4-1** would discharge stormwater to this system. Therefore, cumulative impacts related to increases in stormwater flows that would require construction of new stormwater facilities or expansion of existing facilities are less than significant.

The proposed project and all of the cumulative projects listed in **Table 4-1** would generate construction-related waste requiring off-site disposal and could contribute to a significant cumulative impact on landfill capacity. However, the project's demand on landfill capacity represents an immeasurably small fraction of the total remaining landfill capacity in Alameda County (see Impact PUB-5). Therefore, the project's contribution to cumulative demand on regional landfill capacity would not be cumulatively considerable.

Many of the projects listed in **Table 4-1** could require excavation and associated protection or relocation of utilities, including the formerly planned Auto Mall (Project 9) to the south of the MWWTP. Implementation of these projects could result in a cumulative impact related to disruption of utilities or services if the utilities were damaged during construction. However, the project's contribution to this impact would not be cumulatively considerable with implementation of **Mitigation Measure PUB-7** requiring the construction contractor to appropriately locate utilities prior to excavation and to notify and coordinate with public and private utility providers prior to construction.

4.4 Significant and Unavoidable Impacts of the Project

EBMUD will be required to adopt Findings and prepare a Statement of Overriding Considerations for unavoidable, adverse impacts as part of its approval of the EIR. The only significant unavoidable impact identified for the Land Use Master Plan is the cumulative air quality impact associated with community risks and hazards during operation. As noted above in the cumulative air quality discussion in *Section 4.3, Cumulative Effects*, the combined excess cancer risk from emissions associated with the biodiesel production facility, food waste preprocessing facility, and other Land Use Master Plan elements would be 18.5 per million, which is primarily attributable to mobile equipment operating within the food waste preprocessing facility at the MWWTP. The food waste preprocessing project's community risk and hazards impact is thus potentially significant, but can be reduced below BAAQMD's 10 in a million project-level threshold with implementation of **Mitigation Measure AIR-5**. However, this risk would contribute incrementally to the already impacted condition in the MWWTP vicinity. EBMUD has existing programs to reduce on-site DPM emissions, and implementation of the biodiesel project would contribute to reductions of DPM emissions in the region. Nevertheless, because project-related mitigation would reduce, but would not completely eliminate, the project's TAC emissions, this impact is considered to be cumulatively significant and unavoidable.

4.5 Significant Irreversible Changes

Implementation of the Land Use Master Plan would require irreversible commitment of natural resources including construction materials; labor; and energy required for construction, operation, and maintenance. Commitment of non-renewable natural resources used in construction would include gravel, petroleum products, steel, and others. Commitment of energy resources for construction would include fuel oil, natural gas, and gasoline for heavy machinery.

Operation of the Land Use Master Plan would result in further commitment of energy resources, but EBMUD's goal is that all of the MWWTP facilities would be powered by the on-site PGS, so that the MWWTP would be energy self-sufficient. The biodiesel production facility and the food waste preprocessing facility are both expected to obtain power from PG&E, a portion of which would be produced by fossil fuels. However, both projects contribute to the production of green energy.

Chapter 5 Alternatives

The following discussion evaluates alternatives to the proposed MWWTP Land Use Master Plan (herein the "proposed project" or "project") and examines the potential environmental impacts associated with each alternative. Through comparison of these alternatives to the proposed project, the relative environmental advantages and disadvantages of each are identified.

5.1 Methodology

The CEQA Guidelines Section 15126.6 requires EIRs to evaluate a range of reasonable alternatives to a project, or to the location of a project that would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. The following criteria for selecting alternatives are set forth in the Guidelines:

- An EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. The range of alternatives addressed in an EIR should be governed by a rule of reason. Not every conceivable alternative must be addressed, nor do infeasible alternatives need to be considered (CEQA Guidelines Section 15126.6(a)). When addressing feasibility, factors that may be taken into account may include site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, jurisdictional boundaries, and the proponent's ability to reasonably acquire, control, or otherwise have access to an alternative site.
- Evaluation is to focus on those alternatives capable of either avoiding or substantially lessening any significant environmental effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives, which are identified in *Chapter 2, Project Description* of this EIR, or would be more costly.
- The EIR should identify alternatives that were considered by the lead agency but were rejected as infeasible and the reasons for the lead agency's determination (Section 15126.6(c))
- A "No Project" alternative must be evaluated and the EIR must also identify an environmentally superior alternative (Section 15126.6(e))

The discussion should not consider those alternatives whose implementation is remote or speculative, and the analysis need not be presented in the same level of detail as the assessment of the proposed project.

Alternatives may take the form of no project, reduced project size, different project design, or suitable alternative project sites.

Based on the CEQA Guidelines, several factors should be considered in determining the range of alternatives to be analyzed in an EIR and the level of analytical detail that should be provided for each alternative. These factors include:

1. The potential for the proposed project to result in significant impacts;
2. The ability of alternatives to reduce or avoid the significant impacts associated with the proposed project;
3. The ability of the alternatives to meet the objectives of the proposed project; and
4. The feasibility of the alternatives.

The analysis in this EIR indicates the proposed project would result in potentially significant and unavoidable impacts related to cumulative community risks and hazards. However, the significance of this impact is attributable to existing emissions from existing sources near the MWWTP, primarily freeway traffic in the vicinity. The cumulative baseline emissions still would be considered significant

without addition of emissions from any projects proposed as part of the Land Use Master Plan, thus even the No Project Alternative would have significant cumulative community risks and hazards. Thus, there are no alternatives that would reduce this cumulative impact to less than significant. The alternatives examined herein could reduce the project's contribution to this already significant cumulative air quality impact.

5.2 Development of Land Use Master Plan

From a list of dozens of individual projects and alternative site conditions, EBMUD selected 14 projects for incorporation into the Land Use Master Plan based on the identified objectives. The original list was prioritized and reduced recognizing the limited space available. Project elements considered and not selected for further development include the following:

- Expansion of the recycled water facility
- Expansion of recycled water storage
- On-site hypochlorite production
- Relocation of the Solids Dewatering Building
- Relocation of scum treatment
- Placement of an additional billboard
- Localized EBMUD fleet vehicle maintenance
- Construction of a training center
- Archives and file storage
- Construction of a technical center
- Expansion of maintenance facilities
- Recreation facilities for EBMUD staff

These projects were not considered further because they did not meet the project objectives, did not have a high priority or were not considered to be cost effective at this time or in the foreseeable future. Some projects met all of the objectives and were considered cost-effective, but were still eliminated because other projects met the objectives better. If conditions change, or additional land area is available, these projects may be considered in the future as part of a separate process.

The Land Use Master Plan was developed based on the potential incorporation of the 14 remaining projects. Three alternative layouts were developed to explore different land use possibilities. Alternative 1 was eventually determined to be the recommended alternative and is the proposed project evaluated in this EIR. The proposed project is based on meeting Master Plan objectives given existing site constraints. It assumes that both renewable energy projects – biodiesel production and food waste preprocessing – are successfully implemented in the short term and nearly all the projects are eventually implemented in the long term. Alternative 2 incorporates essentially the same project list and timeframe as the proposed project, but in different configurations based on three sub-alternative layouts that permit improved traffic routing and plant access. All three of the sub-alternatives depend upon obtaining additional land rights or access from at least one other agency. Alternative 3, in contrast, is based on existing property boundaries but does not incorporate either renewable energy project in the short term. Instead, it reserves four acres of the West End property for development of a biosolids-to-energy facility in the long term. This facility would utilize a low-emission pyrolysis or gasification process to extract energy from biosolids to produce heat and/or electricity, and an inert ash byproduct.

Table 5-1 shows elements that are included in each of the Land Use Master Plan Alternatives.

Table 5-1: Summary of Facilities Included in Each Land Use Master Plan Alternative Layout

Facility	Proposed Project Green Energy Scenario		Alternative 2 Alternative Access and Land Exchange Scenario		Alternative 3 Long Term Development Scenario	
	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
Biodiesel Production Facility	✓	✓	✓	✓		
Food Waste Preprocessing Facility	✓	✓	✓	✓		
Odor Control	✓	✓	✓	✓	✓	✓
Food Waste Processing	✓	✓	✓	✓		
Land Leases to EBMUD Water System/Port/City/Storage	✓		✓		✓	
Emergency Response Equipment/ Staging Area	✓	✓	✓	✓	✓	✓
Secondary Treatment Upgrade (Ammonia Removal)		✓		✓		✓
Ultraviolet Disinfection		✓		✓		✓
Tertiary Treatment Facility		✓		✓		✓
Digester Expansion		✓		✓		✓
Household Hazardous Waste Collection Facility		✓		✓		✓
Bay Stewardship Exhibit/ Public Education Facility		✓		✓		✓
Biosolids-to-Energy Facility						✓
Relocation of Septage and R2 Receiving Stations		✓		✓		

Note that these new facilities or expansions were considered for siting within the existing MWWTP, West End property or adjacent properties. Other EBMUD owned land was not considered because it would not be feasible to locate these facilities a great distance from the MWWTP. All of the proposed Master Plan elements are either integral to the treatment processes at the existing MWWTP or support the existing Resource Recovery program and need to be sited in close proximity to existing facilities.

5.2.1 Proposed Project

The proposed project is described in detail in *Chapter 2, Project Description.* It includes two renewable energy projects: biodiesel production and food waste preprocessing. In addition, the project reserves space for construction of potential long-term, regulatory-driven projects, which would be sited to maintain continuity with existing solids and liquids process layouts at the MWWTP, while minimizing demolition of existing facilities or buildings. The project also defines areas suitable for revenue-driven projects that could be implemented in the short term without interfering with regulatory projects in the future.

5.2.2 Alternative 2 – Alternative Access and Land Exchange Scenarios

Alternative 2 includes all of the same facilities as the proposed project, but considers possible scenarios for land exchange with or purchase from adjacent landowners to improve facility layout, access and traffic circulation. The following potential agreements were evaluated:

- An agreement with the City of Oakland to purchase and/or exchange land;
- Acquisition of a new, additional railroad crossing for entry and exit to the MWWTP; and
- Coordination with the City of Oakland and any other agency to obtain access to the MWWTP via Burma Road.

Although EBMUD may pursue land exchange or purchase that would facilitate these options in the future, the potential land acquisition options were deemed too speculative to select this alternative as the preferred project. One similar scenario, which would potentially reduce impacts, is examined below (see analysis of Land-lease Energy Projects on New Property Alternative in *Section 5.4.2*). If EBMUD is able to pursue any of these options in the future, additional environmental review would be conducted.

5.2.3 Alternative 3 – Long Term Development Scenario

This alternative was identified as the "Long Term Development Scenario" because it incorporates the development of fewer projects in the short term than Alternatives 1 or 2. The short-term Alternative 3 layout does not include biodiesel production, food waste preprocessing, or food waste processing facilities. Instead, additional land is allocated to alternative land-lease projects in the short term and a low-emission biosolids-to-energy facility in the long term. In this respect, Alternative 3 resembles the No Project Alternative for the biodiesel production and food waste preprocessing facilities.

5.3 Alternatives Considered but Rejected

All three scenarios described above were evaluated to determine which best met EBMUD's established vision and goals for environmental stewardship, safety, operational efficiency, revenue generation, flexibility for the future, and community relations. Most of the alternatives received similar scores for each category, but Alternative 3 – Long Term Development Scenario scored lower for safety and revenue generation. For that reason Alternative 3 was not carried forward for inclusion in the EIR. As noted above, a variation of the Alternative 2 – Alternative Access and Land Exchange Scenarios has been analyzed in the EIR as the Land-lease Projects on New Property Alternative.

5.4 Alternative Projects Analyzed

Based on analysis conducted as part of the environmental review, it was determined that the most extensive impacts were related to air quality associated with increased truck trips for the biodiesel and food waste preprocessing projects. Several alternative layouts were developed that reduce air quality and transportation impacts. The alternatives include the same Master Plan elements, but evaluate different locations, configurations and scale for the biodiesel and food waste preprocessing facilities.

5.4.1 Biodiesel with Rail Spur Alternative

This alternative sites the biodiesel production facility on the eastern end of the MWWTP where there is an existing rail spur. Although the proposed project might include use of a new rail spur, the new spur would require approval from Burlington North Santa Fe (BNSF) railroad and possibly from the California Public Utilities Commission (CPUC). Because it is not clear whether these approvals can be obtained, it is possible that the project may need to rely on truck transport, resulting in higher levels of truck traffic and emissions. This alternative is not dependant on approvals from BNSF or CPUC. As shown in **Figure 5-1**, the footprint of the facility is adjusted to minimize demolition of existing facilities as much as

possible. However, the maintenance area and oxygen production facilities would need to be relocated, and the complex shape of the site may present some challenges for using the space effectively.

The existing maintenance building would be demolished and moved to the far western end of the property. A new building would have to be constructed at a significant cost and the location would be further from the main treatment facilities. In addition, the oxygen production facility, which provides pure oxygen for the secondary treatment facilities would have to be demolished and relocated, also at a significant cost. In the long term, if the secondary treatment process is upgraded for nitrification and denitrification and converted to air activated sludge, the relocated oxygen production facility would be abandoned. Demolition and reconstruction of the maintenance and oxygen production facilities (or aeration for air activated sludge) would result in construction impacts to noise, air quality and traffic.

Most of the impacts of the Biodiesel with Rail Spur Alternative would be similar to those for the proposed project. Potential impacts associated with aesthetics, biological and cultural resources, geology, hydrology and water quality, land use and recreation, public services, and utilities would be essentially the same as for the proposed project.

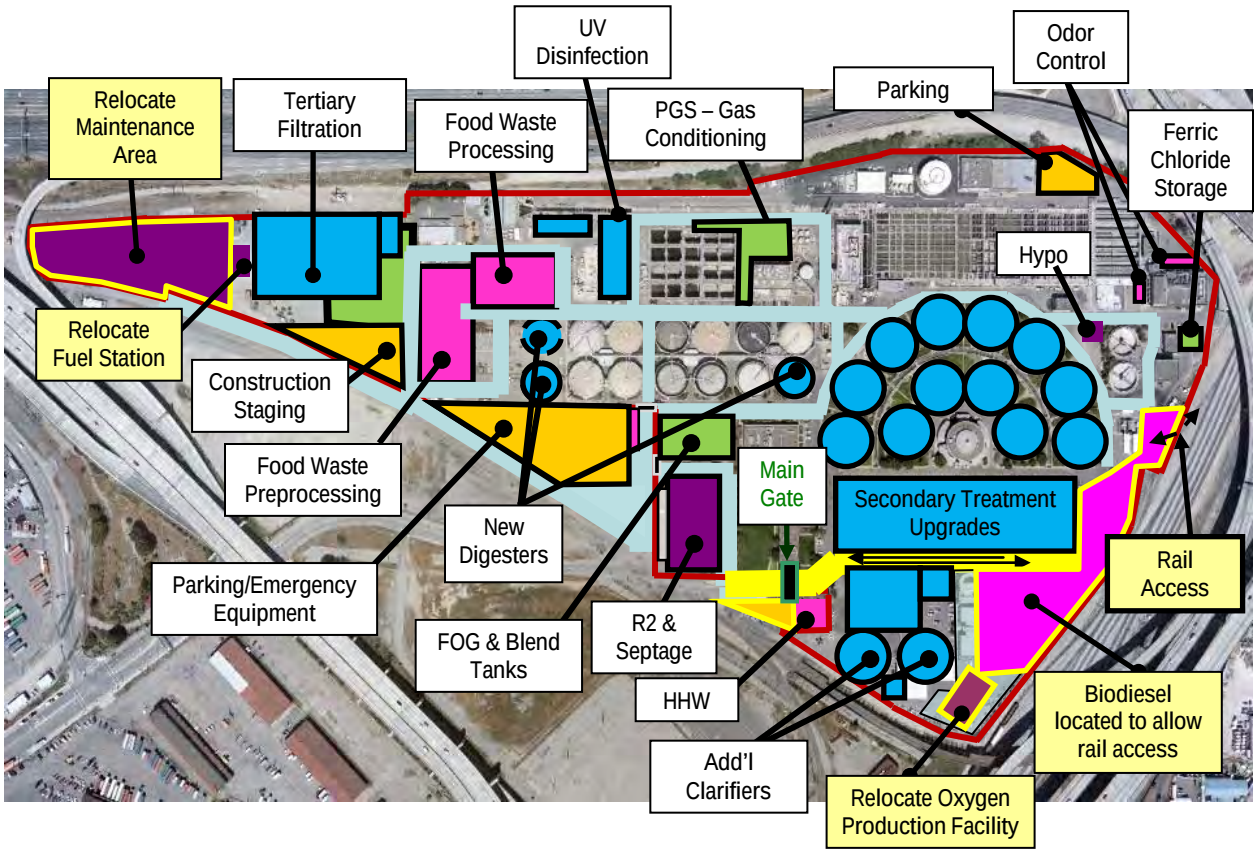


Figure 5-1: Biodiesel with Rail Spur Alternative

Although the availability of a rail spur would reduce traffic associated with the biodiesel facility, siting biodiesel on the eastern side of the MWWTP presents challenges for internal traffic circulation. This alternative does not meet the project objective of increasing safety by improving traffic routing, as all biodiesel facility truck traffic would have to enter through the main gate and share a road with passenger cars and low-strength waste delivery trucks. This situation would increase impacts associated with truck

queuing on Wake Avenue. Trucks entering the main gate would still need to cross the existing railroad tracks.

Noise levels including vibration associated with construction of the biodiesel production facility would be similar to the proposed project, but closer to sensitive receptors. Because of the proximity to sensitive receptors, there is a greater potential for nighttime noise disturbance.

Potential exposure of sensitive receptors to toxic air contaminants (TAC) would be greater because the biodiesel facility would be closer to residences; however, levels would still be expected to be less than significant. By providing rail access, the estimated number of new trucks associated with this project would be reduced from 29.5 down to 9 trucks per day. This large reduction in truck trips would substantially reduce emissions of criteria air pollutants, including nitrogen oxides (NO_X).

The Biodiesel with Rail Spur Alternative would reduce the project's contribution to cumulative community risk and hazard impacts associated with diesel particulate matter from mobile sources, though emissions from the facility itself would be the same. Emissions of TACs (toxic air contaminants) and particle matter with diameter less than 2.5 microns ($PM_{2.5}$) for the biodiesel production facility would be below significance thresholds, but the impact is cumulatively significant because of the substantial emissions from existing sources, which include the adjacent roadways and industrial uses. Thus, cumulative community risk and hazard impacts within 1,000 feet of the project site would be significant with or without development of the biodiesel production facility, and reductions associated with this alternative would not reduce the cumulative impact to less than significant. In addition, benefits of locating the facility where rail access is available may not outweigh the impacts of locating new facilities closer to sensitive receptors.

5.4.2 Land-lease Energy Projects on New Property Alternative

This alternative would site the two revenue-generating green energy projects (biodiesel production and food waste preprocessing) apart from the MWWTP operations. The area to the far western end of the West End property would be reserved for future, unforeseen regulatory-driven expansion of the treatment system (**Figure 5-2**). Truck traffic would be reduced at the Wake Avenue railroad crossing and within the MWWTP. This alternative requires the purchase of the 11.5-acre parcel south of the plant from the City of Oakland. A private road could then be created on this new land with a second railroad crossing, which would provide improved access to the western portion of the plant. Alternatively, the existing Wake Avenue could be realigned with a relocation of the existing railroad crossing at Wake Avenue and Engineers Road.

Most of the impacts of the Land-lease Energy Projects on New Property Alternative would be similar to those for the proposed project. Potential impacts associated with aesthetics, air quality (including cumulative impacts), biological and cultural resources, geology, hydrology and water quality, land use and recreation, noise, public services, and utilities would be essentially the same as for the proposed project. With regard to transportation, truck queuing along Wake Avenue and Digester Road would be eliminated. Trucks would enter the biodiesel and food waste preprocessing facilities directly from Wake Avenue near West Grand Avenue with sufficient area to queue on the new property. This alternative is evaluated here for CEQA purposes, but cannot currently be selected because it depends on negotiating purchase of land from the City of Oakland.

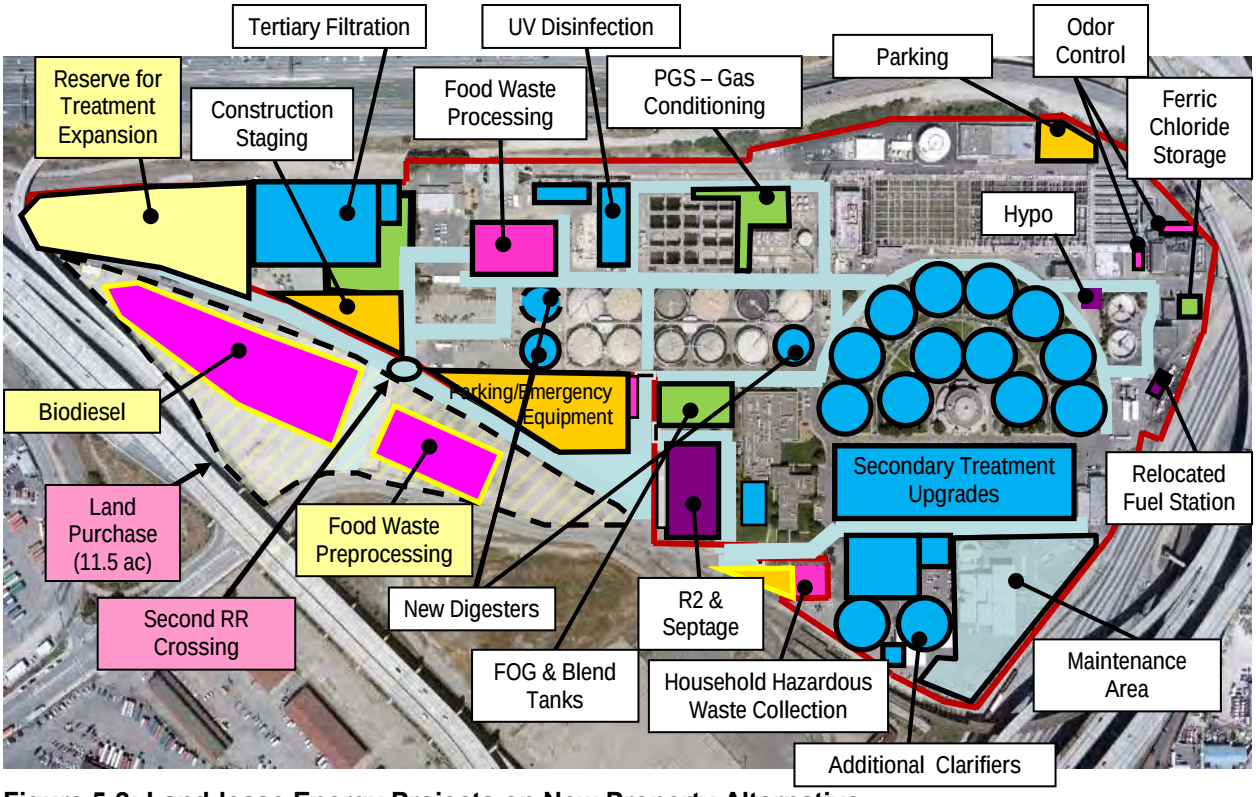


Figure 5-2: Land-lease Energy Projects on New Property Alternative

5.4.3 Smaller Scale Biodiesel Facility Alternative

This alternative would include only the phase one construction and operation of a biodiesel production facility at a maximum capacity of five million gallons per year (mgy) rather than 20 mgy. While this alternative is evaluated here, it may not be feasible if the smaller project is not financially viable. The extra space adjacent to the biodiesel production facility would be used for land lease in the short term, and would be available for additional treatment facilities or lease in the long term.

Most of the impacts of the Smaller Scale Biodiesel Facility Alternative would be similar to those for the proposed project. Potential impacts associated with aesthetics, biological and cultural resources, geology, hydrology and water quality, land use and recreation, public services, and utilities would be essentially the same as for the proposed project. There would be a smaller quantity of hazardous materials stored at the MWWTP if the biodiesel production capacity is reduced, however, by complying with state and federal regulations, hazards associated with chemical storage are not expected to be significant. Noise impacts would be similar to the proposed project, but there would be less noise from truck traffic, though impacts of the proposed project are not expected to be significant. There would be fewer impacts due to truck queuing, as fewer trucks would be needed to bring in raw materials and transport finished product.

The primary difference between the proposed project and the Smaller Scale Biodiesel Facility Alternative would be associated with air quality. Emissions from the smaller scale biodiesel production facility would be reduced to approximately one quarter of that for the proposed project. This change would reduce NO_X emissions (which are primarily associated with mobile sources transporting materials) by approximately 75 percent. However, reducing the scale of the facility would also substantially reduce the positive impacts associated with reducing lifecycle greenhouse gas (GHG) emissions. In addition, the air quality benefits associated with the use of biodiesel would be realized to a lesser extent.

The Smaller Scale Biodiesel Facility Alternative would reduce the project's minimal contribution to cumulative community risk and hazard impacts. Emissions of TACs and $PM_{2.5}$ for the biodiesel production facility would be below significance thresholds, but the impact still would be cumulatively significant because of the substantial emissions from existing sources, which include adjacent roadways and industrial uses. Thus, cumulative community risk and hazard impacts within 1,000 feet of the project site would be significant with or without development of the biodiesel production facility, and therefore, this alternative would not eliminate this existing cumulative condition. A smaller biodiesel facility would thus reduce some impacts, but would also reduce benefits; in addition the reduced scale may not be economically viable.

5.5 No Project Alternative

CEQA Guidelines Section 15126.6(e)(3)(B) requires a comparison of the environmental effects of maintaining the project area in its existing state against the environmental effects that would occur if the project would proceed. Under the No Project Alternative, the proposed Land Use Master Plan would not be implemented, and the biodiesel production and food waste preprocessing facilities would not be constructed. None of the short-term construction impacts or long-term operational impacts described in *Chapter 3, Environmental Analysis* of this EIR would occur. The No Project Alternative would eliminate the potential for short-term construction period impacts associated with aesthetics, air quality, biological and cultural resources, hazardous materials, noise, traffic, and disruption of utilities. Operational impacts associated with stormwater system capacity, operational noise and vibration, railroad crossing safety, and exposure of new facilities to geotechnical hazards would also be eliminated.

Under the No Project Alternative, without construction of the biodiesel production and food waste preprocessing facilities, the community benefits and enhanced revenues through renewable energy generation would not be realized. In addition, the No Project Alternative would not improve the truck queue area, which would expedite truck check-in. Without this improvement, any future impacts associated with truck queuing would not be addressed. The No Project Alternative would also not include upgrades to odor control facilities, and would thus have potentially significant odor impacts. It would also not anticipate regulatory requirements.

All of the construction and operational impacts of the Land Use Master Plan can be reduced to less than significant with implementation of mitigation measures, so the No Project Alternative is not substantively environmentally superior to implementation of the Land Use Master Plan. In addition, the No Project Alternative does not eliminate the cumulatively significant air quality community risk and hazard impact associated with the Land Use Master Plan, because the significance of the impact is primarily attributable to existing traffic emissions in the project area, which would continue even with the No Project Alternative.

CEQA Guidelines Section 15126.6(e)(3)(B) also requires discussion of the practical effects of not proceeding with the project. EBMUD would, over time, likely need to construct a number of the facilities considered in the Land Use Master Plan, because some of these facilities are expected to be necessary to meet future regulatory requirements. If the Land Use Master Plan is not implemented, development of these facilities would still occur, but EBMUD would have less ability to effectively plan the utilization of land at the MWWTP and West End property. If the Land Use Master Plan is not implemented, the individual projects may be developed in such a way that additional facility relocation, building demolition and pumping are required. The No Project Alternative would then result in potentially significant impacts related to transportation and GHG emissions associated with increased energy use. In addition, without development of the green energy projects, there would be fewer lifecycle GHG emissions reductions, air quality improvements and fewer opportunities to generate revenues to off-set rate increases. As noted above, if the Land Use Master Plan is not implemented, access improvements that address potential future traffic impacts and that can be coordinated to benefit multiple projects, would not be constructed.

5.6 Comparison of Alternatives

The alternatives determined to be reasonable and feasible must also be analyzed to determine if their significant impacts can be substantially reduced or avoided. This section provides an analysis of the environmental impacts of the alternatives to the proposed project, as well as the impacts that would result from implementation of the No Project Alternative. **Table 5-2** compares the environmental effects of the alternatives to the proposed project. Because the other Land Use Master Plan elements are the same for all of the project alternatives, those impacts are shown separately in the first column of the table. The three project alternatives differ in regard to the location or scale of the biodiesel and food waste preprocessing facilities, so the comparison of impacts focuses on the differences in the impacts of those project-level facilities.

Table 5-2 reflects the level of significance after mitigation. As shown there, most of the potentially significant impacts of the proposed project and alternatives can be reduced to less than significant with mitigation. The level of impact is color coded, with areas of no impact or less than significant impacts in shades of green, impacts that can be mitigated to less than significant in yellow, potentially significant impacts in orange, and significant and unavoidable impacts highlighted in red.

The No Project Alternative must be analyzed pursuant to Section 15126.6(e) of the CEQA Guidelines to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.

Table 5-2: Comparison of Alternatives

Impact Statement	All Project Alternatives	Proposed Project		Biodiesel with Rail Spur Alternative		Land-lease Energy Projects on New Property Alternative		Smaller Scale Biodiesel Facility Alternative		
	Land Use Master Plan	Biodiesel Production	Food Waste Preprocessing	Biodiesel Production	Food Waste Preprocessing	Biodiesel Production	Food Waste Preprocessing	Biodiesel Production	Food Waste Preprocessing	No Project Alternative
Aesthetics										
AES-1: Potential to damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
AES-2: Alter existing visual character and views in the study area	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
AES-3: New source of substantial light or glare	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
Air Quality										
AIR-1: Construction emissions of criteria pollutants and precursors	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
AIR-2: Local community risks and hazards during construction	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
AIR-3: Odors generated during project construction	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
AIR-4: Direct criteria pollutant emissions during project operation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
AIR-5: Local community risks and hazards during project operation	LTS	LTS	LSM	LTS	LSM	LTS	LSM	LTS	LSM	NI
AIR-6: Odor emissions during project operation	LSM	LTS	LSM	LTS	LSM	LTS	LSM	LTS	LSM	PS
AIR-7: Consistency with applicable air quality plans	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
Biological Resources										
BIO-1: Potential to interfere with wildlife movement or impede use of native wildlife nursery sites	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
BIO-2: Potential for conflict with local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
Cultural Resources										
CUL-1: Potential to cause a substantial adverse change in the significance of a unique archaeological resource	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
CUL-2: Potential to cause a substantial adverse change in significance of a paleontological resource	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
CUL-3: Potential to disturb human remains	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
Energy										
ENE-1: Inefficient, wasteful or unnecessary use of energy resources	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	PS
Geology, Soils, and Seismicity										
GEO-1: Facility damage and exposure of people to hazards from strong seismic groundshaking	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
GEO-2: Facility damage and exposure of people to hazards from liquefaction and lateral spreading	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
GEO-3: Potential for substantial erosion or loss of top soil	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
Greenhouse Gas Emissions										
GHG-1: GHG construction emissions	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
GHG-2: GHG operational emissions	LSM	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
GHG-3: Consistency with applicable greenhouse gas reduction plans	LSM	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
Hazards and Hazardous Materials										
HAZ-1: Hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
HAZ-2: Hazards to public health and the environment due to a release of hazardous materials present in the soil and groundwater	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
HAZ-3: Hazards to public health and the environment due to a release of hazardous building materials present in buildings that would be demolished	LSM	LSM	LSM	LSM	LSM	NI	NI	LSM	LSM	NI
HAZ-4: Hazards to public health and the environment due to a release of hazardous materials from construction equipment	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI

Notes: NI=No Impact, LTS=Less than Significant, LSM=Less than Significant with Mitigation, PS=Potentially significant, S&U=Significant and Unavoidable

Table 5-2: Comparison of Alternatives

Impact Statement	All Project Alternatives	Proposed Project		Biodiesel with Rail Spur Alternative		Land-lease Energy Projects on New Property Alternative		Smaller Scale Biodiesel Facility Alternative		
	Land Use Master Plan	Biodiesel Production	Food Waste Preprocessing	Biodiesel Production	Food Waste Preprocessing	Biodiesel Production	Food Waste Preprocessing	Biodiesel Production	Food Waste Preprocessing	No Project Alternative
Hydrology and Water Quality										
HYD-1: Violation of water quality standards and/or waste discharge requirements	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
HYD-2: Depletion of groundwater supplies or interference with groundwater recharge	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
HYD-3: Alteration of the existing drainage pattern in a manner which would result in flooding	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
HYD-4: Alteration of the existing drainage pattern in a manner which would result in substantial erosion or siltation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
HYD-5: Inundation due to a catastrophic tsunami or seiche	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
Land Use and Recreation										
LUR-1: Physically divide an established community	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
LUR-2: Conflict with any applicable land use plan, policy or regulation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
LUR-3: Require the construction or expansion of recreational facilities	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
LUR-4: Impede the construction or expansion of planned recreational facilities	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
LUR-5: Impede the achievement of environmental justice	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
Noise										
NOI-1: Disturbance from temporary, construction-related noise increases in excess of noise ordinance	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
NOI-2: Temporary disturbance due to construction-related vibration	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
NOI-3: Increases in ambient noise levels due to operational noise and vibration	LSM	LTS	LTS	PS	LTS	LTS	LTS	LTS	LTS	NI
NOI-4: Traffic-related noise increases along truck and rail routes	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
Public Services										
PUB-1: Substantial adverse physical impacts associated with provision of police or fire protection	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
Transportation										
TRA-1: Temporary construction-related increase in traffic	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
TRA-2: Traffic delay on intersection operations	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
TRA-3: Traffic delay on freeway operations	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
TRA-4: Operational increase in local traffic	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
TRA-5: Impacts to emergency access	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
TRA-6: Conflicts with alternative transportation	LTS	LTS	LTS	LSM	LSM	LSM	LSM	LSM	LSM	NI
TRA-7: Safety hazards due to conflicts with rail transport	LTS	LSM	LTS	LSM	LSM	LTS	LTS	LSM	LSM	NI
Utilities										
UTIL-1: Exceed wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
UTIL-2: Have sufficient water supplies available to serve the project	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
UTIL-3: Require construction of new stormwater drainage facilities or expansion of existing facilities	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
UTIL-4: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
UTIL-5: Compliance with federal, state, and local statutes and regulations related to solid waste	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	NI
UTIL-6: Temporary disruption of utilities or services due to construction-related activities	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	LSM	NI
Cumulatively Considerable Impacts										
CUM: Air quality community risks and hazards	S&U	S&U	S&U	S&U	S&U	S&U	S&U	S&U	S&U	S&U

Notes: NI=No Impact, LTS=Less than Significant, LSM=Less than Significant with Mitigation, PS=Potentially significant, S&U=Significant and Unavoidable

5.2 Environmentally Superior Alternative

Although it eliminates the potential for construction period impacts and avoids some operational impacts, the No Project Alternative is not considered environmentally superior. Without implementation of the Land Use Master Plan, renewable energy projects, safety and access improvements and community benefit projects would not be implemented. In addition, odor control projects that address existing odor issues at the MWWTP would not be implemented. The No Project Alternative would not have the benefits associated with the two green energy projects. With no biodiesel facility, the lifecycle benefits of reducing use of fossil fuel-based diesel fuel would not be realized. Elimination of the food waste preprocessing facility would result in a loss of the potential for increased efficiency of programs for waste diversion and energy production at the MWWTP. The majority of environmental impacts associated with the Land Use Master Plan and the two proposed projects at the West End property are less than significant and the rest can be reduced to less than significant with the implementation of mitigation measures.

