SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Revised Addendum to the Final Environmental Impact Report for the Tesoro Los Angeles Refinery Integration and Compliance Project

June 2021

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

PREFACE

This document constitutes the Revised Addendum to the May 2017 Final Environmental Impact Report (EIR) for the Tesoro Los Angeles Refinery Integration and Compliance (LARIC) Project. The original Addendum, dated October 2019, was certified on November 5, 2019. Subsequently the proposed Title V permits were circulated for a 30-day public comment period from November 16, 2019 to December 16, 2019. One comment letter was received on the proposed Title V permits which included questions regarding the worst-case consequence analysis relied on in Section 6.2.2 of the Addendum. The South Coast Air Quality Management District (South Coast AQMD) considered the comments and requested Quest Consultants Inc. (Quest) to provide additional information regarding the Worst-Case Consequence Analysis. This memorandum from Quest, dated July 8, 2020, has been included in the Revised Addendum in new Appendix F. Quest, a firm that specializes in process safety analysis, prepared the Worst-Case Consequence Analysis dated February 10, 2017 which was included in Appendix C of the May 2017 Final EIR along with two additional information memoranda which were included in Attachment H to Appendix G of the May 2017 Final EIR. To respond to the questions in the comment letter, the October 2019 Addendum was revised to include minor modifications to Section 6.2.2 for consistency with the May 2017 Final EIR and to incorporate the July 8, 2020 Quest memorandum into the Revised Addendum as Appendix F. None of the modifications alter any conclusions reached in the May 2017 Final EIR or the October 2019 Addendum. Additions to the text of the Revised Addendum are denoted using double underline. Text that has been eliminated is shown using ~~strikeout~~.

The October 2019 Addendum is the subject of pending litigation. The South Coast AQMD received a declaration from Ms. Julia May on behalf of Communities for a Better Environment dated April 24. 2020 (Declaration), which raises issues related to hydrogen sulfide that are not germane to the October 2019 Addendum. Therefore, the Revised Addendum does not contain revisions addressing the contents of the Declaration. However, pursuant to a stipulation in the pending litigation concerning the October 2019 Addendum, the Declaration and the South Coast AQMD's response to the issues raised in the Declaration have been provided to the Executive Officer for consideration prior to the approval of this Revised Addendum and are included in the South Coast AQMD's file for this project.

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1.0 INTRODUCTION

The Tesoro Refining & Marketing Company LLC (Tesoro) is proposing three modifications to the Los Angeles Refinery Integration and Compliance Project (LARIC Project) that was analyzed in the May 2017 Final LARIC Project Environmental Impact Report (EIR) (May 2017 Final EIR). The LARIC Project was evaluated in the May 2017 Final EIR (State Clearinghouse [SCH] No. 2014091020) (South Coast AQMD, 2017). The LARIC Project was designed to more fully integrate the existing Tesoro Los Angeles Refinery – Wilmington Operations with the existing Carson Operations to become a more efficient operating entity, the Tesoro Los Angeles Refinery (Refinery). The Refinery includes: (1) the Wilmington Operations located at 2101 East Pacific Coast Highway in the Wilmington District of the City of Los Angeles; and (2) the adjacent Carson Operations, which is located at 2350 East 223rd Street in the City of Carson. The Carson Crude Terminal (CCT) is located adjacent to and immediately south of the Carson Operations at 24696 Wilmington Avenue, Carson, California, 90745.

In addition to further Refinery integration, the LARIC Project was designed to comply with the federally-mandated Tier 3 gasoline specifications and with State and local regulations mandating air emission reductions. The analysis in the May 2017 Final EIR for the overall LARIC Project identified reductions of greenhouse gas (GHG) and carbon monoxide (CO) emissions from the Refinery. Further analysis of the LARIC Project identified local benefits in reduced emissions of nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter less than 10 microns in diameter (PM10), and particulate matter less than 2.5 microns in diameter (PM2.5), and regionally neutral air emissions effects because RECLAIM trading credits (RTCs) for NOx and SOx will be retained and Emission Reduction Credits (ERCs) are expected to be generated. The air emissions effects are a result of reconfiguring the combined Refinery complex to enable shutting down the Wilmington Operations Fluidized Catalytic Cracking Unit (FCCU), and improving the gasoline-to-distillate production ratio from the integrated Refinery in order to expeditiously respond and adjust to ongoing changes in market demand for various types of petroleum products. Additionally, heat recovery will be optimized by installing new heat exchangers and modifying specified units to further minimize criteria pollutant and GHG emissions. All new and modified stationary sources with emissions increases will be required to comply with Best Available Control Technology (BACT) requirements in South Coast Air Quality Management District (South Coast AQMD) Rule 1303 - New Source Review Requirements. The May 2017 Final EIR determined the LARIC Project would have significant impacts (see Section 2.0) and feasible mitigation measures were imposed for air quality during construction, traffic during construction, and hazards and hazardous materials during operation.

Tesoro is currently proposing the following modifications: 1) relocate the propane recovery project component from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit; 2) include an increase to the throughput of the Carson Operations Tank 35; and, 3) update the toxic air contaminant (TAC) speciation for the six crude oil storage tanks at the CCT with additional data. The currently proposed modifications are for LARIC Project components that were approved in the May 2017 Final EIR, but have not yet been issued South Coast AQMD permits to construct. Additionally, due to delays, the construction schedule presented in the May 2017 Final EIR needs to be updated. Potential emission changes are evaluated and discussed in this Addendum to the May 2017 Final EIR (Addendum). The proposed modifications will not change the overall conclusions in the May 2017 Final EIR, result in any new significant adverse impacts, or make existing significant adverse environmental impacts substantially worse.

The first proposed modification would relocate propane recovery to the Carson Operations C3 Splitter Unit from the Carson Operations Naphtha Isomerization Unit modification. The approved LARIC Project includes a modification to the Carson Operations Naphtha Isomerization Unit to install additional gas treatment to recover saleable propane, which was evaluated in the May 2017 Final EIR. The currently proposed modification would not install the gas treatment modifications at the Carson Operations Naphtha Isomerization Unit. Instead, the Carson Operations C3 Splitter Unit, which is designed to recover polymer-grade propylene from mixed C3[1] streams, would be modified to include piping modifications and the installation of a heat exchanger to recover saleable propane. The proposed modifications to the Carson Operations C3 Splitter Unit will result in fewer volatile organic compounds (VOC) emissions relative to those analyzed in the May 2017 Final EIR for the approved modifications to the Carson Operations Naphtha Isomerization Unit.

The second proposed modification would increase the maximum permitted throughput of the existing Carson Operations Tank 35 from the current 416,700 barrels per month (bbl/mo) to 1,000,000 bbl/mo, which represents a net increase of 583,300 bbl/mo. The Carson Operations Tank 35 was not originally evaluated in the May 2017 Final EIR. Carson Operations Tank 35 has a capacity of 100,000 barrels and is domed with an external floating roof. Carson Operations Tank 35 is currently permitted to store a variety of materials without explicitly limiting the type of materials that can be stored. The currently proposed modification to the permit would define the materials that can be stored in Carson Operations Tank 35 as wastewater, distillates including jet fuel, and gasoline. The blending of jet fuel to make a finished product occurs at both the Carson and Wilmington Operations. The proposed throughput increase would consolidate most of the jet fuel blending activities to the Carson Operations Tank 35, to improve the efficiency of product blending and product management at the Refinery and to allow for the further integration of the Wilmington and Carson Operations. In addition, the proposed modification will allow the use of the Carson Operations Tank 35 as a back-up tank when other tanks are taken out of service for regular maintenance. The requested increase in throughput to the Carson Operations Tank 35 is necessary because some tanks that are expected to be taken out of service for regular maintenance have greater monthly throughputs than the current throughput limit of Carson Operations Tank 35. Increasing the throughput of Carson Operations Tank 35 will result in changes to VOC and TAC emissions which are evaluated in this Addendum. No changes to the process units that produce jet fuel and gasoline are part of the modifications subject to this Addendum. None of the proposed changes considered in this Addendum would increase Refinery crude oil processing throughput relative to what was previously analyzed in the May 2017 Final EIR.

[1] C3 means compounds that contain three carbon atoms, such as propane and propylene.

The third proposed modification would update the TAC speciation used for analyzing potential health impacts associated with the proposed six crude oil storage tanks at the CCT. The crude oil speciation data available from crude oil providers that was relied upon for the preparation of the May 2017 Final EIR did not provide concentration data for hydrogen sulfide (H_2S) as a potential TAC in crude oil. Since that time, newer analytical data identified differences in concentrations of some TACs, including H_2S concentrations for some crude oils (up to 45 parts per million by weight (ppmw)). Therefore, the speciation for crude oil previously relied upon in the May 2017 Final EIR is proposed to be updated in order to incorporate the most current information and to provide a more comprehensive quantification of the TAC concentrations of the various crude oils expected to be stored in the CCT tanks. No physical or operational changes will result from updating the TAC speciation at the CCT. The revised emission calculations with the updated speciation data are evaluated and presented in this Addendum.

Lastly, updates to the LARIC Project construction schedule are necessary due to the project approval of the LARIC Project EIR occurring in May 2017. The construction schedule analyzed in the May 2017 Final EIR was predicated on the shutdown of the Wilmington Operations FCCU occurring in July 2017. Because the certification of the LARIC Project Final EIR occurred in May 2017 and the initial Permits to Construct were issued in June 2017, the construction necessary to facilitate the shutdown of the Wilmington Operations FCCU could not be accomplished prior to July 2017. Therefore, the shutdown of the Wilmington Operations FCCU was delayed until October 2018. The LARIC Project construction schedule needed to be revised to facilitate the shutdown of the Wilmington Operations FCCU in October 2018 and to realign project component construction with the next scheduled turnaround for the respective units, where applicable.

2.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT AND BASIS FOR DECISION TO PREPARE AN ADDENDUM

South Coast AQMD review and approval of the proposed modifications is a discretionary permitting action that requires review pursuant to the California Environmental Quality Act (CEQA). When the LARIC Project was originally proposed, the South Coast AQMD acted as CEQA Lead Agency because it was the public agency that had principal responsibility for approving the project which had the potential to result in a significant effect on the environment (Public Resources Code §21067). At the time the LARIC Project was proposed, South Coast AQMD staff evaluated the potential environmental impacts associated with the construction and operation of the project components and identified potentially significant adverse impacts in the areas of air quality impacts during construction and significant adverse hazards and hazardous materials impacts during operation. Thus, the South Coast AQMD prepared and certified the Final EIR for the LARIC Project (State Clearinghouse [SCH] No. 2014091020) on May 12, 2017. In addition, mitigation measures were made a condition of project approval and a Mitigation Monitoring and Reporting Plan (MMRP) was adopted for the LARIC Project. Findings were made and a Statement of Overriding Considerations was adopted.

The currently proposed modifications are considered to be modifications to the previously approved LARIC Project that was evaluated in the May 2017 Final EIR and are a “project” as defined by CEQA. CEQA requires evaluation of the potential adverse environmental impacts of proposed projects and identification of feasible method to reduce or avoid identified significant adverse environmental impacts of the~~se~~ project~~s~~.

CEQA Guidelines §15164(a) allows a lead agency to prepare an Addendum to a previously certified EIR if some changes or additions are necessary but none of the following conditions as described in CEQA Guidelines §15162 have occurred that would require a subsequent EIR or Negative Declaration:

- Substantial changes which will require major revision of the previous CEQA document due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

- Substantial changes, with respect to the circumstances under which the project is undertaken, which will require major revisions of the previous CEQA document due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or,

- New information of substantial importance which was not known and could not have been known with the exercise of reasonable diligence at the time the previous CEQA document was certified as complete, such as:

  – The project will have one or more significant effects not discussed in the previous CEQA document;

- Significant effects previously examined will be substantially more severe than shown in the previous CEQA document;

- Identification of mitigation measures or alternatives previously found not to be feasible, but would in fact be feasible, and would substantially reduce one or more significant effects, but the project proponent declines to adopt the mitigation measure or alternatives; or

- Identification of mitigation measures or alternatives which are considerably different from those analyzed in the previous CEQA document would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The environmental impacts from project components that are currently proposed for modification were analyzed in the May 2017 Final EIR. The currently proposed modifications include: 1) relocating the propane recovery project component from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit; 2) increasing the throughput of the Carson Operations Tank 35; 3) updating the TAC speciation for the six crude oil storage tanks at the CCT with additional data; and, 4) updating the construction schedule. The currently proposed modifications will change the environmental impacts analyzed in the May 2017 Final EIR for the respective project components, but will not change the overall conclusions in the May 2017 Final EIR.

Thus, for the purpose of determining whether or not the conditions described in CEQA Guidelines §15162 calling for the preparation of a subsequent EIR or negative declaration have occurred, the effects of the proposed project modifications must be evaluated against the effects of the project as initially reviewed and approved. In other words, the "baseline" against which to evaluate the effects of the currently proposed modifications is the effects of LARIC Project analyzed in the May 2017 Final EIR. As demonstrated in Sections 6.0 and 7.0 of this Revised Addendum, when the effects of the currently proposed modifications are evaluated against this baseline, they are not significant and, therefore, a subsequent EIR or negative declaration is not appropriate.

As stated above, CEQA Guidelines §15164(a) provides: "The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the following conditions as described in CEQA Guidelines §15162 have occurred." Further, CEQA Guidelines §15164(e) requires a brief explanation of the decision not to prepare a subsequent EIR be included in the addendum, the lead agency's findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence. Finally, pursuant to CEQA Guidelines §15164(c), "an addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration."

Based on the analysis of the currently proposed modifications in Sections 6.0 and 7.0, the South Coast AQMD concludes that the only environmental topic area possibly adversely affected by the currently proposed modifications is air quality (including health risk assessment). The May 2017 Final EIR identified significant adverse impacts to the topics of air quality during construction and hazards and hazardous materials during operation. The May 2017 Final EIR also identified less than significant impacts to transportation and less than significant traffic impacts with mitigation imposed during construction. Impacts to air quality during operation, hydrology and water quality, noise, solid and hazardous waste, and transportation and traffic during operation were analyzed and concluded to be less than significant. As indicated in Section 6.0, the currently proposed modifications do not change the conclusions in the May 2017 Final EIR that significant adverse air quality impacts during construction and significant adverse hazards and hazardous materials impacts during operation of the approved LARIC Project are expected to occur. However, as shown in Subsection 6.2.1 of this Revised Addendum, the currently proposed modifications will not increase the severity of significant adverse air quality impacts or result in new significant adverse air quality impacts beyond those previously identified in the May 2017 Final EIR. Hazard impacts are expected to be the same or slightly less for the affected project components with no change to the unaffected project components (see Section 6.2.2). Also, less construction at the Carson Operations C3 Splitter Unit is needed to implement the currently proposed modifications, so no change to the analysis of traffic and transportation impacts during construction as analyzed in the May 2017 Final EIR is necessary (see Section 6.2.6).

The potential health impacts of the currently proposed modifications have been evaluated and determined to be less than significant. The health risk impacts evaluation included: 1) the relocation of the propane recovery project to the Carson Operations C3 Splitter Unit, which will have less VOC emissions and is not expected to increase the health risks from the proposed project; 2) the increase in TAC emissions associated with the Carson Operations Tank 35 increased throughput; and, 3) revision of the TAC speciation for the crude oil storage tanks at the CCT. The health risk assessment also incorporated the use of the latest meteorological data published since the approval of the May 2017 Final EIR. As a result, the currently proposed modifications will not result in any new significant adverse impacts or increase the severity of significant impacts previously identified in the May 2017 Final EIR.

South Coast AQMD review shows that the potential impacts from implementing the currently proposed modifications are within the scope of what was previously analyzed in the May 2017 Final EIR. Further, South Coast AQMD concludes that the currently proposed modifications are not expected to trigger any conditions identified in CEQA Guidelines §15162 that would require preparation of a subsequent EIR. As a result, per CEQA Guidelines §15164(a), an Addendum is the appropriate CEQA document for evaluating the currently proposed modifications. Therefore, the South Coast AQMD has prepared this Revised Addendum to the May 2017 Final EIR to evaluate the currently proposed modifications.

Sections 6.0 and 7.0 of this Revised Addendum to the May 2017 Final EIR provide the evidence which demonstrates that the currently proposed modifications do not contain: 1) substantial changes to the LARIC Project that will cause new significant effects or a substantial increase in the severity of previously identified significant effects; 2) a substantial change in the circumstances that will cause new significant effects or a substantial increase in the severity of previously identified significant effects; or 3) substantial new information that could not have been known at the time the May 2017 Final EIR was certified that will cause new significant effects or a substantial increase in the severity of previously identified significant effects.

3.0 LARIC PROJECT CEQA DOCUMENTS

This section provides summaries of the activities associated with the Tesoro LARIC Project that were evaluated in CEQA documents, which are presented in sequential order. These CEQA documents can be obtained by contacting the South Coast AQMD's Public Information Center at (909) 396-2001 or they can be downloaded from the South Coast AQMD's CEQA Webpage at the following Internet address:

http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/lead-agency-ceqa-documents---permit-projects-2017

Notice of Preparation of an Environmental Impact Report (EIR) (South Coast AQMD, September 2014): A Notice of Preparation (NOP) and Initial Study (IS) for the Tesoro LARIC Project were released for a 30-day public review and comment period from September 10, 2014, to October 10, 2014. The IS included a project description, project location, an environmental checklist, and a preliminary discussion of potential adverse environmental impacts. The NOP requested public agencies and other interested parties to comment on the scope and content of the environmental information to be evaluated in the Draft EIR. A public scoping meeting was held on September 24, 2014, and six written comments were received at the meeting. Eighty-seven additional comment letters were received during the comment period, which were letters of support for the LARIC Project that did not address environmental concern to be included in the EIR. The September 2014 NOP/IS, comment letters, and responses, where appropriate, are included in Appendix A of the May 2017 Final EIR.

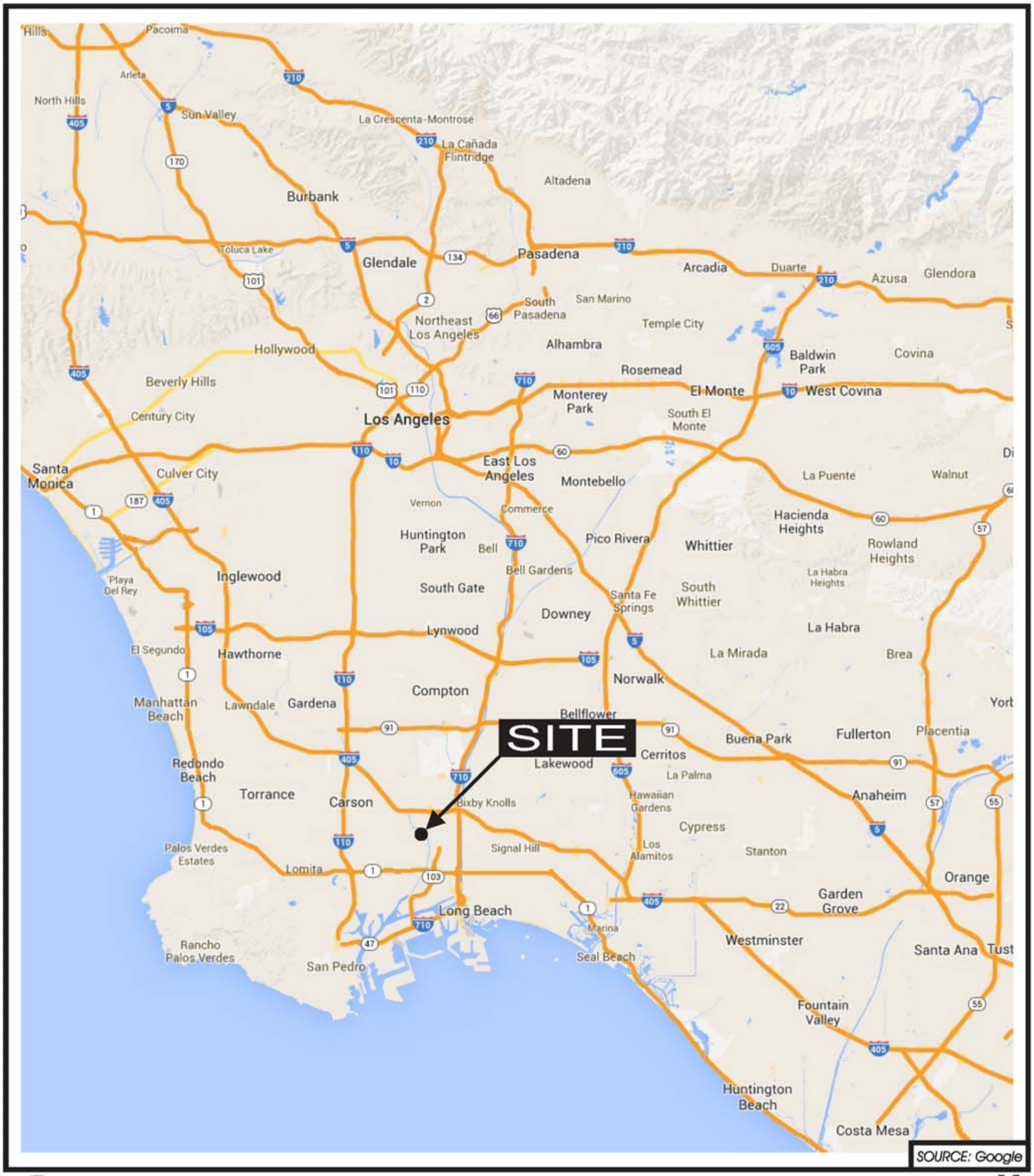
Draft EIR (South Coast AQMD, 2016): The Draft EIR was released for a 45-day public review and comment period from March 8, 2016, to April 22, 2016, which was extended twice for a total of a 94-day public comment period ending on June 10, 2016. The Draft EIR included a project description, a description of the existing environmental setting, a preliminary analysis of potential adverse environmental impacts for each environmental topic (including cumulative impacts) that could be adversely affected by the proposed project, mitigation measures, project alternatives, and all other relevant topics required by CEQA. The Draft EIR also included a copy of the September 2014 NOP/IS, comment letters, and responses described above. The Draft EIR concluded that the Tesoro LARIC Project may have significant adverse impacts on air quality during construction and hazards and hazardous materials during operation, even after implementing mitigation measures, and less than significant noise, solid and hazardous waste, and traffic and transportation impacts. Impacts to all other environmental topic areas were also concluded to be less than significant.

Final EIR (South Coast AQMD, 2017): The Final EIR was prepared by revising the Draft EIR to update project information and present the responses to comments received on the Draft EIR. Of the 2,107 comment letters, responses to only 302 of the comment letters were prepared because the remainder of the comment letters either supported the project and, as such, did not require response; opposed the project but did not raise new issues; or were received after the close of the comment period and did not raise new issues. The changes that were reflected in the Final EIR did not constitute significant new information relating to the environmental analysis or mitigation measures. The Final EIR was certified on May 12, 2017, along with Attachment 1: Findings, Statement of Overriding Considerations, and Mitigation, Monitoring, and Reporting Plan. For reference, the May 2017 Final EIR Chapter 1 – Introduction and Executive Summary is presented in Appendix A of this Revised Addendum.

4.0 PROJECT LOCATION

As described in the May 2017 Final EIR, the LARIC Project will occur at both the Carson Operations and Wilmington Operations of the Refinery and the CCT. The currently proposed modifications to components of the LARIC Project will occur at the Carson Operations and the CCT as part of the ongoing efforts to integrate the Carson Operations with the adjacent Wilmington Operations. The Refinery is approximately 950 contiguous acres in size and operates within the cities of Los Angeles (Wilmington District) and Carson, California.

The Carson Operations are located at 2350 East 223rd Street, Carson, California, 90810. The CCT is located immediately south of the Carson Operations at 24696 Wilmington Ave, Carson, California, 90745. The Wilmington Operations are located at 2101 East Pacific Coast Highway, Wilmington, California, 90744, and are not affected by the currently proposed modifications. Wilmington is a community under the jurisdiction of the City of Los Angeles. The Wilmington Operations Sulfur Recovery Plant, located in Carson, California, is not affected by the currently proposed modifications. Figure 1 depicts the regional location of the Refinery and Figure 2 provides a detailed Site Location Map.



Environmental Audit, Inc.

FIGURE 1
REGIONAL MAP
TESORO LOS ANGELES REFINERY

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Project No. 2844

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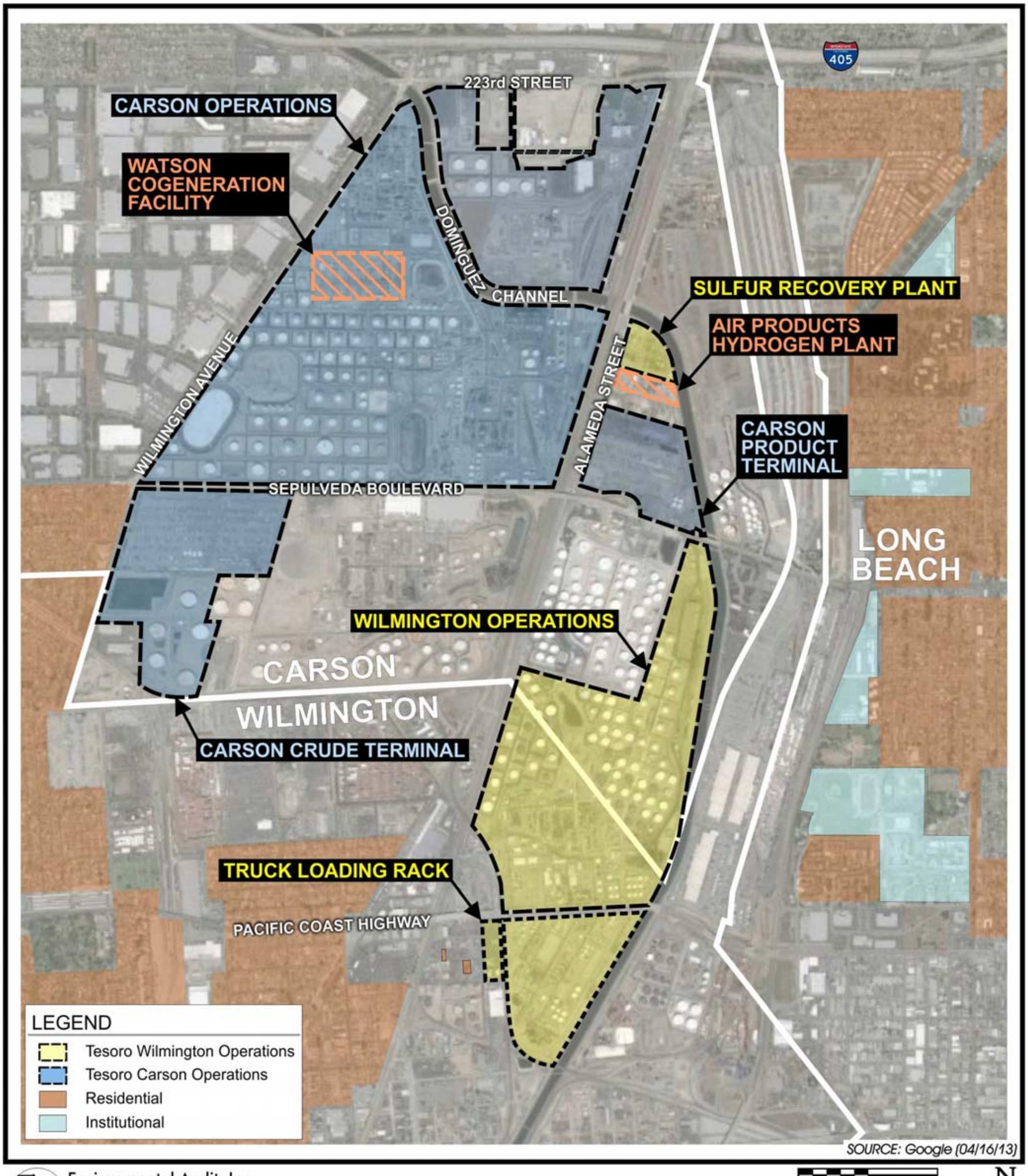

FIGURE 2
SITE LOCATION MAP
TESORO LOS ANGELES REFINERY

Project No. 2844

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5.0 BACKGROUND AND PROJECT DESCRIPTION

Tesoro is proposing the following modifications to the LARIC Project that was analyzed in the May 2017 Final EIR, to: 1) relocate the propane recovery project component from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit; 2) increase the throughput of the Carson Operations Tank 35; 3) update the TAC speciation for the six crude oil storage tanks at the CCT with additional data; and, 4) update the construction schedule. The currently proposed modifications will affect some LARIC Project components that were approved in the May 2017 Final EIR, but have not yet been issued South Coast AQMD permits to construct. Figures 3 and 4 show the LARIC Project components locations in the Carson Operations and CCT. None of the currently proposed modifications will occur in the Wilmington Operations.