Most importantly, as noted above, the No Project Alternative does not eliminate cumulatively significant air quality impacts associated with community risks and hazards, because existing TAC emissions in the project area (primarily from roadways) would exceed the Bay Area Air Quality Management District (BAAQMD) significance thresholds even without construction of any new facilities at the MWWTP.

The Biodiesel with Rail Spur Alternative reduces operational truck traffic and thus lowers emissions of criteria pollutants associated with the biodiesel facility. However, these air quality impacts are less than significant, and relocating the facility closer to sensitive receptors would result in greater exposure to noise and emissions. This alternative also has additional construction impacts because of the need to demolish and reconstruct the facilities that currently occupy the site. As with other alternatives, this alternative does not eliminate cumulatively significant air quality impacts associated with community risks and hazards, which result from existing sources in the area. This alternative is thus not considered environmentally superior.

The Land-lease Energy Projects on New Property Alternative has impacts very similar to the Proposed Project, but would eliminate impacts associated with truck queuing along Wake Avenue and Digester Road. However, it does not eliminate cumulatively significant air quality impacts associated with community risks and hazards. This alternative is thus not considered environmentally superior to the proposed project.

The Smaller Scale Biodiesel Alternative does reduce operational air quality emissions, but again does not eliminate cumulatively significant air quality impacts, because existing freeway emissions in the project area already exceed BAAQMD significance thresholds for cumulative community risk and hazard impacts. Because the biodiesel production facility has lifecycle benefits related to the production of renewable fuel, the Smaller Scale Biodiesel Alternative does not appear to be clearly environmental superior to the proposed project.

Because it is not possible to develop an alternative that avoids significant cumulative air quality impacts, there is no clearly environmentally superior alternative.

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Appendix A Notice of Preparation and Response Letters

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EAST BAY MUNICIPAL UTILITY DISTRICT

NOTICE OF PREPARATION

TO: Responsible and Trustee Agencies, Organizations, and Interested Parties

FROM: East Bay Municipal Utility District
375 Eleventh Street, Mail Slot 702
Oakland, CA 94607-4240

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report for the East Bay Municipal Utility District (EBMUD) Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan

EBMUD will be the lead agency under the California Environmental Quality Act (CEQA) and will prepare a combined program/project Environmental Impact Report (EIR) for the project identified below.

AGENCIES: EBMUD requests the views of public agencies as to the scope and content of the environmental information that is germane to the agency's statutory responsibilities in connection with the proposed project, in accordance with California Code of Regulations, Title 14, Section 15082(b), if the agency will need to use the EIR prepared by EBMUD when considering any permit or other approval for the project.

ORGANIZATIONS AND INTERESTED PARTIES: EBMUD requests comments and concerns from organizations and interested parties regarding the environmental issues associated with construction and operation of the proposed project.

PROJECT TITLE: EBMUD Main Wastewater Treatment Plant Land Use Master Plan

PROJECT LOCATION: The MWWTP is located at 2020 Wake Avenue, Oakland, CA, near the base of the San Francisco-Oakland Bay Bridge.

PROJECT DESCRIPTION: The Project includes the overall MWWTP Land Use Master Plan and two specific projects that are part of the overall plan: biodiesel production and food waste pre-processing. The MWWTP Land Use Master Plan will be evaluated at a program level and the two projects will be evaluated at a project level in the EIR.

The MWWTP Land Use Master Plan will serve as a high-level planning tool to guide development of the existing MWWTP site and the newly-acquired, adjacent West End property (former U.S. Army Reserve Center) over a 30-year time horizon. The Master Plan coordinates near-term land uses with potential plans for future expansion to maintain an efficient plant layout and minimize building demolition and facility relocation requirements. Short- and long-term layouts were developed with recommended locations for identified projects given available land at the MWWTP, which now includes the West End property. Objectives for the Master Plan are to:

- Promote environmental stewardship through the protection of water, air and soil quality;
- Provide flexibility to construct advanced treatment facilities to meet potentially more stringent air, water and/or biosolids regulations in the future;
- Enhance revenues to maintain reasonable rates through land-lease agreements and continued growth of successful resource recovery programs that increase renewable energy production;
- Provide benefits to the community and enhance community relations by reducing the potential for odor or aesthetic impacts; and
- Maintain safety through emergency preparedness and by improving traffic routing to, from and within the MWWTP.

EBMUD has identified short- and long-term actions that may be implemented at the MWWTP in the future. Many of the potential actions would not be undertaken until the facilities are needed to meet a specific future regulatory requirement. The purpose of this program EIR is to evaluate the range of potential projects that could be developed as part of the Master Plan. In particular, two projects have been identified and are being considered for implementation in

the near future: biodiesel production and food waste pre-processing. Both projects involve contracting with private companies under a land-lease agreement to construct and operate a facility at the MWWTP that meets the Master Plan objectives as outlined above.

The biodiesel and food waste projects would provide a direct benefit to our customers by helping to maintain reasonable wastewater rates, as revenue generated from the land-lease agreements and electricity sales would help offset the costs associated with treating wastewater from the East Bay communities. In addition, these proposed projects would produce "green" energy, create local jobs, and feed renewable energy directly into the local power grid in West Oakland. The biodiesel produced may be used in heavy-duty trucks that access the Port of Oakland and travel in local neighborhoods in the West Oakland community. Food waste digestion would assist local Bay Area cities and counties in meeting waste diversion goals from landfills.

EBMUD will prepare a combined program/project EIR addressing the long-term potential for development of new facilities at the expanded MWWTP site, which includes both the existing plant site and the West End property. In addition, the EIR will address the proposed biodiesel production and food waste pre-processing facilities at a project level. The MWWTP Land Use Master Plan and biodiesel and food waste pre-processing projects are the subject of this EIR. Additional details on the Project are provided in Attachment A.

POTENTIAL ENVIRONMENTAL EFFECTS: The following areas of potentially significant environmental impact will be analyzed in the Draft EIR: Aesthetics, Air Quality/Climate Change, Biological Resources, Cultural Resources, Geology/Soils, Hazards & Hazardous Materials, Hydrology/Water Quality, Land Use/Planning, Noise, Population/Housing, Public Services, Recreation, Transportation/Traffic, and Utilities & Service Systems. Potential cumulative impacts and potential for growth inducement will be addressed; alternatives, including the No Project Alternative, will be evaluated.

PUBLIC REVIEW PERIOD: This NOP is available for public review and comment pursuant to California Code of Regulations, Title 14, Section 15082(b) for 30 days. The comment period for the NOP begins November 18, 2009 and ends on December 21, 2009. Due to the limits mandated by State Law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

RESPONSES AND COMMENTS: Please indicate a contact person for your agency and send your responses and comments to:

Vince De Lange, P.E.
East Bay Municipal Utility District
375 Eleventh Street, MS702
Oakland, CA 94607-4240

SCOPING MEETING: EBMUD will hold a scoping meeting on December 14, 2009 from 6:00 p.m. to 8:00 p.m. (open house format) at the EBMUD Adeline Maintenance Center at 1100 21st Street, Oakland. You are welcome to attend and present environmental information that you believe should be addressed in the EIR.

The NOP and all CEQA related documents for this project will be available for review on the web. You can view the NOP electronically at:

http://ebmud.com/wastewater/MWWTP_Land_Use_Master_Plan/default.htm

If you require additional project information, please contact Vince De Lange at (510) 287-1141 or vdelange@ebmud.com or visit the EBMUD website indicated above.

David R. Williams, Director of Wastewater
East Bay Municipal Utility District

Date

EAST BAY MUNICIPAL UTILITY DISTRICT

NOTICE OF PREPARATION

ATTACHMENT A

Draft EIR Schedule

The East Bay Municipal Utility District (EBMUD) is seeking input on the scope and content of environmental information relevant to the proposed Project, including input on environmental issues and alternatives to be addressed in the EIR. The Draft EIR is scheduled for circulation in summer 2010.

Background

In order to provide flexibility for future needs, EBMUD acquired the 15.9-acre West End property from the United States Army Reserve (USAR) in 2007. The property is situated directly to the west of EBMUD's existing 48-acre Main Wastewater Treatment Plant (MWWTP) (see Figure 1). EBMUD is currently leasing the property back to USAR, which is scheduled to vacate the property by June 2010. A master planning process was initiated to coordinate future expansion and determine an appropriate plan for use of available land at the MWWTP (existing site and West End property). Master planning efforts have resulted in identification of a recommended land use layout that sites near-term projects appropriately, while reserving land for future projects identified in the Master Plan. This document will serve as a guide as individual projects are implemented. The Draft Land Use Master Plan is summarized here and will be posted, when available for review, at:

http://ebmud.com/wastewater/MWWTP_Land_Use_Master_Plan/default.htm

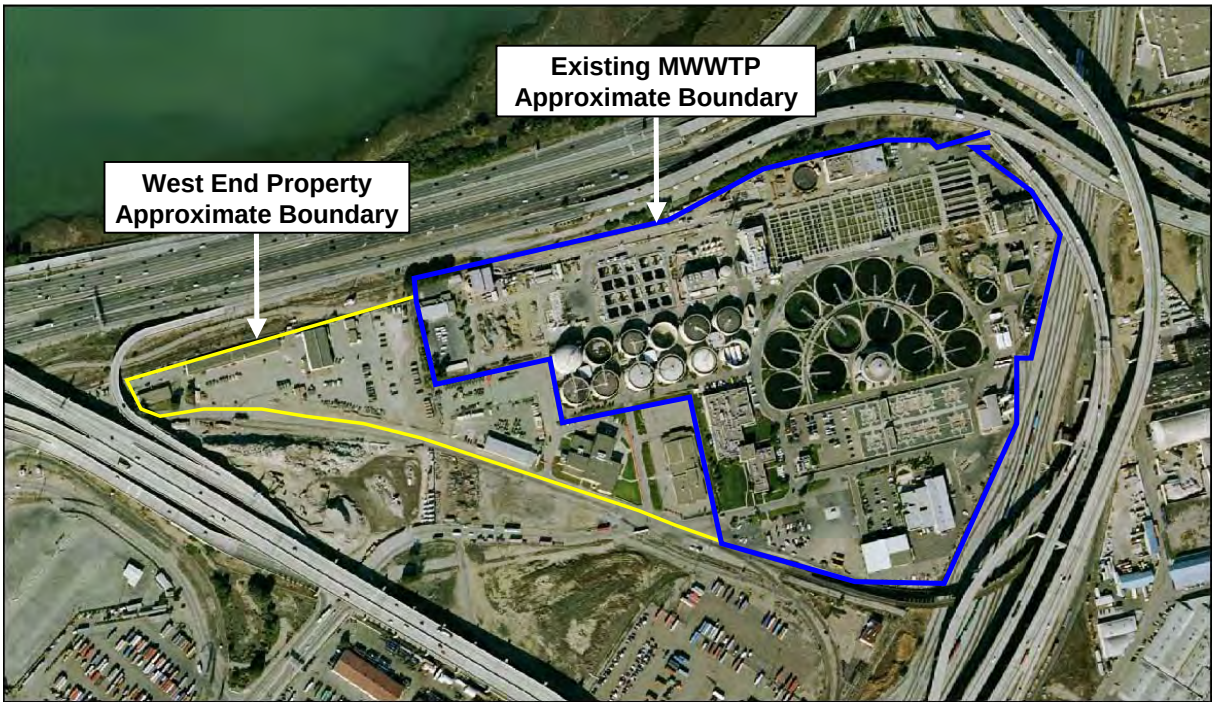


Figure 1. MWWTP and West End Property Site Boundaries

Project Description

The Project includes both the overall MWWTP Land Use Master Plan, which will be evaluated at a program level, and two specific projects that are part of the Land Use Master Plan and will be evaluated at a project level: biodiesel production and food waste pre-processing. Each is described below.

Biodiesel Production Facility

EBMUD is considering siting a biodiesel facility that would be owned and operated by a private company on a portion of the West End property under a land-lease agreement (see location in Figure 2). The facility would utilize a variety of oils, including animal fats and used cooking oil to produce biodiesel. Glycerin, a byproduct of the biodiesel production process would be sent to EBMUD for anaerobic digestion, gas generation and renewable energy production at the MWWTP.

Project Drivers

This project would produce biodiesel, a diesel fuel substitute that has much lower particulate matter emissions and can be used by local trucking companies, including those operating at the Port of Oakland. EBMUD would feed glycerin, a high-energy value byproduct of the biodiesel production process, directly to the EBMUD existing anaerobic digesters at the MWWTP for on-site electricity production. At the ultimate facility capacity, glycerin digestion would generate approximately 1 megawatt, enough renewable electricity to power 1,500 California households.

Facilities

The biodiesel production facility would occupy approximately 3 acres and would consist of an office, a quality control laboratory, processing equipment, waste oil truck parking, and storage tanks. The facility would be located in the northwest corner of the West End property to avoid land availability conflicts with future regulatory-driven projects and provide potential rail access for transport of inputs and products. The facility would initially be designed to produce 5 million gallons per year (MGY) of biodiesel. It may be expanded to process a maximum of 20 MGY by expanding the building, adding additional processing equipment, additional storage tanks and utilizing another existing building within the same 3-acre footprint. The EIR will address, at a project level, any potential impacts associated with the ultimate maximum capacity of the biodiesel facility.

Initial facilities would include a pre-engineered, corrugated metal building to house the offices, laboratory, shop, and process area. The building would be approximately 140 feet by 110 feet, with an exterior height of approximately 20 feet. The ultimate 20-MGY facility would expand the process area by adding a 60-foot by 270-foot building addition. Expansion would require demolition of an existing building on the West End property and utilization of another existing 40-foot by 100-foot building for administrative offices. For the initial phase, the biodiesel storage area would consist of 15 vertical tanks up to 30 feet tall, and two horizontal tanks. At the expanded capacity of 20 MGY, the biodiesel storage area would include an additional eight tanks. Table 1 lists the tank contents, capacity and height at the initial and ultimate facility capacity.

Table 1. Biodiesel Tank Farm (Initial and Ultimate Capacity)

Material	Number of Tanks	Tank Capacity (1,000 gallons)	Height (feet)
At Initial Capacity (5 MGY)			
Biodiesel	6	30	30
Glycerin	1	20	20
Oil Feedstock	6	30	30
Trap Grease Feedstock	2	8	14
Wastewater	1	6	12
Methanol	1	12	8.5[a]
Sodium Methoxide	1	8	8.5 [a]
Additional Storage Required for Ultimate Capacity (20 MGY)			
Biodiesel	4	135	30
Oil Feedstock	4	150	30

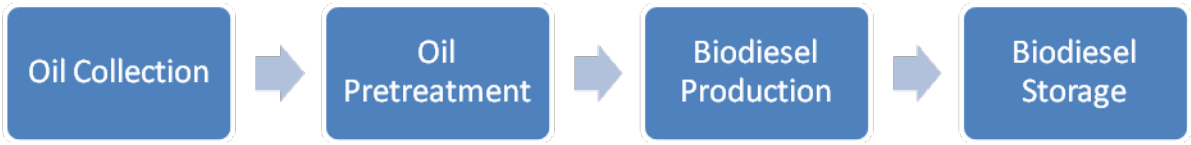
[a] Tanks are horizontal, so height represents tank diameter.

The project may include construction of a rail spur so that both delivery of materials and conveyance of biodiesel produced could occur by rail. Two tracks with capacity for four rail cars each would be constructed roughly parallel to Engineers Road.

Process

Biodiesel is produced through a reaction between oil and an alcohol (commonly methanol) in the presence of a catalyst, such as sodium methoxide. A strong acid, such as sulfuric acid may also be used for pre-treatment. The reaction products are biodiesel and glycerin (also referred to as glycerol). The oil may be virgin oil from plants (such as soy), waste cooking oil (yellow grease) or animal fat. The glycerin byproduct, which would likely contain some amount of methanol, soap, biodiesel and possibly oil and water, would be conveyed to the MWWTP for digestion to increase biogas for renewable energy production. Potential waste streams include small volumes of wash water, which would be treated at the MWWTP, and spent adsorbent, which would be sent to a landfill.

The flow chart below shows a simplified diagram of the biodiesel production process:



- Filtration
- Drying

- Acid Esterification
- Transesterification
- Glycerin Separation
- Biodiesel Purification

The pretreatment and biodiesel production steps are explained below:

Oil Pretreatment

Filtration is performed to remove impurities in the oil.

Drying is accomplished by heating the oil to remove water, and then centrifugation to separate impurities and any remaining trace moisture.

Biodiesel Production

Acid Esterification converts the free fatty acids (which may be up to 15% of the waste oil) to biodiesel through a chemical reaction in which sulfuric acid and methanol are added to the pretreated oil at elevated temperatures.

Transesterification converts monoglycerides, diglycerides and triglycerides to biodiesel and glycerin through a chemical reaction between the waste oil and methanol in the presence of sodium methoxide.

Glycerin Separation is accomplished by gravity in a two-stage process in which the heavier glycerin is separated from the lighter crude biodiesel product.

Biodiesel Purification is performed in an ion exchange tower that removes any soaps, free glycerin and residual catalyst. The impurities are attracted to and attach to packed resin beads, while the biodiesel passes through the tower.

Operations

Table 2 summarizes estimated gallons per day (gpd) of waste oil collection and biodiesel production at the ultimate facility capacity of 20 MGY.

Table 2. Daily Material Inputs and Outputs (Ultimate, Maximum Capacity)

Material	Quantity (gpd)
Incoming fats and oils	68,000
Biodiesel produced	55,600
Glycerin byproduct to be conveyed to EBMUD digesters	14,400
Wastewater to be treated by EBMUD at MWWTP[a]	7,000

[a] The wastewater total does not include stormwater run off from the 3-acre site.

Materials would be transported into and out of the site by truck or a combination of truck and rail. For the 20-MGY facility, oil deliveries would require eight local truck deliveries per day in addition to either two railcar or nine tanker truck deliveries per day. Other chemicals for the biodiesel production process would require 1 or 2 truck deliveries per day. Biodiesel produced at the facility would be transported in up to ten tanker trucks or up to three railcars per day.

Construction Activities

Construction of the proposed biodiesel facility would be expected to begin in the spring of 2011 and be complete in the fall of 2011. All staging and construction parking would occur at the far western end of the proposed site on the West End property. Construction would require site grading to remove the existing asphalt surfaces and about 1,500 cubic yards of soil, requiring up to 75 trucks, each making a roundtrip. Soil removal would be handled in accordance with a soil management plan, which would address existing soil contamination on the West End property.

Food Waste Pre-Processing Facility

EBMUD is considering siting a food waste pre-processing facility that would be owned and operated by one or more private companies on a portion of the West End property under a land-lease agreement (see location in Figure 2).

EBMUD has an existing food waste processing facility, which was recently approved for expansion to treat up to 250 tons per day (tpd) of pre-processed food waste. Currently, food waste is pre-processed to remove non-digestible material at a combination of facilities located in the greater San Francisco Bay

Area, including but not limited to facilities in Vacaville, San Carlos and Martinez. With the construction of a food waste-pre-processing facility at the EBMUD MWWTP, organics-rich waste would be delivered directly to the MWWTP to be pre-processed to improve process efficiency and material consistency. This material would then be conveyed to the existing food waste processing facility. Material not suitable for anaerobic digestion would be transported off-site for further processing at a compost facility.

Project Drivers

Siting the pre-processing facility adjacent to the existing EBMUD food waste processing facility (which is located adjacent to the West End property) would help this program continue to grow. This facility would remove non-digestible material from the organics-rich food waste feedstock and improve existing facility operating efficiency and associated energy production. Locating these food waste facilities at the same site would help support a sustainable, long-term approach to continued on-site renewable energy production. Processing of all incoming raw material through an on-site facility also ensures that a higher and more consistent quality of food waste is generated for use at the EBMUD facility. Food waste digestion is an important component of EBMUD's renewable energy generation program. At the ultimate capacity, the food waste associated with this project would generate approximately 2.5 megawatts, enough renewable electricity to power 3,700 California households. In addition, digestion of food waste would assist local Bay Area cities and counties to meet waste diversion goals from landfills by turning food waste into electricity rather than sending this material to landfills where it would degrade and release methane (a highly potent greenhouse gas). Methane produced through anaerobic digestion is instead captured and used for electricity production.

Facilities

A food waste pre-processing building, ancillary facilities (such as utility connections), and office space would occupy approximately 1.5 acres of land on the West End property, directly northwest of the existing digesters. An adjacent paved area would be used for truck maneuvering. The initial phase of the project would accept between 200 and 300 tons per day (tpd) of incoming raw material to produce approximately 125 tpd of pre-processed material for treatment at the existing food waste facility. The pre-processing building would be approximately 29,000 square feet, of steel-frame construction with an exterior height of up to 40 feet. The full build-out of the facility would double the capacity to accept between 400 and 600 tpd of incoming raw material to produce up to 250 tpd of pre-processed material for treatment at the existing food waste facility. The expansion would be accommodated by the addition of a second parallel processing train by making a side-by-side expansion of the building itself within the same 1.5 acre footprint. The expanded building would be approximately 58,000 square feet. Depending on market conditions at the time of the initial construction phase, the expanded building (with two processing trains) may be constructed at one time. The EIR will address, at a project level, any potential impacts associated with the ultimate capacity of the pre-processing facility, assuming the larger building and a maximum acceptance of 600 tpd of raw material.

Process

Organic-rich waste would be delivered to the pre-processing facility via enclosed (tarp-covered, leak-proof) trucks. The facility would be a fully-enclosed building that would house a feed hopper, an optional shredder, trommel screen, high-speed grinder, and a system of conveyor belts for materials transport. All waste receiving, processing and loading activities would occur indoors. The facility would pre-process the incoming organic-rich feedstock so that it is sized correctly and contains a minimal amount of non-digestible material.

Material would be processed through a trommel screen. Material greater than the screen opening size ("overs") would continue along a belt conveyor for further processing off-site; material passing through the screen ("unders") would be ground for delivery to the EBMUD Food Waste Facility. A shredder may be used upstream of the trommel screen. The pre-processed material would either be loaded into a truck

trailer for transport or otherwise conveyed to the EBMUD Food Waste Facility. All oversized material (i.e., overs) and other process rejects would be trucked off-site for further processing at a composting facility. Non-compostable materials would be landfilled.

Operations

Daily maximum material throughput at the food waste pre-processing operation is summarized in Table 3.

Table 3. Daily Material Flows for Food Waste Pre-Processing (Ultimate, Maximum Capacity)

Material	Quantity (tpd)
Incoming feedstock	600
Ground food waste to be conveyed to EBMUD Food Waste Facility	250
Oversized material for further processing at an off-site compost facility	350

Truck deliveries and processing of food waste would occur 24 hours per day, 7 days per week. A total of approximately 75 trucks per day delivering organics-rich material and taking away non-digestible material would be required at peak capacity.

Construction Activities

Construction of the food waste pre-processing facility would be expected to begin by the summer or fall of 2011, and would take 14 to 16 months to complete, with start up in the fall or winter of 2012. Staging and construction parking would occur adjacent to the proposed site, on the MWWTP or West End property. Construction may involve site grading of up to two feet on half of the area requiring up to 2,500 cubic yards of fill, which would be brought in by approximately 130 trucks, each making a roundtrip during the construction period. Soil removal would be handled in accordance with a soil management plan, which would address existing soil contamination on the West End property.

Land Use Master Plan

In addition to the biodiesel and food waste pre-processing project elements, the Master Plan has identified 11 other project elements with potential for implementation at the MWWTP. These 11 project elements are briefly described below, along with the estimated acreage requirements for each, the preferred site locations, the key project drivers (i.e., regulatory, revenue enhancement) and the estimated timeframe for implementation. These elements of the Land Use Master Plan will be evaluated in the EIR at a program level.

Odor Control (0.2 ac)

This project element includes several smaller parcels of land for odor control upgrades at the Influent Pump Station, primary sedimentation tanks, Solids Dewatering Building and Resource Recovery (R2) Receiving Station. The odor control equipment would be sited close to the facility that it serves. The drivers are enhancement of community relations and regulatory needs. It is estimated that 0.2 acres are required and the individual facility timelines range from three to five years, to more than 10 years.

Food Waste Processing (0.8 ac)

This project element would relocate and convert the existing Food Waste Facility to an advanced processing facility to receive pre-processed food waste, slurry, and remove contaminants and grit prior to feeding to the digesters. This facility may be implemented in the near term, within 10 years. It would be sited close to the Food Waste Pre-Processing Facility and the digesters.

Emergency Response Equipment Storage (0.3 ac)

This project element would provide space for the storage of emergency response equipment (e.g., portable pumps, generators, hoses and piping) to allow continued conveyance and treatment of wastewater when normal treatment or conveyance facilities are not operational (i.e., due to severe earthquake). EBMUD is

planning to implement near-term improvements for emergency equipment storage. The storage area would be sited close to Wake Avenue for better access to wastewater interceptors and remote pumping facilities.

Secondary Treatment Upgrade for Nutrient Removal (4.7 ac)

If a future EBMUD National Pollutant Discharge Elimination System (NPDES) permit were to include limits on effluent ammonia, the secondary treatment system would need to be upgraded for nitrification and denitrification. This project element includes converting and enlarging the existing high-purity oxygen activated sludge plant to air activated sludge with an enhanced process and constructing two additional secondary clarifiers to accommodate the higher solids loading rate. The 4.7-acre footprint includes space for the activated sludge process, the aeration building, two additional center feed clarifiers and expansion of the return activated sludge/waste activated sludge (RAS/WAS) pump station. To make the best use of existing equipment and piping as well as to preserve the areas allocated for liquid stream processes, the secondary treatment upgrade would be sited as close to the existing secondary process as possible. Expanding the facility in its current location would require relocation of the maintenance yard and fuel station. Because this project element is driven by the potential for future regulatory requirements that may be many years in the future, the facility is only included in the long-term layout.

Ultraviolet Disinfection (0.4 ac)

This project element would replace existing chlorination and dechlorination facilities with ultraviolet (UV) disinfection. The footprint is based on sizing a system to treat peak wet weather flows of 320 million gallon per day (MGD) during blending. It includes a blending basin to combine tertiary effluent and primary effluent during wet weather events, and to split flow to the UV disinfection channels. The feasibility of this project element depends on construction and operation of a facility to treat the secondary effluent to tertiary quality (see below), at a significant additional cost. Even with tertiary treatment facilities, there are significant technical uncertainties and significant cost hurdles to treat this high and infrequent volume of flow. The benefit is that UV disinfection would completely eliminate the need for the chlorination and dechlorination facilities. A more technically feasible and cost effective scenario would be to provide UV disinfection for the average dry weather flows and maintain the chlorination and dechlorination facilities to treat wet weather flows. However, in order to provide a more conservative footprint, it is assumed for the purposes of the Master Plan that UV disinfection of peak wet weather flows is both cost effective and technically feasible.

To maintain process continuity and reuse existing facilities, the UV disinfection facility would be sited adjacent to the plant effluent channel. Although there may be operational efficiency drivers, the main driver would be future regulatory requirements that significantly favor or require UV disinfection, which may be many years in the future, therefore the facility is only included in the long-term layout.

Tertiary Treatment Facility (2.4 ac)

This facility would provide tertiary treatment (i.e., granular media filtration) of secondary effluent. Land requirements include ancillary facilities (e.g., backwash tanks, filter feed pump station, and backwash pumps and equipment). The facility would treat secondary effluent minus the flows that are diverted to East Bayshore (recycled water) Facility, which already receive tertiary treatment. The tertiary treatment facilities are sized to accommodate peak flows of 166 MGD.

To maintain continuity of the existing liquid treatment process train, the tertiary treatment facility would be sited close to the effluent channel, on the northern side of the MWWTP site. As a regulatory-driven facility expected to be many years in the future, this facility only appears in the long-term layout.

Digester Expansion (1.0 ac)

Digester capacity would be expanded to treat additional waste streams (e.g., food waste, which allows expansion of resource recovery operations), and provide adequate redundancy for improved facility operation. This project element includes up to three new, egg-shaped digesters that would be on the order of 65 feet above grade. It is assumed that one digester would be located in the area of former Digester No. 1 (currently used for sodium hypochlorite storage). Sodium hypochlorite storage would be relocated to an area northeast of the existing clarifiers. The other two new digesters would be located adjacent to the existing digesters (west of Digesters Nos. 11 and 12). The diameter of the digesters was assumed to be the same as the existing digesters. Currently, the existing digesters provide sufficient capacity for the planned solids loading; therefore, this facility is only included in the long-term layout.

Land Lease (as available)

Land leases of varying durations could be negotiated to generate revenue to help minimize wastewater rate increases, while reserving land for future needs in the short and long term. The specific locations and timeframe for implementation depend on land availability and uses designated for other project elements. Unlike the food waste pre-processing and biodiesel production facility projects, which are also land leases, this category refers to shorter-term, low capital commitment leases for activities without any relation to MWWTP processes. Examples include Port of Oakland-related container storage, vehicle parking, or equipment storage. Lease contracts would allow EBMUD to reclaim the land with little notice or penalty, in order to provide maximum future flexibility for alternative demands and uses. As a result, it is expected that tenants would not invest in any significant capital investments or land improvements.

Household Hazardous Waste Collection Facility (0.4 ac)

This project element would provide a public facility for disposal of household hazardous waste to reduce pollutant discharges to the sanitary sewer system. The facility could be sited in a number of different locations. In order to provide convenient and safe public access it would be located near the MWWTP fenceline, out of the way of heavy truck traffic and adjacent to on-site parking.

Bay Stewardship Exhibit/Public Education Facility (0.3 ac)

This project element would provide an exhibit and public education facility to showcase and educate the public on stewardship of San Francisco Bay. It would further EBMUD's ongoing environmental stewardship. The facility could be sited in a number of different locations. In order to provide convenient and safe public access it would be located near the MWWTP fenceline, out of the way of heavy truck traffic and adjacent to on-site parking.

Relocation of Septage and R2 Receiving Stations (0.8 ac)

In order to reduce the impact of truck traffic within the MWWTP and improve safety, the Septage Receiving Station and the R2 Receiving Station would be relocated closer to the front entrance of the MWWTP. The site could be anywhere along Engineers Road to provide convenient access from Wake Avenue.

Other Approved Projects

In addition to these 13 projects, three other approved facilities that are currently planned or in construction are also included in the layouts. These facilities are:

1. The Power Generation Station (PGS) expansion project will increase EBMUD's renewable energy production capacity to minimize flaring of excess methane gas and maximize recovery of electricity and heat. This project will also provide a new gas conditioning system to improve operation of the new and expanded PGS. To reduce hydrogen sulfide production in the digesters, a ferric chloride storage and feed system will be installed at the primary sedimentation tanks.

2. The Digester Upgrade Project – Phase II will rehabilitate four existing digesters by replacing the floating covers with fixed covers and adding internal mixers. These modifications will help reduce the potential for off-site odor impacts, while improving process performance and efficiency.
3. Construction of a receiving area for fats, oils and grease (FOG) and of a sludge blending tank are also part of the ongoing Digester Upgrade Project. The blend tank will mix and preheat primary sludge, secondary sludge, and high strength wastes, prior to feeding to the digesters to enhance the overall consistency of the organic feed stream. The FOG receiving and blend tank facility is being constructed on a portion of the West End property.

Short-Term Layout

Figure 2 shows projects considered for implementation in the short term, defined as within, approximately, the next 10 years. Included are the biodiesel production facility, the food waste pre-processing facility, relocation of the existing food waste facility, odor control facilities, space for employee parking, visitor parking and emergency equipment storage, temporary land lease, and the three projects currently planned or in construction. The locations for each of the new facilities were selected to avoid conflicts with future regulatory-driven wastewater treatment process infrastructure that may be implemented in the longer term. In order to improve traffic routing to the various facilities, Engineers Road would be widened to three lanes, which would require demolition of two buildings on the West End property.

Long-Term Layout

In the long term, defined as within 30 years, there are a number of regulatory-driven projects that could be implemented. A long-term layout was developed to determine appropriate siting for all of these projects (Figure 3). Siting of long-term, regulatory-driven projects was based on maintaining continuity with existing solids and liquids process layouts and alignment at the MWWTP, while minimizing demolition of existing facilities and buildings. Costs and implementation schedules were not considered. Instead, it was assumed that all projects identified above would be implemented sometime within 30 years. The EIR will address the impacts for the long-term layout, assuming all projects are implemented. It is possible that the facilities included in the long-term layout may not be implemented or may be implemented outside the 30-year timeframe.

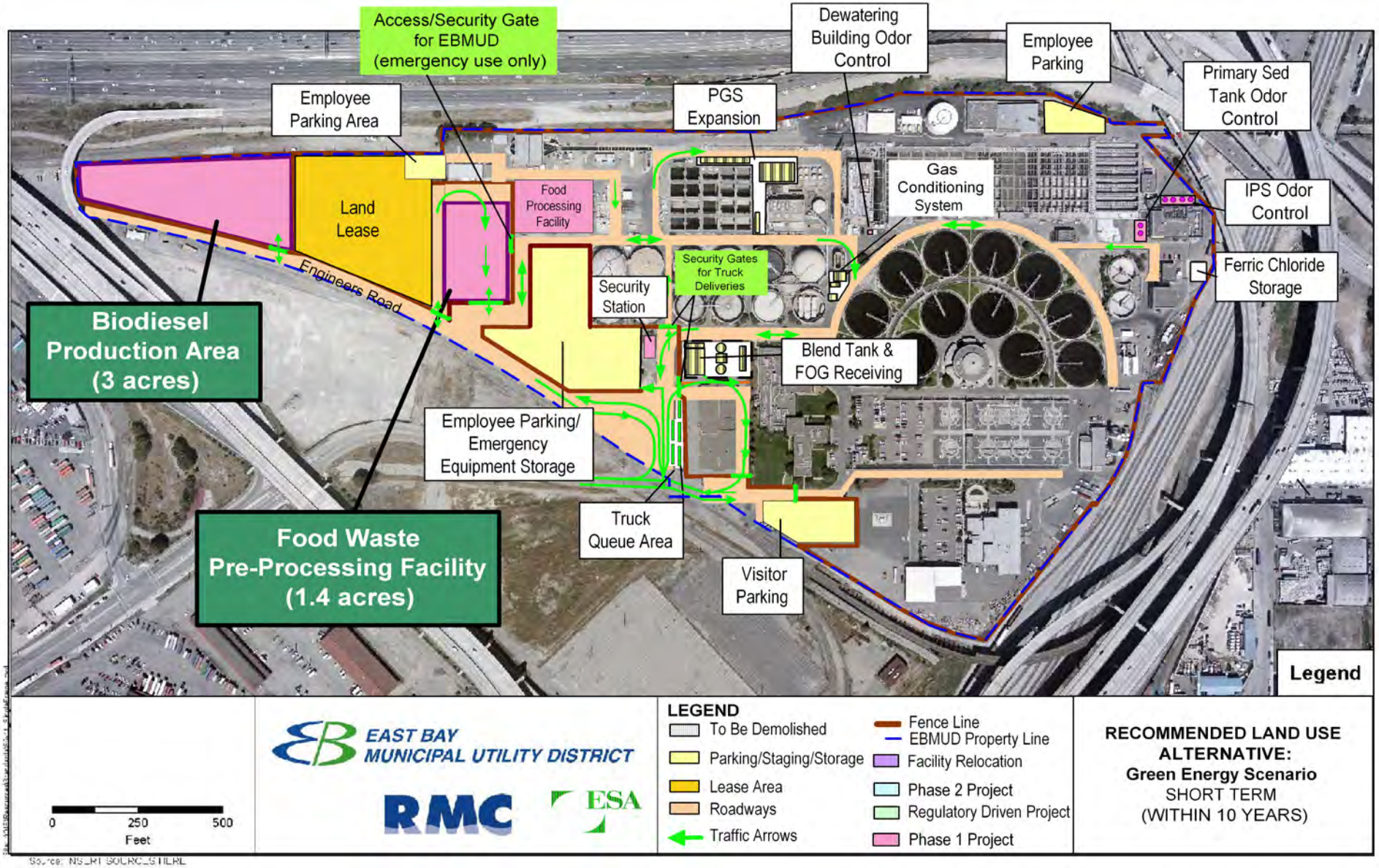


Figure 2. MWWTP Recommended Land Use Alternative – Short Term

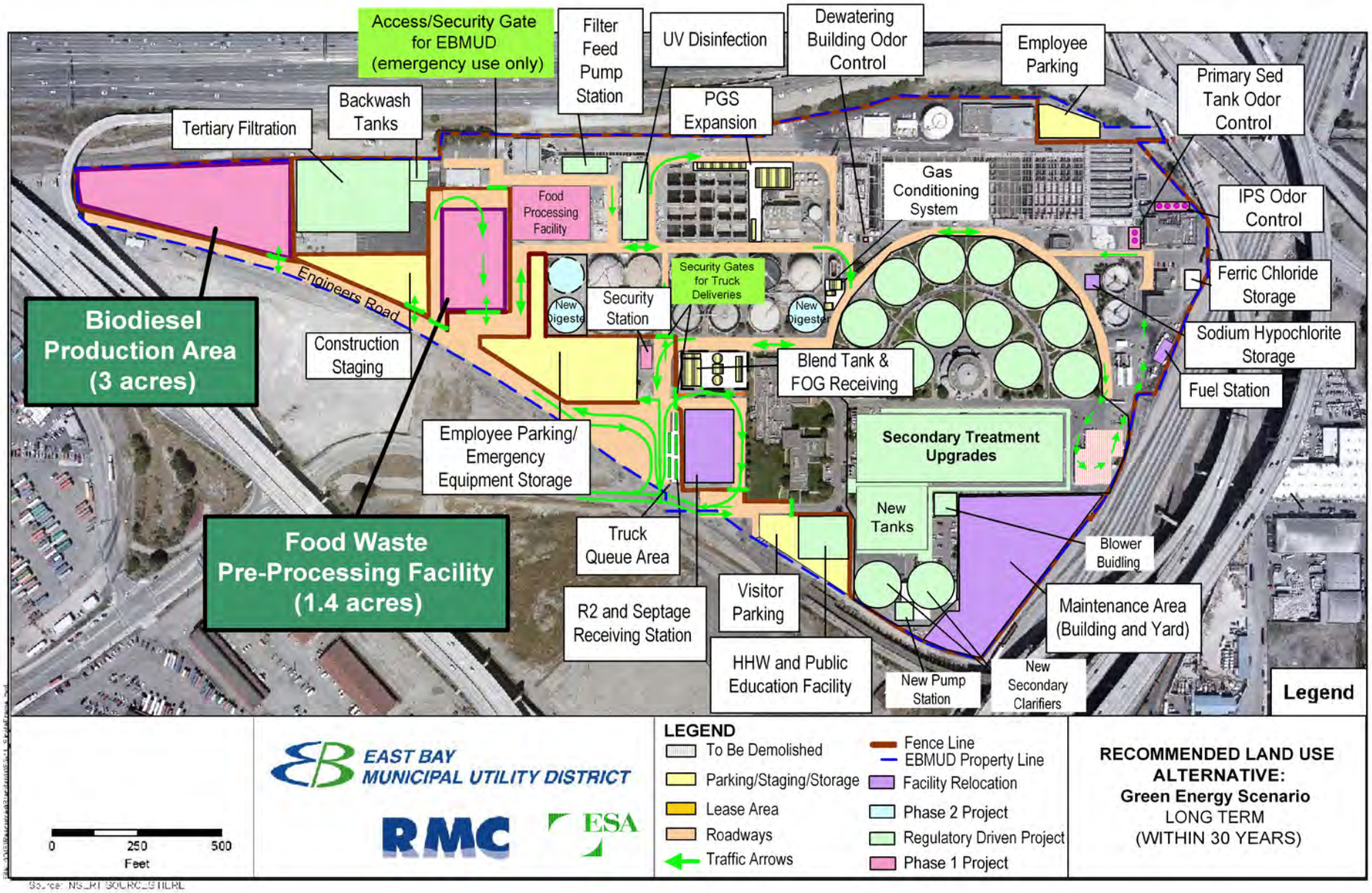


Figure 3. MWWTP Recommended Land Use Alternative – Long Term

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LINDA S. ADAMS
SECRETARY FOR ENVIRONMENTAL PROTECTION

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD

ARNOLD SCHWARZENEGGER
GOVERNOR

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December 22, 2009

Vince De Lange
East Bay Municipal Utilities District
375 11th Street
Oakland, CA 94607

RE: Environmental Impact Report, State Clearinghouse No. 2009112073 for the East Bay Municipal Utilities District (EBMUD) Waste Water Treatment Plant Land Use Master Plan, Alameda County

Dear Mr. De Lange,

Permit Staff at the California Integrated Waste Management Board (Board or CIWMB) have received a Notice of Preparation (NOP) for a Land Use Master Plan Environmental Impact Report (EIR) for the development and operation of a Main Wastewater Treatment Plant (MWWTP) at the East Bay Municipal Utilities Facility (EBMUD), Oakland. Currently EBMUD bio-solids composting operation (Solids Waste Facility No. 01-AA-0299), is regulated under the Notification Permit Tier.

Board staff has reviewed the NOP, offers the following project description, and staff comments for the proposed document based on Board staff's understanding of the project. If the Board's project description of the proposed project varies substantially from the project as understood by the Lead Agency, Board staff requests that the Lead Agency clarify any significant differences in the project description prior to certification of the EIR.

Project Description

The project includes the overall MWWTP Land Use Master Plan (MP) and two specific projects that are part of the overall plan: biodiesel production and food waste pre-processing. The MWWTP Land Use MP will be evaluated at a program level and the two projects will be evaluated at a project level in the EIR.

The MWWTP Land Use MP will serve as a high-level planning tool to guide development of the existing MWWTP site and the newly acquired, adjacent West End property (former US Army Reserve Center) over a 30-year time horizon. The MP coordinates near-term land uses with potential plans for future expansion to maintain an efficient plant layout and minimize building demolition and facility relocation requirements. Short and long-term layouts were developed with recommended locations for identified projects given available land at the MWWTP, which now includes the West End property.

Objectives of the Master Plan are:

- Promote environmental stewardship through the protection of water, air and soil quality;
- Provide flexibility to construct advanced treatment facilities to meet potentially more stringent air, water and/or bio-solids regulations in the future;
- Enhance revenues to maintain reasonable rates through land-lease agreements and continued growth of successful resource recovery programs that increase renewable energy production;
- Provide benefits to the community and enhance community relations by reducing the potential for odor or aesthetic impacts; and
- Maintain safety through emergency preparedness and by improving traffic routing to, from and within the MWWTP.

EBMUD has identified short and long-term actions that may be implemented at the MWWTP in the future. Many of the potential actions would not be undertaken until the facilities are needed to meet a specific future regulatory requirement. The purpose of the program EIR is to evaluate the range of potential projects that could be developed as part of the Master Plan. In particular, two projects have been identified and are being considered for implementation in the near future; bio-solid production and food waste processing. Both projects involve contracting with private companies under a land-lease agreement to construct and operate a facility at the MWWTP that meets the MP objectives as outlined above.

It is Board staff's understanding that EBMUD is proposing the Food Waste Facility Phase 2 Project as part of the existing Resource Recovery program at the Main Wastewater Treatment Plant in Oakland, California. The project would expand EBMUD's capacity to accept and treat food waste. The existing bio-solids facility currently is approved to accept 100 tons per day of food waste. The expansion of the facility would allow the facility to accept up to an additional 150 tons per day of food waste. The treatment steps are pre-chlorination (for odor control), screening (to remove large objects) grit removal, primary sedimentation, secondary treatment using high-purity, oxygen-activated sludge, final clarification, sludge digestion and dewatering. The primary treatment consists of removing floating material, oils and greases, sand and silt and organic solids heavy enough to settle in water. The secondary treatment process most of the suspended and dissolved organic and chemical impurities are biologically and physically removed. Solids from these steps are combined and treated in anaerobic digesters. The treated liquid effluent is then disinfected, dechlorinated and

discharged one mile off the East Bay shore through a deep-water outfall into San Francisco Bay.

Board Staff Comments

Permits

The Food Waste processing (bio-solids composting) operation currently operates under the Notification Tier, Solid Waste Information System (SWIS) No. 01-AA-0299. If the proposed Food Waste project in the future will have proposed changes (for example: digesting food waste separately from bio-solids, a change in the composting material), the facility may need to change its regulatory tier status. The project proponent should work closely with their Local Enforcement Agency (LEA) before making any other project changes. The contact for the County of Alameda is: Wing Suen, County of Alameda Environmental Health Department, 1131 Harbor Bay Parkway, Suite 200, Alameda, CA 94502-6567. Telephone: 510-777-2218

Odor Impact Minimization Plan

The Odor Impact Minimization Plan (OIMP) regulatory requirements in Title 14, California Code of Regulations (CCR) Section 17863.4 have been developed to allow an operator to aggressively devise an operational plan to prevent odors from occurring and to plan in advance the mitigation measures that should be taken if odors do occur. The OIMP also contains the site's complaint investigation procedures which should include a 24 hour phone hotline for receipt of odor complaints, notification to the LEA and emergency procedures for the cease and desist of any operations that are causing odor impacts. The project proponent should work with the LEA to identify the need for an OIMP for projects proposed at this site.

California Environmental Quality Act

If the proposed EIR will be used as environmental support for any solid waste facility projects on the EBMUD site, the EIR must be prepared per CEQA guidelines and contain detailed project descriptions and impact analysis for the proposed project(s). If it is determined by the LEA that the current composting operations have expanded and require a Solid Waste Facilities Permit, this document should be prepared with as much detail as possible to support the proposed project, and any other future projects as well. For information necessary for a complete and detailed environmental document for a composting facility, please refer to
http://www.ciwmb.ca.gov/PermitToolbox/CEQA/Documents/Guidance/Compost.htm

Conclusion

Board staff requests copies of and consultation on any draft, subsequent or revised environmental documents. Board staff requests to be noticed of the date, time and location of any public hearings regarding the project proposal at least ten days in advance.

Board staff are available for consultation. If you have any questions regarding these comments, please contact me via telephone at (916) 341-6727, or email dpost@ciwmb.ca.gov.

Sincerely,

Diana Post, Integrated Waste Management Specialist (IWMS)
Permitting and LEA Support Division, North Permits Section 1
California Integrated Waste Management Board

Pc: Virginia Rosales, Supervisor
Permits North, Region 1
Waste Compliance and Mitigation Program
CIWMB

Reinhard Hohlwein, IWMS
Permits North, Region 1
Waste Compliance and Mitigation Program
CIWMB

Wing Suen, LEA
County of Alameda Environmental Health Dept
1131 Harbor Bay Parkway, Suite 200
Alameda, CA 94502-6567

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5505
FAX (510) 286-5559
TTY 711

Flex your power!
Be energy efficient!

December 22, 2009

ALAVAR007
SCH#2009112073

Vince De Lange
Wastewater Planning
East Bay Municipal Utility District
375 11th Street, MS 702
Oakland, CA 94607

Dear Mr. De Lange:

East Bay Municipal Utilities District (EBMUD) Main Wastewater Treatment Plan Land Use Master Plan – Notice of Preparation

Thank you for including the California Department of Transportation (Department) in the environmental review process for the EBMUD Land Use Master Plan. We reviewed the Notice of Preparation and have the following comments:

Traffic Analysis
Please ensure that the environmental document evaluates the proposed project's impacts on State transportation facilities. The following criteria should be used in determining if a traffic analysis for these facilities is warranted:

1. The project would generate over 100 peak hour trips assigned to a State highway facility.

2. The project would generate 50 to 100 peak hour trips assigned to a State highway facility, and the affected highway facilities are experiencing noticeable delay; approaching unstable traffic flow (level of service (LOS) "C" or "D") conditions.

3. The project would generate 1 to 49 peak hour trips assigned to a State highway facility, and the affected highway facilities are experiencing significant delay; unstable or forced traffic flow (LOS "E" or "F") conditions.

We recommend using the Department's *"Guide for the Preparation of Traffic Impact Studies"* for determining which scenarios and methodologies to use in the analysis. The guide can be accessed from the following webpage:
http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

If the proposed project will not generate the amount of trips needed to meet the Department's trip generation thresholds, an explanation of how this conclusion was reached must be provided.

Vince De Lange/ East Bay Municipal Utility District
December 22, 2009

Encroachment Permit
Any work or traffic control within the State Right-of-Way 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,

Pat Li for

LISA CARBONI
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

East Bay Regional Park District
2950 PERALTA OAKS COURT PO BOX 5381 OAKLAND CALIFORNIA 94605-0381
T. 1 888 EBPARKS F 510 569 4319 TDD 510 633 0460 WWW.EBPARKS.ORG

December 09, 2009

Vince De Lange, PE
East Bay Municipal Utility District
375 Eleventh Street, MS702
Oakland, CA 94607-4240

RE: EAST BAY REGIONAL PARK DISTRICT SCOPING COMMENTS FOR EAST BAY MUNICIPAL UTILITY DISTRICT (EBMUD) MAIN WASTEWATER TREATMENT PLANT LAND USE MASTER PLAN (MWWTP)

Dear Mr. De Lange:

Thank you for providing East Bay Regional Park District (the "Park District") with a copy of EBMUD's Notice of Preparation (NOP) for the MWWTP Land Use Master Plan (Master Plan) project. We maintain and operate Eastshore State Park, Middle Harbor Shoreline Park, segments of the San Francisco Bay Trail, and are working with the US Army and National Park Service on development of "Gateway Park", a future park located at the terminus of Burma Road. Our 2007 Master Plan identifies the completion of a key segment of the San Francisco Bay Trail between Martin Luther King Jr. Regional Shoreline and Eastshore State Park as an objective. The segment of this trail that bisects portions of EBMUD's proposed master plan area should be analyzed in detail in the Draft Environmental Impact Report (DEIR) prepared for the project.

We request that future projects associated with the Master Plan be designed and operated in a manner that does not conflict with the planned San Francisco Bay Trail alignment. The DEIR should analyze the project's potential impacts to future trail users given the trail's close proximity to future or planned Master Plan uses, operations and construction related impacts. The scope of the DEIR analysis should also include planned trail connections between the San Francisco Bay Trail and the future Gateway Park via Burma Road.

The cumulative impact analysis and land use section should analyze how implementation of public access mitigation requirements for Cal Trans' San Francisco/Oakland Bay Bridge Seismic Retrofit Project and Cypress Freeway Project, the future development of Gateway Park, and redevelopment of the Oakland Army Base area may be impacted by Master Plan projects. Policies, available work products and/or permit requirements of relevant stakeholders such as the Gateway Park Working Group (GPWG), Toll Bridge Program Oversight Committee

(TBPOC), San Francisco Bay Conservation and Development Commission, State Lands Commission, Cal Trans, Bay Area Air Quality Management District and the City of Oakland should be included as resources for analyzing impacts in this area.

Thank you for your review and consideration of our comments. We request that we be notified of any public meetings or hearings scheduled for this project and that a copy of any CEQA notices or associated documents be forwarded to us for this project. If you have any questions or concerns, please contact me at (510) 544-2627 or via email at cbarton@ebparks.org.

Sincerely,

Chris Barton
Senior Planner

cc: Jim Townsend, Regional Trails Program Manager

PORT OF OAKLAND

December 21, 2009

Vince De Lange, P.E.
East Bay Municipal Utility District
375 Eleventh Street, MS702
Oakland, CA 94607-4240

Re: Response to the Notice of Preparation of a Draft Environmental Impact Report (EIR) for the East Bay Utility District (EBMUD) Main Wastewater Treatment Plant (MWWTP) Land Use Master Plan

Dear Mr. De Lange:

The Port of Oakland (Port) is pleased to respond to EBMUD's Notice of Preparation (NOP) regarding the Land Use Master Plan for the Main Wastewater Treatment Plant. The Port offers these comments as the District develops its EIR.

1. Please analyze impacts to air quality and especially measures to control and reduce emissions, during both construction and operations.

2. In addition to air emissions, the EIR should address traffic congestion and circulation patterns, especially regarding how additional vehicles generated by EBMUD's activity in the Port area might impact existing Port operations and future activities on Port and City property at the former Oakland Army Base, as well as the West Oakland community. Regarding measures to reduce vehicle emissions, this may include limiting truck trips, requiring emission controls on vehicles, use of alternative fuels or the use of the most efficient transport methods, *e.g.,* rail versus truck.

3. The EIR should address the cumulative impacts of construction and operation on proposed development projects within the Port area, including marine terminal improvements in the Outer Harbor and development of the former Oakland Army Base. Increases in cargo movements through the Port up to 2020 were covered in the 2002 Oakland Army Base Redevelopment Plan EIR.

4. As part of its land use analysis, the EIR should evaluate project compatibility with surrounding uses, including Port operations, consistent with the City of Oakland's General Plan, Port planning documents, and with Section 708 of the Charter of the City of Oakland.

530 Water Street ■ Jack London Square ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone: (510) 627-1100 ■ Facsimile: (510) 627-1826 ■ Web Page: www.portofoakland.com

5. We understand that your initial projects are primarily "green" projects involving biofuels, energy generation, and waste recycling and re-use. Please analyze the potential environmental impacts from these processes that may occur during construction and operation.

6. In the near future, a public park ("Gateway Park") is planned to be developed near the Plant's existing outfall. Public access and a bicycle trail are planned close to the MWWTP. Please discuss impacts from plant operations on public access and the Bay Trail.

7. Because the MWWTP is one of the first features encountered by the public when approaching Oakland from the north and west, the Port believes the planned development should be aesthetically pleasing, compatible with its use. Please discuss the aesthetic impacts of the MWWTP, particularly its effects on the Oakland Gateway area.

8. The Port understands that the District's Master Plan may offer direct benefits to the Port, both in the ready availability of biofuels to truckers who serve the Port and in potential access to electricity produced locally from renewable resources, which might serve the Port's existing plans to electrify certain maritime operations. We look forward to initiating discussion of these issues.

We suggest that EBMUD and Port staff meet regularly for coordination purposes. Please contact Jeff Jones, Environmental Compliance Supervisor, at 510-627-1360, jjones@portoakland.com.

Sincerely,

Richard Sinkoff, ~~MCP,~~ JD, AICP
Director, Environmental Programs and Planning Division

cc: Anne Whittington
Jeff Jones
Dale Klettke
Pamela Kershaw
Joshua Safran

COMMENT FORM

EAST BAY MUNICIPAL UTILITY DISTRICT

Main Wastewater Treatment Plant Land Use Master Plan Environmental Impact Report

Scoping Meeting
December 14, 2009
6:00 pm – 8:00 pm
EBMUD Adeline Maintenance Center

CONTACT INFORMATION

Name: LAWRENCE RICE

Affiliation: WOPAC
Agency/Business/Neighborhood Name

Address: 729 40th ST
OAKLAND CA 94609

Email: larry_e_rice@hotmail.com

Phone No: 510-655-9075

Would you like to be added to the project mailing list for future notifications? ☒ Yes ☐ No

COMMENTS

SOUNDS LIKE A PROMISING PROJECT. THANK YOU FOR LOOKING AHEAD AND PLANNING FOR FUTURE NEEDS. PLEASE CONTINUE TO ENSURE THE FACILITY REMAINS UP-TO-DATE AND READY TO MEET THE FUTURE NEEDS OF OAKLAND RESIDENTS.

Note: Comments must be received by EBMUD by Monday, December 21, 2009.
Comments may be submitted in hard copy during the Public Scoping Meeting, by mail (see reverse side), or by email (send to vdelange@ebmud.com)

COMMENT FORM

EAST BAY MUNICIPAL UTILITY DISTRICT

Main Wastewater Treatment Plant Land Use Master Plan Environmental Impact Report

Scoping Meeting
December 14, 2009
6:00 pm – 8:00 pm
EBMUD Adeline Maintenance Center

CONTACT INFORMATION

Name: Musia + Michael Stagg

Affiliation: WON
Agency/Business/Neighborhood Name

Address: 3234 Ettie St
Oakland 94608

Email: musiastagg@yahoo.com

Phone No: 658 8438

Would you like to be added to the project mailing list for future notifications? ☒ Yes ☐ No

COMMENTS

We are very supportive of EBMUD's plans for the WWTP, and for Biodiesel, + Food Waste facilities.

Since we came to West Oakland in 1992 EBMUD's Odor Control has improved astronomically + we are proud to have such a conscientious industrial neighbor.

Note: Comments must be received by EBMUD by Monday, December 21, 2009.
Comments may be submitted in hard copy during the Public Scoping Meeting, by mail (see reverse side), or by email (send to vdelange@ebmud.com)

Appendix B URBEMIS2007 Air Quality Modeling Output

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Food Waste and Bio Diesel\Construction\BioDiesel Construction Val.urb924

Project Name: Biodiesel Construction

Project Location: Bay Area Air District

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
2011 TOTALS (tons/year unmitigated)	0.05	0.44	0.24	0.00	0.18	0.02	0.20	0.04	0.02	0.06	47.97
2011 TOTALS (tons/year mitigated)	0.05	0.38	0.24	0.00	0.02	0.00	0.02	0.00	0.00	0.01	47.97
Percent Reduction	0.00	13.71	0.00	0.00	90.50	79.87	89.29	90.40	79.90	86.61	0.00
2012 TOTALS (tons/year unmitigated)	0.21	1.38	1.23	0.00	0.00	0.08	0.09	0.00	0.08	0.08	235.44
2012 TOTALS (tons/year mitigated)	0.21	1.21	1.23	0.00	0.00	0.02	0.03	0.00	0.02	0.02	235.44
Percent Reduction	0.00	12.05	0.00	0.00	0.00	74.56	71.21	0.00	74.69	73.39	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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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Food Waste and Bio Diesel\Construction\BioDiesel Construction Val.urb924

Project Name: Biodiesel Construction

Project Location: Bay Area Air District

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
2011 TOTALS (lbs/day unmitigated)	4.14	35.33	17.64	0.01	16.37	1.77	18.14	3.42	1.63	5.05	3,796.88
2011 TOTALS (lbs/day mitigated)	4.14	30.45	17.64	0.01	1.16	0.35	1.51	0.25	0.32	0.57	3,796.88
2012 TOTALS (lbs/day unmitigated)	3.21	21.07	18.77	0.01	0.06	1.27	1.33	0.02	1.17	1.19	3,594.53
2012 TOTALS (lbs/day mitigated)	3.21	18.53	18.77	0.01	0.06	0.32	0.38	0.02	0.30	0.32	3,594.53

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

11/4/2010 11:06:19 AM

Time Slice 3/1/2011-3/30/2011 Active Days: 22	0.81	5.84	4.64	0.00	0.42	0.37	0.79	0.09	0.34	0.43	736.74
Demolition 03/01/2011- 03/30/2011	0.81	5.84	4.64	0.00	0.42	0.37	0.79	0.09	0.34	0.43	736.74
Fugitive Dust	0.00	0.00	0.00	0.00	0.41	0.00	0.41	0.08	0.00	0.08	0.00
Demo Off Road Diesel	0.72	5.09	3.08	0.00	0.00	0.34	0.34	0.00	0.31	0.31	501.02
Demo On Road Diesel	0.04	0.68	0.22	0.00	0.00	0.02	0.03	0.00	0.02	0.02	108.25
Demo Worker Trips	0.04	0.07	1.34	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.47
Time Slice 4/1/2011-4/29/2011 Active Days: 21	**4.14**	**35.33**	17.64	0.01	**16.37**	**1.77**	**18.14**	**3.42**	**1.63**	**5.05**	**3,796.88**
Mass Grading 04/01/2011- 04/30/2011	4.14	35.33	17.64	0.01	16.37	1.77	18.14	3.42	1.63	5.05	3,796.88
Mass Grading Dust	0.00	0.00	0.00	0.00	16.35	0.00	16.35	3.41	0.00	3.41	0.00
Mass Grading Off Road Diesel	3.92	32.55	15.42	0.00	0.00	1.67	1.67	0.00	1.54	1.54	3,238.05
Mass Grading On Road Diesel	0.17	2.71	0.88	0.00	0.02	0.10	0.11	0.00	0.09	0.10	431.36
Mass Grading Worker Trips	0.04	0.07	1.34	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.47
Time Slice 5/1/2012-10/30/2012 Active Days: 131	3.21	21.07	**18.77**	**0.01**	0.06	1.27	1.33	0.02	1.17	1.19	3,594.53
Building 05/01/2012-10/30/2012	3.21	21.07	18.77	0.01	0.06	1.27	1.33	0.02	1.17	1.19	3,594.53
Building Off Road Diesel	2.74	16.92	10.53	0.00	0.00	1.12	1.12	0.00	1.03	1.03	2,140.89
Building Vendor Trips	0.29	3.85	2.82	0.01	0.03	0.14	0.17	0.01	0.13	0.14	893.62
Building Worker Trips	0.17	0.30	5.42	0.01	0.03	0.01	0.04	0.01	0.01	0.02	560.03

Phase Assumptions

Phase: Demolition 3/1/2011 - 3/30/2011 - Default Paving Description

Building Volume Total (cubic feet): 10000

Building Volume Daily (cubic feet): 968

On Road Truck Travel (VMT): 26.89

Off-Road Equipment:

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1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Mass Grading 4/1/2011 - 4/30/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 3

Maximum Daily Acreage Disturbed: 0.75

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 75 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 107.14

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 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 5/1/2012 - 10/30/2012 - Default Building Construction Description

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 3 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

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2011	0.05	0.44	0.24	0.00	0.18	0.02	0.20	0.04	0.02	0.06	47.97
Demolition 03/01/2011-03/30/2011	0.01	0.06	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	8.10
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.01	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.51
Demo On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
Demo Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
Mass Grading 04/01/2011-04/30/2011	0.04	0.37	0.19	0.00	0.17	0.02	0.19	0.04	0.02	0.05	39.87
Mass Grading Dust	0.00	0.00	0.00	0.00	0.17	0.00	0.17	0.04	0.00	0.04	0.00
Mass Grading Off Road Diesel	0.04	0.34	0.16	0.00	0.00	0.02	0.02	0.00	0.02	0.02	34.00
Mass Grading On Road Diesel	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.53
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34
2012	0.21	1.38	1.23	0.00	0.00	0.08	0.09	0.00	0.08	0.08	235.44
Building 05/01/2012-10/30/2012	0.21	1.38	1.23	0.00	0.00	0.08	0.09	0.00	0.08	0.08	235.44
Building Off Road Diesel	0.18	1.11	0.69	0.00	0.00	0.07	0.07	0.00	0.07	0.07	140.23
Building Vendor Trips	0.02	0.25	0.18	0.00	0.00	0.01	0.01	0.00	0.01	0.01	58.53
Building Worker Trips	0.01	0.02	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.68

Phase Assumptions

Phase: Demolition 3/1/2011 - 3/30/2011 - Default Paving Description

Building Volume Total (cubic feet): 10000

Building Volume Daily (cubic feet): 968

On Road Truck Travel (VMT): 26.89

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

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1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Mass Grading 4/1/2011 - 4/30/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 3

Maximum Daily Acreage Disturbed: 0.75

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 75 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 107.14

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 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 5/1/2012 - 10/30/2012 - Default Building Construction Description

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 3 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

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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
2011	0.05	0.38	0.24	0.00	0.02	0.00	0.02	0.00	0.00	0.01	47.97
Demolition 03/01/2011-03/30/2011	0.01	0.06	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	8.10
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.01	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.51
Demo On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
Demo Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
Mass Grading 04/01/2011-04/30/2011	0.04	0.32	0.19	0.00	0.01	0.00	0.02	0.00	0.00	0.01	39.87
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.04	0.29	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.00
Mass Grading On Road Diesel	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.53
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34
2012	0.21	1.21	1.23	0.00	0.00	0.02	0.03	0.00	0.02	0.02	235.44
Building 05/01/2012-10/30/2012	0.21	1.21	1.23	0.00	0.00	0.02	0.03	0.00	0.02	0.02	235.44
Building Off Road Diesel	0.18	0.94	0.69	0.00	0.00	0.01	0.01	0.00	0.01	0.01	140.23
Building Vendor Trips	0.02	0.25	0.18	0.00	0.00	0.01	0.01	0.00	0.01	0.01	58.53
Building Worker Trips	0.01	0.02	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.68

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Demolition 3/1/2011 - 3/30/2011 - Default Paving Description

For Concrete/Industrial Saws, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Concrete/Industrial Saws, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

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NOX: 15%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Mass Grading 4/1/2011 - 4/30/2011 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

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

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Scrapers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Scrapers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 5/1/2012 - 10/30/2012 - Default Building Construction Description

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

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PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Bore/Drill Rigs, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Bore/Drill Rigs, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Food Waste and Bio Diesel\Construction\FoodWaste Val.urb924