It should be noted that the Wilmington Operations DCU H-100 heater project has been delayed. After the approval of the May 2017 Final EIR, a South Coast AQMD Permit to Construct was issued to change the described heat release level of the Wilmington Operations DCU H-100 heater from 252 million British thermal units per hour (mmBtu/hr) to 302.4 mmBtu/hr, without making any physical modifications. New permit limits on criteria pollutants were also included as part of the South Coast AQMD Permit to Construct to ensure that emissions would not exceed what they would be at 252 mmBtu/hr. After extensive review, Tesoro determined that additional engineering evaluation of the Wilmington Operations DCU H-100 heater was needed. Therefore, Tesoro requested the Permit to Construct be cancelled. Tesoro has informed the South Coast AQMD that once the engineering evaluation of the Wilmington Operations DCU H-100 heater is complete, a new South Coast AQMD permit application will be submitted. However, it is speculative as to when a new permit application can be submitted. At the request of Tesoro, the Permit to Construct has been cancelled and the existing Permit to Operate (A/N 469243) has been administratively re-issued to include a new permit condition limiting the heat release level of the Wilmington Operations DCU H-100 heater to no more than 252 mmBtu/hr. Compliance with the 252 mmBtu/hr heat release level condition ensures that the emission impacts of the Wilmington Operations DCU H-100 heater do not exceed those evaluated in the May 2017 Final EIR. Any potential changes to the Wilmington Operations DCU H-100 heater will be reviewed by the South Coast AQMD once a new South Coast AQMD permit application has been received. Any modifications needed to the CEQA evaluation for the Wilmington Operations DCU H-100 heater will be addressed at that time. The May 2017 Final EIR currently reflects the anticipated emissions associated with the Wilmington Operations DCU H-100 heater.

Sections 5.1 through 5.4 provide further details about the currently proposed modifications to the LARIC Project.

5.1 Carson Operations Propane Recovery

The South Coast AQMD analyzed modifications to the Carson Operations Naphtha Isomerization Unit modification in the May 2017 Final EIR and granted approval for Tesoro to install additional gas treatment to recover saleable propane. Specifically, the approved modifications to the Carson Operations Naphtha Isomerization Unit included the installation of an off-gas caustic scrubber, two reactor effluent flash drums, up to two heat exchangers, four pumps, associated piping and instrumentation, and pressure relief valves that connect the modifications to the Refinery gas recovery and flare system. However, Tesoro did not submit permit applications to the South Coast AQMD for the analyzed modifications to the Carson Operations Naphtha Isomerization Unit.

After further engineering design of the LARIC Project was conducted, a simpler method of recovering saleable propane was identified that would produce fewer air emissions. As such, Tesoro is currently proposing modifications to the adjacent Carson Operations C3 Splitter Unit (see Figure 3), which are less complex and require less construction than the modifications to the Carson Operations Naphtha Isomerization Unit that were previously analyzed in the May 2017 Final EIR. The Carson Operations C3 Splitter Unit in the Isomerization Complex is designed to recover polymer-grade propylene and sales-grade propane from mixed C3 streams (i.e., hydrocarbons that contain three carbon atoms) in Refinery gas streams. In order to increase the yield of saleable propane from the Carson Operations C3 Splitter Unit, a new line will be installed to connect the existing Carson Operations C3 Splitter Unit regeneration propane header (which currently routes to the Refinery fuel gas system) to the existing Coker Gas Treatment System. The Carson Operations C3 Splitter Unit modifications will require the installation of a vaporizer (heat exchanger) and associated piping and instrumentation, as needed. As with the previously evaluated modifications to the Naphtha Isomerization Unit, part of the piping for the Carson Operations C3 Splitter Unit modifications will require the installation of one new pressure relief valve that will be connected for emergency venting to the No. 5 Gas Recovery and Flare System. By recovering the propane present in the Carson Operations C3 Splitter Unit, the installation of additional gas treatment equipment at the Carson Operations Naphtha Isomerization Unit, which was originally evaluated as part of the approved LARIC Project, is no longer necessary. No other Refinery units will be affected by the currently proposed modification. Therefore, no change in propane production will result from the change in location of propane recovery activities.

5.2 Additional Increased Utilization of Carson Operations Storage Tank 35

The proposed modification to the Carson Operations Tank 35 would increase the maximum permitted throughput of the existing Carson Operations Tank 35 from the current 416,700 bbl/mo to 1,000,000 bbl/mo, which represents a net increase of 583,300 bbl/mo. Carson Operations Tank 35 has a capacity of 100,000 barrels and is domed with an external floating roof. Carson Operations Tank 35 is currently permitted to store a variety of materials without explicitly limiting the type of materials that can be stored. The currently proposed modification would define the materials that can be stored in Carson Operations Tank 35 as wastewater, distillates including jet fuel, and gasoline. The blending of jet fuel to make a finished product occurs at both the Carson and Wilmington Operations. The proposed throughput increase would consolidate most of the jet fuel blending activities to the Carson Operations Tank 35, to improve product management at the Refinery and to allow for the further integration of the Wilmington and Carson Operations. In addition, the proposed modification will allow the use of the Carson Operations Tank 35 as a back-up tank when other tanks are taken out of service for regular

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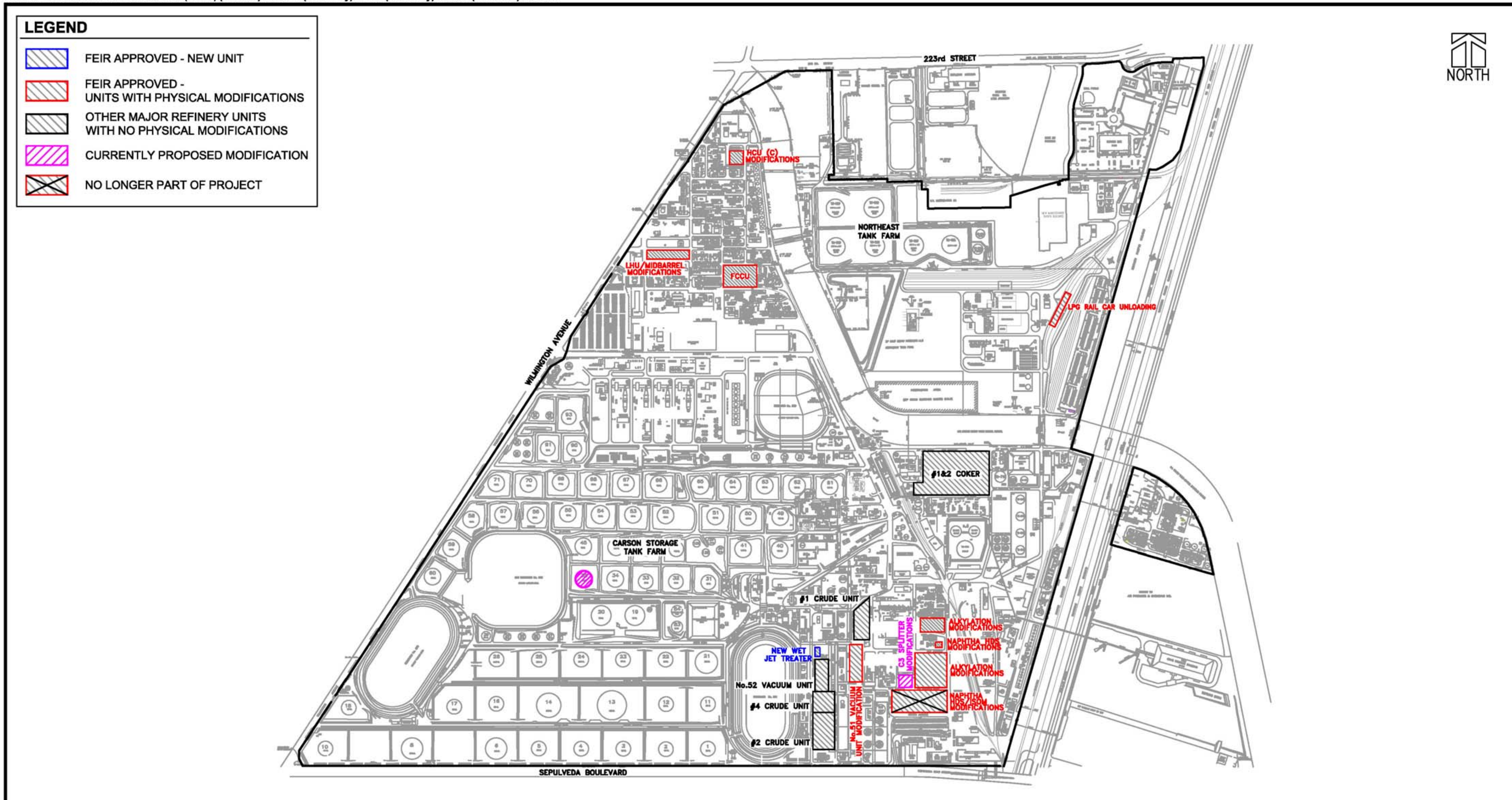

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FIGURE 3
TESORO LOS ANGELES REFINERY
MAY 2017 FINAL EIR CARSON OPERATIONS MODIFICATIONS
WITH CURRENTLY PROPOSED MODIFICATIONS

Project No. 2844

I:\2844\Figure 4 - Tesoro Los Angeles Refinery, Carson Crude Terminal (rev.2) **(Created)** 11/06/18 **(Drawn By)** A.S.K. **(Check By)** M.R.B. **(Last Rev.)** 04/17/19

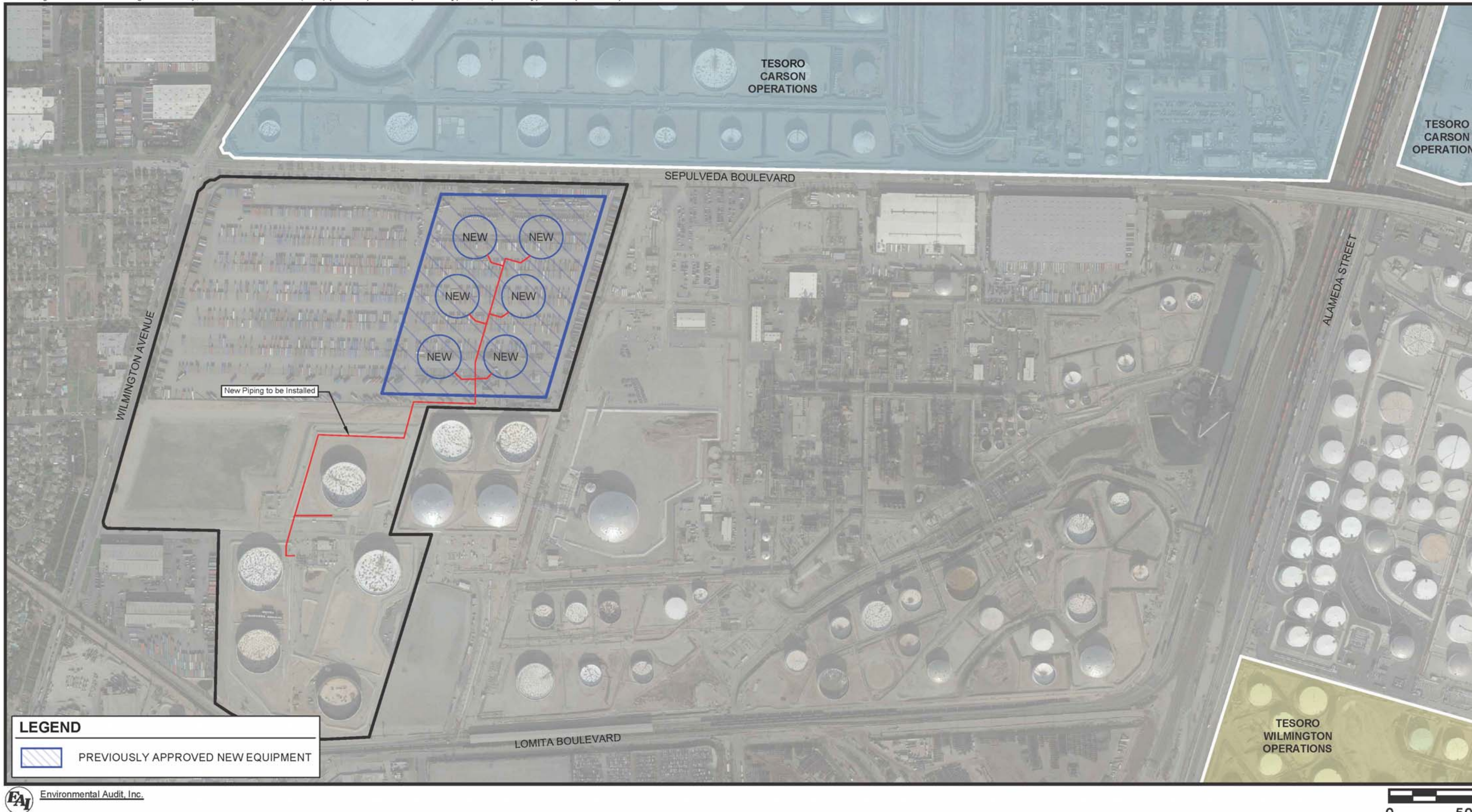

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FIGURE 4
TESORO LOS ANGELES REFINERY
CARSON CRUDE TERMINAL

Project No. 2844

maintenance. The requested increase in throughput to the Carson Operations Tank 35 is necessary because some tanks that are expected to be taken out of service for regular maintenance have greater monthly throughputs than the current throughput limit of Carson Operations Tank 35. Increasing the throughput of Carson Operations Tank 35 will result in changes to VOC and TAC emissions which are evaluated in this Revised Addendum.

No changes to the process units that produce jet fuel and gasoline are part of the modifications subject to this Revised Addendum. Market demand is the primary influence on the amount of jet fuel produced. The volume of products produced in the refining process is not dependent on the volume of storage available. Multiple storage tanks exist at the Refinery that are capable of storing jet fuel. Thus, this proposed throughput increase would not change the amount of jet fuel or gasoline produced by the Refinery. Additionally, no changes to the wastewater generated at the Refinery are proposed. Therefore, the amount of jet fuel and gasoline production and wastewater generated will not be affected by the Carson Operations Tank 35 proposed throughput increase.

5.3 Revise TAC Speciation for CCT Crude Oil Storage Tanks

In the baseline period (i.e., 2012-2013) analytical data from crude oil suppliers did not include data for H_2S in crude oil. Thus, the data used during the preparation of the May 2017 Final EIR did not provide concentration data for H_2S as a potential TAC in crude oil. For this reason, the May 2017 Final EIR describes the concentration of H_2S in crude oil as typically less than 5 ppm (as explained in Appendix F, 5 ppm is by weight (ppmw)) (the analytical detection limit) (page G1-1186 in Appendix G1 of the May 2017 Final EIR). During the preparation of the permit applications for the CCT storage tanks, analytical data became available that identified differences in concentrations of some TACs and included H_2S concentrations for some crude oils (up to 45 ppmw). The South Coast AQMD verified the relevant crude oil speciation data during the permit application review process. Therefore, the speciation for crude oil used in the May 2017 Final EIR has been updated in this Revised Addendum to incorporate the most current information (i.e., the highest value in the crude oil speciation data set, 45 ppmw H_2S, along with the higher values for some TACs) and to provide a more comprehensive quantification of the TAC concentrations of the various crude oils expected to be stored in the CCT tanks. The updated speciation reflects quantification improvements of the TAC speciation, but there are no changes in the types of crude oils stored from those previously analyzed in the May 2017 Final EIR. This update is informational only, as there are no physical or operational changes to the CCT tanks from what was previously analyzed in the May 2017 Final EIR. The highest value of H_2S (45 ppmw) for the crude oil does not represent a change in the actual H_2S content of the crude oil processed at the Refinery but rather represents updated information about the content of crude oil. Based on the most current information, the highest value of H_2S is 45 ppmw both before and after the implementation of the Project, although this information was not previously known at the time the May 2017 Final EIR was certified.

The update in TAC speciation of the crude oil does not affect the location, physical capacity or throughput of the crude oil storage tanks as evaluated in the May 2017 Final EIR. The CCT crude oil storage tanks affected by the change in speciation in this Revised Addendum are shown in Figure 4. As analyzed in the May 2017 Final EIR, impacts of TACs were evaluated as a composite of worst-case concentrations of crude oil previously processed and additional potentially foreseeable crude oils to be processed by the Refinery.

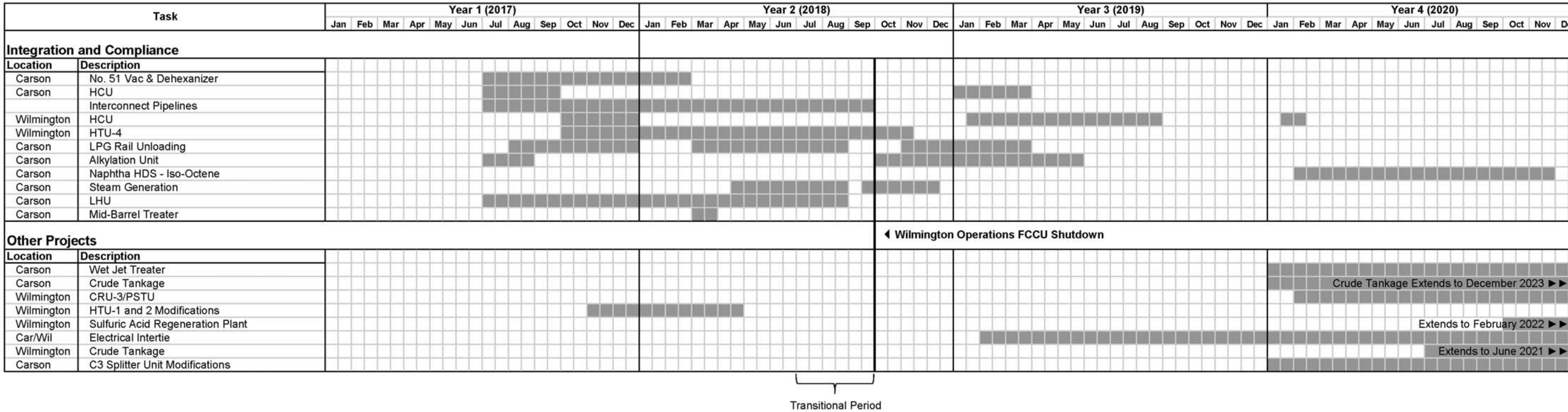
5.4 Update the Construction Schedule

The LARIC Project construction schedule presented in the May 2017 Final EIR was contingent upon project approval and the issuance of South Coast AQMD Permits to Construct for project components on a schedule that would precede the planned shutdown of the Wilmington Operations FCCU in July 2017. Because the certification of the LARIC Project Final EIR occurred in May 2017 and the initial Permits to Construct were issued in June 2017, the construction necessary to facilitate the shutdown of the Wilmington Operations FCCU could not be accomplished prior to July 2017. Thus, the scheduled shutdown of the Wilmington Operations FCCU needed to be delayed until October 2018 to allow the completion of construction of the project components. Therefore, the project schedule was adjusted to facilitate the shutdown of the Wilmington Operations FCCU in October 2018 and to realign project component construction with the next scheduled turnaround for the respective units, where applicable.

Construction activities were rescheduled to commence in July 2017. Adjustments to the construction schedule reflect the following considerations:

- Splitting construction schedules to coincide with planned shutdowns;
- Replacing the Carson Naphtha Isomerization Modifications with the C3 Splitter Unit Modifications;
- Delaying project components to the next planned shutdown;
- Delaying projects for permitting (CCT Crude Tankage); and,
- Delaying projects for engineering design delays.

The revised construction schedule is presented in Figure 5.



Note: Carson FCCU Modifications are operational changes only and have no construction schedule.
Transitional Period is the 90-day period prior to the shutdown of the Wilmington Operations FCCU.

FIGURE 5

REVISED CONSTRUCTION SCHEDULE
TESORO LOS ANGELES REFINERY

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6.0 IMPACT ANALYSIS

The following sections present a summary of the impact analysis contained in the May 2017 Final EIR for the affected LARIC Project components and analyze the currently proposed modifications.

The baseline period in the May 2017 Final EIR was operating years 2012 and 2013, which were the two years prior to the publication of the September 2014 NOP/IS in accordance with the requirements of CEQA Guidelines §15125. The May 2017 Final EIR considered all direct impacts (i.e., emissions associated with modified existing units and proposed new units), as well as indirect impacts (e.g., emissions associated with mobile sources) of the LARIC Project. All equipment potentially impacted by the LARIC Project (including upstream and downstream equipment) was also evaluated to determine if the LARIC Project would result in increased environmental impacts, even if the equipment was operating within permit limits. Downstream effects were described in Section 4.1.2 of the May 2017 Final EIR and included in the analysis in Sections 4.2 through 4.8 of the May 2017 Final EIR.

The following sections summarize and compare the environmental impacts of the LARIC Project that were previously evaluated in the May 2017 Final EIR to the currently proposed modifications.

6.1 Summary of Environmental Impacts in the May 2017 Final EIR

The September 2014 NOP/IS for the LARIC Project evaluated all 17 environmental topics in accordance with CEQA and determined that 11 environmental topic areas identified in the South Coast AQMD environmental checklist would not be significantly adversely affected by the LARIC Project. The environmental topic areas identified as not being significantly affected by the LARIC Project are: aesthetics; agriculture and forestry resources; biological resources; cultural resources; energy; geology and soils; land use and planning; mineral resources; population and housing; public services; and, recreation. The South Coast AQMD received 87 comment letters and six written comment cards from the public CEQA scoping meeting relative to the September 2014 NOP/IS. None of the comments addressed the conclusions in the September 2014 NOP/IS that the 11 aforementioned environmental topic areas would not be significantly affected by the LARIC Project. Thus, the less than significant environmental topic areas were not addressed in detail but were summarized in Section 4.10 of the May 2017 Final EIR.

The following six environmental topic areas were determined to be potentially significantly affected by the LARIC Project and required further evaluation in the EIR: air quality; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and, transportation and traffic. The May 2017 Final EIR concluded that three of the six environmental topic areas (hydrology and water quality; noise; and, solid and hazardous waste) evaluated in the EIR would not be significantly adversely affected by the LARIC Project and one of the six environmental topic areas (transportation and traffic) impacts could be mitigated to a level of insignificance. Air quality impacts during construction and hazards and hazardous materials during operation were determined to be significant even after mitigation measures were applied. Traffic during construction was determined to be less than significant after mitigation measures were applied.

The May 2017 Final EIR concluded that the LARIC Project would result in the significant unavoidable adverse impacts to air quality and hazards and hazardous materials after implementation of feasible mitigation measures, as follows:

- Air quality, including project-specific and cumulatively considerable VOC and NOx emissions in exceedance of regional significance thresholds during construction, and nitrogen dioxide (NO_2) concentrations above the local significance threshold during construction. Mitigation measures imposed included requirements such as the development of a construction management plan, electrification of equipment where feasible, and use of construction equipment having Tier 4 engines with limited exceptions.

- Hazards and hazardous materials, including project-specific and cumulatively considerable off-site impacts which could occur in the event of a flash fire the Carson Operations Naphtha Isomerization Unit, a pool fire in the area of the new crude oil storage tanks, a toxic cloud arising from the proposed Sulfuric Acid Regeneration Plant (SARP), or a flash fire associated with the Interconnecting Pipelines under "worst-case" scenarios for each unit, respectively. The mitigation measure imposed included early compliance with applicable hazardous material rules and regulations.

6.2 Analysis of Impacts from the Currently Proposed Modifications

This Revised Addendum includes an evaluation of all 17 of the environmental topic areas identified in the environmental checklist and concludes that the only environmental topic area evaluated in the May 2017 Final EIR that would require minor changes to reflect the currently proposed modifications is air quality. The six environmental topic areas (i.e., air quality; hazards and hazardous materials; hydrology and water quality; noise; solid and hazardous waste; and, transportation and traffic) analyzed in detail in the May 2017 Final EIR are presented in the following subsections. The analysis of the air quality impacts in the May 2017 Final EIR is the only analysis revised by the currently proposed modifications. The analysis of potential impacts to the five other environmental topic areas analyzed in detail in the May 2017 Final EIR did not require revision. The analysis in this Revised Addendum demonstrates that the currently proposed modifications to the LARIC Project would not result in substantial changes or new significant impacts to these six environmental topic areas. The remaining 11 environmental topic areas that were evaluated in the 2014 NOP/IS for the LARIC Project are examined in Section 7.0. No potentially significant impacts to these 11 environmental topic areas are expected due to the currently proposed modifications. Therefore, the conclusions from the May 2017 Final EIR do not change as a result of implementing the currently proposed modifications.

6.2.1 Air Quality

The September 2014 NOP/IS determined that air quality impacts of the LARIC Project were potentially significant. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (criteria air pollutants, GHGs, and TACs) during the construction and operational phases of the LARIC Project were analyzed in the May 2017 Final EIR (see Sections 4.2, 5.2.1, and 5.2.2 of the May 2017 Final EIR). Potential adverse health impacts to sensitive receptors were also analyzed in the May 2017 Final EIR. The May 2017 Final EIR determined that only construction impacts were potentially significant. Air quality impacts that equal or exceed the significance thresholds identified in Table 1 are considered to be potentially significant adverse air quality impacts.

6.2.1.1 Construction Emissions Impacts

6.2.1.1.1 May 2017 Final EIR Construction Emissions Impacts

The original construction emission analysis in the May 2017 Final EIR was conservative and encompasses the currently proposed modifications, only one of which requires construction (i.e., the Carson Operations C3 Splitter Unit modifications). Table 4.2-2 of the May 2017 Final EIR (presented here as Table 2) concluded that unmitigated VOC and NOx emissions were significant and mitigation was imposed. The May 2017 Final EIR peak construction emissions were expected to occur in Months 18, 20, and 25.

6.2.1.1.2 Currently Proposed Modifications Construction Emissions Impacts

The currently proposed modification to the existing Carson Operations Tank 35 does not require any construction. The change to the crude speciation for the six CCT crude oil storage tanks does not affect the construction schedule or the level of construction needed to build the storage tanks. The Carson Operations C3 Splitter Unit modifications require less construction than the previously approved for the Carson Operations Naphtha Isomerization Unit because less equipment will be installed and no foundations are needed. The original construction schedule presented in the May 2017 Final EIR has been revised due to the delayed approval date of the LARIC Project (see Figure 5). The effects of the revised construction schedule are evaluated in this Revised Addendum.

With the revisions to the construction schedule, while the peak emissions from construction shifts to Month 7 for NOx, SOx, and PM10, Month 11 for PM2.5 and CO, and Month 40 for VOC pollutants, the revised unmitigated peak construction emissions are less in comparison to the May 2017 Final EIR unmitigated peak construction emissions. The peak daily VOC emissions are now less than significant; however, the peak daily NOx emissions remain significant. Note that months 7 and 11 of construction have already occurred. Table 3 presents the revised construction emissions that result from the currently proposed modifications. The peak daily construction emissions are less than previously analyzed because the restructuring of the construction schedule reduced the number of overlapping construction activities for various project components as well as reduced the number of construction workers needed during the peak construction period. The currently proposed modifications do not change the conclusion made in the May 2017 Final EIR and do not make a significant impact more severe.

TABLE 1

South Coast AQMD Air Quality Significance Thresholds

Mass Daily Thresholds[a]		
Pollutant	**Construction[b]**	**Operation[c]**
NO_x	100 lb/day	55 lb/day
VOC	75 lb/day	55 lb/day
PM10	150 lb/day	150 lb/day
PM2.5	55 lb/day	55 lb/day
SOx	150 lb/day	150 lb/day
CO	550 lb/day	550 lb/day
Lead	3 lb/day	3 lb/day
Toxic Air Contaminants, Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Chronic and Acute Hazard Index ≥ 1.0 (project increment) Cancer Burden ≥ 0.5 excess cancer cases (in areas ≥ 1 in 1 million)	
Odor	Project creates an odor nuisance pursuant to South Coast AQMD Rule 402	
GHG	10,000MT/yr CO_2eq for industrial facilities	
Ambient Air Quality for Criteria Pollutants[d]		
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.18 ppm (state) and 0.100 (federal)[e] 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour annual average	10.4 $\mu g/m^3$ (construction)[f] and 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$	
PM2.5 24-hour average	10.4 $\mu g/m^3$ (construction)[f] and 2.5 $\mu g/m^3$ (operation)	
SO_2 1-hour average 24-hour average	0.255 ppm (state) and 0.075 ppm (federal – 99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 $\mu g/m^3$ (state)	
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day average Rolling 3-month average Quarterly average	1.5 $\mu g/m^3$ (state) 0.15$\mu g/m^3$ (federal) 1.5$\mu g/m^3$ (federal)	

a) Source: South Coast AQMD CEQA Handbook (South Coast AQMD, 1993, Revised April 2019)
b) Construction thresholds apply to both the SCAB and Coachella Valley (Salton Sea and Mojave Desert Air Basin)
c) For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
d) Ambient air quality thresholds for criteria pollutants based on South Coast AQMD Rule 1303, Table A-2 unless otherwise stated.
e) The federal threshold has not been adopted for general use yet by South Coast AQMD, but as it is a federal requirement for permits being issued for this project.
f) Ambient air quality threshold based on South Coast AQMD Rule 403.

KEY: ppm = parts per million; $\mu g/m^3$ = microgram per cubic meter; lb/day = pounds per day; MT/yr CO2eq = metric tons per year of CO_2 equivalents, ≥ greater than or equal to, > = greater than

TABLE 2

Tesoro Los Angeles Refinery
LARIC Project Unmitigated Peak Construction Emissions
as Presented in the May 2017 Final EIR[a]
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5[b]
Construction Equipment	41.18	422.81	420.92	0.90	29.82	26.23
Vehicle Emissions	3.22	92.73	154.81	0.51	32.57	10.96
Fugitive Dust From Construction[c]	--	--	--	--	2.36	0.68
Fugitive Road Dust[c]	--	--	--	--	3.80	0.80
Architectural Coating	62.25	--	--	--	--	--
Total Emissions[d]	**106.65**	**515.54**	**575.73**	**1.41**	**68.55**	**38.67**
Construction Significance Threshold	75	550	100	150	150	55
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) Source: May 2017 Final EIR, Table 4.2-2. Peak emissions for VOC predicted to occur in Month 25. Peak CO predicted to occur in Month 20. NOx, SOx, PM10, and PM2.5 predicted to occur during Month 18.
(b) PM2.5 is determined using the methodology in South Coast AQMD, 2006.
(c) Assumes application of water three times per day.
(d) The emissions in the table may differ slightly from those in Appendix B-1 of the May 2017 Final EIR due to rounding.