Project Name: Food Waste Pre-Processing Facility Construction

Project Location: Bay Area Air District

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
2012 TOTALS (tons/year unmitigated)	0.07	0.54	0.31	0.00	0.26	0.03	0.29	0.06	0.03	0.08	64.21
2012 TOTALS (tons/year mitigated)	0.07	0.46	0.31	0.00	0.02	0.01	0.03	0.00	0.01	0.01	64.21
Percent Reduction	0.00	13.58	0.00	0.00	91.28	79.51	90.13	91.18	79.54	87.41	0.00
2013 TOTALS (tons/year unmitigated)	0.40	2.19	1.82	0.00	0.00	0.16	0.16	0.00	0.14	0.14	294.89
2013 TOTALS (tons/year mitigated)	0.40	1.89	1.82	0.00	0.00	0.03	0.03	0.00	0.03	0.03	294.89
Percent Reduction	0.00	13.72	0.00	0.00	0.00	81.10	79.54	0.00	81.16	80.56	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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2012	0.07	0.54	0.31	0.00	0.26	0.03	0.29	0.06	0.03	0.08	64.21
Demolition 10/01/2012-10/30/2012	0.01	0.05	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	6.75
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16
Demo On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
Demo Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
Mass Grading 11/01/2012-12/30/2012	0.06	0.49	0.27	0.00	0.26	0.03	0.29	0.05	0.02	0.08	57.46
Mass Grading Dust	0.00	0.00	0.00	0.00	0.26	0.00	0.26	0.05	0.00	0.05	0.00
Mass Grading Off Road Diesel	0.06	0.45	0.23	0.00	0.00	0.02	0.02	0.00	0.02	0.02	47.23
Mass Grading On Road Diesel	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.55
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.68
2013	0.40	2.19	1.82	0.00	0.00	0.16	0.16	0.00	0.14	0.14	294.89
Building 01/01/2013-10/30/2013	0.40	2.19	1.82	0.00	0.00	0.16	0.16	0.00	0.14	0.14	294.89
Building Off Road Diesel	0.37	2.00	1.44	0.00	0.00	0.15	0.15	0.00	0.14	0.14	221.27
Building Vendor Trips	0.01	0.17	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	45.25
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.37

Phase Assumptions

Phase: Demolition 10/1/2012 - 10/30/2012 - Default Paving Description

Building Volume Total (cubic feet): 10000

Building Volume Daily (cubic feet): 968

On Road Truck Travel (VMT): 26.89

Off-Road Equipment:

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

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1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 3 hours per day

Phase: Mass Grading 11/1/2012 - 12/30/2012 - Default Fine Site Grading Description

Total Acres Disturbed: 1.4

Maximum Daily Acreage Disturbed: 0.35

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 75 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 89.29

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 6 hours per day

Phase: Building Construction 1/1/2013 - 10/30/2013 - Default Building Construction Description

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

11/4/2010 11:05:07 AM

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
2012	0.07	0.46	0.31	0.00	0.02	0.01	0.03	0.00	0.01	0.01	64.21
Demolition 10/01/2012-10/30/2012	0.01	0.04	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	6.75
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	0.01	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16
Demo On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
Demo Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40
Mass Grading 11/01/2012-12/30/2012	0.06	0.42	0.27	0.00	0.02	0.01	0.02	0.00	0.00	0.01	57.46
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.06	0.38	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.23
Mass Grading On Road Diesel	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.55
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.68
2013	0.40	1.89	1.82	0.00	0.00	0.03	0.03	0.00	0.03	0.03	294.89
Building 01/01/2013-10/30/2013	0.40	1.89	1.82	0.00	0.00	0.03	0.03	0.00	0.03	0.03	294.89
Building Off Road Diesel	0.37	1.70	1.44	0.00	0.00	0.02	0.02	0.00	0.02	0.02	221.27
Building Vendor Trips	0.01	0.17	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	45.25
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.37

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Demolition 10/1/2012 - 10/30/2012 - Default Paving Description

For Concrete/Industrial Saws, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Concrete/Industrial Saws, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

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NOX: 15%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Mass Grading 11/1/2012 - 12/30/2012 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

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

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

11/4/2010 11:05:07 AM

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Scrapers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Scrapers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 1/1/2013 - 10/30/2013 - Default Building Construction Description

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

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PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Food Waste and Bio Diesel\Construction\FoodWaste Val.urb924

Project Name: Food Waste Pre-Processing Facility Construction

Project Location: Bay Area Air District

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
2012 TOTALS (lbs/day unmitigated)	2.88	23.35	12.80	0.00	12.37	1.25	13.62	2.59	1.15	3.73	2,735.99
2012 TOTALS (lbs/day mitigated)	2.88	20.16	12.80	0.00	0.88	0.25	1.13	0.19	0.23	0.42	2,735.99
2013 TOTALS (lbs/day unmitigated)	3.64	20.17	16.79	0.01	0.03	1.43	1.46	0.01	1.32	1.32	2,717.90
2013 TOTALS (lbs/day mitigated)	3.64	17.41	16.79	0.01	0.03	0.27	0.30	0.01	0.25	0.26	2,717.90

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 10/1/2012-10/30/2012 Active Days: 22	0.58	4.31	3.59	0.00	0.42	0.23	0.65	0.09	0.21	0.30	614.02
Demolition 10/01/2012-10/30/2012	0.58	4.31	3.59	0.00	0.42	0.23	0.65	0.09	0.21	0.30	614.02
Fugitive Dust	0.00	0.00	0.00	0.00	0.41	0.00	0.41	0.08	0.00	0.08	0.00
Demo Off Road Diesel	0.50	3.64	2.16	0.00	0.00	0.21	0.21	0.00	0.19	0.19	378.22
Demo On Road Diesel	0.04	0.60	0.20	0.00	0.00	0.02	0.03	0.00	0.02	0.02	108.25
Demo Worker Trips	0.04	0.07	1.23	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.54
Time Slice 11/1/2012-12/28/2012 Active Days: 42	2.88	**23.35**	12.80	0.00	**12.37**	1.25	**13.62**	**2.59**	1.15	**3.73**	**2,735.99**
Mass Grading 11/01/2012-12/30/2012	2.88	23.35	12.80	0.00	12.37	1.25	13.62	2.59	1.15	3.73	2,735.99
Mass Grading Dust	0.00	0.00	0.00	0.00	12.35	0.00	12.35	2.58	0.00	2.58	0.00
Mass Grading Off Road Diesel	2.71	21.27	10.91	0.00	0.00	1.17	1.17	0.00	1.08	1.08	2,248.98
Mass Grading On Road Diesel	0.13	2.01	0.66	0.00	0.01	0.07	0.08	0.00	0.07	0.07	359.47
Mass Grading Worker Trips	0.04	0.07	1.23	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.54
Time Slice 1/1/2013-10/30/2013 Active Days: 217	**3.64**	20.17	**16.79**	**0.01**	0.03	**1.43**	1.46	0.01	**1.32**	1.32	2,717.90
Building 01/01/2013-10/30/2013	3.64	20.17	16.79	0.01	0.03	1.43	1.46	0.01	1.32	1.32	2,717.90
Building Off Road Diesel	3.44	18.45	13.24	0.00	0.00	1.36	1.36	0.00	1.26	1.26	2,039.37
Building Vendor Trips	0.13	1.60	1.23	0.00	0.02	0.06	0.07	0.01	0.05	0.06	417.04
Building Worker Trips	0.07	0.13	2.33	0.00	0.01	0.01	0.02	0.00	0.01	0.01	261.49

Phase Assumptions

Phase: Demolition 10/1/2012 - 10/30/2012 - Default Paving Description

Building Volume Total (cubic feet): 10000

Building Volume Daily (cubic feet): 968

On Road Truck Travel (VMT): 26.89

Off-Road Equipment:

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1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

2 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 1 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 3 hours per day

Phase: Mass Grading 11/1/2012 - 12/30/2012 - Default Fine Site Grading Description

Total Acres Disturbed: 1.4

Maximum Daily Acreage Disturbed: 0.35

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 75 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 89.29

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 6 hours per day

Phase: Building Construction 1/1/2013 - 10/30/2013 - Default Building Construction Description

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 10/1/2012-10/30/2012 Active Days: 22	0.58	3.77	3.59	0.00	0.42	0.06	0.47	0.09	0.05	0.14	614.02
Demolition 10/01/2012-10/30/2012	0.58	3.77	3.59	0.00	0.42	0.06	0.47	0.09	0.05	0.14	614.02
Fugitive Dust	0.00	0.00	0.00	0.00	0.41	0.00	0.41	0.08	0.00	0.08	0.00
Demo Off Road Diesel	0.50	3.09	2.16	0.00	0.00	0.03	0.03	0.00	0.03	0.03	378.22
Demo On Road Diesel	0.04	0.60	0.20	0.00	0.00	0.02	0.03	0.00	0.02	0.02	108.25
Demo Worker Trips	0.04	0.07	1.23	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.54
Time Slice 11/1/2012-12/28/2012 Active Days: 42	2.88	20.16	12.80	0.00	0.88	0.25	1.13	0.19	0.23	0.42	**2,735.99**
Mass Grading 11/01/2012-12/30/2012	2.88	20.16	12.80	0.00	0.88	0.25	1.13	0.19	0.23	0.42	2,735.99
Mass Grading Dust	0.00	0.00	0.00	0.00	0.86	0.00	0.86	0.18	0.00	0.18	0.00
Mass Grading Off Road Diesel	2.71	18.08	10.91	0.00	0.00	0.18	0.18	0.00	0.16	0.16	2,248.98
Mass Grading On Road Diesel	0.13	2.01	0.66	0.00	0.01	0.07	0.08	0.00	0.07	0.07	359.47
Mass Grading Worker Trips	0.04	0.07	1.23	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.54
Time Slice 1/1/2013-10/30/2013 Active Days: 217	**3.64**	17.41	**16.79**	**0.01**	0.03	0.27	0.30	0.01	0.25	0.26	2,717.90
Building 01/01/2013-10/30/2013	3.64	17.41	16.79	0.01	0.03	0.27	0.30	0.01	0.25	0.26	2,717.90
Building Off Road Diesel	3.44	15.69	13.24	0.00	0.00	0.20	0.20	0.00	0.19	0.19	2,039.37
Building Vendor Trips	0.13	1.60	1.23	0.00	0.02	0.06	0.07	0.01	0.05	0.06	417.04
Building Worker Trips	0.07	0.13	2.33	0.00	0.01	0.01	0.02	0.00	0.01	0.01	261.49

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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Demolition 10/1/2012 - 10/30/2012 - Default Paving Description

For Concrete/Industrial Saws, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Concrete/Industrial Saws, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Mass Grading 11/1/2012 - 12/30/2012 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

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

PM10: 44% PM25: 44%

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For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Scrapers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Scrapers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 1/1/2013 - 10/30/2013 - Default Building Construction Description

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

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NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

10/29/2010 2:59:10 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Food Waste and Bio Diesel\Construction\Land Use Master Plan Construction.urb924

Project Name: Land Use Master Plan Construction

Project Location: Bay Area Air District

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
2011 TOTALS (tons/year unmitigated)	0.09	0.54	0.42	0.00	0.00	0.05	0.05	0.00	0.04	0.04	56.26
2011 TOTALS (tons/year mitigated)	0.09	0.46	0.42	0.00	0.00	0.01	0.01	0.00	0.01	0.01	56.26
Percent Reduction	0.00	14.85	0.00	0.00	0.00	84.60	83.94	0.00	84.64	84.38	0.00
2012 TOTALS (tons/year unmitigated)	0.41	3.28	1.79	0.00	0.63	0.17	0.81	0.13	0.16	0.29	370.28
2012 TOTALS (tons/year mitigated)	0.41	2.80	1.79	0.00	0.05	0.03	0.07	0.01	0.03	0.04	370.28
Percent Reduction	0.00	14.65	0.00	0.00	92.85	83.62	90.86	92.73	83.64	87.75	0.00
2013 TOTALS (tons/year unmitigated)	0.41	2.35	1.85	0.00	0.00	0.17	0.17	0.00	0.15	0.16	303.42
2013 TOTALS (tons/year mitigated)	0.41	2.02	1.85	0.00	0.00	0.03	0.03	0.00	0.03	0.03	303.42
Percent Reduction	0.00	13.97	0.00	0.00	0.00	81.89	80.64	0.00	81.94	81.47	0.00

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2015 TOTALS (tons/year unmitigated)	0.34	2.03	1.74	0.00	0.00	0.14	0.14	0.00	0.13	0.13	303.45
2015 TOTALS (tons/year mitigated)	0.34	1.75	1.74	0.00	0.00	0.02	0.03	0.00	0.02	0.02	303.45
Percent Reduction	0.00	14.06	0.00	0.00	0.00	81.89	80.36	0.00	81.95	81.36	0.00
2016 TOTALS (tons/year unmitigated)	0.31	1.88	1.69	0.00	0.00	0.12	0.12	0.00	0.11	0.11	303.45
2016 TOTALS (tons/year mitigated)	0.31	1.62	1.69	0.00	0.00	0.02	0.02	0.00	0.02	0.02	303.45
Percent Reduction	0.00	14.10	0.00	0.00	0.00	81.79	80.08	0.00	81.87	81.21	0.00
2017 TOTALS (tons/year unmitigated)	0.28	1.74	1.65	0.00	0.00	0.11	0.11	0.00	0.10	0.10	302.30
2017 TOTALS (tons/year mitigated)	0.28	1.49	1.65	0.00	0.00	0.02	0.02	0.00	0.02	0.02	302.30
Percent Reduction	0.00	14.13	0.00	0.00	0.00	81.72	79.79	0.00	81.80	81.06	0.00
2018 TOTALS (tons/year unmitigated)	0.25	1.62	1.61	0.00	0.00	0.09	0.10	0.00	0.09	0.09	303.47
2018 TOTALS (tons/year mitigated)	0.25	1.39	1.61	0.00	0.00	0.02	0.02	0.00	0.02	0.02	303.47
Percent Reduction	0.00	14.16	0.00	0.00	0.00	81.56	79.38	0.00	81.65	80.81	0.00
2019 TOTALS (tons/year unmitigated)	0.23	1.49	1.58	0.00	0.00	0.08	0.08	0.00	0.08	0.08	303.47
2019 TOTALS (tons/year mitigated)	0.23	1.28	1.58	0.00	0.00	0.02	0.02	0.00	0.01	0.01	303.47
Percent Reduction	0.00	14.18	0.00	0.00	0.00	81.34	78.84	0.00	81.44	80.48	0.00
2020 TOTALS (tons/year unmitigated)	0.21	1.39	1.56	0.00	0.00	0.07	0.07	0.00	0.07	0.07	304.64
2020 TOTALS (tons/year mitigated)	0.21	1.19	1.56	0.00	0.00	0.01	0.02	0.00	0.01	0.01	304.64
Percent Reduction	0.00	14.21	0.00	0.00	0.00	81.10	78.26	0.00	81.22	80.12	0.00

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2021 TOTALS (tons/year unmitigated)	0.21	1.36	1.50	0.00	0.00	0.07	0.07	0.00	0.07	0.07	303.50
2021 TOTALS (tons/year mitigated)	0.21	1.17	1.50	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.50
Percent Reduction	0.00	14.46	0.00	0.00	0.00	81.96	79.05	0.00	82.07	80.95	0.00
2022 TOTALS (tons/year unmitigated)	0.21	1.36	1.49	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.34
2022 TOTALS (tons/year mitigated)	0.21	1.16	1.49	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.34
Percent Reduction	0.00	14.46	0.00	0.00	0.00	81.96	79.05	0.00	82.07	80.95	0.00
2023 TOTALS (tons/year unmitigated)	0.21	1.36	1.49	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.34
2023 TOTALS (tons/year mitigated)	0.21	1.16	1.49	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.34
Percent Reduction	0.00	14.46	0.00	0.00	0.00	81.96	79.05	0.00	82.07	80.95	0.00
2024 TOTALS (tons/year unmitigated)	0.21	1.37	1.51	0.00	0.00	0.07	0.07	0.00	0.07	0.07	304.66
2024 TOTALS (tons/year mitigated)	0.21	1.17	1.51	0.00	0.00	0.01	0.02	0.00	0.01	0.01	304.66
Percent Reduction	0.00	14.46	0.00	0.00	0.00	81.96	79.05	0.00	82.07	80.95	0.00
2025 TOTALS (tons/year unmitigated)	0.21	1.36	1.50	0.00	0.00	0.07	0.07	0.00	0.07	0.07	303.50
2025 TOTALS (tons/year mitigated)	0.21	1.17	1.50	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.50
Percent Reduction	0.00	14.46	0.00	0.00	0.00	81.96	79.05	0.00	82.07	80.95	0.00
2026 TOTALS (tons/year unmitigated)	0.20	1.35	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	303.52
2026 TOTALS (tons/year mitigated)	0.20	1.16	1.47	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.52
Percent Reduction	0.00	14.56	0.00	0.00	0.00	82.26	79.33	0.00	82.38	81.24	0.00

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2027 TOTALS (tons/year unmitigated)	0.20	1.35	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	303.52
2027 TOTALS (tons/year mitigated)	0.20	1.16	1.47	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.52
Percent Reduction	0.00	14.56	0.00	0.00	0.00	82.26	79.33	0.00	82.38	81.24	0.00
2028 TOTALS (tons/year unmitigated)	0.20	1.35	1.46	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.36
2028 TOTALS (tons/year mitigated)	0.20	1.15	1.46	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.36
Percent Reduction	0.00	14.56	0.00	0.00	0.00	82.26	79.33	0.00	82.38	81.24	0.00
2029 TOTALS (tons/year unmitigated)	0.20	1.35	1.46	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.36
2029 TOTALS (tons/year mitigated)	0.20	1.15	1.46	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.36
Percent Reduction	0.00	14.56	0.00	0.00	0.00	82.26	79.33	0.00	82.38	81.24	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
2011	0.09	0.54	0.42	0.00	0.00	0.05	0.05	0.00	0.04	0.04	56.26
Asphalt 10/01/2011-12/30/2011	0.09	0.54	0.42	0.00	0.00	0.05	0.05	0.00	0.04	0.04	56.26
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.09	0.54	0.34	0.00	0.00	0.05	0.05	0.00	0.04	0.04	48.66
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Paving Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.46

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2012	0.41	3.28	1.79	0.00	0.63	0.17	0.81	0.13	0.16	0.29	370.28
Mass Grading 01/01/2012-12/30/2012	0.41	3.28	1.79	0.00	0.63	0.17	0.81	0.13	0.16	0.29	370.28
Mass Grading Dust	0.00	0.00	0.00	0.00	0.63	0.00	0.63	0.13	0.00	0.13	0.00
Mass Grading Off Road Diesel	0.40	3.21	1.60	0.00	0.00	0.17	0.17	0.00	0.16	0.16	341.66
Mass Grading On Road Diesel	0.00	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.03
Mass Grading Worker Trips	0.01	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.58
2013	0.41	2.35	1.85	0.00	0.00	0.17	0.17	0.00	0.15	0.16	303.42
Building 01/01/2013-12/31/2013	0.41	2.35	1.85	0.00	0.00	0.17	0.17	0.00	0.15	0.16	303.42
Building Off Road Diesel	0.39	2.19	1.51	0.00	0.00	0.16	0.16	0.00	0.15	0.15	240.17
Building Vendor Trips	0.01	0.15	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	38.87
Building Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.37
2015	0.34	2.03	1.74	0.00	0.00	0.14	0.14	0.00	0.13	0.13	303.45
Building 01/01/2015-12/30/2029	0.34	2.03	1.74	0.00	0.00	0.14	0.14	0.00	0.13	0.13	303.45
Building Off Road Diesel	0.33	1.90	1.45	0.00	0.00	0.13	0.13	0.00	0.12	0.12	240.17
Building Vendor Trips	0.01	0.12	0.10	0.00	0.00	0.00	0.01	0.00	0.00	0.00	38.88
Building Worker Trips	0.01	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.40
2016	0.31	1.88	1.69	0.00	0.00	0.12	0.12	0.00	0.11	0.11	303.45
Building 01/01/2015-12/30/2029	0.31	1.88	1.69	0.00	0.00	0.12	0.12	0.00	0.11	0.11	303.45
Building Off Road Diesel	0.30	1.77	1.43	0.00	0.00	0.12	0.12	0.00	0.11	0.11	240.17
Building Vendor Trips	0.01	0.10	0.09	0.00	0.00	0.00	0.01	0.00	0.00	0.00	38.88
Building Worker Trips	0.01	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.40

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2017	0.28	1.74	1.65	0.00	0.00	0.11	0.11	0.00	0.10	0.10	302.30
Building 01/01/2015-12/30/2029	0.28	1.74	1.65	0.00	0.00	0.11	0.11	0.00	0.10	0.10	302.30
Building Off Road Diesel	0.27	1.64	1.40	0.00	0.00	0.10	0.10	0.00	0.10	0.10	239.25
Building Vendor Trips	0.01	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.73
Building Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.32
2018	0.25	1.62	1.61	0.00	0.00	0.09	0.10	0.00	0.09	0.09	303.47
Building 01/01/2015-12/30/2029	0.25	1.62	1.61	0.00	0.00	0.09	0.10	0.00	0.09	0.09	303.47
Building Off Road Diesel	0.24	1.52	1.39	0.00	0.00	0.09	0.09	0.00	0.08	0.08	240.17
Building Vendor Trips	0.01	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.88
Building Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.41
2019	0.23	1.49	1.58	0.00	0.00	0.08	0.08	0.00	0.08	0.08	303.47
Building 01/01/2015-12/30/2029	0.23	1.49	1.58	0.00	0.00	0.08	0.08	0.00	0.08	0.08	303.47
Building Off Road Diesel	0.22	1.41	1.37	0.00	0.00	0.08	0.08	0.00	0.07	0.07	240.17
Building Vendor Trips	0.01	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.89
Building Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.42
2020	0.21	1.39	1.56	0.00	0.00	0.07	0.07	0.00	0.07	0.07	304.64
Building 01/01/2015-12/30/2029	0.21	1.39	1.56	0.00	0.00	0.07	0.07	0.00	0.07	0.07	304.64
Building Off Road Diesel	0.20	1.32	1.36	0.00	0.00	0.07	0.07	0.00	0.06	0.06	241.09
Building Vendor Trips	0.01	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.04
Building Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.51

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2021	0.21	1.36	1.50	0.00	0.00	0.07	0.07	0.00	0.07	0.07	303.50
Building 01/01/2015-12/30/2029	0.21	1.36	1.50	0.00	0.00	0.07	0.07	0.00	0.07	0.07	303.50
Building Off Road Diesel	0.20	1.31	1.36	0.00	0.00	0.07	0.07	0.00	0.06	0.06	240.17
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.89
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.44
2022	0.21	1.36	1.49	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.34
Building 01/01/2015-12/30/2029	0.21	1.36	1.49	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.34
Building Off Road Diesel	0.20	1.31	1.35	0.00	0.00	0.07	0.07	0.00	0.06	0.06	239.25
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.34
2023	0.21	1.36	1.49	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.34
Building 01/01/2015-12/30/2029	0.21	1.36	1.49	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.34
Building Off Road Diesel	0.20	1.31	1.35	0.00	0.00	0.07	0.07	0.00	0.06	0.06	239.25
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.34
2024	0.21	1.37	1.51	0.00	0.00	0.07	0.07	0.00	0.07	0.07	304.66
Building 01/01/2015-12/30/2029	0.21	1.37	1.51	0.00	0.00	0.07	0.07	0.00	0.07	0.07	304.66
Building Off Road Diesel	0.20	1.32	1.36	0.00	0.00	0.07	0.07	0.00	0.06	0.06	241.09
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.04
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.53

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2025	0.21	1.36	1.50	0.00	0.00	0.07	0.07	0.00	0.07	0.07	303.50
Building 01/01/2015-12/30/2029	0.21	1.36	1.50	0.00	0.00	0.07	0.07	0.00	0.07	0.07	303.50
Building Off Road Diesel	0.20	1.31	1.36	0.00	0.00	0.07	0.07	0.00	0.06	0.06	240.17
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.89
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.44
2026	0.20	1.35	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	303.52
Building 01/01/2015-12/30/2029	0.20	1.35	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	303.52
Building Off Road Diesel	0.20	1.31	1.36	0.00	0.00	0.07	0.07	0.00	0.06	0.06	240.17
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.90
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.45
2027	0.20	1.35	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	303.52
Building 01/01/2015-12/30/2029	0.20	1.35	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	303.52
Building Off Road Diesel	0.20	1.31	1.36	0.00	0.00	0.07	0.07	0.00	0.06	0.06	240.17
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.90
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.45
2028	0.20	1.35	1.46	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.36
Building 01/01/2015-12/30/2029	0.20	1.35	1.46	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.36
Building Off Road Diesel	0.20	1.31	1.35	0.00	0.00	0.07	0.07	0.00	0.06	0.06	239.25
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.36

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2029	0.20	1.35	1.46	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.36
Building 01/01/2015-12/30/2029	0.20	1.35	1.46	0.00	0.00	0.07	0.07	0.00	0.06	0.07	302.36
Building Off Road Diesel	0.20	1.31	1.35	0.00	0.00	0.07	0.07	0.00	0.06	0.06	239.25
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.36

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 12/30/2012 - Default Fine Site Grading Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 20 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 22.99

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 5 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: Paving 10/1/2011 - 12/30/2011 - Default Paving Description

Acres to be Paved: 0.25

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

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1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 1/1/2013 - 12/31/2013 - Type Your Description Here

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 4 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Building Construction 1/1/2015 - 12/30/2029 - Default Building Construction Description

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 4 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

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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
2011	0.09	0.46	0.42	0.00	0.00	0.01	0.01	0.00	0.01	0.01	56.26
Asphalt 10/01/2011-12/30/2011	0.09	0.46	0.42	0.00	0.00	0.01	0.01	0.00	0.01	0.01	56.26
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.09	0.46	0.34	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.66
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
Paving Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.46
2012	0.41	2.80	1.79	0.00	0.05	0.03	0.07	0.01	0.03	0.04	370.28
Mass Grading 01/01/2012-12/30/2012	0.41	2.80	1.79	0.00	0.05	0.03	0.07	0.01	0.03	0.04	370.28
Mass Grading Dust	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.40	2.73	1.60	0.00	0.00	0.03	0.03	0.00	0.02	0.02	341.66
Mass Grading On Road Diesel	0.00	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.03
Mass Grading Worker Trips	0.01	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.58
2013	0.41	2.02	1.85	0.00	0.00	0.03	0.03	0.00	0.03	0.03	303.42
Building 01/01/2013-12/31/2013	0.41	2.02	1.85	0.00	0.00	0.03	0.03	0.00	0.03	0.03	303.42
Building Off Road Diesel	0.39	1.86	1.51	0.00	0.00	0.02	0.02	0.00	0.02	0.02	240.17
Building Vendor Trips	0.01	0.15	0.11	0.00	0.00	0.01	0.01	0.00	0.01	0.01	38.87
Building Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.37

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2015	0.34	1.75	1.74	0.00	0.00	0.02	0.03	0.00	0.02	0.02	303.45
Building 01/01/2015-12/30/2029	0.34	1.75	1.74	0.00	0.00	0.02	0.03	0.00	0.02	0.02	303.45
Building Off Road Diesel	0.33	1.62	1.45	0.00	0.00	0.02	0.02	0.00	0.02	0.02	240.17
Building Vendor Trips	0.01	0.12	0.10	0.00	0.00	0.00	0.01	0.00	0.00	0.00	38.88
Building Worker Trips	0.01	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.40
2016	0.31	1.62	1.69	0.00	0.00	0.02	0.02	0.00	0.02	0.02	303.45
Building 01/01/2015-12/30/2029	0.31	1.62	1.69	0.00	0.00	0.02	0.02	0.00	0.02	0.02	303.45
Building Off Road Diesel	0.30	1.50	1.43	0.00	0.00	0.02	0.02	0.00	0.02	0.02	240.17
Building Vendor Trips	0.01	0.10	0.09	0.00	0.00	0.00	0.01	0.00	0.00	0.00	38.88
Building Worker Trips	0.01	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.40
2017	0.28	1.49	1.65	0.00	0.00	0.02	0.02	0.00	0.02	0.02	302.30
Building 01/01/2015-12/30/2029	0.28	1.49	1.65	0.00	0.00	0.02	0.02	0.00	0.02	0.02	302.30
Building Off Road Diesel	0.27	1.39	1.40	0.00	0.00	0.02	0.02	0.00	0.01	0.01	239.25
Building Vendor Trips	0.01	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.73
Building Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.32
2018	0.25	1.39	1.61	0.00	0.00	0.02	0.02	0.00	0.02	0.02	303.47
Building 01/01/2015-12/30/2029	0.25	1.39	1.61	0.00	0.00	0.02	0.02	0.00	0.02	0.02	303.47
Building Off Road Diesel	0.24	1.30	1.39	0.00	0.00	0.01	0.01	0.00	0.01	0.01	240.17
Building Vendor Trips	0.01	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.88
Building Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.41

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2019	0.23	1.28	1.58	0.00	0.00	0.02	0.02	0.00	0.01	0.01	303.47
Building 01/01/2015-12/30/2029	0.23	1.28	1.58	0.00	0.00	0.02	0.02	0.00	0.01	0.01	303.47
Building Off Road Diesel	0.22	1.20	1.37	0.00	0.00	0.01	0.01	0.00	0.01	0.01	240.17
Building Vendor Trips	0.01	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.89
Building Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.42
2020	0.21	1.19	1.56	0.00	0.00	0.01	0.02	0.00	0.01	0.01	304.64
Building 01/01/2015-12/30/2029	0.21	1.19	1.56	0.00	0.00	0.01	0.02	0.00	0.01	0.01	304.64
Building Off Road Diesel	0.20	1.12	1.36	0.00	0.00	0.01	0.01	0.00	0.01	0.01	241.09
Building Vendor Trips	0.01	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.04
Building Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.51
2021	0.21	1.17	1.50	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.50
Building 01/01/2015-12/30/2029	0.21	1.17	1.50	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.50
Building Off Road Diesel	0.20	1.12	1.36	0.00	0.00	0.01	0.01	0.00	0.01	0.01	240.17
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.89
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.44
2022	0.21	1.16	1.49	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.34
Building 01/01/2015-12/30/2029	0.21	1.16	1.49	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.34
Building Off Road Diesel	0.20	1.11	1.35	0.00	0.00	0.01	0.01	0.00	0.01	0.01	239.25
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.34

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2023	0.21	1.16	1.49	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.34
Building 01/01/2015-12/30/2029	0.21	1.16	1.49	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.34
Building Off Road Diesel	0.20	1.11	1.35	0.00	0.00	0.01	0.01	0.00	0.01	0.01	239.25
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.34
2024	0.21	1.17	1.51	0.00	0.00	0.01	0.02	0.00	0.01	0.01	304.66
Building 01/01/2015-12/30/2029	0.21	1.17	1.51	0.00	0.00	0.01	0.02	0.00	0.01	0.01	304.66
Building Off Road Diesel	0.20	1.12	1.36	0.00	0.00	0.01	0.01	0.00	0.01	0.01	241.09
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.04
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.53
2025	0.21	1.17	1.50	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.50
Building 01/01/2015-12/30/2029	0.21	1.17	1.50	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.50
Building Off Road Diesel	0.20	1.12	1.36	0.00	0.00	0.01	0.01	0.00	0.01	0.01	240.17
Building Vendor Trips	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.89
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.44
2026	0.20	1.16	1.47	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.52
Building 01/01/2015-12/30/2029	0.20	1.16	1.47	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.52
Building Off Road Diesel	0.20	1.12	1.36	0.00	0.00	0.01	0.01	0.00	0.01	0.01	240.17
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.90
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.45

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2027	0.20	1.16	1.47	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.52
Building 01/01/2015-12/30/2029	0.20	1.16	1.47	0.00	0.00	0.01	0.02	0.00	0.01	0.01	303.52
Building Off Road Diesel	0.20	1.12	1.36	0.00	0.00	0.01	0.01	0.00	0.01	0.01	240.17
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.90
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.45
2028	0.20	1.15	1.46	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.36
Building 01/01/2015-12/30/2029	0.20	1.15	1.46	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.36
Building Off Road Diesel	0.20	1.11	1.35	0.00	0.00	0.01	0.01	0.00	0.01	0.01	239.25
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.36
2029	0.20	1.15	1.46	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.36
Building 01/01/2015-12/30/2029	0.20	1.15	1.46	0.00	0.00	0.01	0.02	0.00	0.01	0.01	302.36
Building Off Road Diesel	0.20	1.11	1.35	0.00	0.00	0.01	0.01	0.00	0.01	0.01	239.25
Building Vendor Trips	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.75
Building Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.36

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2012 - 12/30/2012 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

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

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Scrapers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Scrapers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Paving 10/1/2011 - 12/30/2011 - Default Paving Description

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pavers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

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PM10: 85% PM25: 85%

For Pavers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Signal Boards, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Signal Boards, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Sweepers/Scrubbers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Sweepers/Scrubbers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 1/1/2013 - 12/31/2013 - Type Your Description Here

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

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For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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The following mitigation measures apply to Phase: Building Construction 1/1/2015 - 12/30/2029 - Default Building Construction Description

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

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PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\Sara Gerrick\Application Data\Urbemis\Version9a\Projects\Food Waste and Bio Diesel\Construction\Land Use Master Plan Construction.urb924

Project Name: Land Use Master Plan Construction

Project Location: Bay Area Air District

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
2011 TOTALS (lbs/day unmitigated)	2.78	16.63	12.87	0.00	0.01	1.45	1.46	0.00	1.33	1.33	1,731.10
2011 TOTALS (lbs/day mitigated)	2.78	14.16	12.87	0.00	0.01	0.22	0.23	0.00	0.20	0.21	1,731.10
2012 TOTALS (lbs/day unmitigated)	3.17	25.25	13.74	0.00	4.87	1.34	6.21	1.02	1.23	2.25	2,848.28
2012 TOTALS (lbs/day mitigated)	3.17	21.55	13.74	0.00	0.35	0.22	0.57	0.07	0.20	0.28	2,848.28
2013 TOTALS (lbs/day unmitigated)	3.14	17.99	14.14	0.00	0.02	1.28	1.30	0.01	1.18	1.19	2,325.06
2013 TOTALS (lbs/day mitigated)	3.14	15.47	14.14	0.00	0.02	0.23	0.25	0.01	0.21	0.22	2,325.06
2015 TOTALS (lbs/day unmitigated)	2.62	15.56	13.31	0.00	0.02	1.05	1.07	0.01	0.96	0.97	2,325.26
2015 TOTALS (lbs/day mitigated)	2.62	13.37	13.31	0.00	0.02	0.19	0.21	0.01	0.17	0.18	2,325.26

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2016 TOTALS (lbs/day unmitigated)	2.39	14.43	12.97	0.00	0.02	0.93	0.95	0.01	0.85	0.86	2,325.32
2016 TOTALS (lbs/day mitigated)	2.39	12.39	12.97	0.00	0.02	0.17	0.19	0.01	0.15	0.16	2,325.32
2017 TOTALS (lbs/day unmitigated)	2.16	13.37	12.66	0.00	0.02	0.83	0.85	0.01	0.76	0.77	2,325.38
2017 TOTALS (lbs/day mitigated)	2.16	11.48	12.66	0.00	0.02	0.15	0.17	0.01	0.14	0.15	2,325.38
2018 TOTALS (lbs/day unmitigated)	1.95	12.38	12.37	0.00	0.02	0.73	0.75	0.01	0.67	0.67	2,325.43
2018 TOTALS (lbs/day mitigated)	1.95	10.63	12.37	0.00	0.02	0.13	0.15	0.01	0.12	0.13	2,325.43
2019 TOTALS (lbs/day unmitigated)	1.77	11.45	12.13	0.00	0.02	0.63	0.65	0.01	0.58	0.59	2,325.47
2019 TOTALS (lbs/day mitigated)	1.77	9.82	12.13	0.00	0.02	0.12	0.14	0.01	0.11	0.11	2,325.47
2020 TOTALS (lbs/day unmitigated)	1.60	10.63	11.91	0.00	0.02	0.55	0.57	0.01	0.50	0.51	2,325.51
2020 TOTALS (lbs/day mitigated)	1.60	9.12	11.91	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.51
2021 TOTALS (lbs/day unmitigated)	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
2021 TOTALS (lbs/day mitigated)	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
2022 TOTALS (lbs/day unmitigated)	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
2022 TOTALS (lbs/day mitigated)	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
2023 TOTALS (lbs/day unmitigated)	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
2023 TOTALS (lbs/day mitigated)	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69

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2024 TOTALS (lbs/day unmitigated)	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
2024 TOTALS (lbs/day mitigated)	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
2025 TOTALS (lbs/day unmitigated)	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
2025 TOTALS (lbs/day mitigated)	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
2026 TOTALS (lbs/day unmitigated)	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
2026 TOTALS (lbs/day mitigated)	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
2027 TOTALS (lbs/day unmitigated)	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
2027 TOTALS (lbs/day mitigated)	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
2028 TOTALS (lbs/day unmitigated)	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
2028 TOTALS (lbs/day mitigated)	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
2029 TOTALS (lbs/day unmitigated)	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
2029 TOTALS (lbs/day mitigated)	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 10/3/2011-12/30/2011 Active Days: 65	2.78	16.63	12.87	0.00	0.01	**1.45**	1.46	0.00	**1.33**	1.33	1,731.10
Asphalt 10/01/2011-12/30/2011	2.78	16.63	12.87	0.00	0.01	1.45	1.46	0.00	1.33	1.33	1,731.10
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.69	16.47	10.45	0.00	0.00	1.44	1.44	0.00	1.32	1.32	1,497.14
Paving On Road Diesel	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.52
Paving Worker Trips	0.08	0.13	2.41	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.44
Time Slice 1/2/2012-12/28/2012 Active Days: 260	**3.17**	**25.25**	13.74	0.00	**4.87**	1.34	**6.21**	**1.02**	1.23	**2.25**	**2,848.28**
Mass Grading 01/01/2012-12/30/2012	3.17	25.25	13.74	0.00	4.87	1.34	6.21	1.02	1.23	2.25	2,848.28
Mass Grading Dust	0.00	0.00	0.00	0.00	4.86	0.00	4.86	1.01	0.00	1.01	0.00
Mass Grading Off Road Diesel	3.10	24.66	12.33	0.00	0.00	1.32	1.32	0.00	1.21	1.21	2,628.18
Mass Grading On Road Diesel	0.03	0.52	0.17	0.00	0.00	0.02	0.02	0.00	0.02	0.02	92.55
Mass Grading Worker Trips	0.04	0.07	1.23	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.54
Time Slice 1/1/2013-12/31/2013 Active Days: 261	3.14	17.99	**14.14**	**0.00**	0.02	1.28	1.30	0.01	1.18	1.19	2,325.06
Building 01/01/2013-12/31/2013	3.14	17.99	14.14	0.00	0.02	1.28	1.30	0.01	1.18	1.19	2,325.06
Building Off Road Diesel	3.00	16.76	11.60	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,840.39
Building Vendor Trips	0.09	1.14	0.88	0.00	0.01	0.04	0.05	0.00	0.04	0.04	297.88
Building Worker Trips	0.05	0.09	1.66	0.00	0.01	0.00	0.01	0.00	0.00	0.01	186.78
Time Slice 1/1/2015-12/31/2015 Active Days: 261	2.62	15.56	13.31	**0.00**	0.02	1.05	1.07	0.01	0.96	0.97	2,325.26
Building 01/01/2015-12/30/2029	2.62	15.56	13.31	0.00	0.02	1.05	1.07	0.01	0.96	0.97	2,325.26
Building Off Road Diesel	2.50	14.59	11.14	0.00	0.00	1.01	1.01	0.00	0.93	0.93	1,840.39
Building Vendor Trips	0.08	0.90	0.76	0.00	0.01	0.03	0.04	0.00	0.03	0.03	297.92
Building Worker Trips	0.04	0.07	1.41	0.00	0.01	0.00	0.01	0.00	0.00	0.01	186.95

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Time Slice 1/1/2016-12/30/2016 Active Days: 261	2.39	14.43	12.97	**0.00**	0.02	0.93	0.95	0.01	0.85	0.86	2,325.32
Building 01/01/2015-12/30/2029	2.39	14.43	12.97	0.00	0.02	0.93	0.95	0.01	0.85	0.86	2,325.32
Building Off Road Diesel	2.28	13.56	10.96	0.00	0.00	0.89	0.89	0.00	0.82	0.82	1,840.39
Building Vendor Trips	0.07	0.80	0.71	0.00	0.01	0.03	0.04	0.00	0.03	0.03	297.93
Building Worker Trips	0.04	0.07	1.30	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.00
Time Slice 1/2/2017-12/29/2017 Active Days: 260	2.16	13.37	12.66	**0.00**	0.02	0.83	0.85	0.01	0.76	0.77	2,325.38
Building 01/01/2015-12/30/2029	2.16	13.37	12.66	0.00	0.02	0.83	0.85	0.01	0.76	0.77	2,325.38
Building Off Road Diesel	2.06	12.60	10.79	0.00	0.00	0.80	0.80	0.00	0.73	0.73	1,840.39
Building Vendor Trips	0.07	0.71	0.67	0.00	0.01	0.03	0.04	0.00	0.02	0.03	297.94
Building Worker Trips	0.04	0.06	1.20	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.04
Time Slice 1/1/2018-12/31/2018 Active Days: 261	1.95	12.38	12.37	**0.00**	0.02	0.73	0.75	0.01	0.67	0.67	2,325.43
Building 01/01/2015-12/30/2029	1.95	12.38	12.37	0.00	0.02	0.73	0.75	0.01	0.67	0.67	2,325.43
Building Off Road Diesel	1.86	11.69	10.63	0.00	0.00	0.70	0.70	0.00	0.64	0.64	1,840.39
Building Vendor Trips	0.06	0.64	0.63	0.00	0.01	0.02	0.04	0.00	0.02	0.03	297.96
Building Worker Trips	0.03	0.06	1.11	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.07
Time Slice 1/1/2019-12/31/2019 Active Days: 261	1.77	11.45	12.13	**0.00**	0.02	0.63	0.65	0.01	0.58	0.59	2,325.47
Building 01/01/2015-12/30/2029	1.77	11.45	12.13	0.00	0.02	0.63	0.65	0.01	0.58	0.59	2,325.47
Building Off Road Diesel	1.69	10.82	10.51	0.00	0.00	0.60	0.60	0.00	0.55	0.55	1,840.39
Building Vendor Trips	0.06	0.57	0.59	0.00	0.01	0.02	0.03	0.00	0.02	0.02	297.97
Building Worker Trips	0.03	0.05	1.03	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.10

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Time Slice 1/1/2020-12/31/2020 Active Days: 262	1.60	10.63	11.91	**0.00**	0.02	0.55	0.57	0.01	0.50	0.51	2,325.51
Building 01/01/2015-12/30/2029	1.60	10.63	11.91	0.00	0.02	0.55	0.57	0.01	0.50	0.51	2,325.51
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.05	0.51	0.55	0.00	0.01	0.02	0.03	0.00	0.02	0.02	297.99
Building Worker Trips	0.03	0.05	0.95	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.13
Time Slice 1/1/2021-12/31/2021 Active Days: 261	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building 01/01/2015-12/30/2029	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/3/2022-12/30/2022 Active Days: 260	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building 01/01/2015-12/30/2029	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/2/2023-12/29/2023 Active Days: 260	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building 01/01/2015-12/30/2029	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25

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Time Slice 1/1/2024-12/31/2024 Active Days: 262	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building 01/01/2015-12/30/2029	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/1/2025-12/31/2025 Active Days: 261	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building 01/01/2015-12/30/2029	1.58	10.44	11.49	0.00	0.02	0.54	0.56	0.01	0.50	0.51	2,325.69
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/1/2026-12/31/2026 Active Days: 261	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building 01/01/2015-12/30/2029	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38
Time Slice 1/1/2027-12/31/2027 Active Days: 261	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building 01/01/2015-12/30/2029	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38

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Time Slice 1/3/2028-12/29/2028 Active Days: 260	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building 01/01/2015-12/30/2029	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38
Time Slice 1/1/2029-12/28/2029 Active Days: 260	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building 01/01/2015-12/30/2029	1.57	10.37	11.26	0.00	0.02	0.54	0.56	0.01	0.50	0.50	2,325.84
Building Off Road Diesel	1.52	10.07	10.40	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 12/30/2012 - Default Fine Site Grading Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 20 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 22.99

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 5 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: Paving 10/1/2011 - 12/30/2011 - Default Paving Description

Acres to be Paved: 0.25

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Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 1/1/2013 - 12/31/2013 - Type Your Description Here

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 4 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Building Construction 1/1/2015 - 12/30/2029 - Default Building Construction Description

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 8 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 8 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 4 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

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1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 10/3/2011-12/30/2011 Active Days: 65	2.78	14.16	12.87	0.00	0.01	0.22	0.23	0.00	0.20	0.21	1,731.10
Asphalt 10/01/2011-12/30/2011	2.78	14.16	12.87	0.00	0.01	0.22	0.23	0.00	0.20	0.21	1,731.10
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.69	14.00	10.45	0.00	0.00	0.22	0.22	0.00	0.20	0.20	1,497.14
Paving On Road Diesel	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.52
Paving Worker Trips	0.08	0.13	2.41	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.44
Time Slice 1/2/2012-12/28/2012 Active Days: 260	**3.17**	21.55	13.74	0.00	0.35	0.22	0.57	0.07	0.20	0.28	**2,848.28**
Mass Grading 01/01/2012-12/30/2012	3.17	21.55	13.74	0.00	0.35	0.22	0.57	0.07	0.20	0.28	2,848.28
Mass Grading Dust	0.00	0.00	0.00	0.00	0.34	0.00	0.34	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	3.10	20.96	12.33	0.00	0.00	0.20	0.20	0.00	0.18	0.18	2,628.18
Mass Grading On Road Diesel	0.03	0.52	0.17	0.00	0.00	0.02	0.02	0.00	0.02	0.02	92.55
Mass Grading Worker Trips	0.04	0.07	1.23	0.00	0.01	0.00	0.01	0.00	0.00	0.00	127.54

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Time Slice 1/1/2013-12/31/2013 Active Days: 261	3.14	15.47	**14.14**	**0.00**	0.02	0.23	0.25	0.01	0.21	0.22	2,325.06
Building 01/01/2013-12/31/2013	3.14	15.47	14.14	0.00	0.02	0.23	0.25	0.01	0.21	0.22	2,325.06
Building Off Road Diesel	3.00	14.24	11.60	0.00	0.00	0.19	0.19	0.00	0.17	0.17	1,840.39
Building Vendor Trips	0.09	1.14	0.88	0.00	0.01	0.04	0.05	0.00	0.04	0.04	297.88
Building Worker Trips	0.05	0.09	1.66	0.00	0.01	0.00	0.01	0.00	0.00	0.01	186.78
Time Slice 1/1/2015-12/31/2015 Active Days: 261	2.62	13.37	13.31	**0.00**	0.02	0.19	0.21	0.01	0.17	0.18	2,325.26
Building 01/01/2015-12/30/2029	2.62	13.37	13.31	0.00	0.02	0.19	0.21	0.01	0.17	0.18	2,325.26
Building Off Road Diesel	2.50	12.40	11.14	0.00	0.00	0.15	0.15	0.00	0.14	0.14	1,840.39
Building Vendor Trips	0.08	0.90	0.76	0.00	0.01	0.03	0.04	0.00	0.03	0.03	297.92
Building Worker Trips	0.04	0.07	1.41	0.00	0.01	0.00	0.01	0.00	0.00	0.01	186.95
Time Slice 1/1/2016-12/30/2016 Active Days: 261	2.39	12.39	12.97	**0.00**	0.02	0.17	0.19	0.01	0.15	0.16	2,325.32
Building 01/01/2015-12/30/2029	2.39	12.39	12.97	0.00	0.02	0.17	0.19	0.01	0.15	0.16	2,325.32
Building Off Road Diesel	2.28	11.53	10.96	0.00	0.00	0.13	0.13	0.00	0.12	0.12	1,840.39
Building Vendor Trips	0.07	0.80	0.71	0.00	0.01	0.03	0.04	0.00	0.03	0.03	297.93
Building Worker Trips	0.04	0.07	1.30	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.00
Time Slice 1/2/2017-12/29/2017 Active Days: 260	2.16	11.48	12.66	**0.00**	0.02	0.15	0.17	0.01	0.14	0.15	2,325.38
Building 01/01/2015-12/30/2029	2.16	11.48	12.66	0.00	0.02	0.15	0.17	0.01	0.14	0.15	2,325.38
Building Off Road Diesel	2.06	10.71	10.79	0.00	0.00	0.12	0.12	0.00	0.11	0.11	1,840.39
Building Vendor Trips	0.07	0.71	0.67	0.00	0.01	0.03	0.04	0.00	0.02	0.03	297.94
Building Worker Trips	0.04	0.06	1.20	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.04

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Time Slice 1/1/2018-12/31/2018 Active Days: 261	1.95	10.63	12.37	**0.00**	0.02	0.13	0.15	0.01	0.12	0.13	2,325.43
Building 01/01/2015-12/30/2029	1.95	10.63	12.37	0.00	0.02	0.13	0.15	0.01	0.12	0.13	2,325.43
Building Off Road Diesel	1.86	9.93	10.63	0.00	0.00	0.10	0.10	0.00	0.10	0.10	1,840.39
Building Vendor Trips	0.06	0.64	0.63	0.00	0.01	0.02	0.04	0.00	0.02	0.03	297.96
Building Worker Trips	0.03	0.06	1.11	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.07
Time Slice 1/1/2019-12/31/2019 Active Days: 261	1.77	9.82	12.13	**0.00**	0.02	0.12	0.14	0.01	0.11	0.11	2,325.47
Building 01/01/2015-12/30/2029	1.77	9.82	12.13	0.00	0.02	0.12	0.14	0.01	0.11	0.11	2,325.47
Building Off Road Diesel	1.69	9.20	10.51	0.00	0.00	0.09	0.09	0.00	0.08	0.08	1,840.39
Building Vendor Trips	0.06	0.57	0.59	0.00	0.01	0.02	0.03	0.00	0.02	0.02	297.97
Building Worker Trips	0.03	0.05	1.03	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.10
Time Slice 1/1/2020-12/31/2020 Active Days: 262	1.60	9.12	11.91	**0.00**	0.02	0.10	0.12	0.01	0.09	0.10	2,325.51
Building 01/01/2015-12/30/2029	1.60	9.12	11.91	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.51
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.05	0.51	0.55	0.00	0.01	0.02	0.03	0.00	0.02	0.02	297.99
Building Worker Trips	0.03	0.05	0.95	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.13
Time Slice 1/1/2021-12/31/2021 Active Days: 261	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building 01/01/2015-12/30/2029	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25

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Time Slice 1/3/2022-12/30/2022 Active Days: 260	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building 01/01/2015-12/30/2029	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/2/2023-12/29/2023 Active Days: 260	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building 01/01/2015-12/30/2029	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/1/2024-12/31/2024 Active Days: 262	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building 01/01/2015-12/30/2029	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25
Time Slice 1/1/2025-12/31/2025 Active Days: 261	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building 01/01/2015-12/30/2029	1.58	8.93	11.49	0.00	0.02	0.10	0.12	0.01	0.09	0.10	2,325.69
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.04	0.35	0.43	0.00	0.01	0.01	0.03	0.00	0.01	0.02	298.04
Building Worker Trips	0.02	0.03	0.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.25

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Time Slice 1/1/2026-12/31/2026 Active Days: 261	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building 01/01/2015-12/30/2029	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38
Time Slice 1/1/2027-12/31/2027 Active Days: 261	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building 01/01/2015-12/30/2029	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38
Time Slice 1/3/2028-12/29/2028 Active Days: 260	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building 01/01/2015-12/30/2029	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38
Time Slice 1/1/2029-12/28/2029 Active Days: 260	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building 01/01/2015-12/30/2029	1.57	8.86	11.26	0.00	0.02	0.10	0.12	0.01	0.09	0.09	2,325.84
Building Off Road Diesel	1.52	8.56	10.40	0.00	0.00	0.08	0.08	0.00	0.07	0.07	1,840.39
Building Vendor Trips	0.03	0.28	0.37	0.00	0.01	0.01	0.02	0.00	0.01	0.02	298.07
Building Worker Trips	0.01	0.02	0.49	0.00	0.01	0.00	0.01	0.00	0.00	0.01	187.38

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2012 - 12/30/2012 - Default Fine Site Grading Description

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For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

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

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Scrapers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Scrapers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

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For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Paving 10/1/2011 - 12/30/2011 - Default Paving Description

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pavers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pavers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Signal Boards, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Signal Boards, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Sweepers/Scrubbers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Sweepers/Scrubbers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 1/1/2013 - 12/31/2013 - Type Your Description Here

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

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For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Building Construction 1/1/2015 - 12/30/2029 - Default Building Construction Description

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cranes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Forklifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Forklifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Aerial Lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Aerial Lifts, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Cement and Mortar Mixers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Cement and Mortar Mixers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

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PM10: 85% PM25: 85%

For Pumps, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Generator Sets, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Air Compressors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Air Compressors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Dumpers/Tenders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Dumpers/Tenders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85% PM25: 85%

For Welders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in California (Scenario Years 2007 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories:
Passenger Vehicles & Delivery Trucks.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:
Emissions (pounds per day) = N x TL x EF
where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

All the emission factors account for the emissions from start, running and idling exhaust.
In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: **2007**
All model years in the range 1965 to 2007

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.01155158	CO	0.02407553
NOx	0.00121328	NOx	0.02508445
ROG	0.00118234	ROG	0.00323145
SOx	0.00001078	SOx	0.00002626
PM10	0.00008447	PM10	0.00091020
PM2.5	0.00005243	PM2.5	0.00078884
CO2	1.10672236	CO2	2.72245619
CH4	0.00010306	CH4	0.00016030

Scenario Year: **2008**
All model years in the range 1965 to 2008

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.01054844	CO	0.02194915
NOx	0.00110288	NOx	0.02371258
ROG	0.00107919	ROG	0.00299270
SOx	0.00001075	SOx	0.00002565
PM10	0.00008505	PM10	0.00085607
PM2.5	0.00005293	PM2.5	0.00073933
CO2	1.09953226	CO2	2.71943400
CH4	0.00009465	CH4	0.00014769

Scenario Year: **2009**
All model years in the range 1965 to 2009

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00968562	CO	0.02016075
NOx	0.00100518	NOx	0.02236636
ROG	0.00099245	ROG	0.00278899
SOx	0.00001066	SOx	0.00002679
PM10	0.00008601	PM10	0.00080550
PM2.5	0.00005384	PM2.5	0.00069228
CO2	1.09755398	CO2	2.72330496
CH4	0.00008767	CH4	0.00013655

Scenario Year: **2010**
All model years in the range 1966 to 2010

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00826276	CO	0.01843765
NOx	0.00091814	NOx	0.02062460
ROG	0.00091399	ROG	0.00258958
SOx	0.00001077	SOx	0.00002701
PM10	0.00008698	PM10	0.00075121
PM2.5	0.00005478	PM2.5	0.00064233
CO2	1.09568235	CO2	2.73222199
CH4	0.00008146	CH4	0.00012576

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in California (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Scenario Year: **2011**

All model years in the range 1967 to 2011

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00826276	CO	0.01693242
NOx	0.00084460	NOx	0.01893366
ROG	0.00085233	ROG	0.00241868
SOx	0.00001077	SOx	0.00002728
PM10	0.00008879	PM10	0.00070097
PM2.5	0.00005653	PM2.5	0.00059682
CO2	1.10235154	CO2	2.75180822
CH4	0.00007678	CH4	0.00011655

Scenario Year: **2012**

All model years in the range 1968 to 2012

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00765475	CO	0.01545741
NOx	0.00077583	NOx	0.01732423
ROG	0.00079628	ROG	0.00223776
SOx	0.00001073	SOx	0.00002667
PM10	0.00008979	PM10	0.00064975
PM2.5	0.00005750	PM2.5	0.00054954
CO2	1.10152540	CO2	2.76628414
CH4	0.00007169	CH4	0.00010668

Scenario Year: **2013**

All model years in the range 1969 to 2013

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00709228	CO	0.01407778
NOx	0.00071158	NOx	0.01577311
ROG	0.00074567	ROG	0.00206295
SOx	0.00001072	SOx	0.00002682
PM10	0.00009067	PM10	0.00059956
PM2.5	0.00005834	PM2.5	0.00050174
CO2	1.10087435	CO2	2.78163459
CH4	0.00006707	CH4	0.00009703

Scenario Year: **2014**

All model years in the range 1970 to 2014

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00660353	CO	0.01284321
NOx	0.00065484	NOx	0.01425162
ROG	0.00070227	ROG	0.00189649
SOx	0.00001069	SOx	0.00002754
PM10	0.00009185	PM10	0.00054929
PM2.5	0.00005939	PM2.5	0.00045519
CO2	1.10257205	CO2	2.79845465
CH4	0.00006312	CH4	0.00008798

Scenario Year: **2015**

All model years in the range 1971 to 2015

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00614108	CO	0.01169445
NOx	0.00060188	NOx	0.01285026
ROG	0.00066355	ROG	0.00173890
SOx	0.00001070	SOx	0.00002741
PM10	0.00009259	PM10	0.00050307
PM2.5	0.00006015	PM2.5	0.00041268
CO2	1.10192837	CO2	2.81247685
CH4	0.00005923	CH4	0.00008076

Scenario Year: **2016**

All model years in the range 1972 to 2016

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00575800	CO	0.01080542
NOx	0.00055658	NOx	0.01172881
ROG	0.00063254	ROG	0.00161521
SOx	0.00001071	SOx	0.00002767
PM10	0.00009392	PM10	0.00046606
PM2.5	0.00006131	PM2.5	0.00037868
CO2	1.10677664	CO2	2.83134285
CH4	0.00005623	CH4	0.00007355

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in California (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Scenario Year: **2017**

All model years in the range 1973 to 2017

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00537891	CO	0.00998101
NOx	0.00051297	NOx	0.01070034
ROG	0.00060109	ROG	0.00150242
SOx	0.00001079	SOx	0.00002723
PM10	0.00009446	PM10	0.00043131
PM2.5	0.00006192	PM2.5	0.00034605
CO2	1.10627489	CO2	2.84005015
CH4	0.00005300	CH4	0.00006663

Scenario Year: **2018**

All model years in the range 1974 to 2018

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00502881	CO	0.00923234
NOx	0.00047300	NOx	0.00979416
ROG	0.00057178	ROG	0.00139856
SOx	0.00001071	SOx	0.00002749
PM10	0.00009494	PM10	0.00040110
PM2.5	0.00006234	PM2.5	0.00031792
CO2	1.10562643	CO2	2.84646835
CH4	0.00005003	CH4	0.00006203

Scenario Year: **2019**

All model years in the range 1975 to 2019

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00471820	CO	0.00857192
NOx	0.00043716	NOx	0.00900205
ROG	0.00054654	ROG	0.00130563
SOx	0.00001072	SOx	0.00002706
PM10	0.00009523	PM10	0.00037393
PM2.5	0.00006259	PM2.5	0.00029276
CO2	1.10496100	CO2	2.85060182
CH4	0.00004743	CH4	0.00005619

Scenario Year: **2020**

All model years in the range 1976 to 2020

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00444247	CO	0.00799617
NOx	0.00040506	NOx	0.00831802
ROG	0.00052463	ROG	0.00122382
SOx	0.00001073	SOx	0.00002733
PM10	0.00009550	PM10	0.00035054
PM2.5	0.00006279	PM2.5	0.00027128
CO2	1.10456157	CO2	2.85148109
CH4	0.00004495	CH4	0.00005330

Scenario Year: **2021**

All model years in the range 1977 to 2021

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00421218	CO	0.00748303
NOx	0.00037757	NOx	0.00773500
ROG	0.00050573	ROG	0.00115568
SOx	0.00001073	SOx	0.00002755
PM10	0.00009640	PM10	0.00033125
PM2.5	0.00006364	PM2.5	0.00025331
CO2	1.11009559	CO2	2.86434187
CH4	0.00004322	CH4	0.00004905

Scenario Year: **2022**

All model years in the range 1978 to 2022

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00397866	CO	0.00699290
NOx	0.00035150	NOx	0.00722470
ROG	0.00048658	ROG	0.00108569
SOx	0.00001072	SOx	0.00002774
PM10	0.00009661	PM10	0.00031501
PM2.5	0.00006389	PM2.5	0.00023906
CO2	1.11019931	CO2	2.87006769
CH4	0.00004121	CH4	0.00004557

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Passenger Vehicles & Delivery Trucks

Projects in California (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

Scenario Year: **2023**

All model years in the range 1979 to 2023

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00377527	CO	0.00658123
NOx	0.00032851	NOx	0.00679147
ROG	0.00046900	ROG	0.00102852
SOx	0.00001070	SOx	0.00002790
PM10	0.00009676	PM10	0.00030109
PM2.5	0.00006405	PM2.5	0.00022582
CO2	1.11023373	CO2	2.87466338
CH4	0.00003951	CH4	0.00004218

Scenario Year: **2024**

All model years in the range 1980 to 2024

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00358611	CO	0.00625076
NOx	0.00030721	NOx	0.00647083
ROG	0.00045136	ROG	0.00096578
SOx	0.00001080	SOx	0.00002807
PM10	0.00009676	PM10	0.00029407
PM2.5	0.00006410	PM2.5	0.00021880
CO2	1.11061572	CO2	2.88010717
CH4	0.00003781	CH4	0.00004019

Scenario Year: **2025**

All model years in the range 1981 to 2025

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00342738	CO	0.00595363
NOx	0.00028846	NOx	0.00615945
ROG	0.00043545	ROG	0.00092178
SOx	0.00001070	SOx	0.00002761
PM10	0.00009679	PM10	0.00028425
PM2.5	0.00006418	PM2.5	0.00020958
CO2	1.11078571	CO2	2.88143570
CH4	0.00003641	CH4	0.00003765

Scenario Year: **2026**

All model years in the range 1982 to 2026

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00328779	CO	0.00569435
NOx	0.00027141	NOx	0.00589869
ROG	0.00042052	ROG	0.00088403
SOx	0.00001076	SOx	0.00002716
PM10	0.00009687	PM10	0.00027657
PM2.5	0.00006415	PM2.5	0.00020187
CO2	1.11105829	CO2	2.88298299
CH4	0.00003518	CH4	0.00003581

Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in California (Scenario Years 2007 - 2026)
Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: **2007**
All model years in the range 1965 to 2007

HHDT-DSL (pounds/mile)	
CO	0.01446237
NOx	0.04718166
ROG	0.00372949
SOx	0.00003962
PM10	0.00230900
PM2.5	0.00204018
CO2	4.22184493

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00216752
PM2.5	0.00199491

Scenario Year: **2008**
All model years in the range 1965 to 2008

HHDT-DSL (pounds/mile)	
CO	0.01361368
NOx	0.04458017
ROG	0.00351579
SOx	0.00004136
PM10	0.00215635
PM2.5	0.00189990
CO2	4.21067145
CH4	0.00016269

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00201296
PM2.5	0.00185303

Scenario Year: **2009**
All model years in the range 1965 to 2009

HHDT-DSL (pounds/mile)	
CO	0.01282236
NOx	0.04184591
ROG	0.00329320
SOx	0.00004013
PM10	0.00199572
PM2.5	0.00175227
CO2	4.21080792
CH4	0.00015249

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00185393
PM2.5	0.00170680

Scenario Year: **2010**
All model years in the range 1966 to 2010

HHDT-DSL (pounds/mile)	
CO	0.01195456
NOx	0.03822102
ROG	0.00304157
SOx	0.00004131
PM10	0.00183062
PM2.5	0.00160083
CO2	4.21120578
CH4	0.00014201

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00168861
PM2.5	0.00155435

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in California (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

Scenario Year: **2011**

All model years in the range 1967 to 2011

HHDT-DSL (pounds/mile)	
CO	0.01112463
NOx	0.03455809
ROG	0.00279543
SOx	0.00003972
PM10	0.00166087
PM2.5	0.00144489
CO2	4.22045680
CH4	0.00012910

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00151936
PM2.5	0.00139772

Scenario Year: **2012**

All model years in the range 1968 to 2012

HHDT-DSL (pounds/mile)	
CO	0.01021519
NOx	0.03092379
ROG	0.00252764
SOx	0.00004042
PM10	0.00149566
PM2.5	0.00129354
CO2	4.21590774
CH4	0.00011651

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00135537
PM2.5	0.00124837

Scenario Year: **2013**

All model years in the range 1969 to 2013

HHDT-DSL (pounds/mile)	
CO	0.00931790
NOx	0.02742935
ROG	0.00226308
SOx	0.00004086
PM10	0.00133697
PM2.5	0.00114629
CO2	4.21518556
CH4	0.00010441

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00119623
PM2.5	0.00109863

Scenario Year: **2014**

All model years in the range 1970 to 2014

HHDT-DSL (pounds/mile)	
CO	0.00846435
NOx	0.02418049
ROG	0.00201594
SOx	0.00004092
PM10	0.00118458
PM2.5	0.00100582
CO2	4.21279345
CH4	0.00009261

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00104243
PM2.5	0.00096059

Scenario Year: **2015**

All model years in the range 1971 to 2015

HHDT-DSL (pounds/mile)	
CO	0.00766891
NOx	0.02122678
ROG	0.00178608
SOx	0.00004082
PM10	0.00104715
PM2.5	0.00087977
CO2	4.20902225
CH4	0.00008369

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00090631
PM2.5	0.00083282

Scenario Year: **2016**

All model years in the range 1972 to 2016

HHDT-DSL (pounds/mile)	
CO	0.00704604
NOx	0.01887374
ROG	0.00161035
SOx	0.00003952
PM10	0.00094448
PM2.5	0.00078443
CO2	4.21063031
CH4	0.00007508

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00080419
PM2.5	0.00073898

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in California (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:

Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

Scenario Year: **2017**

All model years in the range 1973 to 2017

HHDT-DSL (pounds/mile)	
CO	0.00650533
NOx	0.01690387
ROG	0.00145203
SOx	0.00004033
PM10	0.00084894
PM2.5	0.00069721
CO2	4.20820129
CH4	0.00006722

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00070873
PM2.5	0.00065111

Scenario Year: **2018**

All model years in the range 1974 to 2018

HHDT-DSL (pounds/mile)	
CO	0.00604721
NOx	0.01526414
ROG	0.00131697
SOx	0.00003934
PM10	0.00076808
PM2.5	0.00062383
CO2	4.20756838
CH4	0.00006182

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00062758
PM2.5	0.00057700

Scenario Year: **2019**

All model years in the range 1975 to 2019

HHDT-DSL (pounds/mile)	
CO	0.00565433
NOx	0.01389113
ROG	0.00120235
SOx	0.00004032
PM10	0.00070198
PM2.5	0.00056085
CO2	4.20637830
CH4	0.00005499

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00056085
PM2.5	0.00051320

Scenario Year: **2020**

All model years in the range 1976 to 2020

HHDT-DSL (pounds/mile)	
CO	0.00532242
NOx	0.01274755
ROG	0.00110621
SOx	0.00003957
PM10	0.00064574
PM2.5	0.00050904
CO2	4.20541416
CH4	0.00005216

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00050364
PM2.5	0.00046227

Scenario Year: **2021**

All model years in the range 1977 to 2021

HHDT-DSL (pounds/mile)	
CO	0.00503726
NOx	0.01179977
ROG	0.00103095
SOx	0.00004033
PM10	0.00059437
PM2.5	0.00046287
CO2	4.21495573
CH4	0.00004734

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00045411
PM2.5	0.00041729

Scenario Year: **2022**

All model years in the range 1978 to 2022

HHDT-DSL (pounds/mile)	
CO	0.00478830
NOx	0.01098794
ROG	0.00096142
SOx	0.00004106
PM10	0.00055427
PM2.5	0.00042597
CO2	4.21520828
CH4	0.00004448

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00041399
PM2.5	0.00037807

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in California (Scenario Years 2007 - 2026)

Derived from Peak Emissions Inventory (**Winter**, **Annual**, **Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

Scenario Year: **2023**

All model years in the range 1979 to 2023

HHDT-DSL (pounds/mile)	
CO	0.00457902
NOx	0.01031407
ROG	0.00090210
SOx	0.00004009
PM10	0.00052122
PM2.5	0.00039592
CO2	4.21483461
CH4	0.00004176

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00037922
PM2.5	0.00034915

Scenario Year: **2024**

All model years in the range 1980 to 2024

HHDT-DSL (pounds/mile)	
CO	0.00444444
NOx	0.00974372
ROG	0.00084009
SOx	0.00003930
PM10	0.00050766
PM2.5	0.00038320
CO2	4.19552935
CH4	0.00003930

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00036682
PM2.5	0.00033735

Scenario Year: **2025**

All model years in the range 1981 to 2025

HHDT-DSL (pounds/mile)	
CO	0.00431086
NOx	0.00932573
ROG	0.00080206
SOx	0.00004018
PM10	0.00048541
PM2.5	0.00036326
CO2	4.19512979
CH4	0.00003697

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00034397
PM2.5	0.00031664

Scenario Year: **2026**

All model years in the range 1982 to 2026

HHDT-DSL (pounds/mile)	
CO	0.00420297
NOx	0.00898990
ROG	0.00077178
SOx	0.00003946
PM10	0.00046717
PM2.5	0.00034564
CO2	4.19349747
CH4	0.00003630

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00032670
PM2.5	0.00029830

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Appendix C Biodiesel Emissions Report

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Estimated Emissions from the Proposed East Bay Municipal Utility District Biodiesel Production Facility

PREPARED FOR: RMC Water and Environment

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DATE: May 25, 2010

Introduction

East Bay Municipal Utility District (EBMUD) is considering siting a biodiesel facility that would be owned and operated by a private company on a portion of the EBMUD-owned West End property. The proposed facility would use a variety of oils, including animal fats and used cooking oil, to produce biodiesel, a diesel fuel substitute that has much lower particulate matter emissions and can be used by local trucking companies, including those operating at the Port of Oakland. Glycerin, a high-energy-value byproduct of the biodiesel production process, would be sent to EBMUD's Main Wastewater Treatment Plant for anaerobic digestion, gas generation, and renewable energy production.