TABLE 3

Tesoro Los Angeles Refinery
LARIC Project Unmitigated Peak Construction Emissions
Including the Currently Proposed Modifications[a]
(lb/day)

ACTIVITY	VOC	CO	NOx	SOx	PM10	PM2.5[b]
Construction Equipment	6.45 ~~41.18~~	233.67 ~~422.81~~	242.41 ~~420.92~~	0.59 ~~0.90~~	14.04 ~~29.82~~	15.63 ~~26.23~~
Vehicle Emissions	0.34 ~~3.22~~	83.64 ~~92.73~~	154.96 ~~154.81~~	0.44 ~~0.51~~	30.42 ~~32.57~~	8.53 ~~10.96~~
Fugitive Dust From Construction[c]	--	--	--	--	2.36	0.68
Fugitive Road Dust[c]	--	--	--	--	3.80	0.80
Architectural Coating	62.25	--	--	--	--	--
Total Emissions[d]	**69.04** ~~**106.65**~~	**317.31** ~~**515.54**~~	**397.37** ~~**575.73**~~	**1.03** ~~**1.41**~~	**50.62** ~~**68.55**~~	**25.64** ~~**38.67**~~
~~South Coast AQMD~~ Construction Significance Threshold ~~Level~~	75	550	100	150	150	55
Significant?	~~**Yes**~~**No**	**No**	**Yes**	**No**	**No**	**No**

(a) Peak emissions for NOx, SOx, and PM10 predicted to occur in Month 7. CO and PM2.5 predicted to occur during Month 11. VOC predicted to occur during Month 40. See Appendix B for detailed calculations.
(b) PM2.5 is determined using the methodology in South Coast AQMD, 2006.
(c) Assumes application of water three times per day.
(d) The emissions in the table may differ slightly from those in Appendix B due to rounding.

6.2.1.1.3 May 2017 Final EIR Localized Construction Air Quality Impacts

The May 2017 Final EIR evaluated the localized air quality impacts of construction emissions in Table 4.2-3 (presented here as Table 4). The localized construction impacts were determined to be significant for nitrogen dioxide (NO_2) 1-hour emissions.

TABLE 4

Tesoro Los Angeles Refinery
LARIC Project Localized Construction Air Quality Impact Analysis Results as Presented in the May 2017 Final EIR

Criteria Pollutant	Averaging Period	Modeled GLC (µg/m^3)	Background GLC (µg/m^3)[(a)]	Total GLC (µg/m^3)	Most Stringent Air Quality Standard (µg/m^3) [(b)]	Exceeds Significance Threshold?
CO	1-hour	291.38	7,929.8	8,221.1	23,000	No
	8-hour	58.46	4,908.9	4,967.4	10,000	No
NO_2[(c)]	1-hour	200.43	255.5	455.9	339	Yes
	1-hour (Federal)	156.51[(d)]	146.30[(e)]	302.8	188	Yes
	Annual	4.99	47.7	52.7	57	No
PM10	24-hour	3.46	--	--	10.4	No
	Annual	0.86	--	--	1	No
PM2.5	24-hour	3.46	--	--	10.4	No
	Annual	0.86	--	--	1	No

GLC = ground-level concentration

(a) South Coastal LA County years 2011-2014 Station 033 and 072.

(b) South Coast AQMD Air Quality Significance Thresholds. For PM10 and PM2.5, project comparison to incremental change. CO and NO_2 values converted from ppm values in Table 3. Standards are state standards unless distinguished as Federal.

(c) Impacts from air dispersion model are reported as using ambient ratio method.

(d) The federal 1-hour NO_2 standard is the 3-year average of the 98th percentile. The modeled GLC used highest 98th percentile per year.

(e) 98th percentile background NO_2 value from the South Coast AQMD.

Source: May 2017 Final EIR Table 4.2-3

6.2.1.1.4 Currently Proposed Localized Construction Air Quality Impacts

The schedule changes associated with the currently proposed modifications affect the Localized Significance Threshold (LST) evaluation presented in the May 2017 Final EIR. Due to the revisions to the construction schedule, different project components will be constructed in the peak emissions month than were expected in the May 2017 Final EIR. Consequently, the LST evaluation has been revised to reflect the expected construction schedule including the currently proposed modifications (see Appendix C for the complete LST report). Table 5 shows the revision to the May 2017 Final EIR for the currently proposed modifications localized construction air quality impacts. The revised construction schedule results in less concurrent construction of LARIC Project components, which reduces emissions during peak construction.

While the emissions of NOx still exceed the significance threshold, the total ground-level concentrations are lower than those analyzed in the May 2017 Final EIR. Therefore, the currently proposed modifications do not change the conclusion of the May 2017 Final EIR or increase the severity of impacts identified in the May 2017 Final EIR.

TABLE 5

Tesoro Los Angeles Refinery
LARIC Project Localized Construction Air Quality Impact Analysis Results
Including the Currently Proposed Modifications

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	Background GLC ($\mu g/m^3$)[(a)]	Total GLC ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [(b)]	Exceeds Significance Threshold?
CO	1-hour	99.39 ~~291.38~~	4,196.6 ~~7,929.8~~	4,296.0 ~~8,221.1~~	23,000	No
	8-hour	25.89 ~~58.46~~	2,646.5 ~~4,908.9~~	2,672.4 ~~4,967.4~~	10,000	No
NO_2[(c)]	1-hour	110.48 ~~200.43~~	253.2 ~~255.5~~	363.7 ~~455.9~~	339	Yes
	1-hour (Federal)	82.33[(d)] ~~156.51~~	133.83[(e)] ~~146.30~~	216.2 ~~302.8~~	188	Yes
	Annual	1.15 ~~4.99~~	38.6 ~~47.7~~	39.7 ~~52.7~~	57	No
PM10	24-hour	1.14 ~~3.46~~	--	--	10.4	No
	Annual	0.12 ~~0.86~~	--	--	1	No
PM2.5	24-hour	1.14 ~~3.46~~	--	--	10.4	No
	Annual	0.12 ~~0.86~~	--	--	1	No

GLC = ground-level concentration

(a) South Coastal LA County years 2014-2016 Station 033 and 072 (the three most recent years).

(b) South Coast AQMD Air Quality Significance Thresholds. For PM10 and PM2.5, project comparison to incremental change. CO and NO_2 values converted from ppm values in Table 3. Standards are state standards unless distinguished as Federal.

(c) Impacts from air dispersion model are reported as using ambient ratio method.

(d) The federal 1-hour NO_2 standard is the 3-year average of the 98^{th} percentile. The modeled GLC used highest 98^{th} percentile per year.

(e) 98^{th} percentile background NO_2 value from the South Coast AQMD.

6.2.1.2 Operational Emissions Impacts

6.2.1.2.1 May 2017 Final EIR Criteria Pollutant Emission Impacts

In the May 2017 Final EIR, the LARIC Project was expected to have emissions reductions of CO and less than significant emission increases of VOC, NOx, SOx, PM10, and PM2.5 (see Table 4.2-4 from the May 2017 Final EIR presented here as Table 6). ERCs were required to be supplied for VOC and were expected to be retained by Tesoro for PM10 and PM2.5. RECLAIM trading credits (RTCs) were expected to be retained for NOx and SOx. The operational emissions of the LARIC Project were determined to be less than significant. The increases in emissions of NOx, SOx, PM10 and PM2.5 are exclusively from mobile sources. There are large localized emissions decreases of these pollutants from stationary sources, but these decreases are not creditable on a regional basis because Tesoro is expected to retain RTCs and ERCs that may be sold or used to offset future emission increases elsewhere.

6.2.1.2.2 Currently Proposed Modifications Criteria Pollutant Emission Impacts

The changes to the expected emissions from the LARIC Project due to the currently proposed modifications are shown in Table 7. The changes shown in Table 7 include: 1) reducing the VOC emissions from fugitive emissions associated with replacing the Naphtha Isomerization Unit modifications with the C3 Splitter Unit modifications; and, 2) adding the VOC emissions from the proposed throughput increase for Carson Operations Tank 35. No changes to VOC emissions will occur as a result of the updated toxic speciation profile for the CCT tanks.

Any project VOC emissions increases from stationary sources are required to comply with Regulation XIII; as such, VOC ERCs are required to be provided to offset emission increases, resulting in net zero emissions. Therefore, the projected VOC emissions after implementation of the currently proposed modifications (reported in Table 7) remain the same as analyzed in the May 2017 Final EIR (reported in Table 6). Mobile source emissions are not subject to Regulation XIII or RECLAIM offset requirements. Therefore, the overall LARIC Project regional emissions impacts result from mobile source emissions. The local emissions will be reduced, but these decreases are not creditable on a regional basis because Tesoro is expected to retain RTCs and ERCs that may be sold or used to offset future emission increases elsewhere.

The currently proposed modifications do not change the significance determination made in the May 2017 Final EIR.

TABLE 6

Tesoro Los Angeles Refinery
LARIC Project Operational Emissions Summary
as Presented in the May 2017 Final EIR

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[b]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington HCU H-300/301 Heater Duty Bump[c]	10.10	49.75	4.67	-14.98	10.79	10.79
SARP Process Air Heater	3.27	16.37	6.99	0.28	3.51	3.51
SARP Decomp. Furnace	6.88	34.39	2.45	0.59	7.37	7.37
SARP Converter Heater	0.82	4.09	1.75	0.07	0.88	0.88
SARP Process Vent	--	--	--	31.12	--	--
Wilmington Tanks	141.64	--	--	--	--	--
Wilmington Fugitive Emissions:						
CRU 3	10.24	--	--	--	--	--
Crude Tanks	3.61	--	--	--	--	--
HCU	20.69	--	--	--	--	--
HTU 1	3.50	--	--	--	--	--
HTU 2	3.80	--	--	--	--	--
HTU 4	6.32	--	--	--	--	--
Interconnect Piping	37.20					
PSTU	15.44	--	--	--	--	--
Sulfuric Acid Plant[d]	--	--	--	--	--	--
Wilmington FCCU Shutdown:[e]						
Wilmington FCCU and CO Boiler	-290.46	-909.62	-343.31	-387.50	-121.30	-121.30
Wilmington Heaters H2, H3/H4, and H5	-10.74	-49.36	-226.28	-28.87	-49.88	-49.88
Wilmington Startup Heater	-0.16	-0.81	-3.00	-0.01	-0.17	-0.17
Wilmington Fugitive Components	-17.60	--	--	--	--	--
Carson No. 51 Vacuum Unit Heater	32.85	233.85	32.72	1.80	45.49	45.49
Carson Naphtha HDS ULNB Conversion	1.73	10.23	1.87	0.64	5.56	5.56
Carson Crude Tanks	112.51	--	--	--	--	--
Carson Fugitive Emissions:						
No. 51 Vacuum Unit	11.74	--	--	--	--	--
Alkylation	18.88	--	--	--	--	--
Crude Tanks	43.05	--	--	--	--	--
Carson HCU Mods	6.77	--	--	--	--	--
Interconnect Piping	27.22	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
Carson Naphtha Isomerization Unit	9.46	--	--	--	--	--
Carson NHDS Mods	15.21	--	--	--	--	--
Carson Wet Jet Treater	50.45	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**317.33**	**-616.25**	**-693.17**	**-310.17**	**-98.73**	**-98.73**

TABLE 6 (continued)

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[(a)]
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson FCCU[(f)]	--	--	--	--	--	--
Carson HC Heater R-1	1.77	1.04	18.00	4.61	5.38	5.38
Carson HC Heater R-2	2.36	1.38	14.40	9.81	7.18	7.18
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Carson Existing Tanks 14, 31, 62, 63, 64, 502, and 959	64.35	--	--	--	--	--
Watson Cogen Facility	4.15	4.50	20.60	2.50	9.85	9.85
Subtotal, Indirect Stationary Source Emissions	**81.93**	**17.16**	**125.18**	**62.01**	**32.28**	**32.28**
Mobile Sources[(g)(h)]						
Vehicle Emissions	0.03	0.20	0.73	<0.01	0.21	0.05
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**1.89**	**9.81**	**38.18**	**<0.01**	**1.16**	**0.89**
Total Project Emissions	**401.15**	**-589.28**	**-529.81**	**-248.15**	**-65.29**	**-65.56**
Required Regulation XIII Compliance[(i)]	**-317.33**	--	--	--	--	--
Prior Regulation XIII Compliance[(j)]	**-34.73**	--	--	--	**-9.85**	**-9.85**
Expected ERCs[(k)]	--	--	--	--	**76.30**	**76.30**
Expected RTCs to be Retained[(l)]	--	--	**491.63**	**248.14**	--	--
Total Project Emissions after Regulation XIII Compliance and ERC Generation[(m)]	**49.09**	**-589.28**	**38.18**	**<0.01**	**1.16**	**0.89**
Significance Threshold During Operation	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: May 2017 Final EIR Table 4.2-4

Note: Negative numbers represent emission reductions.

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.

(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.

(c) SOx emissions reduction expected due to fuel switch from refinery fuel gas to natural gas, which contains less sulfur.

(d) No fugitive VOC emissions are expected from the Sulfuric Acid Plant.

(e) Based on actual historical emissions.

(f) Peak daily emissions are not expected to change, but increased utilization will affect annual emissions.

(g) Peak day marine vessel emissions do not change as a result of the proposed project.

TABLE 6 (concluded)

(h) On-road mobile source emissions represent vehicle trips only within the jurisdiction of the South Coast AQMD. On-road mobile source emissions projected to occur outside of the South Coast AQMD's area of jurisdiction are provided in Subsection 4.2.2.2.2.
(i) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.
(j) Some indirect sources (i.e., Carson Tanks 14, 502, and 959, Wilmington H-101, and Carson R-2) have undergone prior new source review. Sources that have previously undergone New Source Review have already provided offsets for some of the emissions included in this table, so this entry reflects those emission reductions.
(k) ERCs for emission reductions are expected to be generated for PM10. No credits are issued for PM2.5 because it is a constituent of PM10.
(l) Local emission reductions of SOx and NOx will result from the project. Tesoro will retain RTCs from retiring the Wilmington Operations FCCU for operation of its Los Angeles Refinery.
(m) Regulation XIII compliance applied to significance determination reduces the VOC emissions to zero from stationary sources and ERCs are expected from emission reductions of PM10, so that the proposed project shows an emissions increase from mobile sources only.

TABLE 7

Tesoro Los Angeles Refinery
LARIC Project Operational Emissions Summary
Including the Currently Proposed Modifications

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[b]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington HCU H-300/301 Heater Duty Bump[c]	10.10	49.75	4.67	-14.98	10.79	10.79
SARP Process Air Heater	3.27	16.37	6.99	0.28	3.51	3.51
SARP Decomp. Furnace	6.88	34.39	2.45	0.59	7.37	7.37
SARP Converter Heater	0.82	4.09	1.75	0.07	0.88	0.88
SARP Process Vent	--	--	--	31.12	6.00[d] ~~--~~	6.00[d] ~~--~~
Wilmington Tanks	141.64	--	--	--	--	--
Wilmington Fugitive Emissions:						
CRU 3	10.24	--	--	--	--	--
Crude Tanks	3.61	--	--	--	--	--
HCU	20.69	--	--	--	--	--
HTU-1	3.50	--	--	--	--	--
HTU-2	3.80	--	--	--	--	--
HTU-4	6.32	--	--	--	--	--
Interconnect Piping	37.20					
PSTU	15.44	--	--	--	--	--
Sulfuric Acid Plant[e]	--	--	--	--	--	--
Wilmington FCCU Shutdown:[f]						
Wilmington FCCU and CO Boiler	-290.46	-909.62	-343.31	-387.50	-121.30	-121.30
Wilmington Heaters H2, H3/H4, and H5	-10.74	-49.36	-226.28	-28.87	-49.88	-49.88
Wilmington Startup Heater	-0.16	-0.81	-3.00	-0.01	-0.17	-0.17
Wilmington Fugitive Components	-17.60	--	--	--	--	--
Carson No. 51 Vacuum Unit Heater	32.85	233.85	32.72	1.80	45.49	45.49
Carson Naphtha HDS ULNB Conversion	1.73	10.23	1.87	0.64	5.56	5.56
Carson Crude Tanks	112.51	--	--	--	--	--
Carson Fugitive Emissions:						
No. 51 Vacuum Unit	11.74	--	--	--	--	--
Alkylation	18.88	--	--	--	--	--
Crude Tanks	43.05	--	--	--	--	--
Carson HCU Mods	6.77	--	--	--	--	--
Interconnect Piping	27.22	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
C3 Splitter Unit Carson ~~Naphtha Isomerization~~ Unit	0.83 ~~9.46~~	--	--	--	--	--

TABLE 7 (continued)

Sources	Emissions (lb/day)					
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5[a]**
Carson NHDS Mods	15.21	--	--	--	--	--
Carson Wet Jet Treater	50.45	--	--	--	--	--
Tank 35	7.89					
Subtotal, Direct Stationary Source Emissions	**316.59 ~~317.33~~**	**-616.25**	**-693.17**	**-310.17**	**-92.73 ~~-98.73~~**	**-92.73 ~~-98.73~~**
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson FCCU[g]	--	--	--	--	--	--
Carson HC Heater R-1	1.77	1.04	18.00	4.61	5.38	5.38
Carson HC Heater R-2	2.36	1.38	14.40	9.81	7.18	7.18
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Carson Existing Tanks 14, 31, 62, 63, 64, 502, and 959	64.35	--	--	--	--	--
Watson Cogen Facility	4.15	4.50	20.60	2.50	9.85	9.85
Subtotal, Indirect Stationary Source Emissions	**81.93**	**17.16**	**125.18**	**62.01**	**32.28**	**32.28**
Mobile Sources[h][i]						
Vehicle Emissions[j]	0.20 ~~0.03~~	0.79 ~~0.20~~	2.98 ~~0.73~~	<0.01	0.22 ~~0.21~~	0.05
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**2.06 ~~1.89~~**	**10.40 ~~9.81~~**	**40.43 ~~38.18~~**	**<0.01**	**1.17 ~~1.16~~**	**0.89**
Total Project Emissions	**400.58 ~~401.15~~**	**-588.69 ~~-589.28~~**	**-527.56 ~~-529.81~~**	**-248.15**	**-59.28 ~~-65.29~~**	**-59.56 ~~-65.56~~**
Required Regulation XIII Compliance[k]	**-316.59 ~~-317.33~~**	**--**	**--**	**--**	**--**	**--**
Prior Regulation XIII Compliance[l]	**-41.62 ~~-34.73~~**	**--**	**--**	**--**	**-9.85**	**-9.85**
Expected ERCs[m]	**--**	**--**	**--**	**--**	**70.30 ~~76.30~~**	**70.30 ~~76.30~~**
Expected RTCs to be Retained[n]	**--**	**--**	**567.99 ~~491.63~~**	**248.16 ~~248.14~~**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance and ERC Generation[o]	**42.37 ~~49.09~~**	**-588.69 ~~-589.28~~**	**40.43 ~~38.18~~**	**<0.01**	**1.17 ~~1.16~~**	**0.89**
Significance Threshold During Operation	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

TABLE 7 (concluded)

Note: Negative numbers represent emission reductions.
(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.
(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.
(c) SOx emissions reduction expected due to fuel switch from refinery fuel gas to natural gas, which contains less sulfur.
(d) Corrects omission from Table 4.2-4 of the May 2017 Final EIR. The PM10 was reported in Appendix B-3 of the May 2017 Final EIR, but not included in the summary table in Chapter 4 (Table 6 of this Revised Addendum).
(e) No fugitive VOC emissions are expected from the Sulfuric Acid Plant.
(f) Based on actual historical emissions.
(g) Peak daily emissions are not expected to change, but increased utilization will affect annual emissions.
(h) Peak day marine vessel emissions do not change as a result of the proposed project.
(i) On-road mobile source emissions represent vehicle trips only within the jurisdiction of the South Coast AQMD. On-road mobile source emissions projected to occur outside of the South Coast AQMD's area of jurisdiction are provided in Subsection 4.2.2.2.2 of the May 2017 Final EIR.
(j) Corrects omission from Table 4.2-4 of the May 2017 Final EIR. The on-site emissions were reported in Appendix B-3 of the May 2017 Final EIR, but not included with the off-site emissions in the summary table in Chapter 4 (Table 6 of this Revised Addendum).
(k) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.
(l) Some indirect sources (i.e., Carson Tanks 14, 502, and 959, Wilmington H-101, and Carson R-2) have undergone prior new source review. Additionally, direct source Tank 35 has undergone prior new source review.
(m) ERCs for emission reductions are expected to be generated for PM10. No credits are issued for PM2.5 because it is a constituent of PM10.
(n) Local emission reductions of SOx and NOx will result from the project. Tesoro will retain RTCs from retiring the Wilmington Operations FCCU for operation of its Los Angeles Refinery. Mathematical correction to totals presented in May 2017 Final EIR.
(o) Regulation XIII compliance applied to significance determination reduces the VOC and PM10 emissions from stationary sources. Mobile sources are not subject to Regulation XIII or RECLAIM offset requirements.

6.2.1.2.3 May 2017 Final EIR Interim Operations Scenario Evaluation

The May 2017 Final EIR presented emissions from an interim operations scenario due to some project components that were expected to be implemented prior to the shutdown of the Wilmington Operations FCCU (see Table 4.2-5 from the May 2017 Final EIR presented here as Table 8). The interim operations emissions were expected to occur for up to approximately one year until the Wilmington Operation FCCU was to be shutdown, at which time, emission reductions would occur. No significant air quality impacts were identified from the interim operations.

6.2.1.2.4 Currently Proposed Interim Operations Scenario Evaluation

The Wilmington Operations FCCU shutdown occurred in October 2018. Therefore, none of the currently proposed modifications would occur during the time period between the LARIC Project approval and the Wilmington Operations FCCU shutdown (i.e., the interim operating period). Thus, the currently proposed modifications have no impact on the interim operations air quality analysis that was presented in the May 2017 Final EIR, do not change the significance determination, or make a significant impact more severe.

TABLE 8

Tesoro Los Angeles Refinery
LARIC Project Interim Operational Emissions Summary
as Presented in the May 2017 Final EIR

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[a]
Direct Emission Impacts from Stationary Sources						
Wilmington DCU H-100 Heater Duty Bump[b]	-0.43	-5.14	-171.03	86.69	-0.98	-0.98
Wilmington Fugitive Emissions:						
HCU	20.69	--	--	--	--	--
Carson Fugitive Emissions:						
Carson HCU Mods	6.77	--	--	--	--	--
Carson LHU Mods	14.34	--	--	--	--	--
Carson Mid Barrel Distillate Treater	2.15	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**43.52**	**-5.14**	**-171.03**	**86.69**	**-0.98**	**-0.98**
Indirect Emission Impacts from Stationary Sources						
Wilmington DCU Heater H-101	0.83	4.36	19.00	7.58	0.83	0.83
Wilmington HTU #3 Heaters H-30 and H-21/22	2.20	3.14	20.56	3.86	2.56	2.56
Wilmington CRU Heaters H-501A/B, H-502, H-503/504, and H-510	0.23	1.55	1.75	0.65	0.74	0.74
Wilmington Boilers 7, 8, 9, and 10	1.26	0.74	24.00	6.14	3.78	3.78
Wilmington SRP Boilers H-1601/1602	0.02	0.01	0.11	0.04	0.05	0.05
Wilmington SRP Incinerators F-704 and F-754	0.02	0.08	0.76	25.32	0.04	0.04
Wilmington Existing Tanks 80044, 80074, 80211, 80215, and 80217	4.12	--	--	--	--	--
Carson LHU Heater	0.62	0.36	6.00	1.50	1.87	1.87
Subtotal, Indirect Stationary Source Emissions	**9.30**	**10.24**	**72.18**	**45.09**	**9.87**	**9.87**
Total Project Emissions	**52.82**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Required Regulation XIII Compliance[c]	**-43.52**	**--**	**--**	**--**	**--**	**--**
Prior Regulation XIII Compliance[d]	**-0.83**	**--**	**--**	**--**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance	**8.47**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Significance Threshold During Operation	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Negative numbers represent emission reductions.
(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.
(b) Negative numbers represent emission reductions as a result of permit limits imposed, which will reduce emissions to less than historically achieved.
(c) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.
(d) Indirect source Wilmington H-101has undergone prior new source review.
Source: May 2017 Final EIR, Table 4.2-5

6.2.1.2.5 May 2017 Final EIR 90-Day Transitional Period Evaluation

The May 2017 Final EIR analyzed the 90-day transitional period when LARIC Project components would become operational to facilitate the shutdown of the Wilmington Operations FCCU and on-going construction would occur concurrently. Table 4.3-6 of the May 2017 Final EIR presented the emissions associated with 90-day transitional period using the peak construction emissions from the transitional period combined with the operational emissions associated with LARIC Project components (presented here as Table 9). The transitional period was determined to be significant for VOC and NOx emissions primarily due to the significant construction VOC and NOx emissions. Mitigation was imposed on construction and for specific stationary sources.

6.2.1.2.6 Currently Proposed Modifications 90-Day Transitional Period Evaluation

The Wilmington Operations FCCU shutdown occurred in October 2018. Therefore, none of the currently proposed modifications would occur during the 90-day time period prior to the shutdown (i.e., the 90-day transitional period). Thus, the currently proposed modifications have no impact on the transitional period air quality analysis that was presented in the May 2017 Final EIR, do not change the significance determination, or make a significant impact more severe.

6.2.1.2.7 May 2017 Final EIR Impacts to Ambient Air Quality

The May 2017 Final EIR included an ambient air analysis for operational activities. Table 4.2-12 of the May 2017 Final EIR presented the results of ambient air quality modeling (presented here as Table 10). No significant impacts to ambient air quality from operations were expected from implementation of the LARIC Project.

6.2.1.2.8 Currently Proposed Modifications Impacts to Ambient Air Quality

The currently proposed modifications affect operational fugitive VOC emissions only and the CO, NO_2, SO_2, PM10, and PM2.5 emissions modeled in the May 2017 Final EIR remain unchanged. Thus, the ambient air quality modeling for CO, NO_2, SO_2, PM10, and PM2.5 is not affected by the currently proposed modifications. Therefore, the currently proposed modifications do not change the significance determination in the May 2017 Final EIR and do not make significant impacts more severe.

TABLE 9

Tesoro Los Angeles Refinery
LARIC Project Construction and 90-Day Transitional Period
Operational Emissions Summary
as Presented in the May 2017 Final EIR

Sources	Emissions (lb/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5[(a)]
CONSTRUCTION EMISSIONS						
Maximum Construction Emissions during Transitional Period[(b)]	**52.38**	**488.48**	**575.73**	**1.41**	**68.55**	**38.67**
TRANSITIONAL PERIOD OPERATIONAL EMISSIONS						
Emissions from Interim Operations[(c)]	**8.47**	**5.10**	**-98.85**	**131.78**	**8.89**	**8.89**
Direct Emission Impacts from Stationary Sources[(d)]						
Wilmington Fugitive Emissions:						
Interconnect Piping[(e)]	13.02	--	--	--	--	--
Carson Fugitive Emissions:						
Interconnect Piping[(e)]	9.53	--	--	--	--	--
Carson LPG Railcar Unload	26.85	--	--	--	--	--
Carson NHDS Mods	15.21	--	--	--	--	--
Subtotal, Direct Stationary Source Emissions	**64.61**	**--**	**--**	**--**	**--**	**--**
Indirect Emission Impacts from Stationary Sources						
Carson Existing Tanks 31 ,62 63, and 64	36.92	--	--	--	--	--
Subtotal, Indirect Stationary Source Emissions	**36.92**	**--**	**--**	**--**	**--**	**--**
Mobile Sources						
Rail Emissions – On-Site Maneuvering	0.66	2.01	11.65	<0.01	0.25	0.24
Rail Emissions – In Basin Transiting	1.20	7.60	25.80	<0.01	0.70	0.60
Subtotal, Mobile Source Emissions	**1.86**	**9.61**	**37.45**	**<0.01**	**0.95**	**0.84**
Total Construction and Transitional Period Project Emissions	**164.24**	**503.19**	**514.33**	**133.19**	**78.39**	**48.40**
Required Regulation XIII Compliance[(f)]	**-64.61**	**--**	**--**	**--**	**--**	**--**
Total Project Emissions after Regulation XIII Compliance	**99.63**	**503.19**	**514.83**	**133.19**	**79.39**	**48.40**
Significance Threshold During Operation[(g)]	**55**	**550**	**55**	**150**	**150**	**55**
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**

(a) PM10 emissions are assumed to be 100 percent PM2.5 emissions for stationary combustion sources.
(b) The projected peak construction emissions during the transitional period are expected to occur in Month 18 (See Appendix B-1 of the May 2017 Final EIR Construction Emission Summary).
(c) From Table 8.
(d) The unmitigated construction emissions combined with the transitional period of operational emissions are expected to occur for the 90 days prior to the Wilmington Operations FCCU shutdown. At which time, emission reductions will occur (see Table 6).
(e) The emissions associated with the interconnecting piping have been reduced to reflect that prior to the shutdown of the Wilmington Operations FCCU only two pipes will be operational.
(f) Regulation XIII compliance requires offsetting the project direct stationary source emissions increases. Indirect stationary source emissions increases comply with Regulation XIII – New Source Review.
(g) When construction activities occur concurrently with project operation, the operational significance threshold is applied.
Source: May 2017 Final EIR, Table 4.2-6

TABLE 10

Tesoro Los Angeles Refinery
LARIC Project Results of Criteria Pollutants Air Quality Modeling as Presented in the May 2017 Final EIR

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	Background GLC. ($\mu g/m^3$)[(a)]	Total GLC ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$) [(b)]	Exceeds Significance Threshold?
CO	1-hour	11.2	4,809.0	4,820.2	23,000	No
	8-hour	5.1	2,977.0	2,982.1	10,000	No
NO_2[(c)]	1-hour	48.5	255.5	304.0	339	No
	1-hour (Fed.)[(d)]	40.8	146.3[(e)]	187.1	188	No
	Annual	2.1	47.6	49.7	57	No
SO_2	1-hour	6.5	64.9	71.4	655	No
	1-hour (Fed.)[(f)]	6.5	40.0	46.6	196	No
	24-hour	0.6	64.9	65.5	105	No
PM10	24-hour	0.42	--	--	2.5	No
	Annual	0.52	--	--	1.0	No
PM2.5	24-hour	0.42	--	--	2.5	No

(a) South Coastal LA County 3 years 2012-2014. Maximum value of the three years was used, except concentrations used to compare with federal standards were averages.
(b) South Coast AQMD Air Quality Significance Thresholds. For PM10 and PM2.5, project comparison to incremental change. Standards are state standards unless distinguished as Federal. CO and NO_2 values converted from ppm values in Table 3.
(c) Impacts from air dispersion model are reported as NOx. NO_2 converted from NOx by using default factor of 0.8 for hourly and 0.75 for annual, per 9/30/2014 Memorandum from R Chris Owen and Roger Brode, U.S. EPA Air Quality Modeling Group, to Regional Air Division Directors re: Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 NAAQ.
(d) Federal standard is the 98th percentile concentration, averaged over three years.
(e) 98th percentile background NO_2 value from the South Coast AQMD.
(f) Federal standard is the 99th percentile concentration, averaged over three years.
Source: May 2017 Final EIR, Table 4.2-12

6.2.1.2.9 May 2017 Final EIR Toxic Air Contaminant Impacts

The May 2017 Final EIR included a health risk assessment (HRA) for operational emissions associated with the LARIC Project. In the response to comments to the Draft EIR, the May 2017 Final EIR included a supplemental HRA focused on the health impacts of the construction and operational activities of the LARIC Project (see May 2017 Final EIR Appendix H, Table 1 (presented here as Table 11)). In all three scenarios, operations, construction, and combined construction and operation, the resulting health risk impacts of the LARIC Project were determined to be less than significant.