The facility would initially be designed to produce 5 million gallons per year (MGY) of biodiesel, and would comprise a pre-engineered, corrugated metal building to house the offices, laboratory, shop, and process area, as well as a feedstock/biodiesel storage area (tank farm). The facility may be expanded to process a maximum of 20 MGY by expanding the administration/facilities building, and adding additional processing equipment and storage tanks. Trucks and/or railcars would deliver feedstock and reagents to the site and haul biodiesel away.

This technical memorandum presents the air emission estimates for the proposed 20 MGY biodiesel processing facility, including equipment, storage tanks, pipeline infrastructure, and the associated boiler unit. Emission estimates include criteria pollutants, greenhouse gases, and toxic air contaminants (TACs).

The analysis presented in this technical memorandum is based on a conceptual biodiesel production process description and equipment list provided by EBMUD. The final design of the facility and tank farm would ultimately be provided by the biodiesel contractor; therefore, a specific technology has not been identified at this time. CH2M HILL has prepared the following emissions estimates based on a generalized process design for a 20 MGY biodiesel production facility using the project description provided in Chapter 2 of

EBMUD's Main Wastewater Treatment Plant Land Use Master Plan EIR Administrative Draft and Attachment 2 of the Notice of Preparation (NOP) for the EIR.

Biodiesel Production Process Description

Biodiesel is produced through a reaction (i.e., acid transesterification) between vegetable oils or animal fats and an alcohol (commonly methanol) in the presence of a catalyst, such as sodium methoxide. The reaction products are biodiesel and glycerin (also referred to as glycerol). The feedstock may be virgin oil from plants (such as soy), waste cooking oil (yellow grease), or animal fat.

The major steps required to synthesize biodiesel are feedstock pretreatment, reactions, and product purification. Water is removed during the pretreatment process because its presence causes the triglycerides to hydrolyze, giving salts of the fatty acids (soaps) instead of undergoing transesterification to give biodiesel. Products of the reaction include not only biodiesel, but also byproducts, soap, glycerin, excess alcohol, and trace amounts of water. All of these byproducts must be removed, though the order of removal is process-dependent. The density of glycerin is greater than that of biodiesel, and this property difference is exploited to separate the bulk of the glycerin byproduct. Residual methanol is typically removed through distillation and reused, though it can be washed out (with water) as a waste. Soaps can be removed or converted into acids. Any residual water must be removed from the fuel.

Although the proposed EBMUD facility has identified the use of three raw materials to produce biodiesel—methanol, trap grease, and oil feedstock—the final facility design would ultimately be provided by the biodiesel contractor. Therefore, for purposes of estimating the air emissions, CH2MHILL prepared a conceptual process design based on biodiesel production design principles and experience in construction of similar process units. To identify emission points and components, CH2M HILL prepared a diagram of the vent collection systems (BFD 1) for the storage tanks containing methanol and a typical process flow (BFD 2). The block flow diagrams are included as Figures 1 and 2 at the end of this memorandum.

General Assumptions Used to Calculate Potential Emissions

The following assumptions were made regarding the generalized process design:

- Any raw material source will have been refined to remove all residual hexane.
- Storage tanks will be provided with balancing lines to recycle displaced vapors back to trucks during unloading.
- Process equipment vents will be collected in headers where practical and allow for vapor balancing as much as possible.
- Methanol is the primary pollutant of concern; biodiesel and vegetable oil emissions from process vents are considered to be negligible.
- Process outlets of chilled-water-cooled vent condensers are at 45 degrees Fahrenheit (°F).

- All storage tanks containing methanol are nitrogen blanketed and have conservation vents collected in a common header to a chilled-water-cooled vent condenser, as specified in the EBMUD documents. A vapor vent outlet of 45°F was assumed, which implies a reasonable chilled water temperature of no higher than 40°F.
- The EBMUD design (per the project description) does not recover methanol from the glycerol stream. If this is added at a later date, additional boiler capacity may be needed, and may result in additional methanol emissions.
- A fuel oil tank will not be needed.
- Per original scope clarifications, the project will not need to install a cooling tower.
- Sulfuric acid is used, but no tank is identified. Tote containers are assumed.
- Methanol working losses associated with recycling recovered methanol are not considered.

Emission Estimates

Process emissions from biodiesel facilities are primarily from the various vent condensers throughout the process. The EBMUD documents identified chilled-water-cooled vent condensers as the final process emission control point. The emissions from these condensers were determined by estimating the amount of non-condensable gasses dissolved in process streams and any non-condensable leaks into the vacuum systems, calculating the amount of methanol carried in this gas, and condensing the resulting mixture to a final temperature of 45°F.

For the conceptual biodiesel facility design, it was assumed four chilled-water-condensers would be used in the process (Points 1 through 4). The four discrete emission points were identified based on the presence of methanol in any stream that could enter the vent, and combining vents from similar processes (see Figures 1 and 2). For instance, the emission estimates from Point 1 represent the volatile organic compounds (VOC) and TAC emissions reclaimed from the working and breathing tank losses. The emissions estimates from Points 2 through 4 represent the VOC and TAC emissions from the biodiesel production process. The fugitive emissions from the valves, flanges, pumps, vents, and compressor connectors throughout the tank farm and biodiesel production facility were also estimated.

Upon reviewing the list of materials proposed for use in the EBMUD biodiesel production facility and comparing it to normal biodiesel plant practice, it was determined that methanol would be the material of interest for the process emission calculations. Because the fugitive hydrocarbon leak emission factors represent the total organic fluid leak from equipment components, glycerol is counted as a fugitive VOC emission constituent in the leak estimate for components in glycerol-methanol mixture service.

Emissions estimates of criteria pollutant, greenhouse gas, and TAC compounds were also prepared for the natural-gas-fired boiler. Boiler emissions will not be vented to the vent condensers. Therefore, the boiler emissions were grouped separately.

Point 1 (Storage Tank Farm) Emission Estimates

The proposed project will include capability for rail and truck delivery of feed materials and load-out of biodiesel product. Triglycerides (animal fats and vegetable oils), methanol, and sodium methylate solution will be off-loaded from the bulk delivery tankers into the site storage tanks. A table providing the storage tank data assumed for the generic biodiesel facility design is included in Attachment 1. The following assumptions were made regarding the Point 1 (storage tank) emission calculations.

- All tankage and offloading/loading areas will have secondary containment per industry best management practices.
- Most tanks will have a pressure conservation vent and nitrogen blanketing.
- All tanks handling volatile components will be vented to the tank farm chilled-water-cooled vent condenser system for reduction of emissions and recovery of methanol. This includes the tanks storing methanol and sodium methylate solution (70 percent methanol), and the tanks handling glycerol byproduct and wastewater, which will have a methanol component.
- The trap grease feedstock will not contain regulated VOCs or TACs, but these tanks will be vented through an activated carbon filter system for control of potential odor emissions.
- The methanol and sodium methylate tanks will have capability for pressure balance with the delivery tank truck or railcar to control vapor emissions during tank filling.
- Excess methanol reactant is recovered from process and returned to storage, but this is not considered to cause a displaced vapor loss from the tank during continued operation since substantially more methanol is withdrawn from storage than is returned.

Projected uncontrolled working and breathing losses from the tanks are estimated using the U.S. Environmental Protection Agency's (EPA) TANKS program, which is based on equations developed by the American Petroleum Institute (API) and included in EPA Publication AP-42, *Compilation of Air Pollutant Emission Factors.*

The standing storage loss refers to the loss of product component vapors as a result of tank vapor space breathing with changes in tank content and vapor space temperature. Working loss refers to loss from displacement of vapors during tank filling. The calculations take into account the component vapor pressures, physical parameters, operating parameters, location and atmospheric conditions, and numerous other inputs.

The oil and grease feed stocks, which are natural triglycerides, and their biodiesel products, which are mixtures of esters and long fatty acids, are non-volatile materials and are not considered VOCs. The byproduct, glycerol, is reported as having insignificant (0 percent) volatility and a vapor pressure around 0.001 mmHg at 25°C and is not included as a volatile material in the TANKS database. There is negligible potential for glycerol vapor loss from tanks, and the TANKS program calculations predict only emissions of methanol from the storage tanks.

Table 1 presents the TANKS program calculation results for working and breathing losses from each storage tank containing methanol as a liquid component and the predicted total uncontrolled vent losses, which are piped to the tank farm vent condenser system. The predicted vent condenser outlet emission is based on ASPEN condenser simulation. The TANKS 4.0 program detailed emissions report worksheets are provided in Attachment 2.

TABLE 1
TANKS 4.0 Emissions Report Summary
EBMUD Proposed 20 MGY Biodiesel Facility

		Uncontrolled Losses (lb/year)			
Tank Description	**Methanol Content (percent)**	**Working Loss**	**Breathing Loss**	**Total Loss**	**Control Technique**
Methanol	100 percent	923	169	1,092	Tanker unloading vapor balance, vent condenser
Sodium methylate solution	70 percent	316	114	430	Tanker unloading vapor balance, vent condenser
Glycerol byproduct	20 percent	923	29	952	Vent condenser
Wastewater	5 percent	20	2.4	23	Vent condenser
Total uncontrolled VOC/methanol losses		2,182	314	2,497	
Estimated vent condenser controlled emission – Point 1 (lb/yr)				1,188	Vent condenser

Point 2 Emission Estimates

Emission Point 2 represents vapor from the acid esterification unit. The process includes the acid esterification reactor plus a drying section to remove excess methanol and water formed during the esterification reaction. The detailed calculations are provided in Attachment 3. The following assumptions were made regarding Point 2 (the vapor outlet from the vent condenser unit connected to the acid esterification process) emission calculations.

- The dryer is assumed to be under vacuum, consequently it is expected there will be some air leakage into the dryer.
- The discharge of the vacuum pump will vent through a chilled-water-cooled vent condenser.
- The amount of emissions will depend on the amount of non-condensable vapor discharged from the vacuum pump, and the condensable vapors carried with it.
- An estimate was made of the entrained non-condensables in the oil feed and the air leakage into the dryer. These are then assumed saturated with methanol and the resulting vapor stream is calculated at the 45°F outlet temperature for the condenser.

Table 2 presents the estimated methanol and other VOC emissions from Point 2.

TABLE 2
Estimated Emissions from the Biodiesel Production Process (Points 2, 3, and 4)
EBMUD Proposed 20 MGY Biodiesel Facility

Emission Source	Location	Methanol		Other VOCs/Glycerol		Total	
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Point 2	Acid Esterification Glycol Vent Condenser	0.353	3,092	0	0	0.353	3,092
Point 3	Reactor/Settler Vent Glycol Vent Condenser	0.010	88	0	0	0.010	88
Point 4	Methanol Recovery Glycol Vent Condenser	0.550	4,818	0	0	0.550	4,818
Total		**0.913**	**7,998**	**0**	**0**	**0.913**	**7,998**

Point 3 Emission Estimates

Emission Point 3 contains vapor from the first and second stage reactors and intermediate settler. The detailed calculations are provided in Attachment 2. The following assumptions were made regarding Point 3 (the vapor outlet from the vent condenser unit connected to the first and second stage reactors) emission calculations.

- The vents are collected and vent through a chilled-water-cooled vent condenser.
- The amount of emissions will depend on the amount of non-condensable vapor discharged from the vacuum pump, and the condensable vapors carried with it.
- An estimate was made of the entrained non-condensables in the oil and methanol. These are then assumed saturated with methanol and the resulting vapor stream is calculated at the 45°F outlet temperature for the condenser. The vapor stream calculation is performed by an ASPEN process simulation.

Table 2 presents the estimated methanol and other VOC emissions from Point 3.

Point 4 Emission Estimates

Emission Point 4 contains vapor from the methanol recovery unit. The process includes a vacuum methanol distillation column to recover the methanol from the biodiesel. Due to the vacuum, it is expected that there will be some air leakage. The detailed calculations are provided in Attachment 2. The following assumptions were made regarding the Point 4 (the vapor outlet from the vent condenser unit connected to the methanol recovery unit) emission calculations.

- The discharge of the vacuum pump vents through a chilled-water-cooled vent condenser.
- The amount of emissions will depend on the amount of non-condensable vapor discharged from the vacuum pump, and the condensable vapors carried with it.

An estimate was made of the entrained non-condensables in the oil feed and the air leakage into the distillation column. These are then assumed saturated with methanol and the resulting vapor stream is calculated at the 45°F outlet temperature for the condenser.

Table 2 presents the estimated methanol and other VOC emissions from Point 4.

Fugitive Emission Estimates

The process units associated with the biodiesel facility have the potential to emit fugitive VOC leak emissions from various components and devices, including valves, flanges, pumps, vents, and compressor connectors. Many of these components in chemical service will be subject to regulation and performance standards of 40 Code of Federal Regulations Part 60 Subpart VVa – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry and Bay Area Air Quality Management District (BAAQMD) Regulation 8 Rule 18 Equipment Leaks.

The numbers of fugitive emission components are estimated based on the conceptual process design, line count, and experience in construction of similar process units. The estimated numbers of potential leak components are identified by category of VOC service: gas vapor, light liquid, and heavy liquid service. The only true light organic liquid in the process is the methanol used as a feed reagent and component of the sodium methylate catalyst solution. The glycerol byproduct has negligible volatility around 0.001 mmHg at ambient temperatures and essentially does not evaporate, but technically could be considered a heavy liquid VOC. For this assessment the glycerol is conservatively assumed to have 20 percent methanol content, which categorizes it as a light liquid, and equipment components in glycerol service are counted as being in VOC service for estimating equipment leak emissions.

The feed material vegetable oils and animal fats consisting of triglycerides and the biodiesel fuel product composed of mono-alkyl esters of long chain fatty acids have no quantifiable vapor pressure, do not evaporate, and are not considered VOCs at ambient conditions. The EPA conducted a study, *The Impact of Declaring Soybean Oil Exempt from VOC Regulations on the Coating Program* (EPA-450/3-91-011), in which it determined that soybean and other vegetable seed oils do not contain VOCs. The study determined that by EPA's Reference Methods 24 and 24A, the oils have no volatile content.

The methods and emission factors for calculating fugitive hydrocarbon emissions from equipment leaks are based on the EPA *Protocol for Equipment Leak Emission Estimates* (EPA-435-/R-95-017) and the California Air Resources Board/California Air Pollution Control Officers Association (CARB/CAPCOA) February 1999 document *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities*. For new Synthetic Organic Compound Manufacturing Industry (SOCMI) facilities subject to regulation, the typical methods for estimating fugitive leak emissions are (1) published average SOCMI emission factors reduced by the projected efficiencies for a Leak Detection and Repair Program (LDAR) or (2) the correlation equation method taking into a screening value for leak detection. This report's fugitive emission estimate uses the correlation equations provided in the 1999 CAPCOA document Table IV-3a. The screening values (SV) applied to the correlation equations are the BAAQMD leak detection standards in its Regulation 8 Rule 18 for organic compounds equipment leaks (100 ppm for valves, 500 ppm

for pumps, etc.). Using the correlation equation method, the resulting emission factors for each component type are the same for each type of VOC service (gas, light liquid, and heavy liquid). The emission factors represent the total VOC leak emission rate for each component.

The detailed fugitive component count and correlation equations from the CAPCOA document are provided in the Attachment 4. Table 3 provides the total organic compound and methanol hazardous air pollutant (HAP)/TAC emissions estimate totals for the facility. The methanol HAP/TAC emission component is based on the liquid percent methanol by weight for components in liquid service and 100 percent methanol for components in gas/vapor service.

It is planned that air within the process building will be exhausted through an activated carbon filtration system for control of potential odor emissions. In addition to intended odor control, the carbon system should capture VOCs and other gas phase contaminants, however, no reduction credit is assumed in the fugitive leak emission estimate.

TABLE 3
Fugitive Emission Calculation Summary
EBMUD Proposed 20 MGY Biodiesel Facility

Unit Process: Equipment	Component Type / Service Type	Methanol		Other TOC Emissions		Total TOC Emissions	
		lb/hr	lb/year	lb/hr	lb/year	lb/hr	lb/year
Biodiesel Production Units and Tanks: Equipment in VOC service	Valves/All	0.015	134	0.016	142	0.032	276
	Pump seals/All	0.037	325	0.080	703	0.12	1,028
	Others/All	0.032	283	0.0039	34	0.036	317
	Flanges/All	0.073	641	0.050	441	0.12	1,082
	Facility Total	**0.16**	**1,383**	**0.15**	**1,321**	**0.309**	**2,704**

Boiler Emission Estimates

Criteria pollutant, greenhouse gas, and TAC emission estimates were prepared for a natural-gas-fired 12 MMBtu/hr boiler. Three approaches were used to determine the boiler size required for the 20 MGY facility. The first approach was based on the fuel oil consumption from Attachment 2, paragraph 7 from the EIR NOP, the second approach was based on the "Energy Life Cycle Assessment of Soybean Biodiesel" USDA Report, Sept 2009, p. 12, Table 3, and the third approach was based on the published value in Lurgi literature. The details associated with each of the approaches are included Attachment 5. The final boiler size rating of 12 MMBtu/hr is based on an estimated value of 10.5 MM Btu/hr with an additional 1.5 MMBtu/hr capacity to account for process peaks.

The criteria pollutant emission estimates were based on best available control technology (BACT) emission limits for a natural-gas-fired boiler and emission rates included in the EPA's AP-42, *Compilation of Air Pollutant Emission Factors*, July 1998. Greenhouse gas emission estimates were based on the California Climate Action Registry, *General Reporting Protocol*, January 2009. The HAP emission estimates were based on the South Coast Air

Quality Management District, *Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emission Inventory, Supplemental Instructions*, January 2010.

Table 4 presents the estimated criteria pollutant and TAC emissions for the 12 MMBtu/hr boiler. The annual greenhouse gas emissions are estimated to be 5,109 metric tons of CO_2 equivalent. The detailed emission calculations are included in Attachment 5.

TABLE 4
Boiler Emission Calculation Summary
EBMUD Proposed 20 MGY Biodiesel Facility

	Emission Estimates	
Pollutant	**Hourly (lb/hr)**	**Annual (lb/year)**
Nitrogen Oxide (NO_x)	0.17	1,399
Carbon Monoxide (CO)	0.44	3,549
VOC	0.78	6,212
Sulfur Oxides (SO_x)	0.42	3,388
Particulate Matter less than 10 microns (PM_{10})	1.07	8,584
Benzene	0.000068	0.55
Formaldehyde	0.00014	1.2
Total PAHs (excluding Napthalene)	0.0000012	0.0094
Napthalene	0.0000035	0.028
Acetaldehyde	0.000036	0.29
Acrolein	0.000032	0.25
Ammonia*	0.038	301
Ethyl Benzene	0.000081	0.65
Hexane	0.000054	0.43
Toluene	0.00031	2.5
Xylene	0.00023	1.9

*Assumes boiler is not equipped with selective non-catalytic reduction or selective catalytic reduction.

Summary

The total estimated emissions for methanol are 10,569 lb/yr, based on the conceptual design assumptions for a 20 MGY facility. The estimated total VOCs (including methanol) are 11,890 lb/yr. The current plant design uses chilled-water-cooled vent condensers as the final control point. However, it is not uncommon for biodiesel plants to incorporate water and/or oil scrubbers on the final emission point. Therefore, the addition of scrubbers would likely provide significant reduction in the methanol emissions.

Table 5 summarizes the estimated emissions associated with the proposed 20 MGY biodiesel facility.

TABLE 5
Estimated Biodiesel Production Facility Emissions*
EBMUD Proposed 20 MGY Biodiesel Facility

Emission Source	Location	Methanol		Other VOCs/Glycerol		Total	
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Point 1	Tank farm glycol vent condenser	0.14	1,188	0	0	0.14	1,188
Point 2	Acid esterification glycol vent condenser	0.35	3,092	0	0	0.35	3,092
Point 3	Reactor/settler vent glycol vent condenser	0.010	88	0	0	0.010	88
Point 4	Methanol recovery glycol vent condenser	0.55	4,818	0	0	0.55	4,818
Fugitive Emissions	Methanol and glycerol emissions	0.16	1,383	0.15	1,321	0.31	2,704
Total		**1.21**	**10,569**	**0.15**	**1,321**	**1.36**	**11,890**

*Does not include boiler emissions.

Criteria pollutant, greenhouse gas, and TAC emissions associated with the natural-gas-fired boiler were also calculated. Emissions of each of the criteria pollutants will be less than 5 tons per year. The annual greenhouse gas emissions are estimated to be approximately 5,000 metric tons of CO_2 equivalent. The total TAC emissions are expected to be less than 310 lb/year, with a majority made up of ammonia

Attachments

1 Storage Tank Data
2 TANKS 4.0 Emissions Report Worksheets
3 Emissions Points 2, 3, and 4 Emissions Calculations
4 Fugitive Emissions Calculations
5 Boiler Emissions Calculations

Attachment 1
Storage Tank Data

EBMUD Proposed 20 MGY Biodiesel Facility
Storage Tank Data
May 2010

		Dimensions & Parameters				Operating				Vent			Emission Control
Tank Number	Service	Diam ft	Height ft	Nominal Capacity, gals	Tank Color	T, deg F	P, in.wc gauge	Heated?	Monthly through-put, gals	Nitrogen Blanket	To Atm	Vent system	APC Device/Technique
T - 1	Biodiesel	12	30	30,000	primer	70 (Min)	1	yes	69,444	yes	yes	no	
T - 2	Biodiesel	12	30	30,000	primer	70 (Min)	1	yes	69,444	yes	yes	no	
T - 3	Biodiesel	12	30	30,000	primer	70 (Min)	1	yes	69,444	yes	yes	no	
T - 4	Biodiesel	12	30	30,000	primer	70 (Min)	1	yes	69,444	yes	yes	no	
T - 5	Biodiesel	12	30	30,000	primer	70 (Min)	1	yes	69,444	yes	yes	no	
T - 6	Biodiesel	12	30	30,000	primer	70 (Min)	1	yes	69,444	yes	yes	no	
T - 7	Glycerin	12	20	20,000	white	100	1	yes	306,551	yes	no	yes	Vent condenser
T - 8	Oil Feedstock	12	30	30,000	primer	70 (Min)	1	yes	61,728	yes	yes	no	
T - 9	Oil Feedstock	12	30	30,000	primer	70 (Min)	1	yes	61,728	yes	yes	no	
T - 10	Oil Feedstock	12	30	30,000	primer	70 (Min)	1	yes	61,728	yes	yes	no	
T - 11	Oil Feedstock	12	30	30,000	primer	70 (Min)	1	yes	61,728	yes	yes	no	
T - 12	Oil Feedstock	12	30	30,000	primer	70 (Min)	1	yes	61,728	yes	yes	no	
T - 13	Oil Feedstock	12	30	30,000	primer	70 (Min)	1	yes	61,728	yes	yes	no	
T - 14	Trap Grease Feedstock	10	14	8,000	primer	100 (min)	0	yes	69,444	no	no	yes	carbon, odor control
T - 15	Trap Grease Feedstock	10	14	8,000	primer	100(min)	0	yes	69,444	no	no	yes	carbon, odor control
T - 16	Wastewater	10	12	6,000	primer	100	0	no	20,000	no	no	yes	Vent condenser
T - 17	Methanol*	8.5	32.5	12,000	white	amb	1	no	250,200	yes	no	yes	Vent condenser, tanker vap.bal.
T - 18	Sodium Methoxide*	8.5	22	8,000	white	amb	1	no	27,105	yes	no	yes	Vent condenser, tanker vap.bal.
T - 19	Biodiesel	30	30	135,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 20	Biodiesel	30	30	135,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 21	Biodiesel	30	30	135,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 22	Biodiesel	30	30	135,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 23	Oil Feedstock	32	30	150,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 24	Oil Feedstock	32	30	150,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 25	Oil Feedstock	32	30	150,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	
T - 26	Oil Feedstock	32	30	150,000	primer	70 (Min)	1	yes	312,500	yes	yes	no	

* Horizontal Tanks

Attachment 2
TANKS 4.0 Emissions Report Worksheets

EBMUD Biodiesel Production Facility
Title: Storage Tank Loss Calculation Worksheets

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	EBMUD MeOH hrz rnA	
City:	San Francisco AP	
State:	California	
Company:	EBMUD	
Type of Tank:	Horizontal Tank	
Description:	**Methanol Storage 12k gal**	
Tank Dimensions		
Shell Length (ft):		32.50
Diameter (ft):		8.50
Volume (gallons):		12,000.00
Turnovers:		250.20
Net Throughput(gal/yr):		3,002,400.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: San Francisco AP, California (Avg Atmospheric Pressure = 14.75 psia)

Liquid Contents of Storage Tank

EBMUD MeOH hrz rnA - Horizontal Tank
San Francisco AP, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	All	59.20	54.43	63.97	57.12	1.4060	1.2072	1.6322	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

Detail Calculations (AP-42)

EBMUD MeOH hrz rnA - Horizontal Tank
San Francisco AP, California

Annual Emission Calcaulations

Standing Losses (lb):	168.9539
Vapor Space Volume (cu ft):	1,174.6580
Vapor Density (lb/cu ft):	0.0081
Vapor Space Expansion Factor:	0.0641
Vented Vapor Saturation Factor:	0.7595
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,174.6580
Tank Diameter (ft):	8.5000
Effective Diameter (ft):	18.7593
Vapor Space Outage (ft):	4.2500
Tank Shell Length (ft):	32.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0081
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4060
Daily Avg. Liquid Surface Temp. (deg. R):	518.8668
Daily Average Ambient Temp. (deg. F):	57.1000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	516.7900
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,552.9167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0641
Daily Vapor Temperature Range (deg. R):	19.0799
Daily Vapor Pressure Range (psia):	0.4250
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4060
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.2072
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	1.6322
Daily Avg. Liquid Surface Temp. (deg R):	518.8668
Daily Min. Liquid Surface Temp. (deg R):	514.0968
Daily Max. Liquid Surface Temp. (deg R):	523.6367
Daily Ambient Temp. Range (deg. R):	16.2333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7595
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	1.4060
Vapor Space Outage (ft):	4.2500
Working Losses (lb):	922.8629
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4060
Annual Net Throughput (gal/yr.):	3,002,400.0000
Annual Turnovers:	250.2000
Turnover Factor:	0.2866
Tank Diameter (ft):	8.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,091.8168

Individual Tank Emission Totals

Emissions Report for: Annual
EBMUD MeOH hrz rnA - Horizontal Tank
San Francisco AP, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	922.86	168.95	1,091.82

Tank vent losses are controlled by a tank farm vent condenser system and delivery tanker vapor balance.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	EBMUD NaMethoxide rnA	
City:	San Francisco AP	
State:	California	
Company:	EBMUD	
Type of Tank:	Horizontal Tank	
Description:	**Sodium Methylate Storage 12k gal (30% Sodium Methoxide in Methanol)**	
Tank Dimensions		
Shell Length (ft):		22.00
Diameter (ft):		8.50
Volume (gallons):		8,000.00
Turnovers:		40.66
Net Throughput(gal/yr):		325,260.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: San Francisco AP, California (Avg Atmospheric Pressure = 14.75 psia)

Liquid Contents of Storage Tank

EBMUD NaMethoxide rnA - Horizontal Tank
San Francisco AP, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	All	59.20	54.43	63.97	57.12	1.4060	1.2072	1.6322	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

Detail Calculations (AP-42)

EBMUD NaMethoxide rnA - Horizontal Tank
San Francisco AP, California

Annual Emission Calcaulations	
Standing Losses (lb):	114.3688
Vapor Space Volume (cu ft):	795.1531
Vapor Density (lb/cu ft):	0.0081
Vapor Space Expansion Factor:	0.0641
Vented Vapor Saturation Factor:	0.7595
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	795.1531
Tank Diameter (ft):	8.5000
Effective Diameter (ft):	15.4343
Vapor Space Outage (ft):	4.2500
Tank Shell Length (ft):	22.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0081
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4060
Daily Avg. Liquid Surface Temp. (deg. R):	518.8668
Daily Average Ambient Temp. (deg. F):	57.1000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	516.7900
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,552.9167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0641
Daily Vapor Temperature Range (deg. R):	19.0799
Daily Vapor Pressure Range (psia):	0.4250
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4060
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.2072
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	1.6322
Daily Avg. Liquid Surface Temp. (deg R):	518.8668
Daily Min. Liquid Surface Temp. (deg R):	514.0968
Daily Max. Liquid Surface Temp. (deg R):	523.6367
Daily Ambient Temp. Range (deg. R):	16.2333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7595
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	1.4060
Vapor Space Outage (ft):	4.2500
Working Losses (lb):	315.5689
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.4060
Annual Net Throughput (gal/yr.):	325,260.0000
Annual Turnovers:	40.6575
Turnover Factor:	0.9045
Tank Diameter (ft):	8.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	429.9377

Individual Tank Emission Totals

Emissions Report for: Annual
EBMUD NaMethoxide rnA - Horizontal Tank
San Francisco AP, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	315.57	114.37	429.94

Tank vent losses are controlled by a tank farm vent condenser system and delivery tanker vapor balance.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	EBMUD Glycerol rnA	
City:	San Francisco AP	
State:	California	
Company:	EBMUD	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	**Glycerol Tank: Glycerol, water, methanol**	
Tank Dimensions		
Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		19.00
Avg. Liquid Height (ft):		9.00
Volume (gallons):		16,074.56
Turnovers:		228.85
Net Throughput(gal/yr):		3,678,612.00
Is Tank Heated (y/n):	Y	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06
Breather Vent Settings		
Vacuum Settings (psig):		0.00
Pressure Settings (psig)		0.00

Meterological Data used in Emissions Calculations: San Francisco AP, California (Avg Atmospheric Pressure = 14.75 psia)

Liquid Contents of Storage Tank

EBMUD Glycerol rnA - Vertical Fixed Roof Tank
San Francisco AP, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Glycerol Tank	All	97.00	94.00	99.00	100.00	1.5400	1.4500	1.6000	29.8000			41.87	
Methyl alcohol						4.2255	3.8970	4.4572	32.0400	0.2000	0.7710	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Unidentified Components-Glycerol+Water						0.5898	-0.8711	0.5078	24.1213	0.8000	0.2290	45.35	

Detail Calculations (AP-42)

EBMUD Glycerol rnA - Vertical Fixed Roof Tank
San Francisco AP, California

Annual Emission Calcaulations

Standing Losses (lb):	37.6108
Vapor Space Volume (cu ft):	1,258.2079
Vapor Density (lb/cu ft):	0.0077
Vapor Space Expansion Factor:	0.0203
Vented Vapor Saturation Factor:	0.5241
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,258.2079
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	11.1250
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	9.0000
Roof Outage (ft):	0.1250
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1250
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0077
Vapor Molecular Weight (lb/lb-mole):	29.8000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5400
Daily Avg. Liquid Surface Temp. (deg. R):	556.6700
Daily Average Ambient Temp. (deg. F):	57.1000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	559.6700
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,552.9167

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0203
Daily Vapor Temperature Range (deg. R):	5.0000
Daily Vapor Pressure Range (psia):	0.1500
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5400
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.4500
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	1.6000
Daily Avg. Liquid Surface Temp. (deg R):	556.6700
Daily Min. Liquid Surface Temp. (deg R):	553.6700
Daily Max. Liquid Surface Temp. (deg R):	558.6700
Daily Ambient Temp. Range (deg. R):	16.2333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.5241
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	1.5400
Vapor Space Outage (ft):	11.1250
Working Losses (lb):	1,196.8403
Vapor Molecular Weight (lb/lb-mole):	29.8000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.5400
Annual Net Throughput (gal/yr.):	3,678,612.0000
Annual Turnovers:	228.8468
Turnover Factor:	0.2978
Maximum Liquid Volume (gal):	16,074.5628
Maximum Liquid Height (ft):	19.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,234.4511

Individual Tank Emission Totals

Emissions Report for: Annual
EBMUD Glycerol rnA - Vertical Fixed Roof Tank
San Francisco AP, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Glycerol Tank totals	1,196.84	37.61	1,234.45
Methyl alcohol	922.80	29.00	951.80
Unidentified Components-Glyc+Water	274.04	8.61	(water vapor) 282.65

Tank vent losses are controlled by a tank farm vent condenser system.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification		
User Identification:	EBMUD ww, rnA	
City:	San Francisco AP	
State:	California	
Company:	EBMUD	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	**Wastewater Tank: water, 5%methanol**	
Tank Dimensions		
Shell Height (ft):		12.00
Diameter (ft):		10.00
Liquid Height (ft) :		11.00
Avg. Liquid Height (ft):		6.00
Volume (gallons):		6,000.00
Turnovers:		40.00
Net Throughput(gal/yr):		240,000.00
Is Tank Heated (y/n):	Y	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06
Breather Vent Settings		
Vacuum Settings (psig):		0.00
Pressure Settings (psig)		0.00

Meterological Data used in Emissions Calculations: San Francisco AP, California (Avg Atmospheric Pressure = 14.75 psia)

Liquid Contents of Storage Tank

EBMUD ww, rnA - Vertical Fixed Roof Tank
San Francisco AP, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Wastewater	All	97.00	94.00	99.00	100.00	0.9500	0.8300	1.0900	32.0000			18.40	
Methyl alcohol						4.2255	3.8970	4.4572	32.0400	0.0500	0.1279	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Unidentified Components-Water						0.8532	0.7311	0.8463	31.9941	0.9500	0.8721	18.00	

Detail Calculations (AP-42)

EBMUD ww, rnA - Vertical Fixed Roof Tank
San Francisco AP, California

Annual Emission Calcaulations

Standing Losses (lb):	18.9551
Vapor Space Volume (cu ft):	479.4201
Vapor Density (lb/cu ft):	0.0051
Vapor Space Expansion Factor:	0.0278
Vented Vapor Saturation Factor:	0.7649
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	479.4201
Tank Diameter (ft):	10.0000
Vapor Space Outage (ft):	6.1042
Tank Shell Height (ft):	12.0000
Average Liquid Height (ft):	6.0000
Roof Outage (ft):	0.1042
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1042
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	5.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0051
Vapor Molecular Weight (lb/lb-mole):	32.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9500
Daily Avg. Liquid Surface Temp. (deg. R):	556.6700
Daily Average Ambient Temp. (deg. F):	57.1000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	559.6700
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,552.9167

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0278
Daily Vapor Temperature Range (deg. R):	5.0000
Daily Vapor Pressure Range (psia):	0.2600
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9500
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.8300
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	1.0900
Daily Avg. Liquid Surface Temp. (deg R):	556.6700
Daily Min. Liquid Surface Temp. (deg R):	553.6700
Daily Max. Liquid Surface Temp. (deg R):	558.6700
Daily Ambient Temp. Range (deg. R):	16.2333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7649
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.9500
Vapor Space Outage (ft):	6.1042
Working Losses (lb):	159.2381
Vapor Molecular Weight (lb/lb-mole):	32.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9500
Annual Net Throughput (gal/yr.):	240,000.0000
Annual Turnovers:	40.0000
Turnover Factor:	0.9167
Maximum Liquid Volume (gal):	6,000.0000
Maximum Liquid Height (ft):	11.0000
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	178.1932

Individual Tank Emission Totals

Emissions Report for: Annual
EBMUD ww, rnA - Vertical Fixed Roof Tank
San Francisco AP, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Wastewater Tank totals	159.24	18.96	178.19
Methyl alcohol	20.36	2.42	22.79
Unidentified Components-Water	138.88	16.53	(water vapor) 155.41

Tank vent losses are controlled by a tank farm vent condenser system.

Attachment 3
Emission Points 2, 3, and 4
Emissions Calculations

EBMUD Proposed Biodiesel Facility
Methanol Emission Calculation Basis for Emission Points 2, 3, and 4
May 2010

1) Final control device is chilled water condenser with outlet vapor at 45 deg F.

2) In all cases, the system pressure is greater than the vapor pressure/partial pressure of methanol, so methanol emission from condenser will be based on saturation of methanol in nitrogen/air.

3) A representative flash calculation was done in ASPEN at 45 deg F to provide saturation value of methanol in nitrogen, this typical result will be ratioed based on nitrogen load.

4) Nitrogen rate was calculated by using entrained air in water data and estimating air leakage into the system.

Entrained Air Basis:
Entrained Air Basis: Ch. 15, Steam Ejectors for Vacuum Service p. 261, Applied Chem Process Design
Assume oil has same entrained air as water

T=70 deg f	11.8	lbs/hr/1000gpm
	2.35529E-05	lbs air/lb water or liquid
T=50 deg F	14.9	lbs/hr/1000gpm
	2.97405E-05	lbs air/lb water or liquid

5) Acceptable air leakage into vacuum systems per fig 42, HEI std for Steam Ejectors

EBMUD Proposed Biodiesel Facility
Methanol Emission Calculation Basis for Emission Points 2, 3, and 4
May 2010

Emission Point #1

all flows and use ASPEN flash simulation to determine vent condenser vapor outlet composition at T at 45 deg F.

Tank Emission calcs:
Glycerol Tank:

Overall condensible vapor pressure=			1.54	psia
Nitrogen pressure=			13.16	psia
Nitrogen Vol %			89.52%	
	MW	loss/yr, lbs	lb moles	vol%
MeOH	32	951.8	29.74375	6.86
Water	18	282.65	15.70278	3.62
N2	28		388.3612	89.52
			433.8078	100.00

Tank Emission calcs:
NaMethoxide Tank:

Overall condensible vapor pressure=			1.4	psia
Nitrogen pressure=			13.3	psia
Nitrogen Vol %			90.48%	
	MW	loss/yr, lbs	lb moles	vol%
MeOH	32	429.9	13.43438	9.52
Water	18	0	0	0.00
N2	28		127.6266	90.48
			141.0609	100.00

Tank Emission calcs:
Methanol Tank:

Overall condensible vapor pressure=			1.4	psia	
Nitrogen pressure=			13.3	psia	
Nitrogen Vol %			90.48%		
	MW	loss/yr, lbs	lb moles	vol%	
MeOH	32	630.38	19.69938	9.52	assumes 1/2 of
Water	18	0	0	0.00	working loss is
N2	28		187.1441	90.48	recovered by vapor
			206.8434	100.00	

Tank Emission calcs:
Wastewater Tank

Overall condensible vapor pressure=			0.95	psia
Nitrogen pressure=			13.75	psia
Nitrogen Vol %			93.54%	
	MW	loss/yr, lbs	lb moles	vol%
MeOH	32	178.19	5.568438	5.27
Water	18	22.79	1.266111	1.20
N2	28		98.9211	93.54
			105.7556	100.00

Total:

	MW	loss/yr, lbs	lb moles	vol%
MeOH	32	2190.27	68.44594	7.71
Water	18	305.44	16.96889	1.91
N2	28		802.053	90.38
			887.4678	100.00

The total was used as input to the ASPEN simulation to determine the condenser vapor emissions.

EBMUD Proposed Biodiesel Facility
Methanol Emission Calculation Basis for Emission Points 2, 3, and 4
May 2010

Emission Point #2

Acid Esterification
Reactor

Flow in:

45 gpm =

Assume 1/2 esterification occurs, so use 6w/w MeOH flow

1217.43 lb/hr MeOH and NaOMe

0.00 lb/hr entrained air released 20290.5 lbs/hr

Based on Flash calc with N2 saturated with methanol at 45 deg F outlet,
10.1 lb/hr air =.72lb/hr MeOH, so 0.04lb/hr air= 0.003lb/hr MeOH

Dryer

No details available, assume 1/3 size of distillation, same vacuum
Allowable air leakage 5 lbs Fig 42, HEI std for steam ejectors

Based on Condenser calc with N2 at 45 deg F outlet,
10.1 lb/hr air =.72lb/hr MeOH, so 5 lb/hr air= 0.353lb/hr MeOH

Emission Point #3

Reactor U-1

Assume same as Acid Esterification

0.00 lb/hr entrained air released

Based on Condenser calc with N2 at 45 deg F outlet,
10.1 lb/hr air =.72lb/hr MeOH, so 0.04lb/hr air= 0.003lb/hr MeOH

Reactor U-2

Assume same as Acid Esterification

0.00 lb/hr entrained air released

Based on Condenser calc with N2 at 45 deg F outlet,
10.1 lb/hr air =.72lb/hr MeOH, so 0.04lb/hr air= 0.003lb/hr MeOH
Total MeOH= .006lb/hr Round to .01 lb/hr MeOH

Emission Point #4

Distillation vacuum system outlet

	dia, ft	h, ft
Estimated dist. Col.	3	60
Est for vapor duct and condenser(50% of column volume)		

System Volume vol., ft3
424.1147

Operates at 75 mmhg abs 233.2631
Allowable system leakage: 657.3777

12 lbs/hr
0 Release from incoming oil
12 lb/hr total air leakage

Fig 42, HEI std for steam ejectors

Based on Condenser calc with water vapor and air 45 deg F outlet,
10.1 lb/hr air =.46lb/hr MeOH, so 12 lb/hr air= 0.55lb/hr MeOH

Attachment 4
Fugitive Emissions Calculations

EBMUD Proposed 20 MGY Biodiesel Facility
Fugitive Component Inventory
May 2010

Unit Process/Equip.	Stream	TAC/HAP Constituent (%)	Component Counts [a]					
			Valves	Pumps	Other[b], PRV,vent, comp.	Connec-tors	Flanges	Open-ends
TANK FARM								
Methanol Tank and pumps	Gas LL [c] HL [d]	methanol 100	10	2	2 0		6 12	
Sodium Methylate Tank and pumps	Gas LL [c] HL [d]	methanol 70	10	2	2 0		6 12	
Glycerine Tank and pumps	Gas LL [c] HL [d]	methanol 20	10	2	2 0		4 11	
Rendering Unit Evaporator and pumps	Gas LL HL	n/a, no MeOH no VOC						
Esterification Unit								
Reactor vessel	Gas LL HL	methanol 20	3	0	2 0		4 12	
pumps	Gas LL HL	methanol 20	4	2	0		8	
settling tanks	Gas LL HL	methanol 20	5	0	1 0		2 18	
Dryers	Gas LL HL	n/a, under vacuum						
Feedstock skid		n/a, no Methanol						
Oil Dryer		n/a, no MeOH						
Reactor U-1								
Reactor vessels(2)	Gas LL HL	methanol 20	12	0	2		4 36	
pumps, MeOH and Na Methylate (16 instrument and strainer flanges)	Gas LL HL	methanol 100	12	0	4		24	
settling tanks	Gas LL HL	methanol 100	8	0	2 0		4 28	
Process pumps	Gas LL HL	methanol 20	8	2	0		8	
Reactor U-2								
Reactor vessels(2)	Gas LL HL	methanol 20	12	0	2 0		4 36	
pumps, MeOH and Na Methylate (16 instrument and strainer flanges)	Gas LL HL	methanol 100	12	0	4		24	

Unit Process/Equip.	Stream	TAC/HAP Constituent (%)	Component Counts [a]					
			Valves	Pumps	Other[b], PRV,vent, comp.	Connec-tors	Flanges	Open-ends
settling tanks	Gas				2		4	
	LL	methanol 100	8	0	0		28	
	HL							
Process pumps	Gas							
	LL	methanol 20	8	2	0		8	
	HL							
Primary Settling Tank								
settling tanks	Gas				2		4	
	LL	methanol 100	8	0	0		28	
	HL							
Process pumps	Gas							
	LL	methanol 20	8	2	0		8	
	HL							
Secondary Settling Tank								
settling tanks	Gas				2		4	
	LL	methanol 20	8	0	0		28	
	HL							
Process pumps	Gas							
	LL	methanol 20	8	2	0		8	
	HL							
Coalescing Unit								
Filter and accumulator tank	Gas				2		4	
	LL	methanol 20	8	0	0		20	
	HL							
Process pumps	Gas							
	LL	methanol 20	8	2	0		8	
	HL							
Buffer Tanks								
Tanks (2)	Gas				2		4	
	LL	methanol 20	8	0	0		20	
	HL							
Process pumps	Gas							
	LL	methanol 20	8	2	0		8	
	HL							
Methanol Dryer	n/a under vacuum							
Cold Soak Unit	n/a, no MeOH							
Process Vent Condenser								
Condenser and accumulator tank	Gas				2		4	
	LL	methanol 100	8	0	0		20	
	HL							
Process pumps	Gas							
	LL	methanol 100	8	2	0		8	
	HL							
			202	22	35		479	

[a] Components not counted: components handling fluids 10% or less by weight VOC, operating under negative pressure at all times, or handling non-volatile heat transfer fluids such as Therminol and glycol, handling exclusively liquids which evaporate 10% or less at 150°C.

[b] The "other" component type includes instruments, loading arms, pressure relief valves, vents, compressors, drains, hatches, meters, and rod stuffing boxes. The "others" component type should be applied for any component type other than connectors, flanges, open-ended line, pumps, or valves.

[c] Light Liquid service means ≥20% by weight total concentration of a pure organic component having a vapor pressure >0.3 kPa at 20°C (1.2 in. H_2O)(2.25 mm Hg)

[d] Heavy Liquid service means not in gas or light liquid service and containing a fluid that is ≥10% VOC by weight.

EBMUD Proposed 20 MGY Biodiesel Facility
Fugitive Component Emission Factors
May 2010
CAPCOA-Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals

Component Type/ Service Type	Default Zero Factor (kg/hr)	Correlation Equation [a] (kg/hr)	Screening Value, SV[b] (ppmv)	Resulting Emission Factor (kg/hr/source)	Resulting Emission Factor (lb/hr/source)
Valves/All	7.80E-06	2.27E-06(SV)^0.747	100	7.08E-05	1.56E-04
Pump seals/All	1.90E-05	5.07E-05(SV)^0.622	500	2.42E-03	5.33E-03
Others/All	4.00E-06	8.69E-06(SV)^0.642	500	4.70E-04	1.04E-03
Connectors/All	7.50E-06	1.53E-06(SV)^0.736	100	4.54E-05	1.00E-04
Flanges/All	3.10E-07	4.53E-06(SV)^0.706	100	1.17E-04	2.58E-04
Open-ended lines/All	2.00E-06	1.90E-06(SV)^0.724	100	5.33E-05	1.18E-04

[a] Source: California Implementaton Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-3a.

[b] Screening Values based on conformance with BAAQMD Regulation 8 Rule 18 Equipment Leaks standards.

EBMUD Proposed 20 MGY Biodiesel Facility
Fugitive Emissions Calculation
May 2010

Unit Process: Equipment	Component Type/ Service Type	Component Counts	Emission kg/hr/source	TOC Emissions lb/hr	TOC Emissions lb/year	Methanol lb/hr	Methanol lb/year
Tank Farm: Methanol tank, Sodium Methylate Tank - 70% MeOH, Glycerine Tanks - ~20% MeOH	Valves/All	30	1.56E-04	0.0047	41	0.0029	26
	Pump seals/All	6	5.33E-03	0.0320	280	0.0201	176
	Others/All	6	1.04E-03	0.0062	54	0.0039	34
	Connectors/All		1.00E-04				
	Flanges/All	51	2.58E-04	0.0132	115	0.0086	75
	Open-ended lines/All		1.18E-04				
Esterification Unit: Reactor, settling tanks - ~20% MeOH	Valves/All	12	1.56E-04	0.0019	16	0.0004	3
	Pump seals/All	2	5.33E-03	0.0107	93	0.0021	19
	Others/All	3	1.04E-03	0.0031	27	0.0031	27
	Connectors/All		1.00E-04				
	Flanges/All	44	2.58E-04	0.0113	99	0.0101	89
	Open-ended lines/All		1.18E-04				
Reactor U-1: Reactor vessels, settling tanks, pumps, instruments. Strainers	Valves/All	40	1.56E-04	0.0062	55	0.0037	33
	Pump seals/All	2	5.33E-03	0.0107	93	0.0021	19
	Others/All	8	1.04E-03	0.0083	73	0.0083	73
	Connectors/All		1.00E-04				
	Flanges/All	104	2.58E-04	0.0268	235	0.0177	155
	Open-ended lines/All		1.18E-04				
Reactor U-2: Reactor vessels, settling tanks, pumps, instruments. Strainers	Valves/All	40	1.56E-04	0.0062	55	0.0037	33
	Pump seals/All	2	5.33E-03	0.0107	93	0.0021	19
	Others/All	8	1.04E-03	0.0083	73	0.0083	73
	Connectors/All		1.00E-04				
	Flanges/All	104	2.58E-04	0.0268	235	0.0177	155
	Open-ended lines/All		1.18E-04				
Settling Tanks: Primary Settling Tk, Secondary Settling Tk, Coalescing Unit, Buffer Tks ~20% MeOH	Valves/All	64	1.56E-04	0.0100	88	0.0020	18
	Pump seals/All	8	5.33E-03	0.0427	374	0.0085	75
	Others/All	8	1.04E-03	0.0083	73	0.0083	73
	Connectors/All		1.00E-04				
	Flanges/All	144	2.58E-04	0.0371	325	0.0107	94
	Open-ended lines/All		1.18E-04				
Process Vent Condenser: Condenser & accumulator tank, pumps - 100% MeOH	Valves/All	16	1.56E-04	0.0025	22	0.0025	22
	Pump seals/All	2	5.33E-03	0.0107	93	0.0021	19
	Others/All	2	1.04E-03	0.0021	18	0.0004	4
	Connectors/All		1.00E-04				
	Flanges/All	32	2.58E-04	0.0083	72	0.0083	72
	Open-ended lines/All		1.18E-04				
			Facility Total	0.309	2,704	0.158	1,383

VOC service estimate		
	Valves/All	202
	Pump seals/All	22
	Others/All	35
	Connectors/All	0
	Flanges/All	479
	Open-ended lines/All	0

Attachment 5
Boiler Emissions Calculations

EBMUD Proposed Biodiesel Facility
20 MPY Biodiesel Plant Boiler Size Estimate
May 2010

Conclusion:

Three approaches were used to estimate the boiler size. Approach 1 provides a value just below the 10 MM BTU/hr threshold, and appears to be an average value with no allowance for instantaneous consumption. Approach 2 is for a conventional biodiesel plant appears to include glycerine recovery, which this plant does not. For that reason, it was assumed approach 2 would provide a value that was too high. Therefore, Approach 3 was used which yields a 10.5 MM BTU/hr boiler. To account for process peaks, a nominal 12 MM BTU/hr boiler is recommended.

Approach #1:

Basis:

Fuel oil consumption from Attachment 2, para. 7 from EBMUD document.

41700 gal/mor fuel oil (fo)

143000 BTU/gal

41700	gal	144000	BTU	12	months	1	yr			=	9007200	MM BTU input
	month		gal fo	1	yr	8000	operating hrs					hr

Approach #2:

Basis:

"Energy Life Cycle Assessment of Soybean Biodiesel" USDA Report, Sept 2009, p.12, Table 3

NG/Steam Input , Conventional Biodiesel Plant

3551 BTU	20,000,000 gal	yr	=	8,877,500 BTU net to process		
gal biod	yr	8000 op hrs		hr		

Add estimated heating for rendering step:

Assume heating to 250 deg F from 60 deg F

Required heat=

190 deg F	20,000,000 gal	yr	7.35 lb	0.56 BTU	=	1,955,100 BTU
	yr	8000 hr	gal	lbdeg F		hr

Total, corrected for boiler efficiency(assumed to be 80%):

10,832,600 BTU		=	13,540,750 BTU fuel input
hr	0.8		hr

EBMUD Proposed Biodiesel Facility
20 MPY Biodiesel Plant Boiler Size Estimate
May 2010

Approach #3:

Published value in Lurgi literature is 320 kg steam / ton biodiesel = 2600 BTU / gal

Using same logic as Approach #2:

$$\frac{2600\ \text{BTU}}{\text{gal biod}} \cdot \frac{20{,}000{,}000\ \text{gal}}{\text{yr}} \cdot \frac{\text{yr}}{8000\ \text{op hrs}} = \frac{6{,}500{,}000\ \text{BTU net to process}}{\text{hr}}$$

Add estimated heating for rendering step:
Assume heating to 250 deg F from 60 deg F
Required heat=

$$\frac{190\ \text{deg F}}{} \cdot \frac{20{,}000{,}000\ \text{gal}}{\text{yr}} \cdot \frac{\text{yr}}{8000\ \text{hr}} \cdot \frac{7.35\ \text{lb}}{\text{gal}} \cdot \frac{0.56\ \text{BTU}}{\text{lbdeg F}} = \frac{1{,}955{,}100\ \text{BTU}}{\text{hr}}$$

Total, corrected for boiler efficiency(assumed to be 80%):

$$\frac{8{,}455{,}100\ \text{BTU}}{\text{hr}} \cdot \frac{}{0.8} = \frac{10{,}568{,}875\ \text{BTU fuel input}}{\text{hr}}$$

EBMUD Biodiesel Facility

Summary of Boiler Emissions - Criteria, HAPS, and Greenhouse Gas Pollutants

May 2010

Operating Data

Annual Operating Hours	8000	
Daily Operating Hours	24	
Fuel Heat content (HHV)	1,020	Btu/scf
Fuel S Content	1.0	gr/100dscf
Heat Input	12.0	MMBTU/hr
Fuel Input	0.0118	MMscf/hr

Given:

Heat Input =	12	MMBTU/hr	
NOx BACT Limit =	12	ppm NOx @ 3% O2	SCAQMD BACT (Fullerton College)
CO BACT Limit =	50	ppm CO @ 3% O2	BAAQMD BACT
Stack Exhaust Oxygen Content =	3	% O2 at stack	
Molecular Weight of NO2 =	46.01	lb/lbmole Nox as NO2	
Molecular Weight of CO =	28.01	lb/lbmole CO	
EPA Fd factor @ 68 deg. =	8,710	dscf/MMBTU	
Heating Value of Natural Gas (AP-42) =	1,020	Btu/scf	
Fuel flow estimate =	11,765	scfh	
Stack Flow =	2,034	dscfm	
NOx Emission Factor =	0.17	lb/hr	Calculated per EPA Reference Method 19 and 12 ppm NOx
CO Emission Factor =	0.44	lb/hr	Calculated per EPA Reference Method 19 and 50 ppm CO
VOC Emission Factor =	5.5	lb/MMscf	AP-42
SO2 Emission Factor =	3	lb/MMscf	AP-42
PM Emission Factor =	7.6	lb/MMscf	AP-42

Boiler Criteria Emission Calculations

	Emission Factor (lb/MMBtu)	Hourly (lb/hr)	Daily (lb/day)	Annual (lb/yr)
NOx	0.015	0.17	4.2	1399
CO	0.037	0.44	10.6	3549
VOC	0.065	0.78	18.6	6212
SOx (as SO2)	0.035	0.42	10.2	3388
PM10	0.089	1.07	25.8	8584

Boiler GHG Emission Calculations

	Emission Factor (kg/MMBtu)	Annual (metric ton/yr)	Annual - CO2 Equiv (metric ton/yr)
CO2	53.06	5094	5094
CH4	0.0059	0.57	12
N2O	0.0001	0.0096	3
		Total (metric ton/yr)	5109

CO2 emission factor from CCAR General Reporting Protocol (version 3.1, January 2009) Table C.7

CH4 and N2O emission factors from CCAR General Reporting Protocol (version 3.1, January 2009) Table C.8.

Global warming potential for CH4 = 21 and N2O = 310 (Reference: Intergovernmental Panel on Climate Change, Second assessment Report, 1996)

Boiler HAP Emission Calculations

	Emission Factor Lb/MMSCF	Hourly (lb/hr)	Annual (lb/yr)
Benzene	0.0058	0.000068	0.5459
Formaldehyde	0.0123	0.000145	1.1576
Total PAHs (excluding Napthalene)	0.0001	0.000001	0.0094
Napthalene	0.0003	0.000004	0.0282
Acetaldehyde	0.0031	0.000036	0.2918
Acrolein	0.0027	0.000032	0.2541
Ammonia*	3.2	0.03765	301.1765
Ethyl Benzene	0.0069	0.00008	0.6494
Hexane	0.0046	0.000054	0.4329
Toluene	0.0265	0.000312	2.4941
Xylene	0.0197	0.000232	1.8541
		Total (lb/yr)	308.8941

* Assumes boiler is not equiped with selective non-catalytic reduction or selective catalytic reduction.

06/18/10
13:34:28

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Biodiesel

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =         AREA
   EMISSION RATE (G/(S-M**2))  =      .302400E-08
   SOURCE HEIGHT (M)          =       3.0000
   LENGTH OF LARGER SIDE (M)  =     110.0000
   LENGTH OF SMALLER SIDE (M) =     110.0000
   RECEPTOR HEIGHT (M)        =       1.0000
   URBAN/RURAL OPTION         =        URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST     CONC             U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
-------  ----------  ----  -----  -----  ------  ------  -------
   100.   .4597E-01    5     1.0    1.0 10000.0    3.00     45.
   200.   .2154E-01    5     1.0    1.0 10000.0    3.00     45.
   300.   .1300E-01    5     1.0    1.0 10000.0    3.00     45.
   400.   .8842E-02    5     1.0    1.0 10000.0    3.00     45.
   500.   .6459E-02    5     1.0    1.0 10000.0    3.00     43.
   600.   .4961E-02    5     1.0    1.0 10000.0    3.00     43.
   700.   .3957E-02    5     1.0    1.0 10000.0    3.00     45.
   800.   .3250E-02    5     1.0    1.0 10000.0    3.00     45.
   900.   .2732E-02    5     1.0    1.0 10000.0    3.00     41.
  1000.   .2340E-02    5     1.0    1.0 10000.0    3.00     45.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND   100. M:
   100.   .4597E-01    5     1.0    1.0 10000.0    3.00     45.

*********************************
*** SCREEN DISCRETE DISTANCES ***
*********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST     CONC             U10M   USTK  MIX HT   PLUME  MAX DIR
   (M)   (UG/M**3)   STAB  (M/S)  (M/S)    (M)   HT (M)   (DEG)
-------  ----------  ----  -----  -----  ------  ------  -------
   685.   .4085E-02    5     1.0    1.0 10000.0    3.00     45.

     ***************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ***************************************

 CALCULATION        MAX CONC    DIST TO   TERRAIN
  PROCEDURE        (UG/M**3)    MAX (M)    HT (M)
--------------    -----------   -------   -------
SIMPLE TERRAIN      .4597E-01      100.        0.