Table 11

Tesoro Los Angeles Refinery
LARIC Project Construction, Operational, and Combined Health Risk Results as Presented in the May 2017 Final EIR

Receptor Location	Operations Only[(a)]		Construction Only[(b)]		Combined Construction and Operations[(c)]	
	Cancer Risk	Chronic HI	Cancer Risk	Chronic HI	Cancer Risk	Chronic HI
Resident	3.7×10^{-6}	0.030	2.9×10^{-6}	0.003	5.7×10^{-6}	0.033
Worker	9.3×10^{-6}	0.106	2.5×10^{-6}	0.008	9.3×10^{-6}	0.115

HI = hazard index
(a) Resident UTM Coordinates: 383700, 3741400; Worker UTM Coordinates: 386005.9, 3742921.4
(b) Resident UTM Coordinates: 385251.4, 3739502.8; Worker UTM Coordinates: 384457.8, 3741374.6
(c) Resident UTM Coordinates: 385251.4, 3739502.8; Worker UTM Coordinates: 386005.9, 3742921.4
Source: May 2017 Final EIR, Appendix H, Table 1

6.2.1.2.10 Currently Proposed Modifications Toxic Air Contaminant Impacts

The following currently proposed modifications will alter the TAC emission estimates that were evaluated in the May 2017 Final EIR:

- Carson Operations C3 Splitter Unit: Replacing the Carson Naphtha Isomerization Unit modification portion of the project with the Carson Operations C3 Splitter Unit will change the quantities, types and location of TACs emitted from the project.
- Carson Operations Storage Tank 35: This proposed modification will increase the TAC emissions from the project due to increased throughput at Carson Operations Tank 35.
- Carson Crude Terminal: The speciation will be revised to incorporate the differences in concentrations of some TACs and to include H_2S concentrations for some crude oils.

Therefore, new modeling was performed for the entire LARIC Project updated with the potential changes in TAC emissions from the currently proposed modifications (see Appendix E for details).

The HRA included in the May 2017 Final EIR relied upon the South Coast AQMD's meteorological data set for years 2006-2011. Subsequently, the South Coast AQMD published a new meteorological data set for years 2012–2016. To show the effect on the change in meteorological data, Table 12 summarizes the results of the HRA for the LARIC Project using the 2006–2011 meteorological data set as published in the May 2017 Final EIR results and compares it to the results for the LARIC Project using the 2012–2016 meteorological data set. The change in meteorological data has the effect of reducing the residential and worker cancer risk and chronic hazard index values and slightly increasing the maximum cancer risk at a sensitive receptor and acute health hazard index. Table 12 also presents the results using the 2012–2016 meteorological data set including the potential impacts from the currently proposed modifications to the LARIC Project. The results for the LARIC Project using the 2012–2016 meteorological data set are similar to those for the LARIC Project including the currently proposed modifications using the same 2012–2016 meteorological data set (i.e., the incremental change with the currently proposed modifications indicates the residential cancer risk increase is about 0.1 and the chronic hazard index increase is 0.007). The projected maximum impact locations are shown in Figure 6.

TABLE 12

Tesoro Los Angeles Refinery
Comparison of LARIC Project Results of Health Risk Modeling
Including the Currently Proposed Modifications
Using Different Meteorological Data Sets

Location	Significance Threshold	LARIC Project as in the Final EIR using 2006-2011 met data	Original LARIC Project using 2012-2016 met data[(a)]	LARIC Project with Currently Proposed Modifications using 2012-2016 met data	Incremental Change	Exceeds Significance Threshold?
Cancer Risk (per million)						
Residential Receptor	10	3.7	2.8	2.9	0.1	No
Offsite Workplace Receptor	10	9.3	7.0	7.0	<0.1	No
Sensitive Receptor	10	2.1	2.4	2.4	<0.1	No
Chronic Hazard Index						
Offsite Workplace Receptor	1	0.106	0.078	0.085	0.007	No
Acute Hazard Index						
Offsite Workplace Receptor	1	0.052	0.076	0.076	<0.001	No

See Appendix E for further details.
(a) Only the meteorological data was changed to show that effect independently of the currently proposed modifications.

The currently proposed modifications do not change the construction equipment that will be utilized, but rearrange the construction schedule. The supplemental HRA presented in Appendix H of the May 2017 Final EIR conservatively assumed all construction and operational modifications occurred concurrently. This assumption overestimated the expected risk because the operation of the approved project components to be constructed was assumed to occur concurrently with their construction.

Using the same approach as used in Appendix H of the May 2017 Final EIR (i.e., evaluating the construction and operation impacts as if they were occurring concurrently), the currently proposed modifications and construction activities were combined to determine the potential health impacts. Table 13 compares the potential health impacts from the currently proposed modifications occurring concurrently with construction to the results presented in the May 2017 Final EIR. In each case, the results do not exceed the significance thresholds.

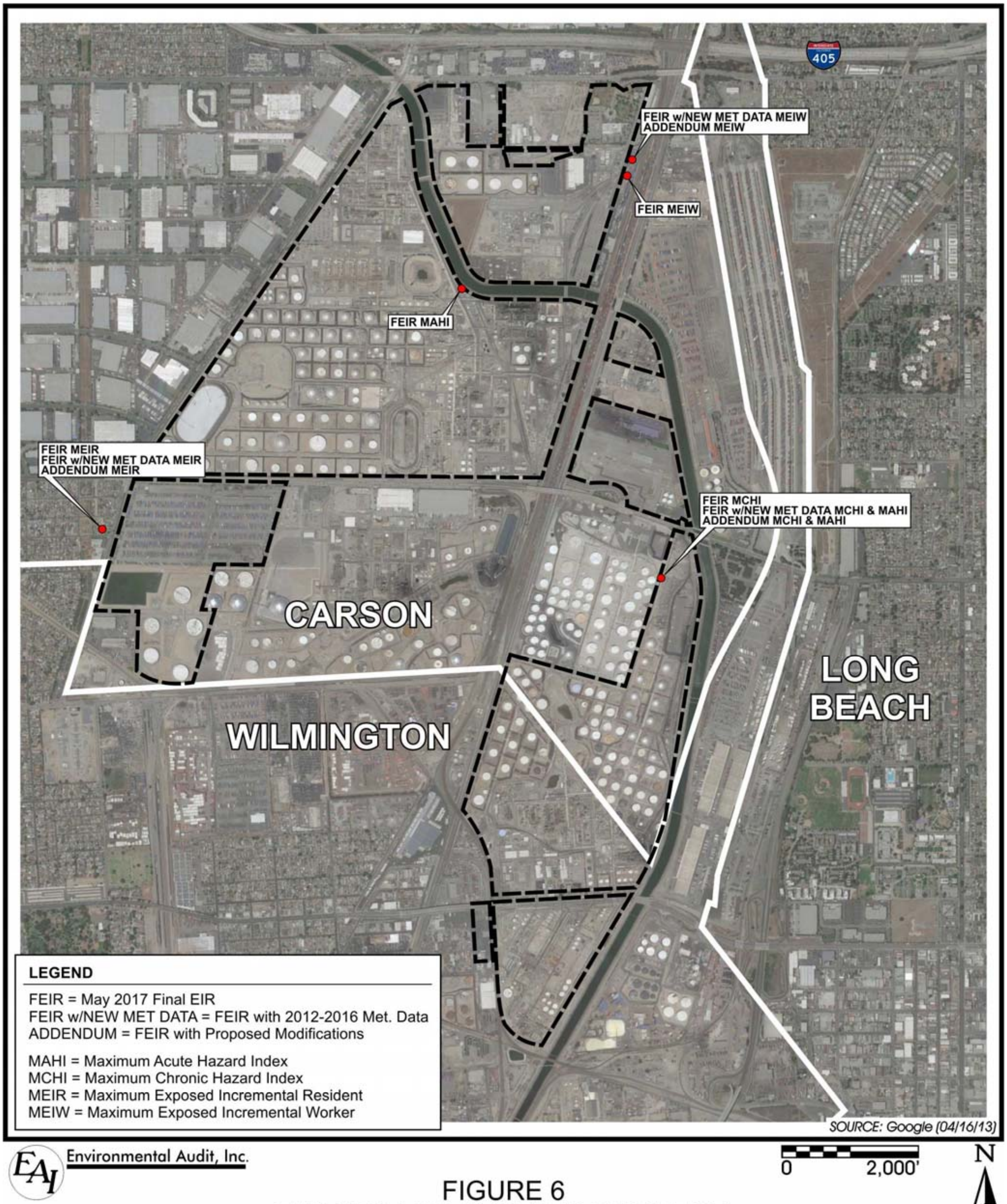

FIGURE 6
TESORO LOS ANGELES REFINERY
RECEPTOR LOCATIONS MAP

Project No. 2844

N:\2844\Receptor-2019APR\Receptor Locations Map.cdr

TABLE 13

Tesoro Los Angeles Refinery
Comparison of LARIC Project Combined Construction and Operational Health Risk Results to the LARIC Project with the Currently Proposed Modifications and Revised Construction Health Risk Results

Receptor Location	May 2017 Final EIR Combined Construction and Operation using 2006-2011 met data	Original LARIC Project using 2012-2016 met data[(a)]	LARIC Project with Currently Proposed Modifications using 2012-2016 met data[(b)]	Incremental Change[(c)]	Significance Threshold	Exceeds Significance Threshold?
	Cancer Risk (per million)					
Resident	5.7	4.7	4.7	<0.1	10	No
Worker	9.3	7.0	7.0	<0.1	10	No
	Chronic Hazard Index					
Offsite Workplace Receptor	0.115	0.089	0.096	0.007	1	No

The revised HRA prepared as part of this Revised Addendum (see Appendix E) conservatively represents the potential health impacts of the currently proposed modifications with the restructured construction schedule; no change in the significance determination in the May 2017 Final EIR or in the severity of significant impacts is expected from the currently proposed modifications.

6.2.1.3 Cumulative Air Quality Impacts

6.2.1.3.1 Construction Impacts

Section 5.2.1.2 of the May 2017 Final EIR concluded that the cumulative air quality impacts associated with the construction phase of the LARIC Project would exceed the air quality significance thresholds for VOC and NOx. Therefore, the cumulative air quality construction impacts were considered significant. Since CO, SOx, PM10, and PM2.5 construction emissions were not expected to exceed their respective project-specific thresholds, they were not considered to be cumulatively considerable and, therefore, would not contribute to cumulative construction air quality impacts.

The currently proposed modifications do not change the construction air quality significance determinations from the May 2017 Final EIR (see Tables 2 and 3). Therefore, no change to the cumulative construction impacts is expected.

6.2.1.3.2 Operational Impacts

In Section 5.2.1.3 of the May 2017 Final EIR, it was concluded that the cumulative air quality impacts associated with the operational phase of the LARIC Project was not cumulatively considerable and would not contribute to the cumulative operational impacts for CO, VOC, NOx, SOx, PM10, and PM2.5.

The currently proposed modifications do not change the significance determination made in the May 2017 Final EIR (see Table 6 and 7) for operational air quality impacts and, therefore, do not change the cumulative operational air quality significance determination from the May 2017 Final EIR.

6.2.1.3.3 Toxic Air Contaminants

Section 5.2.1.4 of the May 2017 Final EIR concluded that the cumulative impacts of TAC emissions associated with the LARIC Project were below the significance criteria for cancer risk of ten per one million and below the significance criteria for hazard indices of 1.0. Therefore, significant adverse cumulative TAC impacts were not expected from the LARIC Project.

As presented in Tables 12 and 13, the currently proposed modifications do not substantially alter the HRA results from those reported in the May 2017 Final EIR (see Section 6.2.1.2.10 of this Revised Addendum Table 11) and do not change the significance determinations for TACs in the May 2017 Final EIR. Therefore, the currently proposed modifications do not alter the cumulative TAC impacts, which are less than significant.

6.2.1.3.4 Greenhouse Gas Emissions

An evaluation of greenhouse gas (GHG) emissions, as presented in Section 5.2.2 of the May 2017 Final EIR, estimated construction emissions of 772 metric tons per year as amortized over 30 years, and a decrease in operational GHG emissions of 68,947 metric tons per year. The overall GHG emissions from the LARIC Project were expected to be a decrease of 68,175 metric tons per year with an AB32 Cap and Trade Allowance that offset the reduction to result in an emissions neutral GHG impact. Therefore, the GHG emissions impact was less than significant.

The currently proposed project takes into account a revised construction schedule, which will have the effect of reducing the 30-year amortized GHG emissions from 772 metric tons per year to 610 metric tons per year (see Appendix B); there will be no change in operational GHG emissions presented in the May 2017 Final EIR. Fewer construction GHG emissions will occur because fewer construction activities will be needed to implement the proposed Carson Operations C3 Splitter Unit modifications than the Carson Operations Naphtha Isomerization Unit modifications. Therefore, the currently proposed modifications will result in fewer GHG emissions than those presented in the May 2017 Final EIR such that the conclusion of less than significant GHG impacts will not change.

6.2.1.4 Mitigation Measures

The May 2017 Final EIR included the following eight construction mitigation measures to reduce the impact of the construction emissions and one operational mitigation measure, because the VOC and NOx emissions during construction exceeded the South Coast AQMD air quality significance thresholds:

- Require development and implementation of a construction management program,
- Minimize the use of diesel-powered equipment through the use of electric or alternative-fueled equipment where available,
- Limit on-road truck and off-road equipment idling,
- Require equipment maintenance,
- Use electric welders instead of gas or diesel welders where electricity is available,
- Use on-site electricity rather than temporary power generators where electricity is available,
- Require use of Tier 4 engines on construction equipment greater than 50 hp unless unavailable, then use equipment with Tier 3 engines, and
- Prohibit the use of air pollutant emitting construction equipment on days with a first stage smog alert.

In addition, the May 2017 Final EIR included one operational mitigation measure to reduce NOx operational emissions during the construction period. The operational mitigation measure required Tesoro to implement early SCR catalyst replacement of three specified units on a schedule established in the May 2017 Final EIR. The SCR catalyst replacements were completed by year-end in 2017. Because the currently proposed modifications do not change the significance determinations made in the May 2017 Final EIR, no additional air quality mitigation measures are required.

6.2.2 Hazards and Hazardous Materials

The September 2014 NOP/IS determined that the LARIC Project has the potential to generate significant adverse hazards and hazardous materials impacts. The hazards and hazardous material impacts from the LARIC Project are discussed in this section.

Impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.

- Non-conformance to National Fire Protection Association standards.

- Non-conformance to regulations or generally accepted industry practices related to operating policies and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.

- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.
- Exposure to radiant heat exposures in excess of 1,600 British Thermal Units (Btu)/(hr-ft^2) (the level that creates second degree burns on unprotected skin).

- Overpressure exposure that exceeds one pound per square inch (gauge) (psig) (the level that would result in partial demolition of houses).

- Flash fire hazard zones that exceed the lower flammable limit (LFL) (the level that would result in a flash fire in the event a flammable vapor cloud was ignited).

The significance criteria used in the May 2017 Final EIR also applies to this Revised Addendum.

6.2.2.1 May 2017 Final EIR

The potential hazard and hazardous material impacts of the LARIC Project were analyzed in Section 4.3 of the May 2017 Final EIR. The Carson Operations Naphtha Isomerization Unit, the new crude oil storage tanks, SARP, and Interconnecting Pipelines were determined to pose potentially significant off-site hazards. One mitigation measure was imposed to require an evaluation of, and early compliance with, regulatory requirements related to process safety and accident prevention. The analysis identified construction hazards from disturbing areas with existing soil contamination during excavation activities and these hazards were concluded to have less than significant impacts.

6.2.2.2 Currently Proposed Modifications

The currently proposed modification to relocate propane recovery to the Carson Operations C3 Splitter Unit from the proposed Carson Operations Naphtha Isomerization Unit is expected to reduce hazard impacts from the original project analyzed because the proposed Carson Operations C3 Splitter modifications only require piping modifications and the installation of a new heat exchanger, which are located farther from the property line (approximately 150 feet). As shown in Figure 3, the Carson Operations C3 Splitter Unit is located just north of the Carson Operations Naphtha Isomerization Unit farther from the fenceline. Hazard impacts from processing units are evaluated based on the composition of the streams in the process lines and operating conditions. The conditions analyzed for the approved modification to the Carson Operations Naphtha Isomerization Unit were more complex than the currently proposed modification of the Carson Operations C3 Splitter Unit. The Carson Operations Naphtha Isomerization Unit hazard impacts were based on the hazard zone of influence extending off-site beyond the fenceline. Moving the proposed modification farther from the fenceline would lessen the size of the hazard zone that extends off-site. Therefore, the hazard impacts presented in the May 2017 Final EIR for the Carson Operations Naphtha Isomerization Unit overestimate the potential hazard impact from the proposed Carson Operations C3 Splitter Unit modifications.

Hazard impacts associated with storage tanks are evaluated based on the maximum volume of the storage tank, the properties of the materials stored in the storage tank, and the dimensions of the primary containment (i.e., tanks)[2] s~~econdary containment surrounding the tank~~. ~~The secondary containment is designed to contain the maximum volume of the tank when released from the storage tank.~~ These characteristics are used to evaluate the ~~a release and subsequent~~ primary hazard of a fire of the pool of material within the ~~secondary~~ tank ~~containment~~ (i.e., pool fire). In the case of a ~~release from the~~ storage tank fire, the radius of the hazard impact zone is determined by the dimensions of the liquid pool, the properties of the material, and meteorological conditions. ~~proper procedure requires shutting off supply to the tank.~~ Thus, hazard impacts from a pool fire are not influenced by throughput. The currently proposed modification to increase the throughput of the Carson Operations Tank 35 makes no physical modification to the tank ~~or secondary containment~~, and does not change the types of materials stored. Therefore, no change in hazards associated with the Carson Operations Tank 35 is expected and no new hazards are expected from the currently proposed throughput increase.

No construction activities are associated with the currently proposed modifications to the CCT crude oil TAC speciation. The hazard analysis presented in the May 2017 Final EIR would not be affected by a change in the speciation. The hazard analysis for the crude oil storage tanks is based on the maximum volume of the storage tank, the properties of the materials stored in the storage tank, and the dimensions of the ~~secondary~~ primary containment (i.e., tank dimensions)~~surrounding the tank~~. The proposed change in TAC speciation does not affect these parameters. Therefore, the hazard analysis presented in the May 2017 Final EIR is representative of the currently proposed modifications. The currently proposed modifications to the CCT TAC speciation do not change the significant impacts or make the significant impacts more severe.[3]

The schedule of construction activities associated with the LARIC Project was reorganized, but the expected amount of excavation work did not change. The only currently proposed modification that would change construction activities is the replacement of the Carson Operations Naphtha Isomerization Unit modifications with the Carson Operations C3 Splitter Unit modifications. The Carson Operations C3 Splitter Unit modifications require no new foundations, less equipment, and, thus, less construction. Therefore, the change in construction schedule does not affect the volume or location of excavation work and would not affect the amount of contaminated soil encountered during excavation activities.

[2] This section has been revised to correct the Addendum's description of the Worst-Case Consequence Analysis in Appendix C of the May 2017 Final EIR. The event that was evaluated in the Worst-Case Consequence Analysis was the contents of the tank catching fire, not a fire within the secondary containment.

[3] Appendix F provides further information on the effect of the update in speciation on the hazard assessment.

The hazards impacts from the currently proposed modifications are expected be the same as or less than the hazard impacts analyzed in the May 2017 Final EIR. Thus, the significance conclusion made in the May 2017 Final EIR conservatively addresses the hazard impacts associated with the modified LARIC Project. The currently proposed modifications would not create new signification hazard impacts or make a significant hazard impact more severe.

6.2.2.3 Cumulative Hazard Impacts

6.2.2.3.1 May 2017 Final EIR

Section 5.2.3 of the May 2017 Final EIR concluded that the cumulative hazards and hazardous materials impacts associated with the construction phase of the LARIC Project would not generate significant impacts. Therefore, the cumulative construction hazards and hazardous materials impacts were less than significant.

Section 5.2.3 of the May 2017 Final EIR concluded that the cumulative hazards and hazardous materials impacts associated with the operations of the LARIC Project were cumulatively considerable and cumulatively significant. No additional feasible mitigation measures beyond what was required in the May 2017 Final EIR for the project hazards was identified or imposed.

6.2.2.3.2 Currently Proposed Modifications

The proposed change in construction schedule does not affect the volume or location of excavation work, only the timing of the work. Therefore, construction hazards are expected to be the same as those identified in the May 2017 Final EIR. The hazard impacts from construction of the LARIC Project are expected to remain less than significant with the currently proposed modifications. Therefore, no change to the significance determination for construction hazards and hazardous materials is expected as a result of implementation of the currently proposed modifications.

Further, the currently proposed modifications do not change the LARIC Project operational hazard impacts because the changes do not affect the parameters that determine the hazard impacts or in the case of the Carson Operations C3 Splitter Unit would not worsen, and potentially lessen the hazard impacts, but are expected to remain significant. The three other LARIC Project components that were determined to have significant impacts (i.e., the new crude oil storage tanks, SARP and Interconnecting Pipelines) would continue to have the same potentially significant hazard impacts and cumulatively significant hazard impacts after implementation of the currently proposed modifications. Therefore, the operational hazard impacts would remain significant and the cumulative hazard impacts would also remain significant, but potentially less severe than what was analyzed in the May 2017 Final EIR.

6.2.3 Hydrology and Water Quality

The September 2014 NOP/IS for the LARIC Project determined that the hydrology and water quality impacts of the LARIC Project were potentially significant for water supply. The potential adverse impacts of the LARIC Project on water supply were evaluated in the May 2017 Final EIR. The September 2014 NOP/IS also concluded that the LARIC Project would have less than significant impacts to water quality including wastewater generation. However, to provide a complete understanding of the water supply and wastewater discharge relationship, a discussion of the LARIC Project wastewater impacts was provided along with the analysis of water supply impacts in the May 2017 Final EIR. The potential adverse impacts of the currently proposed modifications on water supply and wastewater treatment facilities are evaluated in this subsection.

The impacts on hydrology and water quality would be considered significant if the following occurs:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases demand for water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of NPDES permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

6.2.3.1 May 2017 Final EIR

Section 4.4 of the May 2017 Final EIR concluded that the LARIC Project was expected to increase water use for construction by about 40,000 gallons per day (gpd), which is below the significance threshold for water demand. The wastewater discharge treatment facilities during construction were concluded to be sufficient to meet the added project needs. Therefore, the impact to water supply and wastewater treatment facilities during construction would be less than significant.

Section 4.4 of the May 2017 Final EIR concluded that the LARIC Project was expected to increase the operational water demand of the Refinery by approximately 110,160 gpd, which is below the significance threshold. The LARIC Project was expected to decrease wastewater generation by 79,344 gpd. Therefore, no significant hydrology and water quality impacts were identified in the May 2017 Final EIR.

6.2.3.2 Currently Proposed Modifications

The currently proposed modifications are not expected to increase the water demand estimates presented in the May 2017 Final EIR during construction because the currently proposed modifications do not increase earth movement that would require water for dust suppression. The currently proposed modifications to the Carson Operations Tank 35 throughput and the CCT crude oil speciation do not involve construction and the Carson Operations C3 Splitter Unit modifications involve fewer construction activities (i.e., piping modifications and a heat exchanger) than the previously approved Carson Operations Naphtha Isomerization Unit modifications (i.e., new off-gas scrubber, reactor effluent flash drums, heat exchangers, pumps, piping, and instrumentations). Therefore, the construction water use analyzed in the May 2017 Final EIR represents the estimated water use for the LARIC Project with the currently proposed modifications and will remain less than significant.

The currently proposed modifications are not expected to change the water demand during operation of the LARIC Project because the currently proposed modifications do not require water. The proposed relocation of propane recovery to the Carson Operations C3 Splitter Unit from the Naphtha Isomerization Unit is a hydrocarbon stream separation process that does not use water. The currently proposed modification to increase the throughput of the Carson Operations Tank 35 will not require any operational water use. The change in TAC speciation at the CCT crude oil storage tanks also does not involve water use. Therefore, the operational water use analyzed in the May 2017 Final EIR represents the estimated water use for the LARIC Project with the currently proposed modifications. It was determined water demand impacts to be less than significant in Section 4.4 of the May 2017 Final EIR. The currently proposed modifications will not change the conclusions in the May 2017 Final EIR. The currently proposed modifications would not create new significant hydrology and water quality impacts, or make significant hydrology and water quality impacts more severe.

6.2.3.3 Cumulative Hydrology and Water Quality Impacts

6.2.3.3.1 May 2017 Final EIR

In Section 5.2.4 of the May 2017 Final EIR, it was concluded that the cumulative water demand and water quality impacts from the LARIC Project were less than significant.

6.2.3.3.2 Currently Proposed Modifications

The currently proposed modifications do not change the water demand or water quality impacts analyzed in the May 2017 Final EIR. Therefore, the currently proposed modifications do not change the less than significant determination made in the May 2017 Final EIR for water demand or water quality impacts.

6.2.4 Noise

The September 2014 NOP/IS determined that the LARIC Project has the potential to generate significant adverse noise impacts during construction and operation. Potential noise impacts associated with the LARIC Project construction and operational activities were evaluated in the May 2017 Final EIR (see Section 4.5 of the May 2017 Final EIR).

Sensitive noise receptors in the vicinity of the LARIC Project fall within three jurisdictions, the Wilmington District of the City of Los Angeles, the City of Carson, and the City of Long Beach (see Figure 3.5-2). The significance thresholds used for this noise analysis rely on the Los Angeles CEQA Thresholds Guide (City of Los Angeles 2006) and the vibration significance criterion from the Federal Transit Administration (FTA) Vibration Impact Criteria for General Assessment, which sets acceptability limits for vibration in buildings (including residential structures.)

A project would have a significant adverse noise or vibration impact under the following circumstances:

- Construction of the proposed project would have a significant noise impact if construction noise levels exceed the local noise ordinances, or if the noise ordinance is currently exceeded, if ambient Community Noise Exposure Levels (CNEL) would be increased by 3.0 dBA or more at a noise sensitive receptor during the construction period.

- Operation of the proposed project would have a significant noise impact if proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, ambient CNEL noise levels would be increased by 3.0 dBA or more at a noise sensitive receptor.

- Construction and operation of the proposed project would have a significant vibration impact if ground vibration levels for residential structures would exceed 72 vibration decibels (VdB) for frequent events (70+ vibration events), 75 VdB for occasional events (30-70 events), and/or 80 VdB for infrequent events (30 or fewer events), the acceptability limits prescribed by the FTA.

The local noise ordinances were summarized in Subsection 3.5.3 of the May 2017 Final EIR for the jurisdictions in which the LARIC Project is located (i.e., the Cities of Carson and Los Angeles). In order to provide a conservative analysis of noise impacts, noise impacts will be considered significant if there would be an increase of 3.0 dBA or more during construction and operational activities as the use of the noise ordinances could allow increases greater than 3.0 dBA.

6.2.4.1 May 2017 Final EIR

In Section 4.5 of the May 2017 Final EIR, construction noise and vibration impacts were analyzed and it was concluded that the impacts were less than 3 dBA and less than 72 VdB, respectively from the LARIC Project. Therefore, the expected construction noise and vibration impacts were determined to be less than significant.

In Section 4.5 of the May 2017 Final EIR, operational noise and vibration impacts were analyzed and it was concluded that the impacts were less than 3 dBA and less than 72 VdB, respectively from the LARIC Project. Therefore, the expected operational noise and vibration impacts were determined to be less than significant.

6.2.4.2 Currently Proposed Modifications

No physical modifications are needed for the currently proposed modifications to increase throughput in the Carson Operations Tank 35 or the change in the TAC speciation for the CCT crude oil storage tanks. The replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications would reduce the amount of construction and move construction farther into the Refinery interior. Therefore, less construction related noise is expected from the currently proposed modifications than was analyzed in the May 2017 Final EIR.

The noise and vibration analyses presented in Section 4.5 of the May 2017 Final EIR are conservative and representative of the potential noise and vibration impacts from the currently proposed modifications. As such, the currently proposed modifications do not change the construction noise and vibration conclusions or significance determinations made in the May 2017 Final EIR. The construction noise and vibration impacts will remain less than significant.

No physical modifications are needed for the currently proposed increased throughput in the Carson Operations Tank 35 or the change in TAC speciation for the CCT crude oil storage tanks. The currently proposed modifications to the Carson Operations C3 Splitter Unit are piping modifications and a heat exchanger and do not add noise generating equipment (e.g., pumps). Therefore, the noise and vibration analyses presented in the May 2017 Final EIR are conservative and representative of the currently proposed modifications. As such, the currently proposed modifications do not change the operational noise and vibration conclusions or significance determinations made in the May 2017 Final EIR. The operational noise and vibration impacts will remain less than significant. The currently proposed modifications would not create new significant noise impacts, or make significant noise impacts more severe.

6.2.4.3 Cumulative Noise Impacts

6.2.4.3.1 May 2017 Final EIR

The cumulative noise impacts from the LARIC Project were determined to be not cumulatively considerable and would not contribute to a significant adverse cumulative construction noise or operational noise impacts.

6.2.4.3.2 Currently Proposed Modifications

The May 2017 Final EIR noise and vibration analyses encompass the currently proposed modifications and are representative of the expected impacts. Therefore, no change to the cumulative noise and vibration impacts will occur from implementation of the currently proposed modifications. The cumulative noise impacts from construction and operation of the currently proposed modifications will remain less than significant.

6.2.5 Solid and Hazardous Waste

The September 2014 NOP/IS determined that construction and operation of the LARIC Project could generate potentially significant adverse solid and hazardous waste impacts. Therefore, Section 4.6 of the May 2017 Final EIR addressed the potential solid and hazardous waste impacts associated with the LARIC Project.

A project would have a significant impact on solid and hazardous waste if it would:

- Result in an increase in solid or hazardous waste generation due to project operations that would exceed the capacity of existing solid or hazardous waste handling and disposal facilities.

6.2.5.1 May 2017 Final EIR

Section 4.6 of the May 2017 Final EIR evaluated construction and operational impacts of the LARIC Project on solid waste and hazardous waste. The May 2017 Final EIR concluded that there would be a less than significant increase in the generation of non-hazardous and hazardous wastes associates with the construction of the LARIC Project.

Section 4.6 of the May 2017 Final EIR also concluded that there would be a less than significant increase in the generation of non-hazardous and hazardous wastes associated with the operation of the LARIC Project.

6.2.5.2 Currently Proposed Modifications

No physical modifications are needed for the currently proposed increased throughput in the Carson Operations Tank 35 or the change in TAC speciation for the CCT crude oil storage tanks. The replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications would reduce the amount of construction as less equipment is needed and no new foundations are necessary. The currently proposed modifications are not expected to increase the amount of solid or hazardous waste generated during construction. The currently proposed modifications do not involve the removal of any existing structures and the project area has been previously graded. Therefore, the solid and hazardous waste generation associated with construction analyzed in the May 2017 Final EIR conservatively represents the solid and hazardous waste generation with the currently proposed modifications. The May 2017 Final EIR determined construction solid and hazardous waste impacts to be less than significant. The currently proposed modifications will not change the conclusions in the May 2017 Final EIR.

The currently proposed modifications are not expected to change the amount of solid or hazardous waste generated for disposal during operation. The proposed change in TAC speciation for the CCT crude oil storage tanks and the replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications do not involve operational activities that generate any additional solid or hazardous waste. The increased throughput of the Carson Operations Tank 35 involves refined material that does not generate solid waste. Process tanks are taken out of service and cleaned as required by regulation or when maintenance is required but is not expected to increase the need for tank cleaning that may generate solid waste. Solids produced from tank cleaning are expected to be processed at the Refinery. Therefore, no additional solid or hazard waste that would be sent offsite for disposal is expected, so the operational solid and hazardous waste generation analyzed in the May 2017 Final EIR represents the estimated solid and hazardous waste generation with the currently proposed modifications. The May 2017 Final EIR determined operational solid and hazardous waste impacts to be less than significant. The currently proposed modifications will not change the conclusions in the May 2017 Final EIR. The currently proposed modifications would not create new significant solid and hazardous waste impacts, or make significant solid and hazardous waste impacts more severe.

6.2.5.3 Cumulative Solid and Hazardous Waste Impacts

6.2.5.3.1 May 2017 Final EIR

The cumulative solid and hazardous waste impacts from the LARIC Project were determined to be not cumulatively considerable and would not contribute to a significant adverse cumulative construction solid and hazardous waste or operational solid and hazardous waste impacts.

6.2.5.3.2 Currently Proposed Modifications

The May 2017 Final EIR solid and hazardous waste analyses encompass the currently proposed modifications and are representative of the expected impacts. Therefore, no change to the cumulative analysis for solid and hazardous waste impacts will occur from implementation of the currently proposed modifications. The cumulative solid and hazardous waste impacts from construction and operation of the currently proposed modifications will remain less than significant.

6.2.6 Transportation and Traffic

The September 2014 NOP/IS concluded that the traffic and parking impacts associated with the construction phase of the LARIC Project were potentially significant and would be evaluated in the Draft EIR. The other transportation and traffic issues were determined to be less than significant and did not require additional environmental review. Potential traffic impacts associated with the LARIC Project construction activities were evaluated in Section 4.7 of the May 2017 Final EIR.

The LARIC Project will occur at the Refinery. For intersections under City of Los Angeles and Carson jurisdictions, a project's impacts on transportation and traffic would be considered significant if any of the following significance criteria occurs (using the Intersection Capacity Utilization methodology):

- Peak period levels on major arterials are disrupted to a point where the Level of Service (LOS) is reduced to D, E, or F for more than one month.
- An intersection's volume to capacity (Vehicle/Capacity) ratio increases by 0.02 (two percent) or more when the LOS is already D, E, or F.

For freeway ramp intersections, a project's impacts on transportation and traffic would be considered significant if the following significance criteria occur (using the Highway Capacity Manual methodology):

- Peak period levels on major arterials are disrupted to a point where the LOS is reduced to D, E, or F for more than one month.

The following significance thresholds apply to all portions of a project, regardless of the jurisdiction:

- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- A major roadway is closed to all through traffic and no alternate route is available.
- The demand for parking facilities is substantially increased.

6.2.6.1 May 2017 Final EIR

The traffic analysis in the May 2017 Final EIR determined that during the construction phase of the LARIC Project one intersection (Interstate 405/Wilmington Avenue Southbound Ramps prior to the completions of the Interstate 405/Wilmington Avenue Interchange project) could potentially be significantly impacted. Peak construction activities would require about 1,060 construction workers on a peak day. Therefore, the construction activities associated with the LARIC Project were determined to result in significant adverse traffic impacts during the construction phase.

Operational phase truck traffic to the Refinery was determined to be less than significant in the September 2014 NOP/IS.

Mitigation was imposed requiring a traffic management plan and restricting access to the Refinery to routes avoiding the Interstate 405/Wilmington Avenue Southbound Ramps. The traffic impacts of the LARIC Project during construction were mitigated to less than significant.

6.2.6.2 Currently Proposed Modifications

The currently proposed modifications are not expected to impact transportation and traffic during construction. First, the intersection of Wilmington Avenue and the 405 freeway, which was under construction at the time of the May 2017 Final EIR preparation, has been completed. Second, only the Carson Operations C3 Splitter Unit modifications require construction and the level of effort to complete that proposed modification is less than that analyzed for the approved Carson Operations Naphtha Isomerization Unit (i.e., less excavation and grading and less installation of equipment, so fewer construction workers and deliveries). Finally, the peak construction month for the LARIC Project occurred in November 2017, so the construction of the currently proposed Carson Operations C3 Splitter Unit modifications is not expected to occur during peak construction activities. Therefore, the construction transportation and traffic analyzed in the May 2017 Final EIR conservatively represents the transportation and traffic expected to occur with the currently proposed modifications.

The currently proposed modifications are not expected to impact transportation and traffic during operation. The proposed change in TAC speciation for the CCT crude oil storage tanks and the replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications do not involve operational activities that generate any additional products or waste for transport. The increase in throughput of the Carson Operations Tank 35 does not affect transportation because it does not increase jet fuel production and jet fuel is and will continue to be transferred to the airports via pipeline, not by truck or rail. Therefore, the operational transportation and traffic impacts analyzed in the May 2017 Final EIR represents the transportation and traffic impacts expected to occur with the currently proposed modifications.

The May 2017 Final EIR determined LARIC Project transportation and traffic impacts to be less than significant after mitigation was imposed. The currently proposed modifications will not change the conclusions in the May 2017 Final EIR. The currently proposed modifications would not create new significant transportation and traffic impacts, or make significant transportation and traffic impacts more severe.

6.2.6.3 Cumulative Transportation and Traffic Impacts

6.2.6.3.1 May 2017 Final EIR

The cumulative transportation and traffic impacts from the LARIC Project were determined to be not cumulatively considerable and would not contribute to a significant adverse cumulative construction transportation and traffic or operational transportation and traffic impacts.

6.2.6.3.2 Currently Proposed Modifications

The May 2017 Final EIR transportation and traffic analysis encompasses the currently proposed modifications and is representative of the expected impacts. Therefore, no change to the cumulative transportation and traffic impacts will occur from implementation of the currently proposed modifications. The cumulative transportation and traffic impacts from construction and operation of the currently proposed modifications will remain less than significant.

7.0 POTENTIAL ENVIRONMENTAL IMPACTS IN ORIGINAL NOP/IS FOUND TO BE NOT SIGNIFICANT

This section discusses the remaining 11 environmental topic areas found not to be potentially significantly affected by the LARIC Project in the September 2014 NOP/IS and the May 2017 Final EIR, or as a result of the currently proposed modifications to the LARIC Project. The effect of the currently proposed modifications on the conclusions relating to each of these environmental topic areas is discussed in the following sections.

Neither the proposed change in TAC speciation for the CCT crude oil storage tanks nor the throughput increase for the Carson Operations Tank 35 involve physical modifications. The replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications for propane recovery will require less equipment changes and less construction. The currently proposed modifications do not affect the potential environmental impacts of the LARIC Project to the resources discussed in this section.

7.1 AESTHETICS

7.1.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the LARIC Project is zoned for industrial use. The existing Refinery configuration will not appear substantially different after implementation of the LARIC Project. There are no scenic vistas in the vicinity of the LARIC Project. New structures that will be built as the result of the LARIC Project are largely of similar height or smaller than existing structures. Some structures are higher than existing adjacent units; however, the overall visual characteristics of the integrated Refinery are expected to be the same or similar to the existing configuration at the Refinery.

Additionally, no significant light or glare was anticipated from the LARIC Project. Therefore, the LARIC Project was not expected to have significant aesthetics impacts.

7.1.2 Currently Proposed Modifications

The proposed change in TAC speciation for the CCT crude oil storage tanks and the proposed throughput increase for the Carson Operations Tank 35 do not involve physical modifications. The replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications for propane recovery will require less equipment (i.e., piping modifications and a heat exchanger). The proposed modifications at the Carson C3 Splitter Unit are not expected to be discernible from the existing equipment. Therefore, the aesthetic impacts are expected to be the same as previously analyzed in the May 2017 Final EIR.

The currently proposed modifications will not cause significant adverse impacts to aesthetics or change the conclusions in the May 2017 Final EIR.

7.2 AGRICULTURAL AND FORESTRY RESOURCES

7.2.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, there are no agricultural or forest resources, such as, food crops grown for commercial purposes, located in or near the vicinity of the Refinery. The LARIC Project is located in a heavy industrial zoned area. Except for the Interconnecting Pipelines and electrical intertie construction, the LARIC Project would not involve construction or operation outside of the existing boundaries of the integrated Refinery. As such, no farmland or forest resources would be converted to non-agricultural use and the LARIC Project would not conflict with agricultural land uses, Williamson Act contracts or forest resources. Therefore, no significant impacts on agricultural or forest resources are expected from the LARIC Project.

7.2.2 Currently Proposed Modifications

The currently proposed modifications only affect existing equipment within the existing Refinery and do not involve any construction outside the existing boundaries of the Carson Operations and CCT, so no agricultural or forest resources will be affected. No existing agricultural or forest land will be converted to non-agricultural land uses. Further, the currently proposed modifications will not conflict with a Williamson Act contract. Therefore, the agricultural and forestry resources impacts are expected to be the same as previously analyzed in the May 2017 Final EIR.

The currently proposed modifications will not cause significant adverse impacts to agricultural and forestry resources or change the conclusions from the May 2017 Final EIR.

7.3 BIOLOGICAL RESOURCES

7.3.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the LARIC Project would be located in a heavy industrial zoned area and, with the exception of the Interconnecting Pipelines and electrical intertie construction, would be within the boundaries of the existing Refinery. The area has already been graded and developed and the area is devoid of vegetation and wildlife, with the exception of landscape vegetation near the administration buildings.

The September 2014 NOP/IS concluded that the LARIC Project was not expected to adversely affect plant species or other biological resources (riparian habitats, wetlands, or migratory corridors); or conflict with ordinances or conservation plans.

7.3.2 Currently Proposed Modifications

None of the currently proposed modifications would have potential impact to have an impact on biological resources. The currently proposed modifications would take place within the confines of the Refinery and the CCT, which are devoid of vegetation and wildlife. Therefore, the biological resource impacts are expected to be the same as previously analyzed in the May 2017 Final EIR.

The currently proposed modifications will not cause significant adverse impacts to biological resources or change the conclusions from the May 2017 Final EIR.

7.4 CULTURAL RESOURCES

7.4.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the buildings, structures, and equipment associated with the LARIC Project were not listed on registers of historic resources, and did not meet any of the eligibility criteria as cultural resources. The entire active portions of the Wilmington and Carson Operations have been previously graded and developed. LARIC Project activities will occur in areas of the integrated Refinery and CCT where the ground surface has already been disturbed, within or adjacent to existing refining and other units. This past disturbance reduces the likelihood that previously unknown cultural resources will be encountered. Further, the Refinery site does not contain known paleontological resources and, thus, the LARIC Project also is not expected to impact any sites of paleontological value. It was concluded that the LARIC Project would not cause significant adverse impacts to cultural resources.

During the public comment period for the Draft EIR, the South Coast AQMD consulted with the Tribal Administrator of the Tongva Ancestral Territorial Tribal Nation. No issues were raised that would change the conclusion in the September 2014 NOP/IS that impacts on cultural resources were considered less than significant.

7.4.2 Currently Proposed Modifications

CEQA Guidelines §15064.5(3) states that, "generally, a resource shall be considered "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources including the following:

A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B) Is associated with the lives of persons important in our past;

C) 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;

D) Has yielded or may be likely to yield information important in prehistory or history."

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. The currently proposed modifications do not involve the removal of any existing structures and the areas have been previously graded. The currently proposed modifications do not involve grading outside areas that were analyzed in the May 2017 Final EIR. Implementing the currently proposed modifications would not change the determination that no significant impacts to cultural resources would occur due to the LARIC Project.

Cultural resources have not been encountered unexpectedly during ground disturbance associated with construction related to the LARIC Project, so the standard protective measures included in the May 2017 Final EIR were not employed. Further, the Refinery does not contain known paleontological resources and thus the LARIC Project, including the currently proposed modifications, are not expected to impact any sites of paleontological value. No significant adverse impacts to cultural resources are expected. Standard protective measures will be implemented if any cultural resources are encountered.

The currently proposed modifications will not cause significant adverse impacts to cultural resources or change the conclusions from the May 2017 Final EIR.

7.5 ENERGY

7.5.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the LARIC Project was not expected to conflict with any adopted energy conservation plan or existing energy standard. There are no known energy conservation plans or existing energy standards that would apply to either the existing Wilmington and Carson Operations or the LARIC Project, as it primarily involves new and modified equipment that will allow the Refinery to operate more efficiently. Electricity for the Carson Operations is provided by the existing Watson Cogeneration Facility. The Watson Cogeneration Facility produces excess electricity that it sells to Southern California Edison. Under the LARIC Project, the amount of electricity that would be sold would be reduced and used to provide the electricity requirements associated with the LARIC Project. Therefore, no significant adverse impacts on electricity production are expected as a result of the LARIC Project.

As evaluated in the September 2014 NOP/IS, construction of the LARIC Project was estimated to require about 64,000 gallons of diesel fuel per year. In 2011, the Los Angeles region used 4,892 million gallons of gasoline and 281 million gallons of diesel. The fuel associated with construction of the entire project represents less than one percent of the total annual demand in the Los Angeles region, is a negligible fraction of the total use of fuel in California, and is not considered to be a wasteful use of fuel. Therefore, less than significant adverse energy impacts are expected during the construction period. Additionally, no additional permanent employees are anticipated to be needed to operate the Refinery once construction of the LARIC Project is completed, so no additional demand for gasoline fuel is expected.

7.5.2 Currently Proposed Modifications

The proposed change in TAC speciation for the CCT crude oil storage tanks and throughput increase for the Carson Operations Tank 35 do not involve physical modifications. The replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications for propane recovery will require less equipment changes and construction. The increased throughput of the Carson Operations Tank 35 is not expected to increase electricity demand from operation of the pump because the pump operates continuously to support the variable flow-through activity of the tank. The increased throughput in Carson Operations Tank 35 would be accommodated by the adjustment of a control valve that does not require electricity. The currently proposed modifications in the Carson Operations C3 Splitter Unit are piping modifications and a heat exchanger and do not involve equipment that uses electricity. Because the currently proposed modifications do not change the electricity demand of the LARIC Project of the Refinery, no change to purchased electricity would occur and no change to electricity produced for the region would occur. Therefore, no change in energy use is expected from the currently proposed modifications and the analysis presented in the May 2017 Final EIR conservatively represents the energy demand of the currently proposed modifications. Thus, the conclusions in the May 2017 Final EIR would not change and energy impacts would remain less than significant.

The currently proposed modifications will not cause significant adverse impacts to energy or change the conclusions in the May 2017 Final EIR.

7.6 GEOLOGY AND SOILS

7.6.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the LARIC Project would be constructed in an area of known seismic activity. The most significant potential geologic hazard is estimated to be seismic shaking from future earthquakes generated by active or potentially active faults in the region. Past experience indicates that there has not been any substantial damage, structural or otherwise, to the Wilmington and Carson Operations as a result of earthquakes. No faults or fault-related features are known to exist at the Refinery. The closest fault zone to the Refinery is the Newport-Inglewood Fault Zone, which is located approximately 1.5 to 2.0 miles northeast of the Refinery.

New and modified equipment and structures at the Refinery associated with the LARIC Project will require building permits, as applicable from the City of Los Angeles and the City of Carson. Issuance of building permits from the local authority will assure compliance with the California Building Code requirements, which include requirements for building within seismic hazard zones. No significant adverse impacts from seismic hazards are expected since the LARIC Project will be required to comply with the California Building Codes, including those addressing seismic effects.

The LARIC Project would not alter the exposure of people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards. As a result, substantial exposure of people or structures to the risk of loss, injury, or death involving the rupture of an earthquake fault, seismic ground shaking, ground failure or landslides is not anticipated.

7.6.2 Currently Proposed Modifications

The currently proposed modifications require less construction and equipment installation than the LARIC Project as proposed in the May 2017 Final EIR. The currently proposed modifications at the Carson C3 Splitter Unit require the piping modifications and a heat exchanger that would not require the installation of foundations. Therefore, no grading activities are expected and, thus, the currently proposed modifications would not result in any changes to geology and soils impacts that were evaluated in the May 2017 Final EIR.

The currently proposed modifications will not alter the conclusions from the May 2017 Final EIR and no significant adverse impacts to geology and soils are expected.

7.7 LAND USE AND PLANNING

7.7.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the LARIC Project includes improvements and modifications within an existing industrial facility zoned for heavy industrial uses. The construction and operation of the LARIC Project will occur primarily within the confines of the existing Wilmington and Carson Operations, except for the Interconnecting Pipelines and electrical intertie construction that will also occur in the heavy industrial use zone. As a result, no component of the LARIC Project would result in physically dividing any established communities, but will continue the use of the site as a Refinery.

The LARIC Project is consistent with the heavy industrial land use designation of the Refinery and no land use or planning requirements would be altered by the LARIC Project. Therefore, present or planned land uses in the region would not be affected as a result of the LARIC Project. No significant adverse land use or planning impacts are expected from the implementation of the LARIC Project.

7.7.2 Currently Proposed Modifications

The currently proposed modifications occur within the confines of the Carson Operations and the CCT and do not divide an established community. The currently proposed modifications are consistent with the activities and uses currently ongoing at the Refinery and CCT and would not require a zoning or land use change. The crude oil storage tanks at the CCT have been approved through a Conditional Use Permit from the City of Carson and the currently proposed modifications would not require additional land-use approval. As such, the currently proposed modifications are not expected to have significant adverse impacts on land use. Therefore, the land use and planning impacts are expected to be the same as previously analyzed in the May 2017 Final EIR.

The currently proposed modifications will not alter the conclusions from the May 2017 Final EIR and no significant adverse impacts to land use and planning are expected.

7.8 MINERAL RESOURCES

7.8.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, construction and operation of the LARIC Project would occur entirely within the boundaries of the existing Refinery and adjacent industrial areas, all of which are zoned for heavy industrial uses. According to the California Geologic Energy Management Division (CalGEM (formerly, the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR)) online data, there are no oil wells (active or abandoned) located within the confines of the LARIC Project. The nearest oil and gas wells are located adjacent to the southwestern property line and are either idle or abandoned wells in the Wilmington Oil Field. Thus, the LARIC Project would not affect the availability of known crude oil or other mineral resources (no other known mineral resources are expected to be required for the LARIC Project).

There are no provisions of the LARIC Project that would result in the loss of availability of a known mineral resource of value to the region and the residents of the State of California, such as aggregate, coal, clay, shale, etc., or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Thus, no significant impacts to mineral resources are expected.

7.8.2 Currently Proposed Modifications

There are no known mineral resources currently on the Refinery property. Therefore, the currently proposed modifications will not to be located on a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Furthermore, the currently proposed modifications do not involve any known mineral resources (i.e., aggregate, coal, clay, shale, etc.), the currently proposed modifications to the LARIC Project will not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State of California. No significant adverse impacts to mineral resources are expected due to the currently proposed modifications. Therefore, the mineral resource impacts are expected to be the same as previously analyzed in the May 2017 Final EIR.

The currently proposed modifications will not alter the conclusions from the May 2017 Final EIR and no significant adverse impacts to mineral resources are expected.

7.9 POPULATION AND HOUSING

7.9.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, construction and operational activities associated with the LARIC Project are not expected to involve the relocation of individuals, adversely impact housing or commercial facilities, or change the distribution of the population in the region. It is estimated that as many as 1,060 construction workers are expected to be needed during peak construction activities for the LARIC Project and most of the workers are expected to come from the large labor pool in southern California (over five million workers). No increase in the permanent number of workers at the Refinery is expected following the construction phase of the LARIC Project and no operational impacts to population and housing are expected. The LARIC Project is not expected to affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the region.

7.9.2 Currently Proposed Modifications

The currently proposed modifications involve less physical modifications to Refinery equipment and do not require the need for additional construction workers beyond what was previously analyzed in the May 2017 Final EIR. The May 2017 Final EIR determined that no additional housing was necessary for construction workers because they were expected to be drawn from the local pool of workers. Since no additional construction workers are needed for the currently proposed modifications, no additional housing is needed. Construction activities for the currently proposed modifications will not involve the relocation of individuals, impact housing or commercial facilities, or change the distribution of the population because the currently proposed modifications would occur completely within the boundaries of the existing Refinery. No displacement of existing housing or people will occur and the currently proposed modifications would not change the less than significant determination of the May 2017 Final EIR.

Additionally, no new operational employees will be needed as a result of the currently proposed modifications. Therefore, the population and housing impacts are expected to be the same as previously analyzed in the May 2017 Final EIR.

The currently proposed modifications will not alter the conclusions from the May 2017 Final EIR and no significant adverse impacts to population and housing are expected.

7.10 PUBLIC SERVICES

7.10.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR, the LARIC Project would not substantially change the load on the Refinery's firefighting and emergency response resources and would not be expected to create the need for additional fire protection services or resources by Tesoro or the City of Carson or the City of Los Angeles.

Both the Wilmington and Carson Operations maintain their own emergency response teams to respond to emergencies. Each Operation maintains fully trained 24-hour emergency response team and equipment to protect against flammable and combustible materials. The LARIC Project is not expected to increase the need or demand for additional services from the fire department above current levels because on-site firefighting and emergency response capabilities and personnel will be maintained and are expected to be able to continue to respond to potential emergencies in the future, while maintaining acceptable service ratios, response times, or other performance objectives.

The existing Wilmington and Carson Operations have security departments that provide 24-hour protective services for people and property within the fenced boundaries of each facility. The LARIC Project is not expected to require additional staffing at the security department as the security needs at the integrated Refinery are not expected to change. Thus, no additional or altered police protection would be required for the LARIC Project once it becomes operational.

As previously discussed in Section 7.9.1, the LARIC Project is not expected to induce population growth in any way. The existing labor pool in southern California is expected to be sufficient to fulfill the labor requirements for construction of the LARIC Project. There would be no increase in population and, therefore, there would be no need for physically altered government facilities.

7.10.2 Currently Proposed Modifications

No physical modifications are needed for the currently proposed increased throughput in the Carson Operations Tank 35 or the change in TAC speciation for the CCT crude oil storage tanks. The replacement of the approved Carson Operations Naphtha Isomerization Unit modifications with the proposed Carson Operations C3 Splitter Unit modifications would involve less physical modifications to the Refinery equipment and less construction. The currently proposed modifications will not alter the existing on-site emergency response requirements or capabilities nor increase the requirements for additional or altered fire protection. No additional fire response capabilities are expected for the currently proposed physical modifications because they occur in an existing unit.

The currently proposed modifications occur within the boundaries of the Refinery and CCT, which is already equipped with 24-hour security, fencing, and controlled access. Thus, no additional or altered police protection is required for the currently proposed modifications.
The currently proposed modifications are not expected to increase the number of long-term staff at the Refinery. Therefore, no impacts are expected to schools, parks, or other public facilities, such as government services, as a result of implementing the currently proposed modifications.

No significant adverse impacts to public services are expected from the currently proposed modifications. Therefore, the analysis presented in the May 2017 Final EIR conservatively represents the currently proposed modifications and the conclusions are unchanged.

7.11 RECREATION

7.11.1 May 2017 Final EIR

As discussed in the September 2014 NOP/IS and the May 2017 Final EIR and summarized in Section 7.9 of this document, the LARIC Project is expected to draw from the existing construction labor pool and no permanent workers are expected. Therefore, implementation of the LARIC Project is not expected to increase the demand for neighborhood or regional parks or other recreational facilities and it would not adversely affect existing recreational facilities.

Additionally, the LARIC Project does not include new recreational facilities or require expansion of existing recreational facilities and, thus, would not have an adverse physical effect on recreation resources.

7.11.2 Currently Proposed Modifications

As discussed in Section 7.9, the existing labor pool in southern California is sufficient to fulfill the labor requirements of the LARIC Project and no additional housing is required for the currently proposed modifications. The operation of the currently proposed modifications will not require additional workers above the levels estimated in the May 2017 Final EIR. Therefore, there would be no significant changes in population densities resulting from the currently proposed modifications, and thus, no increase in the use of existing neighborhood and regional parks or other recreational facilities.

The currently proposed modifications do not include recreational facilities or require the construction or expansion of existing recreational facilities. No significant adverse impacts to recreational facilities are expected. Therefore, the analysis presented in the May 2017 Final EIR conservatively represents the currently proposed modifications.

The currently proposed modifications will not alter the conclusions from the May 2017 Final EIR and will not cause significant adverse impacts to recreation.

8.0 CONCLUSIONS

As shown in Sections 6.0 and 7.0, the analysis of the currently proposed modifications indicate that no new significant adverse impacts would be created for any environmental areas analyzed in the May 2017 Final EIR, nor would the modifications make substantially worse any existing significant adverse impacts. Based on the environmental analysis prepared for the currently proposed modifications, the South Coast AQMD has quantitatively and qualitatively demonstrated that the currently proposed modifications qualify for an Addendum to the previously certified May 2017 Final EIR.