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
```

TAC Emissions from Biodiesel Production Facility

Pollutant	One Hour (pounds/hr) (CH2MHill)	Annual (pounds/yr) (CH2M Hill)	OEHHA Cancer Risk Factors	Calculated Cancer Risk	Cancer Risk With 70-Year Age-Sensitivity Factor	Acute Hazard	Chronic Hazard
Methanol from All Facilities	1.21	10,569		NA		0.0006	0.0004
TAC Emissions from Natural Gas-Fired Boiler							
Benzene	0.000068	0.55	0.000029	0.0024	0.004	0.000001	0.000001
Formaldehyde	0.00014	1.2	0.000006	0.0011	0.002	0.00003	0.00002
Total PAHs (excluding Napthalene)*	0.0000012	0.0094	0.0011	0.0016	0.003	NA	NA
Napthalene	0.0000035	0.028	0.000034	0.0001	0.0002	NA	0.0000005
Acetaldehyde	0.000036	0.29	0.0000027	0.0001	0.0002	0.000001	0.0000003
Acrolein	0.000032	0.25		NA		0.0002	0.0001
Ammonia	0.038	301		NA		0.0001	0.0002
Ethyl Benzene	0.000081	0.65	0.0000025	0.0002	0.0004	NA	0.00000005
Hexane	0.000054	0.43		NA		NA	0.00000001
Toluene	0.00031	2.5		NA		0.0000001	0.000001
Xylene	0.00023	1.9		NA		0.0000001	0.0000004
Total Emissions	1.249	10,877.8		0.0057	0.010	0.0009	0.00076
DPM (PM2.5) from On-Site Mobile Sources (Acrolein Component of DPM for Acute Risk)**	0.0002	1.56	0.0003	0.12		0.0000024	0.0000479
Combined Stationary and Mobile Sources			0.0003	0.128	0.13	0.0009	0.0008

*Assumes all are Benzo[a]pyrene (worst-case)

Appendix D
Hazardous Materials Summary for West End Property

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Appendix D

Hazardous Material Summary of the West End Property

This appendix presents a more detailed description of previous investigations and remediations at nine locations within the West End Property that are summarized in Section 3.7, Hazards and Hazardous Materials. The location of each area discussed is shown on Figure 3.7-1 in Section 3.7.

Building 1070 Yard

In 2004, benzo(a)pyrene was detected at 0.51 milligram per kilogram (mg/kg) in a soil sample from the northeast corner of a fenced compound east of Building 1070 (Geologica, 2007a). The Preliminary Remediation Goal for benzo(a)pyrene is 0.21 mg/kg. In two locations of the Building 1070 yard, lead was detected at concentrations of 1,320 mg/kg and 4,730 mg/kg at depths of 5 and 9 feet, in excess of the Preliminary Remediation Goal of 800 mg/kg. The manganese concentration in the soil sample with the greatest lead concentration was 32,500 mg/kg, in excess of the Preliminary Remediation Goal of 19,458 mg/kg. Additional sampling conducted in 2005 characterized the extent of soils containing lead at concentrations greater than the Preliminary Remediation Goal, and excavation was conducted in 2005 to remove these soils from both locations. At the completion of excavation, lead concentrations of up to 2,490 mg/kg and 1,770 mg/kg remained at both locations. Additional soil sampling conducted in 2006 to evaluate the extent of lead in the soil detected lead at concentrations of up to 38,600 and 84,300 mg/kg at each location. All of the lead detections that were greater than the Preliminary Remediation Goal were at a depth of greater than two feet, and many were at a depth of greater than four feet. Additional soil sampling in 2007 confirmed the extent of soil affected by lead at this site (Geologica, 2007b).

The remedial action for this site included construction of a 55,000-square-foot engineered asphalt cap over lead affected soil on June 21, 2007 to prevent human contact with the soil remaining in place and infiltration of rain water (Geologica, 2007b). Construction of the cap involved the excavation of up to six inches of existing pavement and surficial soil, grading and compaction of the subsurface soil to provide a foundation for the cap, and placement of a 6-inch thick layer of asphaltic concrete. The surface of the cap is sloped to divert runoff to a stormwater collection system. An additional 8,000-square-foot area is paved with a 3-inch-thick layer of asphalt to promote stormwater drainage from the northeastern part of the engineered cap. The capped area is demarcated with a 3-inch-wide traffic-grade yellow warning stripe around the perimeter, and posted with signs warning against cap intrusion.

Some of the gravel excavated for construction of the cap was reused as fill on the east side of the cap area because none of the metals concentrations in the excavated gravel materials exceeded Preliminary Remediation Goals or hazardous waste criteria. Approximately 325 cubic yards of gravelly soil excavated for construction of the cap was characterized as a California hazardous waste based on soluble lead concentrations of up to 32.4 milligram per liter (mg/L), and was disposed of at the Chemical Waste Management Class I landfill in Kettlemen City, California (see Section 3.7.2.2, State Policies and Regulations for a description of hazardous waste classification criteria).

Although elevated lead levels have not been identified in the groundwater, implementation of this remedial action includes monitoring of seven groundwater monitoring wells around the perimeter of the cap to evaluate whether there are changes in groundwater quality that would necessitate treatment or removal of the capped soil or containment of the groundwater. The required groundwater monitoring is specified in the operation and maintenance plan for the site, described below.

Former Vehicle Wash Rack, Building 1073

The Building 1073 vehicle wash rack was formerly used to wash vehicles and engine components and may have been used for repainting vehicles. When the wash rack was in use, it consisted of a concrete pad on which vehicles were washed, with wash water drained to an oil/water separator.

Soil Quality. Soil samples collected from the vicinity of the oil/water separator in 1998 contained tetrachloroethylene at concentrations of 67,000 and 13,000 microgram per kilogram (µg/kg), in excess of the Preliminary Remediation Goal of 1,300 µg/kg (Geologica, 2007a). Lead was also detected at a concentration of 4,900 mg/kg in a soil sample from this location. Additional soil sampling conducted in 1999 and 2001 detected total petroleum hydrocarbons as gasoline at concentrations of up to 3,000 mg/kg, in excess of the Environmental Screening Level of 400 mg/kg. Total petroleum hydrocarbons as diesel and motor oil were detected at concentrations of up to 930 and 2,400 mg/kg, in excess of their Environmental Screening Levels of 500 and 1,000 mg/kg, respectively. The maximum tetrachloroethylene concentration detected in the soil during this investigation was 560,000 µg/kg and trichloroethylene was detected at a maximum of 20,000 µg/kg, in excess of the Preliminary Remediation Goal of 6,500 µg/kg. Benzo(a)pyrene was detected at a maximum concentration of 1,900 µg/kg, in excess of the Preliminary Remediation Goal of 210 µg/kg, and dibenzo(a,h)anthracene was detected at a maximum concentration of 1,100 µg/kg, in excess of the Preliminary Remediation Goal of 210 µg/kg.

Groundwater Quality. Grab groundwater sampling in 1998 and 2001 detected total petroleum hydrocarbons as gasoline at a maximum concentration of 1,090 microgram per liter (µg/L), total petroleum hydrocarbons as diesel at a maximum concentration of 1,400 µg/L, and total petroleum hydrocarbons as motor oil at a maximum concentration of 1,400 µg/L (Geologica, 2007a). Vinyl chloride was detected at a maximum concentration of 2,230 µg/L, in excess of the Environmental Screening Level of 3.8 µg/L; trichloroethene at a maximum concentration of 919 µg/L, in excess of the Environmental Screening Level of 360 µg/L; and tetrachloroethylene at a maximum concentration of 1,420 µg/L, in excess of the Environmental Screening Level of 120 µg/L. Benzo(b)fluoranthene was detected at a maximum concentration of 0.097 µg/L, in excess of the Environmental Screening Level of 0.029 µg/L, and indeno(1,2,3-cd)pyrene was detected at a maximum concentration of 0.057 µg/L, in excess of the Environmental Screening Level of 0.029 µg/L. Total petroleum hydrocarbons as diesel and motor oil were each detected at a maximum concentration of 1.4 mg/L, in excess of the RWQCB Environmental Screening Level of 0.64 mg/L. The concentrations of several metals detected in the groundwater also exceeded their Environmental Screening Levels, including antimony, arsenic, barium, chromium, cobalt, copper, lead, mercury, nickel, selenium, vanadium, and zinc.

To further evaluate groundwater quality at the former wash rack, six groundwater monitoring wells were installed in 2004. Constituents detected in the groundwater samples at concentrations greater than Environmental Screening Levels include vinyl chloride detected at 50 µg/L, in excess of the Environmental Screening Level of 3.8 µg/L; diethyl phthalate detected at a maximum concentration of 3.3 µg/L, in excess of the Environmental Screening Level of 1.5 µg/L; and the metals copper, lead, mercury, nickel, vanadium, and zinc. When these wells were monitored again in July 2004 and January 2005, only the concentrations of vinyl chloride, copper, lead, mercury, nickel, vanadium, and silver exceeded Environmental Screening Levels.

Soil Vapor Quality. Soil vapor sampling in 1998 detected tetrachloroethylene at a maximum concentration of 149,000 microgram per cubic meter (µg/m$^{3)}$, in excess of the Environmental Screening Level of 1,400 µg/m^3; trichloroethene at a maximum concentration of 15,000 µg/m^3, in excess of the Environmental Screening Level of 4,100 µg/m^3; and vinyl chloride in one soil vapor sample at a concentration of 2,300 µg/m^3, in excess of the Environmental Screening Level of 110 µg/m^3 (Geologica, 2007a). During subsequent soil vapor sampling in 2004, only tetrachloroethylene was detected above the Environmental Screening Level. The maximum concentration was 3,400 µg/m^3, in excess of the

Environmental Screening Level of 1,400 µg/m^3. Further analysis concluded that the volatile organic compounds detected in the soil vapor samples were unlikely to pose significant risk to future site workers.

Remedial Actions. The concrete pad, oil/water separator, associated piping, and approximately 900 cubic yards of adjacent soil were removed from this site and transported off site for proper disposal in May 2003 (Geologica, 2007a). However, following removal a small area of the remaining soil contained tetrachloroethylene at 2,500 µg/kg, greater than the Preliminary Remediation Goal of 1,300 µg/kg.

Building 1064 Parking Lot

cPAH concentrations exceeded the benzo(a)pyrene toxic equivalent cleanup level of 1 mg/kg in samples from three locations (Geologica, 2007a). The concentrations ranged from 1.3 to 8.2 mg/kg. cPAH concentrations exceeding a benzo(a)pyrene toxic equivalent of 1 mg/kg extended to a depth of at least 6 feet.

Additional sampling was conducted in 2005 to characterize the extent of soil containing cPAHs at concentrations greater than the benzo(a)pyrene toxic equivalent cleanup level of 1 mg/kg. This sampling identified substantially lower cPAH concentrations in the vicinity of one location, indicating that the previously identified level of cPAHs was not indicative of bulk soil conditions and no further soil sampling or excavation was conducted at this location. Soil containing cPAHs was removed from a second location in 2005; although benzo(a)pyrene was detected in soil from the excavated pit at concentrations of up to 1,100 µg/kg, in excess of the Preliminary Remediation Goal of 210 µg/kg, no further sampling or excavation was conducted at this site.

At the third location, referred to as PV-18, benzo(a)pyrene was detected at concentrations up to 2,700 µg/kg, greater than the Preliminary Remediation Goal of 210 µg/kg in the excavated pit in 2005. Additional soil sampling conducted in 2006 to evaluate the extent of cPAHs in the soil detected cPAH concentrations of up to a benzo(a)pyrene toxic equivalent concentration of 14.45 mg/kg. The remedial action for this site included removal of approximately 600 cubic yards of cPAH affected soil from a 50 foot by 100 foot excavation area to a depth of 5 to 5.5 feet in May 2007 (Geologica, 2007b). At the completion of excavation, cPAH concentrations in the excavation bottom and sidewalls ranged from a benzo(a)pyrene equivalent of 0.2 to 7.7 mg/k, many of which exceeded the cleanup level of 1 mg/kg. However, further excavation to the west was limited by the presence of a storm drain pipe that would have required extensive bracing or repair to prevent/mitigate damage from the excavation, and excavation to a greater depth in the northern portion of the excavation was impractical because groundwater was encountered at a depth of approximately 5 feet and additional excavation would have required construction dewatering and shoring. Because further excavation was impractical, the excavation was backfilled with clean fill material and the DTSC agreed to the implementation of institutional controls for the protection of human health and the environment. The institutional controls are specified in the deed restriction and the operation and maintenance plan for the site, described below. The excavated soil was disposed of at the Altamont Landfill in Livermore, California, as a non-hazardous waste.

Total petroleum hydrocarbons as motor oil were detected at concentrations greater than the 1,000 mg/kg in two soil samples from a depth of 5 feet (Geologica, 2008a). The detected concentration was 1,200 mg/kg in each sample. No further action was required regarding these detections.

Building 1064 Transformers

Soil samples collected from beneath the former location of pole mounted transformers behind Building 1064 in 1998 contained total petroleum hydrocarbons as diesel at concentrations of 720 and 510 mg/kg, which is above the Environmental Screening Level of 500 mg/kg. Lead was also detected at a maximum concentration of 2,300 mg/kg during this sampling event, above the Preliminary Remediation Goal of 800 mg/kg (Geologica, 2007a). In 2004, lead was detected at 1,400 mg/kg in a soil sample from a depth of four feet. Additional sampling conducted in 2005 characterized the extent of soil lead at concentrations greater than the screening level of 800 mg/kg, and soil containing petroleum hydrocarbons and lead above

screening levels was removed from this site and transported off site for proper disposal in November 2005.

Safety Patrol Shack

The Safety Patrol Shed, located near the southern property boundary, is painted with lead-based paint that is flaking off of the structure (Geologica, 2007a). Lead was detected at 3,250 mg/kg in a soil sample from immediately south of the Safety Patrol Shack in 2004. Soils containing greater than 800 mg/kg of lead were removed from this site in 2005.

Hazardous Materials Storage Area

cPAH concentrations exceeded the benzo(a)pyrene toxic equivalent cleanup level of 1 mg/kg in one soil sample from a depth of one foot in 2004; the concentration was 2.2 mg/kg. Additional sampling conducted to evaluate the extent of cPAHs identified in the soil revealed substantially lower cPAH concentrations, indicating that the previously identified level of cPAHs was not indicative of bulk soil conditions. Several PAHs, including benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, and indeno(1,2,3-cd)pyrlene, were detected at concentrations greater than their Environmental Screening Levels in 2004 in grab groundwater samples from two soil borings at the hazardous materials storage area. No additional soil sampling or excavation were conducted at this location.

Waste Oil Removal Action

A waste oil underground storage tank (UST) and affected soil were removed from the Building 1070 yard in 1995 (Geologica, 2007a). Approximately 60 cubic yards of soil were excavated when the UST was removed, and disposed of as a hazardous waste in a permitted landfill. The Alameda County Department of Environmental Health provided oversight for the UST removal and required no further action at this site.

Groundwater Monitoring Network

In total, 16 groundwater monitoring wells have been installed for the evaluation of groundwater quality at the West End property, a number of which have been abandoned because they are no longer needed. These wells include:

- Monitoring Wells MW-1 through MW-6 installed at the Building 1070 Yard in 2004 (Geologica, 2007a);
- Monitoring Wells EMW-1 through EMW-6 installed around the property perimeter in 2004 (Geologica, 2007a); and
- Monitoring Wells FMW-1 through FMW-4 installed in 2007 to enhance the groundwater monitoring well network at the Building 1070 Yard (Geologica 2008).

Monitoring Wells MW-1 through MW-4 were abandoned in accordance with California Department of Water Resources well closure guidelines in 2007 because wells MW-1 and MW-2 were located within the area that was capped at the former wash rack and wells MW-3 and MW-4 would not be needed for future groundwater monitoring activities (Geologica, 2007b).

Monitoring Wells EMW-1 through EMW-3, EMW-5, and EMW-6 were abandoned in accordance with California Department of Water Resources well closure guidelines in 2007 because they are no longer needed. **[EBMUD: Do you have a report documenting the abandonment of these wells? Abandonment is identified as planned in the Remedy Completion Report dated June, 2007, and the operation and maintenance plan dated September 8, 2008 indicates that they had been abandoned at the time the plan was prepared.]**

As of 2009, the existing monitoring well network consists of seven monitoring wells (MW-5, MW-6, FMW-1 through FMW-4, and EMW-4) located at the Building 1070 Yard.

References

Geologica, 2007a. Final Remedial Investigation/Feasibility Study Report, Heroic War Dead United States Army Reserve Center Oakland, Oakland, California. May.

Geologica, 2007b. Remedy Completion Report, Heroic War Dead United States Army Reserve Center, Oakland, California. June.

Geologica, 2008. 2007 Annual Monitoring and Compliance Report East Bay Municipal Utility District West End Property Site Code: 201764 (Former Historic War Dead United States Army Reserve Center), 2400 Engineers Road, Oakland, California. March.

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Appendix E Mitigation Monitoring and Reporting Program

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EAST BAY MUNICIPAL UTILITY DISTRICT LAND USE MASTER PLAN ENVIRONMENTAL IMPACT REPORT
MITIGATION MONITORING AND REPORTING PROGRAM

Impact No.	Impact Summary	Mitigation No.	Mitigation Measure (Exact Text)	Monitoring and Reporting Program			
				Implementation and Reporting		Monitoring and Reporting Actions	Implementation Schedule - Design (D) - Pre-Construction (PC) - During Construction (C) - Operational (O)
				Responsible Party	Reviewing & Approval Party		
3.2 AESTHETICS							
AES-2	Alter Existing Visual Character and Views in the Study Area	AES-2a	**Mitigation Measure AES-2a: Maintenance of Construction Worksite** Throughout the period of demolition and construction, EBMUD will require that the construction contractor keep the worksite free and clean of all rubbish and debris and promptly remove from the site or from property adjacent to the site of the work, all unused and rejected materials, surplus earth, concrete, plaster, and debris.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Verify that worksite is kept free and clean of all rubbish and debris.	1. D 2. C
		AES-2b	**Mitigation Measure AES-2b: Design of Facilities to Be Aesthetically Consistent with Existing Visual Character** EBMUD would require all new facilities be, at a minimum, designed to be aesthetically consistent with existing visual character and surrounding wastewater treatment buildings. Design, exterior finishes, and color would blend with the surrounding facilities.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that design is consistent with measure.	1. D
AES-3	New Source of Substantial light or Glare	AES-3	**Mitigation Measure AES-3: Lighting Design and Low Reflective Paint** EBMUD would require that lighting be consistent with existing lighting in terms of height, spacing and design. New lighting would be shielded and directed to the interior of the project site. New structures and buildings would be painted in low reflective paint consistent with existing structures at the MWWTP.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is incorporated in specifications for the project 2. Confirm that lighting is installed as required by specifications	1. D 2. C.
3.3 AIR QUALITY							
AIR-1	Construction Emissions of Criteria Pollutants and Precursors	AIR-1	**Mitigation Measure AIR-1: Criteria Air Pollutant and Precursor Reduction Measures** To limit dust, criteria pollutant, and precursor emissions associated with construction of all Land Use Master Plan projects, EBMUD shall include the following measures, as applicable, in contract specifications: a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. b. All haul trucks transporting soil, sand, or other loose material off site shall be covered. c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. d. All vehicle speeds on unpaved areas shall be limited to 15 miles per hour. e. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]).	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. EBMUD inspector to verify that dust control measures are implemented during construction	1. D 2. C

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			Clear signage shall be provided for construction workers at all access points. g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. h. A publicly visible sign with the telephone number and person to contact at the Lead Agency regarding complaints related to excessive dust or vehicle idling shall be posted at the MWWTP entrance. This person shall respond and take corrective action within 48 hours.				
AIR-5	Local Community Risks and Hazards During Project Operation	AIR-5	**Mitigation Measure AIR-5: Diesel Particulate Reduction Measures** Diesel-powered on-site rolling stock (2 loaders, excavator, and 2 end dump trucks) associated with the food waste preprocessing facility and any other diesel equipment or trucks operating solely within the MWWTP and West End property under the control of EBMUD shall install a CARB-verified Level 3 Diesel Particulate Filter to reduce PM2.5 emissions to achieve a minimum reduction of 50 percent (sufficient to reduce combined emissions to below the BAAQMD CEQA excess cancer risk threshold of 10 in a million). Alternative options for achieving this reduction can also be implemented, including the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as such become available.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the plans for the project. 2. EBMUD to verify food waste preprocessing diesel equipment uses diesel particulate filters or other appropriate measures to reduce DPM emissions	1. D 2. O
AIR-6	Odor Emissions During Project Operation	AIR-6a	**Mitigation Measure AIR-6a: Odor Controls in Food Waste Preprocessing Facility** EBMUD shall include the following measures in contract specifications: • Roof vents on the proposed building or point sources should be designed to accommodate odor controls in the event that odor problems occur in the future and controls are ultimately needed. • All food waste shall be processed within 48 hours of receipt or protocols shall be implemented to minimize nuisance odor problems and ensure compliance with applicable BAAQMD air permit requirements.	EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the plans for the project. 2. EBMUD to verify food waste preprocessing minimizes nuisance odor problems.	1. D 2. O
		AIR-6b	**Mitigation Measure AIR-6b: Odor Controls on Other Land Use Master Plan Elements** All short- and long-term Land Use Master Plan projects shall be reviewed for odor potential during the design phase. Operational and design odor control measures shall be incorporated into the project to minimize off-site odor impacts and ensure compliance with BAAQMD air permit fenceline monitoring limits. Odor controls that could be implemented where appropriate include: activated carbon filter/carbon adsorption, biofiltration/bio trickling filters, fine bubble aerator, hooded enclosures, wet and dry scrubbers, caustic and hypochlorite chemical scrubbers, ammonia scrubber, energy efficient blower system, thermal oxidizer, capping/covering storage basins and anaerobic ponds, mixed flow exhaust, wastewater circulation technology, and exhaust stack and vent location with respect to receptors.	EBMUD (MP)	EBMUD	1. Confirm that measure is in the design plans for the project.	1. D

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3.4 BIOLOGICAL RESOURCES							
BIO-1	Potential to Interfere with Wildlife Movement or Impede the Use of Native Wildlife Nursery Sites	BIO-1	**Mitigation Measure BIO-1: Protection of Nesting Birds** To the extent practicable, project construction activities including tree removal/pruning and demolition will occur outside of the generally accepted nesting season (February 1 to August 31). If tree removal cannot be completed between September 1 and January 31, and it is not feasible to avoid starting construction during the nesting season, then the following measures will be taken: a) No more than two weeks before the initiation of construction/demolition activities that would commence between February 1 and August 31, a nesting bird survey will be conducted within 250 feet of the project site by a qualified biologist. If active nests are observed, buffer zones will be established around the nests, with a size acceptable to the California Department of Fish and Game. Construction activities will not occur within buffer zones until young have fledged or the nest is otherwise abandoned. b) If construction/demolition is halted for more than two weeks during the nesting season, then additional surveys will be conducted as above. c) Nests that are established during construction/demolition will be protected from direct project impact (e.g., trees or a buffer area around the nests shall be flagged and avoided).	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Confirm that trees are removed or surveys performed before nesting season. 3. Confirm bird protection is implemented as needed during construction	1. D 2. PC 3. C
BIO-2	Potential for Conflict with Local Policies or Ordinances Protecting Biological Resources, Such as Tree Preservation Policy or Ordinance	BIO 2	**Mitigation Measure BIO-2: Replacement of Protected Trees** EBMUD will replace each tree that is removed for this project and that is considered a "protected tree" under the City of Oakland Tree Preservation and Removal Ordinance. The replacement tree (e.g., 5-gallon size) will be planted on site in a suitable location at the MWWTP/West End property.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Confirm that trees have been replaced	1. D 2. DC

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3.5 CULTURAL RESOURCES							
CUL-1	Potential to Cause a Substantial Adverse Change in the Significance of a Unique Archaeological Resource	CUL-1	**Mitigation Measure CUL-1: Recovery of Buried Cultural Resources** If previously unidentified cultural materials are unearthed during construction, EBMUD will halt work in that area until a qualified archaeologist can assess the significance of the find. Prehistoric materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. If any find is determined to be significant, EBMUD and the archaeologist will determine the appropriate avoidance measures or other appropriate mitigation. All significant cultural materials recovered will be, as necessary and at the discretion of the consulting archaeologist, subject to scientific analysis, professional museum curation, and documentation according to current professional standards. In considering any suggested measures proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, EBMUD will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the project while mitigation for historical resources or unique archaeological resources is being carried out.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Confirm that any cultural resources uncovered during construction are treated in accordance with recommendation from a consulting archaeologist	1. D 2. C
CUL-2	Potential to Cause a Substantial Adverse Change in the Significance of a Paleontological Resource	CUL-2	**Mitigation Measure CUL-2: Recovery of Buried Paleontological Resources** In the event that paleontological resources are discovered, EBMUD will notify a qualified paleontologist. The paleontologist will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines § 15064.5. If a breas[1] or other fossil is discovered during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If EBMUD determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important. The plan will be submitted to EBMUD for review and approval prior to implementation.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Confirm that any paleontological resources uncovered during construction are treated in accordance with recommendation from a consulting paleontologist	1. D 2. C

[1] A seep of natural petroleum that has trapped extinct animals, thus preserving and fossilizing their remains.

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CUL-3	Potential to Disturb Human Remains	CUL-3	**Mitigation Measure CUL-3: Recovery of Discovered Human Remains** In the event human burials are encountered, EBMUD will halt work in the vicinity and notify the Alameda County Coroner and contact an archaeologist to evaluate the find. If human remains are of Native American origin, the Coroner will notify the Native American Heritage Commission (NAHC) within 24 hours of this identification. The NAHC will then identify the person(s) thought to be the Most Likely Descendent of the deceased Native American, who would then help determine what course of action should be taken in dealing with the remains.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Confirm that any burials uncovered during construction are treated in accordance with recommendation from a consulting archaeologist with appropriate notifications	1. D 2. C
3.7 GEOLOGY							
GEO-1	Facility Damage and Exposure of People to Hazards From Strong Seismic Groundshaking	GEO-1	**Mitigation Measure GEO-1: Perform Design-Level Geotechnical Evaluations for Seismic Hazards** During the design phase for all other Land Use Master Plan elements that require ground-breaking activities, EBMUD will perform site-specific, design-level geotechnical evaluations to identify potential secondary ground failure hazards (i.e., seismically-induced settlement) associated with the expected level of seismic ground shaking. For specific Land Use Master Plan element sites within the MWWTP that have previously been subject to a geotechnical investigation, a geotechnical memorandum shall be prepared to update the previous investigation. The geotechnical analysis will provide recommendations to mitigate those hazards in the final design and, if necessary, during construction The design-level geotechnical evaluations, based on the site conditions, location, and professional opinion of the geotechnical engineer, may include subsurface drilling, soil testing, and analysis of site seismic response as needed. The geotechnical engineer will review the seismic design criteria of facilities to ensure that facilities are designed to withstand the highest expected peak acceleration, set forth by the CBC for each site. Recommendations resulting from findings of the geotechnical study will be incorporated into the design and construction of proposed facilities. Design and construction for buildings will be performed in accordance with EBMUD's seismic design standards, which meet and/or exceed applicable design standards of the International Building Code.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that geotechnical studies have been conducted as needed. 2. Confirm that any recommendations from geotechnical study are included in plans and specifications. 3. Confirm that construction is conducted in accordance with specifications.	1. D 2. D 3. C
GEO-2	Facility Damage and Exposure of People to Hazards from Liquefaction and Lateral Spreading	GEO-2	**Mitigation Measure GEO-2: Perform Design-Level Geotechnical Evaluations for Liquefaction and Other Geologic Hazards** During the design phase for all other Land Use Master Plan elements that require ground-breaking activities, EBMUD will perform site-specific design-level geotechnical evaluations to identify geologic hazards and provide recommendations to mitigate those hazards in the final design and during construction. For specific Land Use Master Plan element sites within the MWWTP that have previously been subject to a geotechnical investigation, a geotechnical memorandum shall be prepared to update the previous investigation. The design-level geotechnical evaluations will include the collection of subsurface data for determining liquefaction potential, and appropriate feasible measures will be developed and incorporated into the project design. The performance standard to be used in the geotechnical	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that geotechnical studies have been conducted as needed. 2. Confirm that any recommendations from geotechnical study are included in plans and specifications. 3. Confirm that construction is conducted in accordance with specifications.	1. D 2. D 3. C

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			evaluations for mitigating liquefaction hazards will be minimization of the hazards. Measures to minimize significant liquefaction hazards could include the following, unless the site-specific soils analyses dictate otherwise: • Densification or dewatering of surface or subsurface soils; • Construction of pile or pier foundations to support pipelines and/or buildings; and • Removal of material that could undergo liquefaction in the event of an earthquake, and replacement with stable material. • If soil needs to be imported, EBMUD would require that the contractor ensure that such imported soil complies with specifications that define the minimum geotechnical properties and analytical quality characteristics that must be met for use of fill material from off-site borrow sources.				
3.8 GREENHOUSE GAS EMISSSIONS							
GHG-1	Greenhouse Gas Construction Emissions	GHG-1	**Mitigation Measure GHG-1: GHG Reduction Measures** EBMUD shall implement BAAQMD-recommended Best Management Practices (BMPs) for GHG emissions where feasible, which include the following: • At least 15 percent of the fleet should be alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment. • At least 10 percent of building materials should be from local sources. • At least 50 percent of construction waste or demolition materials should be recycled or reused. See also **Mitigation Measure AIR-1: Criteria Air Pollutant and Precursor Reduction Measures** above.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Construction contractor to verify that BMPs are implemented.	1. D 2. C
GHG-2	Greenhouse Gas Operational Emissions	GHG-2a	**Mitigation Measure GHG-2a: Energy Efficiency Measures** Measures GHG 2a and 2b apply to the other Land Use Master Plan elements, as applicable, to reduce overall GHG emissions. Direct and indirect GHG emissions shall be estimated based on the final project design, and energy efficiency measures shall be incorporated into the project as necessary to meet the BAAQMD GHG significance threshold in effect at the time of project implementation.	EBMUD (MP)	EBMUD	1. Confirm that emissions are estimated and efficiency measures are incorporated.	1. D
		GHG-2b	**Mitigation Measure GHG-2b: Water Conservation Measures for Land Use Master Plan Projects** Non-potable water shall be used wherever feasible for equipment and area wash down to minimize GHG emissions associated with increased water demand.	EBMUD (MP)	EBMUD	1. Confirm that non-potable water is used wherever feasible.	1. O

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3.9 HAZARDS AND HAZARDOUS MATERIALS							
HAZ-3	Hazards to Public Health and the Environment due to a Release of Hazardous Building Materials Present in the Buildings that Would be Demolished	HAZ-3	**Mitigation Measure HAZ-3: Hazardous Building Materials Surveys and Abatement** For any building not already surveyed for lead, a registered environmental assessor or a registered engineer would perform a lead-based paint survey for the structure prior to reuse or demolition. Adequate abatement practices for lead-containing materials, such as containment and/or removal, would be implemented prior to reuse or demolition of each structure that includes lead-containing materials or lead-based paint. For demolition, any PCB- or DEHP-containing equipment or fluorescent lights containing mercury vapors would also be removed and disposed of properly. If removal of a transformer is required, EBMUD or the owner/operator would retain a qualified professional to determine the PCB content of the transformer oil. For removal, the transformer oil would be pumped out with a pump truck and appropriately recycled or disposed of off site. The drained transformer would be reused or disposed of in accordance with applicable regulations.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that hazardous materials surveys have been conducted as needed. 2. Confirm that any recommendations from survey are included in plans and specifications. 3. Confirm that materials are disposed of appropriately	1. D 2. D 3. C
3.10 HYDROLOGY - WATER QUALITY							
HYD-3	Alteration of the Existing Drainage Pattern in a Manner Which Would Result in Flooding	HYD-3	**Mitigation Measure HYD-3: Prepare and Implement a Comprehensive Drainage Plan** Prior to expanding the stormwater collection system to treat runoff from the West End property, EBMUD shall prepare and implement a Comprehensive Drainage Plan for the Land Use Master Plan that incorporates measures to ensure that the storm drain system and treatment capacity are not exceeded during peak conditions. The drainage plan shall define operational controls necessary to prevent flooding of the MWWTP headworks and/or release of surface runoff off site.	EBMUD	EBMUD	1. Confirm that Comprehensive Drainage Plan has been prepared. 2. Confirm that any recommendations from plan are included in plans and specifications. 3. Confirm that necessary improvements are constructed	1. D 2. D 3. C
HYD-5	Inundation Due to a Catastrophic Tsunami or Seiche	HYD-5	**Mitigation Measure HYD-5: Prepare and Implement a Tsunami Response Plan** EBMUD shall prepare and implement a Tsunami Response Plan for the MWWTP site that defines emergency response and coordination procedures. The Tsunami Response Plan shall contain information specific to actions that may be necessary related to receipt of a tsunami watch, warning, or as a result of an actual tsunami along the San Francisco Bay. The first priority of emergency management response shall be the protection of life and property.	EBMUD	EBMUD	1. Confirm that Tsunami Response Plan for the MWWTP site has been prepared and implemented	1. O

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				Responsible Party	Reviewing & Approval Party		
3.12 NOISE							
NOI-1	Disturbance from Temporary, Construction-Related Noise Increases in Excess of Noise Ordinance	NOI-1	**Mitigation Measure NOI-1: Implement Noise Controls** EBMUD's Construction Specifications (013544-3.4) require compliance with local noise ordinances, and measures that shall be employed to meet applicable City of Oakland Noise Ordinance noise limits include the following: • Pile driving activities and operation of other types of impact equipment such as jackhammers should be limited to the daytime hours (7 a.m. to 7 p.m. on weekdays); • If impact pile drivers must be used near the eastern MWWTP boundary, they should not be operated for longer than 10 days to the extent feasible. If pile driving must occur for longer than 10 days near this boundary, sonic or vibratory pile drivers should be used if feasible; • "Quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration) should be employed where feasible (where geotechnical and structural requirements allow); • Pile driving activities with all construction projects at the MWWTP should be coordinated to ensure that these activities do not overlap; • Best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks as necessary; and • If any construction activities must occur during the nighttime hours (7 p.m. to 7 a.m. on weekdays, 8 p.m. to 9 a.m. on weekends), operation of noisier types of equipment should be prohibited as necessary to meet ordinance noise limits.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Construction contractor to verify that construction activities comply with specifications.	1. D 2. C
NOI-2	Temporary Disturbance due to Construction-Related Vibration	NOI-2	**Mitigation Measure NOI-2: Implement Vibration Controls** To ensure that adjacent freeway structures and future commercial structures to the south are not subject to cosmetic damage, EBMUD shall ensure that any future pile driving activities associated with Master Plan projects do not exceed the 0.2 in/sec PPV threshold at these structures. Measures that could be employed to meet this performance standard include using sonic or vibratory pile drivers where feasible or pre-drilling pile holes.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for projects. 2. Construction contractor to verify that construction activities comply with specifications.	1. D 2. C
NOI-3	Increases in Ambient Noise Levels due to Operational Noise and Vibration	NOI-3	**Mitigation Measure NOI-3: Employ Noise Controls for Stationary Equipment** EBMUD shall use best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) as necessary on stationary equipment associated with all Master Plan projects in order to comply with applicable City of Oakland Noise Ordinance noise limits, adjusted to reflect ambient noise levels occurring at the time of project implementation (under 2010 conditions, the nighttime noise limit is 54 dBA [Leq] at receiving residential uses to the east and 73 dBA [Leq] at future receiving commercial uses to the south).	EBMUD (MP)	EBMUD	1. Confirm that measure is in the design plans for projects. 2. Confirm best available noise control techniques are used on stationary equipment.	1. D 2. C

EAST BAY MUNICIPAL UTILITY DISTRICT LAND USE MASTER PLAN ENVIRONMENTAL IMPACT REPORT
MITIGATION MONITORING AND REPORTING PROGRAM

Impact No.	Impact Summary	Mitigation No.	Mitigation Measure (Exact Text)	Monitoring and Reporting Program			
				Implementation and Reporting		Monitoring and Reporting Actions	Implementation Schedule - Design (D) - Pre-Construction (PC) - During Construction (C) - Operational (O)
				Responsible Party	Reviewing & Approval Party		
3.14 TRANSPORTATION							
TRA-1	Temporary Construction-Related Increase in Traffic	TRA-1	**Measure TRA-1: Construction Traffic Management Plan** EBMUD would implement the following measures during project construction at the local intersections outside the MWWTP property: EBMUD and the construction contractor would coordinate with the appropriate City of Oakland agencies to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion during construction of this project and other nearby projects that could be simultaneously under construction. EBMUD would develop a construction management plan for submittal to the Planning and Zoning Division, the Building Services Division, and the Transportation Services Division. The plan would include at least the following items and requirements: a. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours and designated construction access routes; b. Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries would occur; and c. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Construction contractor to verify compliance with comprehensive traffic control measures.	1. D 2. C
TRA-7	Safety Hazards Due to Conflicts with Rail Transport	TRA-7a	**Measure TRA-7a: Railroad Crossing Safety for New Rail Spur** EBMUD shall install pavement markings and warning signs along Engineers Road where the new rail spur would cross to enter the internal driveway for the biodiesel production facility. Pavement markings and warning signs shall conform to standards set forth in the *California Manual on Uniform Transportation Devices* (Caltrans 2010).	EBMUD (MP) EBMUD/BD Owner (BD)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Confirm that markings and signs have been installed.	1. D 2. C
		TRA-7b	**Measure TRA-7b: Coordination with Burlington Northern Santa Fe (BNSF)** EBMUD and its rail contractor(s) shall work with BNSF during the design phase to obtain the necessary permits and construction approvals for the rail spur and connection with the existing BNSF rail line.	EBMUD (MP) EBMUD/BD Owner (BD)	EBMUD	1. Confirm proper BSNF permits and construction approvals are obtained.	1. D
3.15 UTILITIES							
UTIL-1	Exceed Wastewater Treatment Requirements of the San Francisco Bay Regional Water Quality Control Board		See **Mitigation Measure HYD-3: Prepare and Implement a Comprehensive Drainage Plan** above.				
UTIL-3	Require Construction of New Stormwater Drainage Facilities or Expansion of Existing Facilities		See **Mitigation Measure HYD-3: Prepare and Implement a Comprehensive Drainage Plan** above.				

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MITIGATION MONITORING AND REPORTING PROGRAM

Impact No.	Impact Summary	Mitigation No.	Mitigation Measure (Exact Text)	Monitoring and Reporting Program			
				Implementation and Reporting		Monitoring and Reporting Actions	Implementation Schedule - Design (D) - Pre-Construction (PC) - During Construction (C) - Operational (O)
				Responsible Party	Reviewing & Approval Party		
UTIL-6	Temporary Disruption of Utilities or Services Due to Construction-Related Activities	UTIL-6	**Mitigation Measure UTIL-6 Coordinate Relocation and Interruptions of Service with Utility Providers During Construction** The construction contractor will be required to verify the nature and location of underground utilities before the start of any construction that would require excavation. The contractor will be required to notify and coordinate with public and private utility providers at least 48 hours before the commencement of work adjacent to any utility. The contractor will be required to notify the service provider in advance of service interruptions to allow the service provider sufficient time to notify customers. The contractor will be required to coordinate timing of interruptions with the service providers to minimize the frequency and duration of interruptions.	EBMUD (MP) EBMUD/BD Owner (BD) EBMUD/FW Owner (FW)	EBMUD	1. Confirm that measure is in the construction specifications for the project. 2. Construction contractor to verify coordination with public and private utility providers to locate and identify underground utilities. 3. Construction contractor to verify coordination with public and private utility providers at least 48 hours before the commencement of work adjacent to any utility.	1. D 2. PC 3. C

Notes: MP – Land Use Master Plan, FW – Food Waste Preprocessing Facility, BD – Biodiesel Facility