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APPENDIX A

MAY 2017 FINAL EIR - CHAPTER 1 - INTRODUCTION AND EXECUTIVE SUMMARY

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CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

Introduction
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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Tesoro Refining & Marketing Company LLC (Tesoro) is proposing the Los Angeles Refinery Integration and Compliance Project (proposed project). In June 2013, Tesoro purchased the adjacent BP West Coast Products LLC (BP) Carson Refinery which, as part of the proposed project, will be more fully integrated with the Tesoro Los Angeles Refinery – Wilmington Operations to form the Tesoro Los Angeles Refinery (Refinery). The Refinery includes: (1) the Wilmington Operations located at 2101 East Pacific Coast Highway in the Wilmington District of the City of Los Angeles; and (2) the Carson Operations, which is the former BP Carson Refinery located at 2350 East 223rd Street in the City of Carson.

In addition to further Refinery integration, the proposed project is designed to comply with the federally-mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions. The Los Angeles Refinery Integration and Compliance Project is expected to substantially reduce greenhouse gas (GHG), sulfur oxides (SOx), nitrogen oxides (NOx), and carbon monoxide (CO) at the Refinery. This will be accomplished by reconfiguring the combined Refinery complex to enable shutting down the Fluid Catalytic Cracking Unit (FCCU) at the Wilmington Operations, and by reconfiguring the combined Refinery complex to improve the gasoline to distillate production ratio from the integrated Refinery in order to expeditiously respond and adjust to ongoing changes in market demand for various types of petroleum products. Additionally, heat recovery will be optimized by installing new heat exchangers and modifying specified units to further minimize criteria pollutant and GHG emissions. All new and modified stationary sources with emissions increases will be required to comply with Best Available Control Technology (BACT) requirements in South Coast Air Quality Management District (SCAQMD) Rule 1303.

1.2 PURPOSE/LEGAL REQUIREMENTS

The California Environmental Quality Act (CEQA) (Public Resources Code §21000 et seq., and California Code of Regulations, Title 14, Division 6, Chapter 3) requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment (Public Resources Code §21067). The proposed project requires discretionary approvals from the SCAQMD, City of Carson, and the Alameda Corridor Transportation Authority and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21080 (a)). If a proposed project is to be carried out by a nongovernmental person or entity, such as the proposed project, the lead agency will normally be the agency with general governmental powers, such as a city or county (CEQA Guidelines §15051(b)(1)). However, because the proposed project modifications will be located within both the cities of Carson and Los Angeles, each of these public agencies would only have discretionary approval authority for the components of the proposed project in their jurisdictions.

The SCAQMD has discretionary approval authority of the project components within both the City of Los Angeles and City of Carson. Because the SCAQMD is the public agency with the greatest responsibility for supervising or approving the project as a whole, it is the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)). Therefore, as lead agency, the SCAQMD is responsible for preparing the Environmental Impact Report (EIR) for the proposed project.

In accordance with §15121(a) of the CEQA Guidelines, the purpose of an EIR is to serve as an informational document that: "will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project."

To fulfill the purpose and intent of CEQA, as the lead agency for the proposed project, the SCAQMD prepared and released a Notice of Preparation and Initial Study (NOP/IS) for a 30-day public review and comment period beginning on September 10, 2014 through October 10, 2014. The NOP/IS was circulated to responsible agencies, neighboring jurisdictions, other public agencies, and interested individuals in order to solicit input on the scope of the environmental analysis to be included in the EIR.

The NOP/IS provided a preliminary analysis of environmental impacts that may be associated with the Tesoro Integration and Compliance Project (see Appendix A). Potentially significant adverse environmental impacts from the proposed project identified in the NOP/IS form the basis for and focus of the technical analyses in this EIR.

The NOP/IS concluded that the proposed project would not create significant adverse environmental impacts to the following areas: aesthetics, agricultural and forestry resources, biological resources, cultural resources, energy, geology and soils, land use and planning, mineral resources, population and housing, public services, and recreation.

A total of 93 comment letters were received on the NOP/IS during the public comment period, 85 of which expressed support for the proposed project. A copy of the comment letters received and responses to individual comments are provided in Appendix A. No comments were received on the NOP/IS that identified new potentially significant environmental topics or disputed any of the conclusions for each environmental topic.

1.3 SCOPE AND CONTENT

The following discussion summarizes the scope and content of this EIR. This chapter contains a summary of the proposed actions and its consequences (CEQA Guidelines §15123), Chapter 2 contains a complete and comprehensive project description (CEQA Guidelines §15124), and Chapter 3 contains the environmental setting which describes the physical environmental conditions in the vicinity of the project and normally constitutes the baseline physical conditions by which a lead agency determines whether an impact is significant (CEQA Guidelines §15125). The following environmental resources were identified in the NOP/IS as being potentially significant and are further analyzed (CEQA Guidelines §15126.2) in Chapter 4 of this document:

- Air Quality and Greenhouse Gas Emissions[1]
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Solid and Hazardous Waste
- Transportation and Traffic

Mitigation measures have been identified in Chapter 4 for any adverse impacts that exceed applicable significance thresholds (CEQA Guidelines §15126.4). Pursuant to CEQA Guidelines §15130, a discussion of potential cumulative impacts has been prepared and is provided in Chapter 5. Alternatives to the proposed project in Chapter 6 of this Draft EIR were prepared in accordance with §15126.6 of the CEQA Guidelines. Chapter 6 describes a range of reasonable alternatives that could feasibly attain the basic objectives of the proposed project as a means of eliminating or reducing some of the significant adverse environmental effects associated with the proposed project.

1.4 RESPONSIBLE AND OTHER AGENCIES

CEQA Guidelines §15381 define a "responsible agency" as: "a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For purposes of CEQA, responsible agencies include all public agencies other than the lead agency that have discretionary approval authority over the project." The SCAQMD is the lead agency for the proposed project. The City of Carson is a responsible agency and has discretionary authority for some aspects of the proposed project within its jurisdiction and has also been given an opportunity to review and comment of the NOP/IS and EIR for the proposed project. The Alameda Corridor Transportation Authority (ACTA), a joint powers authority of the cities of Los Angeles and Long Beach, is also a responsible agency over the proposed project as permits will be required from ACTA for the construction of pipelines along the Alameda Corridor and has also been given an opportunity to review and comment on the NOP/IS and EIR for the proposed project. While a portion of the proposed project is located in the Wilmington District of the City of Los Angeles, only ministerial permits with no discretionary approval are necessary for the proposed project from the City of Los Angeles.

No trustee agencies as defined by CEQA Guidelines §15386 have been identified with respect to the proposed project. However, notice of the proposed project has been sent to the Office of Planning and Research pursuant to Public Resources Code §21080.4 for distribution in the event trustee or other responsible agencies are identified for the proposed project. Agencies with

[1] Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, the project's GHG emissions and the resulting significance of potential impacts are more properly assessed on a cumulative basis. Therefore, the environmental setting and the significance of potential impacts from the proposed project's GHG emissions is determined on a cumulative basis in Chapter 5 - Cumulative Impacts.

discretionary permitting responsibilities for the proposed project have been identified and are listed in Table 2.10-1.

1.5 INTENDED USES OF THE EIR

The Draft EIR is intended to be a decision-making tool that provides full disclosure of the environmental consequences associated with implementing the proposed project. Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses:

- A list of the agencies that are expected to use the Draft EIR in their decision-making;
- A list of permits and other approvals required to implement the project; and,
- A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

To the extent that local public agencies, such as the City of Carson, City of Los Angeles, and ACTA, are responsible for making land use and planning decisions related to the proposed project, it is expected that they will rely on this EIR during their decision-making process. See the preceding section for the public agencies, currently identified as responsible agencies, whose approval may be required and who may also be expected to use this EIR in their decision-making process. See also Table 2.10-1 in Chapter 2 for a list of discretionary permits and other approvals required to implement the proposed project.

1.6 AREAS OF CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency, including issues raised by agencies and the public, shall be identified in the CEQA document. "Controversy" is defined as a difference in opinion or a dispute. Consistent with the purpose of the NOP/IS to solicit comments or other information, responses to individual issues raised in the comment letters that are related specifically to potential impacts from the proposed project were prepared. As necessary, some issues were further addressed in this EIR. Of the 93 comment letters, 85 were letters in support of the proposed project.

Eight letters were received that provided specific comments on the NOP/IS. Comment letters were received from the City of Carson, the California Department of Transportation (Caltrans), and the Native American Heritage Commission (NAHC). The City of Carson and attorneys representing the City of Carson, requested clarification of the lead agency and asked that certain information and analyses be included in the EIR. Caltrans provided guidance on addressing construction traffic impacts. The NAHC provided guidance for evaluation of historical resources. Finally, four letters were received regarding the storage and transportation of liquid petroleum gas (LPG) in the vicinity of the Tesoro Refinery and at third party storage facilities. The NOP/IS, the comment letters received on that document, and responses to individual comments can be found in Appendix A of this EIR.

The SCAQMD held a public scoping meeting on September 24, 2014 on the proposed project at the Carson Community Center at 801 E. Carson Street, Carson, California. An additional six comment letters expressing support for the proposed project, were received at the public scoping meeting. The issues that could be considered controversial are provided in Table 1.6-1. Table 1.6-1 contains only areas of controversy raised in the comments on the NOP/IS or at the scoping meeting. No other areas of controversy have been communicated to the SCAQMD prior to release of this EIR for public comment.

TABLE 1.6-1

Summary of Potentially Controversial Topics

Key Issues Raised	EIR Sections Where Addressed
Concerns regarding the storage and transport of LPG.	Section 4.3
Air quality and greenhouse gas analysis	Section 4.2 and Section 5.3

1.7 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION

1.7.1 INTRODUCTION

Tesoro is proposing the Los Angeles Refinery Integration and Compliance Project (proposed project). The proposed project is designed to better integrate the Wilmington Operations and Carson Operations. In addition, the proposed project is designed to comply with the new federally-mandated Tier 3 gasoline specifications and with State and local regulations mandating emission reductions.

On April 23, 2014, the SCAQMD released a Notice of Intent to adopt a Draft Negative Declaration for the Tesoro Storage Tank Replacement and Modification project. The tank replacement modification project was considered to be a separate project from the Tesoro Refinery Integration and Compliance Project because it could go forward with or without the currently proposed project; that is, neither project relies on the other project to be implemented and both have independent utility. However, because of the timing of construction and implementation of the two projects, it was decided to incorporate the Tesoro Storage Tank Replacement and Modification project into the currently proposed project to provide a cohesive analysis of all environmental impacts from the two projects.

1.7.2 PROJECT OBJECTIVES

There are multiple objectives for this project that include modifications to further integrate Carson and Wilmington Operations so that consolidated operation can be optimized for improved operation, reduction of GHG emissions and criteria pollutants, improved energy recovery, and environmental compliance requirements. The project objectives include the following:

- Improving process efficiency through integration while maintaining the overall production capability of transportation fuels. Making process modifications that improve efficiency and enable shutdown of the Wilmington Operations FCCU prior to the next scheduled FCCU turnaround expected to occur in 2017, providing substantial emission reductions and reducing carbon intensity.

- Recovering and upgrading distillate range material from FCCU feeds. Tesoro proposes to achieve this objective by modifying 51 Vacuum Unit, the Mid-Barrel Distillate Treater and the Hydrocracker Unit at Carson Operations, and Hydrotreater Unit No. 4, and Hydrocracker Unit modifications at Wilmington Operations. Recovering distillate from FCCU feed enables shut down of the Wilmington Operations FCCU since the Carson Operations FCCU has sufficient capacity to process the FCCU feed that remains after distillate recovery.

- Complying with federal, state, and local regulations. Tesoro proposes to achieve this objective by: (1) meeting the U.S. EPA Tier 3 gasoline specifications; and (2) reducing Refinery NOx, SOx, and GHG emissions through proposed process modifications that improve efficiency, enable shutdown of the Wilmington Operations FCCU and lower carbon intensity.

- Improving financial viability for the newly integrated Tesoro Los Angeles Refinery and the local community. Tesoro proposes to achieve this objective by: (1) reducing future operating, capital, turnaround, and environmental compliance costs, primarily by shutting down the Wilmington Operations FCCU; (2) improving electrical supply reliability; (3) improving integrated Refinery transportation fuel production flexibility between gasoline and distillate products to respond to changes in market demand, including the capability to produce 100 percent of the Refinery gasoline production as CARB compliant gasoline; and (4) providing sustainable local jobs and tax revenue for the community.

- Integrating Carson and Wilmington Operations. Tesoro proposes to achieve this objective by installing the Interconnecting Pipelines to allow efficient transfer of hydrocarbons between the facilities to allow gasoline blending optimization, process unit feedstock optimization, and increased diesel production.

- Increasing overall Refinery processing efficiency. Tesoro proposes to achieve this objective by: (1) adding a Sulfuric Acid Regeneration Plant at the Wilmington Operations to regenerate sulfuric acid on-site; (2) adding a Wet Jet Treater to improve jet fuel quality; (3) upgrading and adding facilities to recover and treat propane for commercial sales, and (4) upgrading existing LPG rail facilities to enable fast unloading of railcars.

- Improving efficiency of water-borne crude oil receipt and marine vessel unloading. Unloading crude oil from marine vessels without delay will reduce vessel emissions at the

Port of Long Beach. Tesoro proposes to achieve this objective by constructing six new 500,000 barrel tanks at the Carson Crude Terminal and replacing two existing 80,000 barrel crude oil tanks at the Wilmington Operations with two 300,000 barrel tanks. Piping within the Carson Crude Terminal will be installed to connect the six new 500,000 barrel tanks to existing pipelines to the Carson Operations and Marine Terminal 1. The two new 300,000 barrel tanks will be connected to existing pipelines from the Wilmington Long Beach Terminal. Within the confines of the Wilmington Operations, the existing 12-inch diameter piping will be replaced with 24-inch diameter piping to connect the replacement tanks to the Wilmington Operations.

1.7.3 PROJECT LOCATION

The proposed project will occur at both the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery. The Wilmington Operations are located within Wilmington, a community under the jurisdiction of the City of Los Angeles, at 2101 East Pacific Coast Highway, Wilmington, Los Angeles County, California 90744. The Carson Operations are located at 2350 East 223rd Street, Carson, California, 90810. Additionally, the Sulfur Recovery Plant (SRP) (considered to be a portion of the Wilmington Operations) is located at 23208 South Alameda Street in the City of Carson. The proposed project would include installing pipelines within the Refinery as well as under the Alameda Street and Sepulveda Boulevard adjacent to the Refinery to connect pipelines between the Wilmington and Carson Operations.

1.7.4 LAND USE AND ZONING

Implementation of the proposed project at the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery will occur within an industrial area. Land uses in the vicinity of the Refinery include oil production facilities, refineries, hydrogen plants, coke handling facilities, container terminals, transportation corridors, storage tank farms, automobile wrecking/dismantling facilities, and other industrial operations. The Wilmington Operations are bounded to the north by Sepulveda Boulevard, to the west by Alameda Street; to the south by railroad tracks and to the east by the Dominguez Channel. The Wilmington Operations are zoned heavy industrial (M3-1). The Carson Operations and all adjacent properties are zoned manufacturing heavy (MH). The closest residential area is approximately 100 feet from the property line across Wilmington Avenue to the southwest of the Refinery (adjacent to the Carson Crude Terminal). The closest residential area to the proposed project locations within the Refinery is about 1,300 feet.

1.7.5 OVERVIEW OF PETROLEUM REFINING

Crude oil is a mixture of hydrocarbon compounds and relatively small amounts of other materials, such as oxygen, nitrogen, sulfur, salt, sediment, and water. Petroleum refining is a coordinated arrangement of manufacturing processes designed to produce physical and chemical changes in the crude oil to remove most of the non-hydrocarbon substances, break the crude oil into its various components, and blend them into various useful products. The overall refining process uses four kinds of techniques: 1) separation, including distilling hydrocarbon liquids into gases, gasoline, diesel fuel, fuel oil, gas oils, and heavier residual materials; 2) cracking or breaking large hydrocarbon molecules into smaller ones by thermal or catalytic processes; 3) reforming using heat and catalysts to rearrange the chemical structure of a particular oil stream to improve its quality; and, 4) chemically combining two or more hydrocarbons to produce high-grade gasoline. Specific topics discussed in detail include types of crude oil, the refining process, and refinery optimization (see Section 2.5.1 through 2.5.3).

1.7.6 TESORO REFINERY EXISTING OPERATIONS

Currently, the Wilmington and Carson Operations function as two separate and distinct facilities with some limited integration.

1.7.6.1 Wilmington Operations

Crude oil for the Wilmington Operations is delivered via ship using the pipeline from the Tesoro Marine Terminal at the Port of Long Beach. Crude oil can also be delivered via pipeline from other onshore locations. No crude oil is transported to the Wilmington Operations via rail and there are no facilities to receive crude oil deliveries by railcar. The Wilmington Operations currently utilize 20 storage tanks to store crude oil and other heavy petroleum liquids. Crude oil is processed in the Crude Unit where it is heated and distilled into various hydrocarbon components, which are further processed in downstream Wilmington Operations units. The Wilmington Operations also receive, process, and transport other petroleum products (crude oil not included) to and from the Wilmington Operations by ship, truck, and railcar. These petroleum products include residuum, gas oil, diesel, gasoline, naphtha, transmix, and LPG.

1.7.6.2 Carson Operations

Crude oil for Carson Operations is unloaded from tankers at terminals located in the Port of Long Beach and then transferred via pipeline and stored at Port of Long Beach Terminals or the Carson Crude Terminal. No crude oil is transported to the Carson Operations via rail and there are no facilities to receive crude oil deliveries by railcar. Crude oil is sent via pipeline from the marine terminals to Carson Operations for further storage in any of nine Refinery crude oil storage tanks and then processed in the Crude Units. Crude oil can also be delivered via pipeline from other onshore locations. The Carson Operations also receive, process, and transport other petroleum products (crude oil not included) to and from the Carson Operations by ship, truck, and railcar. These petroleum products include residuum, gas oil, diesel, gasoline, naphtha, and LPG. Additionally, the Carson Operations has the Watson Cogeneration Facility that currently produces excess power, beyond the Carson Operations' needs, and sells the excess power to Southern California Edison.

1.7.6.3 Tesoro Los Angeles Refinery

The Tesoro Los Angeles Refinery consists of two adjacent facilities, Carson Operations and Wilmington Operations, which are managed as one Refinery. The Carson and Wilmington Operations have in the past and continue to produce a variety of products including unleaded gasoline, jet fuel, diesel fuel, fuel oil, petroleum gases, petroleum coke and sulfur. The Carson

Operations also produces high purity propylene as feedstock to the adjacent Ineos Polypropylene Plant, and calcined coke. Elemental sulfur and petroleum coke are produced as by-products of the refining process. Major processing units at both the Carson and Wilmington Operations include the Crude Units, the Vacuum Units, the Delayed Coker Units, hydrotreating units, reforming units, the FCCUs, the Alkylation Unit, hydrogen plants, the Sulfur Recovery Plants, and the Cogeneration Plants. The major differences between the Carson and Wilmington Operations is that the Carson Operations is a larger operation with three crude, two vacuum, and two coker units whereas the Wilmington Operations only has one crude, one vacuum, and one coker unit.

1.7.6.4 Current Los Angeles Refinery Integration

Currently Carson and Wilmington Operations are connected via Tesoro and third party pipelines that enable the transfer of intermediate and finished products between the two facilities. The Refinery optimizes crude oil and other refinery feedstock processing to produce the mixture of refined products that are marketed from the Tesoro Los Angeles Refinery. Unit turnarounds are aligned between the Carson and Wilmington Operations to minimize economic and local area impacts from shutdowns. Hydrogen use is balanced and managed across the Los Angeles Refinery for hydrotreating purposes and output of clean fuel products. Crude oil, intermediate feedstocks and products are transferred between Carson and Wilmington Operations via pipeline, as required, to optimize Refinery production to meet market demand.

1.7.6.5 Marine Terminals Associated with Los Angeles Refinery

The Refinery receives crude oil from ships which unload at three marine terminals operated by Tesoro Logistics Operations, LLC (Tesoro Logistics) in the Port of Long Beach (POLB). The unloaded crude oil is then piped to the Refinery for processing. The proposed project is not expected to result in any physical changes to the existing marine terminals. Additionally, no changes to the pipelines connecting the marine terminal to the Refinery are planned as a result of the proposed project.

1.7.7 PROPOSED PROJECT

The crude oil and feedstock processing capability at the integrated Refinery has the potential to increase by approximately two percent or 6,000 bbls/day as a result of the proposed project due to a revision of the described duty of the Wilmington Operations Coker fresh feed heater in the existing permit to conform with SCAQMD and industry standards. This permit revision has the potential to enable an increase of 6,000 bbls/day in crude oil processing capacity. To increase crude throughput capacity beyond the 6,000 bbls/day, the Refinery would need to physically modify equipment such as the Crude Units or Delayed Coker Units. No physical modifications to the Crude Units or Delayed Coker Units are included as part of the proposed project; therefore, crude throughput capacity is constrained, so no other increase in crude capacity will occur.

Modifications will be made to recover diesel and jet fuel boiling point range material, also known as distillate, from gas oil that is currently fed to the FCCUs at both Wilmington and Carson Operations. This will enable the remaining gas oil feed from the Wilmington Operations FCCU to be diverted via the proposed interconnecting piping to the Carson Operations FCCU, while maintaining the same overall level of transportation fuels production. In addition, facilities will be added to remove impurities such as sulfur, nitrogen compounds, and organic acids from distillates in order to make on-specification products. The modifications will be designed so that the combined Refinery operates within the existing capacity of the SRPs. Following project completion, when the diesel and jet range material are recovered and the remaining gas oil feed is diverted to the Carson Operations FCCU, the FCCU at Wilmington Operations will be shut down and the Refinery will be integrated as one operating Refinery.

1.7.7.1 Wilmington Operations

Process modifications to improve efficiency and achieve integration will enable shutting down the Wilmington Operations FCCU which is expected to substantially reduce emissions at the integrated Refinery. Reconfiguring the combined Refinery complex is expected to improve the gasoline to distillate production ratio and is anticipated to result in minor increases in air pollutant emissions. However, the net effect on overall emissions from the proposed project is expected to be emissions reductions at the Refinery, primarily associated with process modifications to improve efficiency and integration, enabling the shutdown of the Wilmington Operations FCCU, as well as shutdown or reduced operations of other equipment at the Refinery. Additionally, equipment production efficiency and heat recovery will be optimized for new and modified units to further reduce overall emissions and optimize energy utilization.

1.7.7.1.1 Wilmington Operations FCCU Shutdown

An FCCU cracks or converts heavy hydrocarbons into lighter, gasoline and distillate range hydrocarbons in the presence of fine particles of catalyst that are circulated throughout the process. The Refinery will modify other units to ensure there will be no loss in overall production due to the FCCU shutdown, prior to taking the FCCU offline. Midway through the proposed project, the Wilmington Operations FCCU will be shut down, the equipment will be permanently removed from service in compliance with SCAQMD-requirements, abandoned in place, and Tesoro will relinquish all relevant permits.

1.7.7.1.2 Hydrocracker Unit (HCU) Modifications

The Wilmington Operations HCU capacity is being increased to accommodate conversion of the distillate material previously routed to the Wilmington Operations FCCU. It will be recovered as HCU feed in order to reduce the amount of gas oil feed produced and to enable the shutdown of the Wilmington Operations FCCU. The reactor and fractionation sections will be modified to increase the production of ultra-low sulfur diesel and gasoline. The Wilmington Operations HCU modification will include adding new nozzles to two existing vessels, modifying the hydrogen recycle compressor internals to accommodate higher unit capacity, installing a small hydrogen booster compressor, installing or modifying as many as three heat exchangers to provide improved heat integration, installing two new electrically driven pumps, and associated piping and instrumentation. The proposed project currently includes increasing the permitted firing duty of two existing heaters in the Wilmington Operations HCU, with a common stack and SCR, by a total of 25 mmBtu/hr. While the Wilmington Operations HCU capacity would be increased approximately 15 percent, this modification will have no impact on the overall integrated Refinery crude throughput capacity.

To recover propane for the proposed new Propane Sales Treating Unit (PSTU) described below, the Wilmington Operations HCU fractionation section will also be modified by installing two new water cooled exchangers, one knockout drum, and associated piping and instrumentation. An existing reflux pump and two heat exchangers in the fractionation section will be removed.

1.7.7.1.3 Delayed Coker Unit (DCU) Fresh Feed Heater H-100

The Wilmington DCU fresh feed heater H-100 heats DCU charge, a mixture of crude oil, residual from the Crude Unit, slop oil (internally recycled oil and off-specification products) and FCCU main fractionator bottoms. H-100 provides heat to separate the DCU charge~~that are fed into the unit so they can be fractionated~~ into feedstock streams for other refinery process units. The heater has 36 burners. Each burner can operate up to a maximum heat release of 8.4 mmBtu/hr. Thus, the maximum heat release of the heater as a whole is 302.4 mmBtu/hr (36 x 8.4 = 302.4). The heater manufacturer, however, only guarantees that each burner will operate up to 7 mmBtu/hr. Thus, the guaranteed heat release of the heater as a whole is 252 mmBtu/hr (36 x 7 = 252). ~~The existing equipment description of the Fresh Feed Heater in the Title V permit will be revised to conform to SCAQMD/Industry standards. The description will be changed from the 'design heat release' basis (252 mmBtu/hr) to the industry standard 'maximum heat release' basis (302.4 mmBtu/hr). Revising the equipment description to maximum heat release will ensure that operating the heater at maximum heat released conforms with the SCAQMD's expectation that equipment is operated within the maximum heat release described in the permit.~~

The Refinery has at times operated Heater H-100 above the guaranteed heat release level of 252 mmBtu/hr when it needed~~Additional heat is needed at times~~ to either lift more gas oil out of the Coker feed in downstream distillation columns or simply to process more feed through the DCU, to the physical limits of the downstream units. For example, during a Coker shutdown, residuum and crude oil inventory that are normally processed in the unit accumulate. After a shutdown, it is necessary to process feedstocks at a higher rate in order to process the ~~inventory gains of~~ excess feedstock that accumulated during a shutdown.

The current Title V permit describes the H-100 heater based on the heater's guaranteed heat release of 252 mmBtu/hr. As part of the proposed project, this description will be revised to reflect the heater's actual maximum level of operation (302.4 mmBtu/hr) rather than the lower guaranteed level of operation (252 mmBtu/hr). Heater H-100 will not be physically modified in any way as part of the project. And, as described above, the heater has operated above 252 mmBtu/hr in the past. Nonetheless, the DEIR made the conservative assumption that the change in permit description would allow Tesoro to increase the maximum operation of heater H-100 from 252 mmBtu/hr to 302.4 mmBtu/hr. In order to ensure that this assumed increase in operations would not result in any increase in emissions, the SCAQMD imposed a new permit condition that limits daily emissions of criteria pollutants from the H-100 heater to levels that would be generated if the heater were never operated above 252 mmBtu/hr. This would be achieved through efficient maintenance and operation of air pollution control equipment. These limits apply to mass emissions of CO, NOx, SOx, particulate matter less than ten microns in diameter (PM10), and volatile organic compounds (VOC).

~~Alternatively, higher crude rates may be processed in the DCU heater as analyzed herein. No physical modifications are planned to be made to the heater. However, modifications may be required during the permit review process. The maximum heater firing capability will remain unchanged. The number of burners (36) and the maximum heat release (8.4 mmBtu/hr) of each burner in the heater will remain the same. Although the described duty of the heater will increase to 302.4 mmBtu/hr, there will be no increase in emissions as permit conditions will be imposed to limit criteria pollutant emissions. Mass emissions of CO, NOx, SOx, particulate matter less than ten microns in diameter (PM10), and volatile organic compounds (VOC) will be restricted in the revised permit.~~

The application to revise the permit description of H-100 heater was submitted in early 2014, independent of the proposed project. As a result, this component of the proposed project was not described in the NOP/IS. But upon further review, it was concluded that this description change had the potential to~~could~~ create adverse environmental impacts ~~that would likely occur simultaneously with the proposed project.~~because, for example, it could enable a slight ~~this revision to the heater equipment description has the potential to~~ increase ~~the~~in crude oil throughput to the Refinery ~~by a small amount~~ of up to two percent (or up to 6,000 bbl/day). While the Refinery could opt to process either a small increase in crude oil throughput or slightly heavier crude oil blend, the processing of additional crude oil ~~blend~~ would result in greater environmental impacts downstream of the DCU, as described in Section 4.1.2.1. Therefore, for purposes of analyzing the worst-case impacts, this document assesses an increase in crude oil throughput capacity. The increased heat release from the H-100 heater and/or increased crude oil throughput is anticipated to occur once the modified permit is issued. Including the permit revision as part of the proposed project ensures that all possible impacts from the modification of the Refinery are fully analyzed.

1.7.7.1.4 Catalytic Reformer Unit (CRU)-3 Modifications

The CRU-3 fractionation section will be modified to enable recovery of Hydrocracker propane from the refinery fuel gas system. The modifications to CRU-3 will include installing one new depropanizer tower that is larger than the existing tower, as many as three heat exchangers, as many as four electrically driven pumps, and associated piping and instrumentation.

1.7.7.1.5 Propane Sales Treating Unit (PSTU)

A new PSTU will be constructed at the Wilmington Operations to enable the process efficiency improvement to treat propane for sale. A PSTU conditions liquid propane for sale using absorbers and dryers to meet sales specifications. The PSTU will treat approximately 2,000 bbl/day of propane and will include eight vessels and four pumps that will be installed to purify recovered propane from the Wilmington Operations HCU and CRU-3.

1.7.7.1.6 Hydrotreater Units 1 and 2 (HTU-1 and 2) Modifications

The HTU-1 will be modified to hydrotreat approximately 7,000 bbl/day of FCCU gasoline to comply with the new federally-mandated Tier 3 gasoline specifications and to hydrotreat jet range components. The modifications to HTU-1 will include modifying or installing as many as five heat exchangers, and adding a pump and associated piping and instrumentation. Because the HTU-2 will continue to produce the same types of feedstock that it currently produces, its feedstock will be separated from HTU-1's feedstock. The HTU-2 feedstock separation modifications will include repurposing an existing diesel salt dryer to be used as a feed surge drum, installing as many as two electrically driven pumps, and associated piping and instrumentation.

The proposed modifications to HTU-1 will also allow it to start hydrotreating jet fuel, treating approximately 12,000 bbl/day to remove sulfur impurities. The modifications will include installing one new stripping steam nozzle on the stabilizer, one coalescer, one salt dryer, and condensate pot, and associated piping and instrumentation.

1.7.7.1.7 Hydrotreater (HTU-4) Modifications

HTU-4 will be modified as part of the proposed project to increase distillate yield and must be completed in order to allow for the shutdown of the Wilmington Operations FCCU, and to fully utilize the existing hydrotreating capacity to produce ultra-low sulfur diesel. There will also be modifications to recover jet fuel, and added heat integration equipment to reduce energy consumption by producing steam in heat exchangers, providing process heat to two strippers and preheating boiler feed water. HTU-4 will process either gas oil or high sulfur diesel. The proposed modification to the HTU-4 will allow the Refinery to minimize motor fuels production disruptions during both planned and unplanned outages. Other modifications to HTU-4 include adding new nozzles on the fractionator, modifying the product coolers, installing a new surge drum, a salt dryer, a coalescer, a condensate pot, as many as four new electrically driven pumps and eleven heat exchangers, and associated piping and instrumentation.

1.7.7.1.8 New Sulfuric Acid Regeneration Plant (SARP)

The proposed new Sulfuric Acid Regeneration Plant (SARP) will be constructed at the Wilmington Operations and will remove impurities from and recycle the Wilmington and Carson Operations spent sulfuric acid to produce fresh sulfuric acid on-site rather than sending it off-site for treatment. The SARP is sized for an approximate throughput of 400 tons/day of sulfuric acid production and regeneration and will include three tanks, as many as eight electrically driven pumps, a natural gas fired 42 mmBtu/hr Decomposition furnace, a five mmBtu/hr Converter heater, a natural gas fired 20 mmBtu/hr Process Air Heater, a waste heat steam generator, as many as four blowers, as many as eight heat exchangers, four towers, one reactor, one stripper, three scrubbers, one electrically driven compressor, three drums, and associated piping and instrumentation. The fresh sulfuric acid will be sent back to the Alkylation Units for reuse. Spent sulfuric acid is currently transported off-site for recycling at a third-party vendor.

1.7.7.1.9 Wilmington Replacement Crude Oil Tanks and Other Tank Modifications

To improve the efficiency of water-borne crude oil receipt and marine vessel unloading, two new 300,000 bbl internal floating roof storage tanks (Tanks 300035 and 300036) will replace two existing 80,000 bbl fixed-roof storage tanks (Tanks 80035 and 80036) in the north tank area of Wilmington Operations. The new larger tanks will allow marine vessels to unload without undue delay, thereby reducing the time vessels are required to wait at anchorage until sufficient tankage is available for vessel discharge. The new tanks will be permitted to store the same types of products as the existing tanks. Storage capacity does not affect Refinery throughput, which is based on processing capabilities as described in Section 2.5.4.1.

The scope of this part of the proposed project will include demolishing two existing storage tanks, installing two new larger tanks in the same location as the tanks being removed, replacing 5,000 feet of 12-inch diameter piping with 24-inch diameter piping within the Wilmington Operations to allow the tank loading rate to increase from 5,000 bbl/hr to 15,000 bbl/hr. The scope includes modifying one existing tank (Tank 80038) by connecting it to a vapor recovery system. Existing Tanks 80038, 80060, 80067, and 80079 will require change of service permit modifications and annual throughput increases for each tank.

1.7.7.2 Carson Operations

The proposed Tesoro Los Angeles Refinery Integration and Compliance Project includes modifications at the Carson Operations, resulting in a combined Refinery complex and improving the gasoline to distillate production ratio. Additionally, equipment energy efficiency and heat recovery will be optimized for new or modified units, resulting in lower overall emissions.

In the NOP/IS the project description for the Carson Operations included modifications to the No. 1 and No. 2 Cokers to comply with SCAQMD Rule 1114 – Petroleum Refinery Coking Operations, which requires recovery of additional vent gases during coke drum deheading operations. Rule 1114 requires that the ejector system be installed at the next scheduled turnaround for each Coker unit. Compliance is required beginning in January 2016 for No. 2 Coker. The impacts of the Rule 1114 compliance projects were analyzed separately in the Environmental Assessment for Rule 1114 adoption (SCAQMD, 2013). As a result, because the Rule 1114 component has already been analyzed for potential environmental impacts and does not rely on any components of the proposed project, it has been removed from the proposed project. To the extent that the Rule 1114 component of the proposed project contributes to cumulative impacts, they will be evaluated in Chapter 5 of this EIR.

1.7.7.2.1 No. 51 Vacuum Unit Modifications

The No. 51 Vacuum Unit will be modified to allow increased distillate yield, or diesel production, which will require reducing vacuum gas oil production as much as 8,000 bbl/day. The No. 51 Vacuum Unit modifications will include modifying the feed heater's Title V permit described duty from 300 to 360 mmBtu/hr, installing one new sixteen-inch nozzle on the vacuum tower, as many as five new exchangers, two strainers, as many as three new electrically driven pumps, and associated piping and instrumentation. No substantial heater modifications are required to achieve a firing rate of 360 mmBtu/hr; however, burner tips may be replaced with a different design. The heater duty increase will enable increased recovery of distillate out of gas oil in the vacuum column.

1.7.7.2.2 Carson Operations FCCU Modifications

The NOP/IS presented two types of modifications to the Carson Operations FCCU, physical and operational. The physical modifications (i.e., installing a feed surge drum, as many as two pumps and two heat exchangers, and associated piping and instrumentation) have been canceled and removed from the proposed project. However, the proposed process modifications to improve efficiency and achieve integration will still be included. This will enable shutdown of the Wilmington Operations FCCU, and allow the Carson Operations FCCU to accept a portion of the Wilmington Operations gas oil feed. The throughput capability of the Carson Operations FCCU will remain unchanged. New pipelines will be routed between the Wilmington Operations and the Carson Operations FCCU feed tanks. Although physical modifications to the Carson Operations FCCU are no longer proposed, the impacts from the potential increase in utilization of the Carson Operations FCCU have been addressed in Chapter 4.

1.7.7.2.3 New Wet Jet Treater

One new 50,000 bbl/day Wet Jet Treater will be installed at Carson Operations to treat jet fuel by removing mercaptans and reducing the total acid number (TAN), or organic acid content, in the jet fuel produced in upstream units. The Wet Jet Treater will increase Refinery operating efficiency. The Wet Jet Treater includes one mercaptan removal reactor, one TAN removal reactor, two product separators, one spent caustic loading facility, as many as six associated electrically driven pumps, two salt dryers, two clay filters, and associated piping and instrumentation. Feed and fresh caustic will be routed to the new Wet Jet Treater and spent caustic and treated jet fuel will be routed to existing storage tanks. The spent caustic flow rate is conservatively estimated at approximately 11 gallons per minute (gpm). Approximately four additional railcar loads per week of spent caustic will be generated and shipped to the Gulf Coast for recycling.

1.7.7.2.4 Hydrocracker Unit (HCU) Modifications

The Carson Operations HCU capacity will be increased by approximately 10 percent. The Carson Operations HCU will be modified as part of the proposed project to increase distillate yield to allow for the shutdown the Wilmington Operations FCCU by enabling it to process the distillate recovered from the No. 51 Vacuum Unit. Processing the recovered distillate feed will require increased hydrogen gas usage to allow the modified HCU to comply with existing low sulfur diesel product specifications. The increased hydrogen gas capacity will be provided by increasing the recycle gas compressor speed. In addition, the Carson Operations HCU energy utilization efficiency will be improved by installing a steam generator. The HCU modification will include installing one new steam generator heat exchanger, an air cooler, and associated piping and instrumentation.

1.7.7.2.5 Light Hydrotreating Unit (LHU) Modifications

The LHU will be modified to more effectively remove sulfur from FCCU gasoline to comply with the new federally-mandated Tier 3 gasoline sulfur specifications. The LHU will process a higher sulfur feed material derived from existing fractionation equipment. The proposed modifications will include installing one new stripping steam nozzle on the stabilizer, as many as five new heat exchangers, one coalescer, a condensate pot, and associated piping and instrumentation.

1.7.7.2.6 Naphtha Hydrodesulfurization (NHDS) Unit Modifications

The existing Carson Operations Naphtha Hydrodesulfurization (NHDS) Unit will be modified with the installation of new equipment to allow removal of contaminants from unit feed and sulfur from pentanes. This enables flexibility for additional gasoline production to partially compensate for lost production from the Wilmington Operations FCCU. The existing Reactor Feed Heater will be retrofitted with new ultra-low NOx burners to reduce emissions. The modifications will include repurposing and modifying the existing Isooctene debutanizer tower to separate isopentane from the Carson Operations NHDS feed. The modifications include the addition of eight new nozzles on the debutanizer tower, installation of a caustic scrubber, two knockout drums, a product coalescer, an air cooler, an accumulator, a condensate pot, as many as 14 new heat exchangers, six electrically driven pumps, and associated piping and instrumentation.

1.7.7.2.7 Naphtha Isomerization Unit Modifications

The existing Carson Operations Naphtha Isomerization Unit will be modified to recover propane and heavier material from the Unit off-gas, enabling additional product sales. The Naphtha Isomerization Unit modifications include addition of an off gas caustic scrubber, two reactor effluent flash drums, up to two heat exchangers, four pumps, and associated piping and instrumentation.

1.7.7.2.8 Alkylation Modifications

Amylenes (C5 olefins) will be recovered from FCCU gasoline in an existing fractionation tower and converted to low vapor pressure gasoline in the modified Alkylation Unit. Alkylation Unit capacity will remain unchanged. The modifications to process amylenes will include repurposing the Depentanizer column, replacing one existing four inch nozzle with an eight-inch nozzle on the olefin feed surge drum, installing as many as six heat exchangers, one filter/coalescer, one truck loading rack, two electrically driven pumps, and associated piping and instrumentation. The modifications to process propylene and butylene will include the installation of a propylene chiller and associated piping and instrumentation.

1.7.7.2.9 Mid-Barrel Distillate Treater

The existing Mid-Barrel Distillate Treater incorporates a hydrotreater to remove sulfur from straight run diesel and converts it to ultra-low sulfur diesel. To ensure compliance with U.S.

EPA mandated Tier 3 gasoline specifications, the Mid-Barrel Distillate Treater will be modified to enable it to desulfurize heavy FCCU naphtha. Interconnecting Pipelines to/from the LHU and Mid Barrel Distillate Treater will be installed. New bypass piping to recycle a portion of the product stream back to the feed system will also be installed.

1.7.7.2.10 Steam System Balance Modifications

The Carson Operations steam system demand will increase due to compliance with new federally-mandated Tier 3 gasoline specifications and amylene alkylation. The increased steam demand will be met by a combination of: installing waste heat steam generators (heat exchangers), generating more steam from the existing Watson Cogeneration Facility, and reducing steam demand from existing steam turbines.

1.7.7.2.11 New Crude Tankage

To improve the efficiency of water-borne crude oil receipt and marine vessel unloading, up to six new 500,000 barrel floating roof crude oil storage tanks will be constructed adjacent to the Carson Crude Terminal. The new tanks will allow marine vessels to unload crude oil without undue delay, thereby reducing the time vessels are required to wait at anchorage until sufficient tankage is available for vessel discharge. This portion of the project will reduce the amount of time that vessels spend within the port and increase the amount of crude oil that can be unloaded and stored. Decreasing the amount of time the vessels spend within the port and at anchor will substantially reduce annual ship emissions. Storage capacity does not affect Refinery throughput, which is based on processing capabilities as described in Section 2.5.4.1.

1.7.7.3 Modifications to Supporting Equipment

1.7.7.3.1 Interconnecting Pipelines

To more fully integrate the Refinery, this element of the proposed project includes pipelines to transport materials to and from various refinery units, e.g., new units, and storage facilities, as well as pipelines to transport materials between the Carson Operations and Wilmington Operations. Up to 15 new pipelines are expected to transport gasoline and gasoline blending components, crude oil, gas oil, butylene, propylene, and liquid petroleum gases.

The proposed project would include installing a bundle of pipes under the Alameda Corridor and Sepulveda Boulevard as part of the work that will connect pipelines between the Wilmington and Carson Operations. The pipe "bundle" is where the pipelines come together in one place and go underground to cross adjacent streets. The pipe bundle will require a 54-inch bore using horizontal directional drilling (HDD). HDD would be used to bore underneath (approximately 80 feet in depth) South Alameda Street and East Sepulveda Boulevard.

With the exception of pipelines that will be routed underground near the Carson and Wilmington Operations Coke Barns, pipelines located outside of the HDD bore, would then be routed above ground on pipe racks or ground level pipeline supports into the respective product and supply manifolds within the Refinery property.

1.7.7.3.2 Electrical Connection to Wilmington

To more fully integrate the Refinery, up to six new 69 kV electrical cables and two new 13.8 kV cables will be routed via conduit systems and overhead transmission lines from the Carson Watson Cogeneration Facility located at the Carson Operations to the Sulfur Recovery Plant (see Figure 2-17) and Wilmington Operations. One new 69 kV substation, and at least two new transformers with associated cabling, are proposed to be installed at the Watson Cogeneration Facility. One 69 kV substation with two new 13.8 kV main substations with at least four transformers and associated switch gear and wiring will be installed at the Wilmington Operations. This portion of the proposed project will allow electricity generated at Carson Operations to be used at the Wilmington Operations.

1.7.7.3.3 LPG Rail Unloading

LPG Rail Car Unloading facilities will be modified at Carson Operations to allow increased deliveries of approximately 4,000 bbl/day of Alkylation Unit feedstocks (LPG including propane, propylene, etc.). LPG Rail Unloading facilities will be used to transfer LPG to the Refinery to replace a portion of the Alkylation Unit feed lost by the closure of the Wilmington Operations FCCU. LPG handling at the Refinery may increase by up to ten railcars per day. Increased production of alkylate is critical for blending clean-burning gasoline due to its properties, such as low benzene and sulfur content and high octane content. The scope of work will include installing a vaporizer, a surge drum, a knockout pot, as many as four electrically driven transfer pumps, and associated piping and instrumentation. Currently, Carson Operations unloads up to 11,000 bbls/day of LPG into on-site pressurized tankage for use in the refining process. The LPG rail loading modifications will allow the Refinery to import up to about 15,000 bbl/ day of LPG, resulting in the increase of about 4,000 bbl/day or 10 railcars per day at the Refinery.

1.7.8 CONSTRUCTION OF THE PROPOSED PROJECT

Construction activities for the proposed project were~~are~~ expected to begin in the first half of 2016 and were~~are~~ expected to be completed by March 2021. The construction schedule is expected to commence following certification of the FEIR and issuance of permits. The dates used here and shown in Figure 2-18 will adjust accordingly. The construction activities for most of the components are expected to overlap from about the third quarter of 2016 to second quarter 2017. Most construction activities are expected to be completed by the end of 2018. Construction activities associated with the crude oil storage tanks are not expected to be completed until March 2021. Construction work shifts are expected to last about ten hours per day during most portions of the construction schedule. During normal construction periods, one work shift per day is expected beginning at 7:00 a.m. and ending at 5:30 p.m. During Refinery turnaround periods, two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m.

1.7.9 OPERATION OF THE PROPOSED PROJECT

Construction of the project will not affect where the Refinery obtains crude oil. The project is not designed to enable the Refinery to change its feedstock or crude oil blend. The Refinery will continue its practice of seeking cost-effective crude oils that can be blended with other crude oils and feedstocks to create the necessary blends suitable for Refinery operations (see Section 2.5.4.1 for additional detail).

Once construction of the proposed project is completed, the existing work force at the Refinery is not expected to increase or substantially change the volume of traffic. No increase in permanent workers is expected so no increase in worker traffic is expected. Construction of the Sulfuric Acid Regeneration Plant will decrease traffic in the area because spent sulfuric acid is currently transported off-site for recycling. While truck transport will continue, installing the Sulfuric Acid Regeneration Plant will eliminate approximately 6,000 acid transport truck trip miles per ~~month~~ year that are currently used to transport spent and regenerated sulfuric acid to and from Wilmington Operations due to the reduced distance traveled. Additionally, there will be no daily increase over baseline peak day activity of coke transport trucks to the Port of Long Beach. However, annual coke production may increase as result of the potential increase of up to 6,000 bbl/day in crude oil processed at the Wilmington Operations DCU. Therefore, the annual coke truck trips to the Port are expected to increase by 1,460.

1.7.10 PERMITS AND APPROVALS

The proposed project will require approvals from a variety of federal, state, and local agencies as detailed in Section 2.10.

1.8 EXECUTIVE SUMMARY – CHAPTER 3: EXISTING ENVIRONMENTAL SETTING

1.8.1 INTRODUCTION

This chapter describes the existing environment in the vicinity of the Refinery that could be adversely affected by the proposed project. This EIR is focused only on the environmental topics identified in the NOP/IS (see Appendix A) that could be significantly adversely affected by the proposed project. The environmental topics identified in Chapter 3 include both a regional and local setting.

1.8.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Chapter 3 discusses the effects of meteorological conditions, temperature and rainfall, and wind flow patterns on the existing air quality conditions in the South Coast Air Basin (Basin). Existing air quality is examined for criteria pollutants, regional air quality, local air quality, the Refinery's criteria pollutant emissions, toxic air contaminants (TACs), as well as the regulatory setting.

The Tesoro Los Angeles Refinery is located within the SCAQMD's jurisdiction. Over the last two decades, air quality has substantially improved within the district. Nevertheless, several air quality standards continue to be regularly exceeded. Of the National Ambient Air Quality Standards (NAAQS) established for criteria pollutants, the Basin is designated as non-attainment for PM2.5, and ozone for both state and federal standards. The Basin, including the proposed project area, is classified as attainment for the state and federal standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), CO, sulfates, and lead except in Los Angeles County, and is classified as attainment for the federal PM10 standards but non-attainment for the state PM10 standards and lead in Los Angeles County. This section also shows 2012 – 2013 criteria pollutants emitted by the Refinery. This section also provides information on local toxic air contaminant concentrations in the vicinity of the Refinery and an inventory of GHG emissions in the Basin. Finally, federal, state, and local air quality regulations are identified.

1.8.3 HAZARDS AND HAZARDOUS MATERIALS

The Tesoro Los Angeles Refinery handles hazardous materials with the potential to impact people, property, or the environment. An accidental release of hazardous materials at a facility can occur due to natural events, such as earthquakes, and non-natural events, such as mechanical failure or human error. Potential existing hazards from the Refinery are those associated with accidental releases of toxic/flammable gas, toxic/flammable liquefied gas, and flammable liquids. Potential hazards at a refinery include toxic gas clouds, fires, vapor cloud explosions, thermal radiation, and overpressure. Risks are also associated with transportation, including truck transport, rail transport, and pipeline transport. This section describes existing risks at the Refinery from units that will be affected by the proposed project.

Historic operations at the Refinery have resulted in accidental releases of hazardous materials (primarily petroleum hydrocarbons) to soil and groundwater in some areas of the Refinery. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released. Local laws and regulations that address accidental release, storing, transport, and handling are also describe in the section.

1.8.4 HYDROLOGY AND WATER QUALITY

Water issues in Los Angeles County are complex and affect supply, demand and quality of water for domestic, commercial, industrial and agricultural use. Extensive urbanization in the Carson/Wilmington area has resulted in significant alteration and deterioration of the natural hydrologic environment. The Tesoro Los Angeles Refinery consumed approximately 18 million gallons of water per day in 2012/2013 from potable water, Refinery owned wells, and recycled water (see Table 3.4-1 for use details).

Wastewater streams from the Carson Operations include process wastewater, boiler and cooling tower blowdown, sanitary wastewater, and surface runoff. Process wastewater streams are treated by the Carson Operation's existing wastewater treatment facilities prior to discharge to the Los Angeles County Sanitation District (LACSD) sewer system. Wastewater from the

Carson Operations is treated and sampled in compliance with the LACSD Industrial Wastewater Discharge Permit. The LACSD places limitations on wastewater parameters such as oil and grease contents, pH levels, temperature, heavy metals, organic compounds and other constituents. Wastewater that complies with the LACSD permit requirements is discharged to the sewer. Wastewater that does not comply is returned to the wastewater treatment system for further treatment. The Carson Operations is also permitted to discharge stormwater commingled with treated process water to Dominguez Channel.

The Carson Operations discharged an average of 4.07 million gallons per day of wastewater during 2012 and 2013 to the sewer system. The Carson Operation's current Industrial Wastewater Discharge Permit allows discharge of up to 5.25 million gallons per day to the LACSD sewer system.

The Wilmington Operations discharged an average of 2.88 million gallons per day of wastewater based on a 2012/2013 average. The Wilmington Operation's current Industrial Wastewater Discharge Permit allows discharge of 3.24 million gallons per day. The Wilmington Operations maintains on-site wastewater treatment equipment. Wastewater from the Wilmington Operations is treated and sampled in compliance with the LACSD Industrial Wastewater Discharge Permit.

The Tesoro Los Angeles Refinery is located on the Dominguez Channel and approximately 1.5 miles west of the Los Angeles River. The Los Angeles River and the Dominguez Channel are the major drainages that flow into the Los Angeles-Long Beach Harbor complex. Sediments and contaminants are transported into the harbor with the flows from the Los Angeles River and, to a lesser degree, the Dominguez Channel.

Runoff from the Wilmington and Carson Operations is collected, treated (if applicable), and discharged under the requirements of the existing storm water permit, National Pollutant Discharge Elimination System (NPDES) permit or the Industrial Wastewater Discharge Permit.

1.8.5 NOISE

The existing noise environment at the Refinery and in the vicinity of the Refinery is dominated by refining operations and mobile sources including trucks, cranes, locomotive engines, and other heavy industrial activities. Noise sources in the area currently include: (1) mobile and stationary sources at the Wilmington and Carson Operations; (2) rail traffic and related maintenance and service activities at adjacent rail yards; (3) noise from adjacent industrial facilities; (4) the Alameda Corridor; and (5) traffic along the State Route 102, Interstate 405, Pacific Coast Highway, and other local streets, e.g., Alameda Street, Wilmington Avenue, and Sepulveda Boulevard.

Noise-sensitive receptors are defined as residences, schools, hospitals, libraries, places of worship, and public parks. Although there are numerous sources of noise in the area, there are few sensitive receptors. The closest noise sensitive receptors to the proposed project locations within the Refinery include: (1) a residential area on the corner of Merimac Avenue and West Willard Street approximately 2,000 feet east of the Tesoro Wilmington Operations; (2)

residential area near Mauretania Street and Goodrich Avenue; (3) residential areas west of the Drumm Avenue/East Sandison Street intersection; and (4) residential areas west of Wilmington Avenue near East Pacific Street. There are numerous commercial receptors located adjacent to both Wilmington and Carson Operations, as well as numerous industrial receptors.

Based on a recent noise survey conducted during August and September 2014 to determine the existing ambient noise levels in the vicinity of the Refinery, the Community Noise Equivalent Level (CNEL) in the vicinity of the closest residential areas ranges between 68 and 73 decibels (dBA). The existing CNEL at an industrial area, adjacent to the Wilmington Operations is about 76 dBA. This section also describes the various state and local noise regulations, as well as, criteria in the Noise elements in the General Plans for the cities of Los Angeles and Carson to limit excessive noise levels for a variety of land uses.

1.8.6 SOLID AND HAZARDOUS WASTE

A total of 11 Class III active landfills and two transformation facilities are located within Los Angeles County with a total disposal capacity of 43,648 tons per day and 3,240 tons per day, respectively.

In 2012, residents and businesses in Los Angeles County disposed of 8.72 million tons of solid waste at Class III landfills and transformation (i.e., refuse to energy) facilities located in and out of the County. In addition, the amount of inert waste disposed at permitted inert waste landfills totaled 89,142 tons.

Presently, two transformation facilities operate in Los Angeles County with a combined average daily tonnage of 1,825 tons per day in 2012, or about 569,539 tons per year. It is expected that these two facilities will continue to operate at their current permitted daily capacity during the planning period of 2012 through 2027.

Los Angeles County Department of Public Works conducted a survey requesting landfill operators in the County to provide updates to their estimated remaining disposal capacity. Based on the results of the survey and considering permit restrictions, the total remaining permitted Class III landfill capacity in the County is estimated at 129.2 million tons as of December 31, 2012.

The average amount of solid waste generated by the Tesoro Carson and Wilmington Operations during 2012/2013 was ~~an average of 39,099~~14,874 tons per year~~ of solid waste during 2012/2013~~.

Two hazardous waste landfill facilities within California are the Chemical Waste Management (CWM) Kettleman Hills facility in King’s County, and the Clean Harbors Environmental Services facility in Buttonwillow (Kern County). On May 21, 2014 DTSC finalized a permit modification which allowed the Kettleman Hills facility to increase its capacity by about five million cubic yards. Buttonwillow is a 320-acre landfill operated by Clean Harbors Environmental Services Environmental Services and can accept in excess of 200 loads of waste per day. Buttonwillow has a remaining capacity of approximately 8,890,000 cubic yards or approximately 40 years.

1.8.7 TRANSPORTATION AND TRAFFIC

This section provides an overview of regional and local traffic circulation and facilities in the vicinity of the proposed project. The operating characteristics of an intersection are defined in terms of the level of service (LOS), as represented by intersection volume to capacity (V/C) ratio. LOS describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. For signalized intersections, it is measured from LOS A (excellent conditions) to LOS F (very poor conditions). Intersections that operate at LOS A to C operate well. Level C normally is taken as the design level in urban areas outside a regional core. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration.

Peak hour LOS analyses were developed for 13 intersections in the vicinity of the Refinery. The LOS analysis indicates typical urban traffic conditions in the area surrounding the Refinery, with all intersections operating at Levels A to D during morning and evening peak hours. One intersection currently operates at LOS D (without the proposed project), Wilmington Avenue/Interstate 405 southbound ramps during the morning peak hour. All other intersections operate at LOS A to C during both morning and evening peak hours. This section also provides an overview of applicable state and local traffic laws, ordinances, and General Plan goals.

1.9 EXECUTIVE SUMMARY – CHAPTER 4: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Chapter 4 assesses the potential environmental impacts of the construction and operation of the Tesoro Los Angeles Refinery Integration and Compliance Project. Chapter 4 evaluates those impacts that are considered potentially significant under the requirements of CEQA, as determined by the NOP/IS (see Appendix A). Specifically, an impact is considered significant under CEQA if it leads to a “substantial, or potentially substantial, adverse change in the environment.” Table 1.9-1 (located at the end of this chapter) summarizes the impacts of the proposed project.

The proposed project has potential direct impacts to environmental resources (i.e., air quality, hazards and hazardous materials, hydrology and water quality, noise, solid and hazardous waste, and transportation and traffic). In addition, the proposed project may have indirect impacts on upstream or downstream equipment by causing increased utilization from operational changes, even though the equipment is operating within permit limits and no permit modification would be required. Due to the nature of Refinery operations, all equipment activity levels may continue to fluctuate on a monthly or even daily basis. As discussed in Section 2.5.4 and associated subsections, while the proposed project does not affect the types of crude oils processed at the

Refinery and thus will not have impacts due to changes in crude oils, the proposed project may affect downstream unit processing rates. Those indirect impacts are expected to occur in the following units; Wilmington Operations units downstream of the Coker (from H-100 duty increase and potential crude capacity increase), Hydrotreating Unit No. 3, Catalytic Reforming Unit No. 2, and tanks; and, Carson Operations FCCU, Cogen, and tanks. The impacts associated with these indirect impacts are also evaluated in the EIR.

1.9.1 AIR QUALITY

1.9.1.1 Environmental Impacts

Project-specific air quality impacts associated with increases and decreases in emissions of air contaminants (both criteria air pollutants and TACs) during the construction and operation phases of the proposed project are discussed in Chapter 4, as well as impacts to sensitive receptors.

Construction emissions were calculated for peak day construction activities in each month construction is expected to occur. Construction activities associated with the modifications to the Refinery would result in emissions of CO, VOC, NOx, SOx, PM10, and PM2.5. The peak construction phase of the proposed project will exceed the regional significance threshold for VOC and NOx. The largest source of emissions is associated with construction equipment. Therefore, unmitigated air quality impacts associated with construction are considered significant.

The Localized Significance Threshold (LST) analysis at sensitive receptors for construction CO, NO_2, PM10, and PM2.5 emissions was conducted and indicates that NO_2 emissions are expected to exceed significance thresholds due to construction activities associated with the proposed project. The maximum exceedances occur approximately 1,300 feet west of the Wilmington Operations. Therefore, the localized air impacts from proposed project would be considered significant during construction.

Operational emissions associated with the proposed project include stationary and mobile source emissions. Emission increases are expected from the new SARP, PSTU, crude storage tanks, as well as fugitive emissions associated with modifications to existing units (e.g., HTU-1, HTU-2, HTU-4, No. 51 Vacuum Unit, LPG Rail Unloading, etc.). Emission increases are also associated with mobile sources including locomotive engine and truck emissions. The proposed project includes the shutdown of the Wilmington Operations FCCU, which is a major source of emissions. The proposed project is expected to generate emission reductions of CO providing an emissions benefit and a less than significant increase in VOC, NOx, SOx, PM10, and PM2.5 emissions. Additionally, mobile source criteria pollutant and GHG emission reductions from marine vessels are expected to occur from improving the unloading rate of crude oil deliveries at the Marine Terminal. Therefore, no significant adverse operational air quality impacts are expected from the proposed project.

Due to the complexity and duration of the Refinery integration, some project components are expected to be implemented prior to the shutdown of the Wilmington Operations FCCU (referred to as the Interim Operations Scenario). To assess the interim impact of the proposed project, the project components that will be operational in advance of the shutdown of the Wilmington Operations FCCU have been evaluated. Project components included in the Interim Operations Scenario include the Wilmington Operations DCU H-100 Heater Duty Bump, and fugitive emissions from the Wilmington Operations HCU and Carson HCU Mods, LHU Mods, and Mid Barrel Distillate Treater. The expected interim emissions are less than significant.

An additional transitional period is expected to occur to facilitate the integration of the Refinery and the shutdown of the Wilmington Operations FCCU. The transitional period is expected to be approximately 90 days prior to the Wilmington Operations FCCU shutdown, when Refinery units will become operational while the Wilmington Operations FCCU remains operating. The transitional period is expected to create a temporary increase in emissions that when combined with the concurrent on-going construction of other portions of the proposed project will have significant air quality impacts). The transitional period operational emissions increase will cease and become the reduced emissions discussed previously following the shutdown of the Wilmington Operations FCCU and completion of the proposed project.

There are substantial emission reductions in CO from the proposed project, which will provide a beneficial air quality impact. NOx, SOx, PM10, and PM2.5 will have local emissions benefits, but will be regionally neutral as RECLAIM (RTCs) and Emission Reduction Credits (ERCs) will be retained or generated. VOC emission increases from direct stationary sources associated with the proposed project will be offset using concurrent emission reductions or ERCs as required by SCAQMD Regulation XIII for emission increases greater than one pound per day from newly permitted and modified existing permitted emission sources. Use of emission offsets will reduce potential air quality impacts associated with emission increases from stationary sources, including fugitive emissions. Equipment that will use concurrent emission reductions will be restricted by SCAQMD permit conditions to ensure the Wilmington Operations FCCU is shutdown to provide the necessary offsets.

Dispersion modeling was used to calculate ambient air concentrations of the criteria pollutants from the project sources which emit CO, NOx, SOx, PM10, and PM2.5 emissions during operation of the proposed project and to determine the localized impacts. Based on the AERMOD air dispersion model results, the ground-level concentrations of the criteria pollutants of concern will be below SCAQMD CEQA significance thresholds. Therefore, no significant adverse localized air quality impacts are anticipated to occur from the operation of the proposed project.

To provide a comprehensive analysis of toxic air contaminants and non-cancer toxic air contaminant impacts, risks were calculated using currently adopted guidance. Based on the air quality modeling and related assumptions, the incremental cancer risk to the Maximum Exposed Individual Worker (MEIW) associated with TAC emissions from the proposed project was calculated to be 9.3~~2~~ in one million. The incremental cancer risk to the Maximum Exposed Individual Resident (MEIR) associated with TAC emissions from the proposed project was calculated to be 3.7~~6~~ in one million. The incremental cancer risk to the nearest non-residential sensitive receptor associated with the proposed project was calculated to be 2.1 in one million.

The predicted cancer risks does not exceed the cancer risk significance threshold of 10 per million; therefore, the carcinogenic health risks are considered to be less than significant.

The maximum chronic hazard index (MCHI) is located just east of the southern portion of the facility. The MCHI for the proposed project is 0.106~~127~~, which is below the 1.0 significance threshold. Therefore, the chronic hazards generated by the proposed project are considered to be less than significant.

The maximum 8-hour chronic hazard index is located on the northwestern boundary of the Wilmington Operations. The maximum 8-hour chronic hazard index for the proposed project is 0.108, which is below SCAQMD's chronic hazard index significance threshold of 1.0. Therefore, the peak chronic non-cancer health hazards generated by the proposed project are considered to be less than significant.

The maximum acute hazard index (MAHI) is located just west of the southern portion of the facility. The MAHI for the proposed project is 0.052, which is below the 1.0 significance threshold. Therefore, the acute hazards generated by the proposed project are considered to be less than significant.

1.9.1.2 Mitigation Measures

Feasible mitigation measures are required to minimize the significant air quality impacts associated with the construction phase of the proposed project as the emissions of VOC~~, CO,~~ and NOx are considered significant. Mitigation measures A-1 through A-9 have been imposed which include maintaining a Construction Management Program that incorporates the imposed mitigation measures and Best Management Practices. Mitigation measures include requirements for: prohibiting truck and construction equipment idling in excess of five minutes at the Refinery, maintaining construction equipment to optimize emissions, requiring the use of on-road heavy-duty trucks greater than 19,500 pounds or greater that are compliant with EPA 2007 on-road emissions standards, utilizing electric welders where feasible, utilizing on-site power where available, using equipment rated 50 and greater equipped with Tier 4 or equivalent engines, and suspending all construction activities that generate air pollutant emissions during first stage smog alerts. Additionally, Tesoro will implement selective catalytic reduction catalyst change outs as specified in mitigation measure A-9. The mitigation measures are expected to reduce construction emissions; however, construction emissions are expected to remain significant.

During the 90-day transitional period, when construction activities are on-going, VOC~~, CO,~~ and NOx emissions will remain significant. Therefore, the 90-day transitional period combined with construction activities associated with the proposed project are expected to cause significant adverse construction air quality impacts and no additional feasible mitigation has been identified that would reduce the localized impacts during construction.

No mitigation measures are required for the operational phase because no significant air quality impacts were identified. Emissions of CO were calculated to be emission reductions. VOC, NOx, and SOx, PM10, and PM2.5 emissions were calculated to be less than significant. BACT will be required for all new and modified sources with emissions increases.

1.9.1.3 Level of Significance after Mitigation

Regional construction emissions for the proposed project for VOC and NOx are expected to remain significant following mitigation. The regional construction emissions associated with CO, SOx, PM10, and PM2.5 are expected to remain less than significant following mitigation. Construction emissions are expected to be short-term and they will be eliminated following completion of the construction phase.

Localized significant impacts from construction activities were analyzed for ~~CO,~~ NO_2, PM10, and PM2.5. The construction activities associated with the proposed project are expected to cause a significant impact on ambient air quality. While mitigation measures have been imposed, construction air quality impacts would remain significant.

The proposed project is not expected to have significant adverse CO, NOx, SOx, VOC, PM10, or PM2.5 emission impacts during operation. Further, ambient air quality modeling indicates that the proposed project emissions of CO, NO_2, PM10, and PM2.5 during operation of the proposed project would not cause or contribute to an exceedance of any ambient air quality standard. Therefore, the operation of the proposed project is not expected to cause a significant adverse impact on ambient air quality and no mitigation measures are required.

The proposed project was analyzed for cancer and non-cancer human health impacts and determined to be less than significant. The estimated cancer risk due to the operation of the proposed project is expected to be less than the significance criterion of 10 in one million. The chronic and acute hazard indices are expected to be below 1.0. Therefore, the proposed project is not expected to cause a potentially significant adverse impact associated with exposure to TAC.

1.9.2 HAZARDS AND HAZARDOUS MATERIALS

1.9.2.1 Environmental Impacts

1.9.2.1.1 On-site Hazards

The potential hazards associated with the proposed project are common to most oil processing facilities worldwide, and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection and mitigation systems. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions. For hydrocarbon fuel and petrochemical facilities, the possible hazards are: toxic gas clouds (e.g., gas with hydrogen sulfide, sulfur dioxide, or sulfur trioxide); flash fires; torch fires; pool fires; boiling liquid expanding vapor explosions (BLEVEs); and, vapor cloud explosions.

In order to determine the hazards from the existing and proposed units and modifications, the CANARY consequence analysis models were used. See Chapter 3.3 and Appendix C for more details on the model and related assumptions. The maximum vulnerability zones (also referred to as hazard zones) for the existing equipment and proposed changes were evaluated for the new or modified units associated with the proposed project. The maximum hazard zone identifies the area where the injury thresholds would be potentially exceeded in the event of an upset. For each potential release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). For new units, the distance to the threshold level for each release was determined.

The new and modified units that have the ability to create a hazard that could extend further off-site include the Naphtha Isomerization Unit and new crude tanks at the Carson Operations, and the Sulfuric Acid Recovery Plant at the Wilmington Operations. The hazards associated with the Interconnecting Pipelines would also extend off-site as portions of the pipeline are located off-site. The hazards associated with the Naphtha Isomerization Unit, new crude tanks, and Interconnecting Pipelines would only impact the roadways adjacent to the Refinery or other industrial areas (e.g., other refineries, rail yards). The hazards associated with the Sulfuric Acid Regeneration Plant are potentially significant in the event of a worst-case release of sulfur dioxide and could extend up to about 1,905 feet. Although the hazard would avoid residential areas, several houses are located within industrial areas and the projected sulfur dioxide hazard zone, so there could be impacts to residents in the event of a worst-case release. Therefore, the hazard impacts associated with the proposed project are potentially significant.

1.9.2.1.2 Transportation Hazards

The proposed project would increase the transport of fresh and spent caustic trucks using trucks and railcars specifically designed for caustic transport. Using the maximum estimated total combined truck mileage of 45 miles per day, the potential for an accident involving a caustic truck is 0.000002 (45 miles per day / 1 million miles x 0.04 accidents/million miles driven) or approximately one accident every 555,556 years. Though it is difficult to compare hazardous and non-hazardous transport risk, the differences appear to be significant enough to conclude that the magnitude of non-hazardous transport accidents dominates highway transport risk. The specific hazardous material trucking regulations discussed in Section 3.3.7 and additional care provided by carriers and shippers of hazardous materials appear to be reducing the accident rate for hazardous material shipments. Because hazardous materials are currently transported by truck, the consequences of an accident would not change. Therefore, the probability for an adverse impact from truck transport of hazardous materials is extremely low and the potential hazard impact related to truck transport from the proposed project is less than significant.

The proposed project is expected to increase the shipment of caustic by rail. The approximately 110,880 gallons (2,640 barrels) of spent caustic per week will be loaded onto railcars for transport to the Gulf Coast for regeneration. Therefore, the proposed project will add about four railcars per week of spent caustic acid to existing trains that are currently transporting spent caustic from the Refinery. Using the maximum estimated trips travel to the state line of 277 miles per railcar for four railcars, the potential for a serious incident involving a caustic railcar is 0.00007 (1,110 miles per day / 1 million miles x 0.08 accidents/million railcar miles) or approximately one accident every 11,760 years. Because hazardous materials are currently transported by rail, the consequences of an accident would not change. Therefore, the probability for an adverse impact from rail transport of spent or fresh caustic from the proposed project is extremely low and less than significant.

The proposed project is also expected to increase the number of LPG railcars by a maximum of 10 per day. The~~se~~ additional LPG ~~railcars~~ will be transported in railcars specifically designed to transport LPG and added to existing rail shipments. Using the maximum estimated trips travel of 605 miles per day per railcar for 10 railcars, the potential for a serious incident involving a LPG railcar is 0.0002 (6,050 miles per day / 1 million miles x 0.03 accidents/million railcar miles) or approximately one accident every 6,081 years. Therefore, the probability for an adverse impact from rail transport of LPG is extremely low and the potential hazard impact related to rail transport from the proposed project is less than significant.

1.9.2.1.3 Hazard Impacts During Construction

In the event contaminated soil or groundwater is encountered, exposure is expected to be limited to on-site construction workers. Construction workers at the Refinery and other locations are protected by numerous existing rules, regulations and requirements and have been professionally trained to safely work around the potentially hazardous conditions that exist within a refinery. Compliance with these laws and internal Refinery safety procedures will ensure that any worker exposure is less than significant. Because the nearest residential receptors are located 1,000 and 2,000 feet from the two locations where hydrocarbon exceeds the SCAQMD Rule 1166 50 ppm requirement, it is unlikely that they will be exposed to hydrocarbons exceeding 50 ppm.

1.9.2.2 Mitigation Measures

There are a number of rules, regulations, and laws governing the refinery operations that will minimize the potential adverse impacts associated with hazards at the facility and which would minimize the hazards associated with the Naphtha Isomerization Unit, new crude storage tanks, SARP, and Interconnecting Pipelines. Mitigation measure HHM-1 would require the applicant to demonstrate compliance with applicable hazardous material rules and regulations prior to the startup of the new or modified units, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses; PSM requirements under 40 CFR Part 1910, Section 119, and Title 8, CCR, Section 5189; and Article 2, Chapter 6.95 of the California Health and Safety Code that require facilities that handle listed regulated substances to develop RMPs to prevent accidental releases of these substances prior to commencement of operations. Other than mitigation measure HHM-1, no other feasible mitigation measures have been identified, over and above the extensive safety regulations that currently apply to the Tesoro Refinery.

1.9.2.3 Level of Significance after Mitigation

The impacts of the proposed project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and Interconnecting Pipelines are expected to be significant.

Compliance with existing PSM, RMP, and CalARP regulations and implementation of the recommended safety measures would minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, hazards and hazardous material impacts generated by the proposed project are expected to remain significant.

With respect to potential worker exposure to soil and groundwater contamination, compliance with existing regulations and implementation of the proposed project safety measures are intended to minimize the potential impacts associated with excavation. Such compliance is expected to reduce the potential hazard impacts associated with hydrocarbon-contaminated soil and groundwater. Therefore, hazards and hazardous material impacts generated by excavation activities associated with the proposed project are expected to be less than significant.

1.9.3 HYDROLOGY AND WATER QUALITY

1.9.3.1 Environmental Impacts

Water demand during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing. The maximum total daily potable water demand during construction is expected to be a maximum of 40,000 gallons per day (gpd), which is less than the significance threshold of 262,820 gpd. Therefore, the proposed project will have less than significant impacts on water supply during construction.

The water used for the hydrostatic testing tanks and associated piping will be Refinery wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater will not increase the amount of wastewater generated by the Refinery, but will vary the discharge rate during construction. It is expected that for a total of approximately four to six weeks distributed over the construction period, a temporary daily increase in water discharge will occur at the completion of hydrostatic testing. No permit modification or new wastewater treatment facilities are needed to accommodate the temporary increase in discharge of wastewater during testing from the Carson or Wilmington Operations.

The Refinery currently uses on average about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water in its operations. The direct water demand of the proposed project is expected to require an estimated increase in water demand of 76.5 gallons per minute (110,160 gpd). An additional 81,115 gpd of water demand is associated with the indirect effects of the proposed project. The combined total of the proposed project direct and indirect water demand is 191,275 gpd which is less than the significance threshold of 262,820 gpd. The Refinery has adjudicated water rights that allow the production of up to 2.8 billion gallons of water per year from its wells. Therefore, the proposed water supply impacts are expected to be less than significant.

The proposed project is expected to reduce overall wastewater generated during operation at the Refinery by an estimated 55.1 gpm (77,344 gpd). This is due, in large part, to the shutdown of the Wilmington Operations FCCU. While there will be wastewater increases from some operations, such as the SARP, the proposed project will reduce wastewater generation, and adequate capacity in the existing wastewater treatment facilities is available. Therefore, no new wastewater treatment facilities are needed and the existing facilities are adequate to meet the needs of the proposed project. As such, the proposed project impacts to water quality would be less than significant.

1.9.3.2 Mitigation Measures

No significant impacts associated with water demand and wastewater discharge are expected from the proposed project, so no mitigation measures are required.

1.9.3.3 Level of Significance after Mitigation

The proposed project impacts on hydrology and water quality are expected to be less than significant.

1.9.4 NOISE

1.9.4.1 Environmental Impacts

Proposed project construction is anticipated to increase noise levels temporarily at noise-sensitive receptors in the vicinity of the Tesoro Los Angeles Refinery, as heavy construction equipment is required during construction activities associated with the proposed project. Noise from construction activities is generated by a broad array of construction equipment. These noise sources will operate primarily during daylight hours and will be a source of noise over the construction period.

Three dimensional noise models of the proposed project were created using the noise modeling software, SoundPLAN. Actual noise monitoring in the vicinity of the Refinery was used to estimate baseline noise levels. The noise model was used to determine the potential proposed project noise impacts during construction and operational activities.

The noise impacts associated with construction activities would add less than 3.0 dBA to the adjacent residential communities, including all noise-sensitive receptors. The noise levels at the closest residential areas are expected to increase from 0.1 to 0.9 dBA depending on the location and the time of day. An increase of 0.9 dBA is less than the significance threshold of 3.0 dBA. The proposed project noise impacts during the construction phase are expected to be less than significant.

The proposed project will add equipment to the existing Refinery so that there will be additional noise sources at the facility. Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, air coolers, scrubber, as well as new equipment associated with the Wet Jet Treater, PSTU and SARP.

The noise model predicted that the CNEL levels within residential areas would increase by less than 3.0 dBA as a result of the operation of the proposed project. The only noise increase (0.1 dBA) is the residential area west of Alameda Street, north of Pacific Coast Highway. The noise levels associated with the operation of the proposed project is expected to be similar or the same as existing noise levels at all residential receptors adjacent to the Refinery. The noise increases at all receptor locations are predicted to be less than 3.0 dBA and, therefore, noise impacts associated with the operation of the proposed project would be less than significant.

Construction of the proposed project would involve equipment and activities that may have the potential to generate groundborne vibration. Vibration impacts were evaluated using the Federal Transit Administration published standard vibration levels and peak particle velocities for construction equipment operations. The estimated vibration from construction activities is less than the FTA vibration impact level, so no significant vibration impacts are expected during the construction period. Equipment associated with operation of the proposed project is not expected to generate detectable groundborne vibration during normal operation because new and modified equipment is not expected to have oscillating parts that have the potential to generate groundborne vibration.

1.9.4.2 Mitigation Measures

No significant adverse impacts associated with noise or vibration are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

1.9.4.3 Level of Significance after Mitigation

The noise and vibration impacts of the proposed project during construction and operational activities are expected to be less than significant.

1.9.5 SOLID AND HAZARDOUS WASTE

1.9.5.1 Environmental Impacts

Solid waste (i.e., construction debris and uncontaminated soil) generated during construction of the proposed project that may require disposal will be stored on the Refinery property prior to disposal at one of the landfills in southern California. The landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis. In addition, because a percentage of this solid waste has economic value (steel) or can be recycled (concrete), the amount of solid waste generated on a daily basis is expected to be relatively small compared to the total amount of solid waste generated in Los Angeles County. Therefore, the proposed project is not expected to result in a significant impact on solid waste during the construction phase.

Site preparation, grading, and construction activities for the proposed project have the potential to encounter contaminated soils. The project estimates that a total of approximately 290,148 cubic yards of contaminated soil may require removal and disposal: of that, approximately 83,213 cubic yards would be hazardous materials, and approximately 206,953 cubic yards would be non-hazardous materials. In the event that the material still requires disposal (i.e., cannot be treated/remediated), the Kettleman Hills facility has sufficient available capacity (5,000,000 cubic yards) and the Clean Harbors Buttonwillow facility has available capacity (over 8,000,000 cubic yards) to accept the total amount of estimated one-time contaminated soil waste generated by construction activities associated with the proposed project. Since the amount of disposal capacity necessary to dispose of contaminated soils is well below the capacity of the available Class I landfills, no significant adverse hazardous waste impacts will occur from the proposed project.

Once the proposed project becomes operational, the average annual amounts of solid waste are not expected to change because there would be no increase in the number of workers and refinery units do not typically generate solid waste.

Operation of the proposed project may generate solid or hazardous waste streams; however, those waste streams are expected to be reused or recycled. Spent caustic will be generated by the Wet Jet Treater and from scrubbers on the SARP. Spent caustic will be recycled off-site and would not require disposal.

Periodic maintenance of the storage tanks could generate sludge during tank cleaning operations which occur once every ten to 20 years. The sludge would be recycled on-site in the DCU; therefore, no increase in waste disposal would be expected from operation of the new and modified storage tanks.

While operation of the proposed project may generate solid or hazardous waste streams, those waste streams are expected to be reused or recycled. Therefore, operation of the proposed project is not expected to require additional waste disposal capacity and will not interfere with the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, significant solid and hazardous waste impacts are not expected from construction and operation of the proposed project

1.9.5.2 Mitigation Measures

No significant adverse impacts associated with solid or hazardous waste are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

1.9.5.3 Level of Significance after Mitigation

No significant adverse solid or hazardous waste impacts are expected.

1.9.6 TRANSPORTATION AND TRAFFIC

1.9.6.1 Environmental Impacts

Initial construction activities for the proposed project are expected to begin in the third quarter of 2016 and are expected to be completed by second quarter of 2021. The construction activities for most of the components of the proposed project are expected to overlap in the first three years (peak construction period). Construction work shifts are expected to last about ten hours per day during most portions of the construction schedule. During normal construction periods, one work shift per day is expected. During Refinery turnaround periods (when some of the Refinery Units are shut down), two work shifts are expected and work may be conducted 24 hours per day. Shifts would operate from 6:00 a.m. to 6:00 p.m. and 6:00 p.m. to 6:00 a.m.

Construction conditions are analyzed for the construction phase with the maximum number of construction trips during the construction period. The traffic analysis is based on the preliminary construction schedule that included a total of 950 workers, 875 day shift workers and 75 night shift workers. Following the traffic study, the construction schedule has been refined and the number of workers has decreased to 696. The decrease in total trips is within the margin of accuracy. The traffic analysis is based on up to 950 construction workers travelling to and from the proposed project site during the highest trip-generation phase of construction of the proposed project. In addition to worker trips, 120 truck trips would be generated during the peak trip-generating construction phase throughout the work day.

Caltrans began a major construction project to modify the Interstate 405/Wilmington Avenue interchange starting November 2013, and continuing during the baseline conditions of the proposed project. The interchange construction is expected to finish in late 2016 or early 2017, potentially overlapping with the near-term construction period of the proposed project, which would result in significant construction traffic impacts. LOS analysis was conducted to evaluate existing plus construction intersection conditions during the a.m. and p.m. peak hours. The LOS at all intersections is expected to be LOS A, B or C at all intersections, except Wilmington Ave./Interstate 405 Southbound Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction conditions at the Wilmington Ave/Interstate 405 Southbound Ramps.

Following construction, no increase in the number of workers required to operate the Refinery is expected. Therefore, there would be no long-term parking or traffic impacts associated with the proposed project.

1.9.6.2 Mitigation Measures

Mitigation measure TT-1 will be imposed to reduce the proposed project's construction-related trips on the Wilmington Avenue/Interstate 405 Southbound Ramps intersection prior to the completion of the Interstate 405/Wilmington Avenue Interchange Project. Mitigation measure TT-1 requires the applicant to implement a traffic management plan to address project traffic impacts prior to the completion of the improvements at the Wilmington Avenue/Interstate 405

Southbound Ramps intersection. The traffic plan will require that project workers be advised of the construction schedule and potential restrictions and closures associated with the Interchange Modification Project and will be required to avoid the Wilmington Avenue/Interstate 405 Southbound Ramps intersection during morning peak travel periods by traveling either outside of the morning peak travel time or along alternative routes. Additionally, construction workers shall be encouraged to participate in ridesharing to lessen the number of vehicles transiting to the Refinery.

1.9.6.3 Level of Significance after Mitigation

The impacts of the proposed project on traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1 because traffic will be routed to avoid the Interstate 405/Wilmington Avenue Interchange Project.

1.9.7 SIGNIFICANT UNAVOIDABLE IMPACTS

CEQA requires an EIR to discuss significant environmental effects and irreversible environmental changes which would result from a proposed project, should it be implemented. It was determined that implementation of the proposed project would result in potentially significant adverse impacts on air quality during construction and temporary exceedance of the localized significance thresholds. Long-term operational air quality impacts are not expected to have a significant adverse impact on the environment but would, in fact, provide beneficial local air quality impacts by reducing overall emissions of CO, NOx, and SOx, as well as GHG emissions. Therefore, the proposed project is not expected to have long-term adverse environmental impacts on air quality.

The proposed project could result in significant impacts related to the "worst case" hazard impacts associated with the proposed modifications to the Naphtha Isomerization Unit, the proposed new crude tanks, SARP, and Interconnecting Pipelines. Compliance with existing PSM, RMP, and CalARP regulations and implementation of the recommended safety measures would minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. The feasible mitigation measures identified would not reduce the significant adverse hazard impacts to less than significant.

Traffic levels are expected to increase during construction and generate potentially significant adverse traffic impacts. Feasible mitigation measures are expected to reduce traffic impacts to less than significant. Operational traffic levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for traffic are expected during operation of the proposed project.

The proposed project involves modifications to an existing Refinery, located within an industrial area, which has been operating since the early 1900s. Therefore, there is no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment associated with the proposed project.

1.9.8 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

The analysis provided in Section 4.10 summarizes the NOP/IS, which concluded that the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources, biological resources, cultural resources; energy; geology and soils; land use and planning; mineral resources; population and housing; public services and recreation.

1.9.9 GROWTH INDUCING IMPACTS

The proposed project would help ensure the efficient manufacture of petroleum products at an existing Refinery that has been used for refining purposes since the early 1900s. As a development project occurring in an urban, industrialized, and generally built-out environment, the proposed project would increase long-term stability and the availability of petroleum products. The proposed project is expected to require up to 696 construction workers that would be largely be drawn from the local existing workforce pool. No new employees are expected during operation of the proposed project. The proposed project could result in an increase in the import or refining of about 6,000 bbl/day of crude oil, but would not result in a substantial increase in the production of petroleum products (e.g., gasoline and diesel fuels) to allow significant population growth. The proposed project would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (i.e., new roadway access or utilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed project would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

1.10 EXECUTIVE SUMMARY – CHAPTER 5: CUMULATIVE IMPACTS

State CEQA Guidelines §15130 requires that an EIR include a reasonable analysis of the significant cumulative impacts of a proposed project. Cumulative impacts are defined by CEQA as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (State CEQA Guidelines §15355). There are a number of projects proposed for development in the vicinity of the Refinery, which may contribute cumulative impacts to those generated by the proposed Integration and Compliance Project. The discussion in Chapter 5 lists projects which are reasonably expected to proceed in the foreseeable future, i.e., project information has been submitted to a public agency and is publicly available. Identified impacts from cumulative projects listed in Table 5.1.1 were combined with the proposed project's construction and operational impacts to assess cumulative impacts associated with the proposed project. The cumulative analysis is summarized in the following subsections.

1.10.1 AIR QUALITY

1.10.1.1 Environmental Impacts

1.10.1.1.1 Construction Impacts

The proposed project would contribute to potentially significant cumulative construction air quality impacts if project-specific construction emissions are considered to be cumulatively considerable as defined by CEQA Guidelines §15064(h)(1). Because the proposed project's construction emissions exceed the project-specific VOC and NOx thresholds, it is considered cumulatively considerable and cumulatively significant when considered in combination with related projects. Since CO, SOx, PM10, and PM2.5 construction emissions do not exceed their respective project-specific thresholds, they are not considered to be cumulatively considerable and, therefore, are not considered to contribute to cumulative construction impacts. This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, "The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable."

1.10.1.1.2 Operational Impacts

The proposed project includes the shutdown of the Tesoro Wilmington Operations FCCU, which is a major source of emissions. As discussed in Section 4.2.2.2, peak daily emissions associated with the proposed project also would result in emission increases from new and modified units, increased mobile source emissions, and increased utilization of some equipment. The overall change in emissions associated with implementing the proposed project is a reduction in CO emissions and a less than significant increase in VOC, NOx, SOx, PM10 and PM2.5 emissions. As a result, criteria pollutant emissions from the proposed project operation are not considered to be cumulatively considerable and, therefore, are not considered to contribute to cumulative operational emission impacts.

1.10.1.1.3 Toxic Air Contaminants

A health risk assessment was performed to determine if TAC emissions generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and hazard indices. The maximum cancer risk from the proposed project for the resident (MEIR) was determined to be 3.7~~6~~ in one million. The maximum cancer risk to a sensitive receptor was estimated to be 2.1 in one million. The maximum cancer risk at the worker receptor (MEIW) was estimated to be 9.3~~2~~ in one million. The estimated cancer risk at all of the receptors was below the 10 in one million threshold. In addition, the noncancer risks were determined to be 0.106~~127~~, 0.108, and 0.052 for the maximum chronic, maximum 8-hr chronic, and acute hazard indices, respectively, which were also determined to be below the significance threshold of 1.0. Therefore, TAC emissions from the proposed project operation would not make a cumulatively considerable contribution to cumulatively significant impacts for carcinogenic and non-carcinogenic health impacts. Note that the HRA did not include the emission reductions associated with the shutdown of the Wilmington Operations FCCU and only included estimated increases associated with the modification of existing and construction of new units, thus providing a conservative analysis of TAC emissions and related health risk. Therefore, the TAC emission impacts associated with the proposed project are not considered to be cumulatively considerable and are not considered to contribute to cumulative health risk impacts.

1.10.1.2 Mitigation Measures and Cumulative Impacts

The proposed project's construction emissions are cumulatively considerable and cumulatively significant when considered in combination with related projects. Mitigation measures A-1 through A-9 will be imposed on construction activities associated with the proposed project. However, after mitigation, construction emissions are expected to remain above SCAQMD thresholds for VOCs and NOx. Therefore, the construction of the proposed project would make a cumulatively considerable and unavoidable contribution to a cumulative significant impact during construction activities. While increases in operational emissions of VOC, NOx, SOx, PM10, and PM2.5 emissions are expected, which are less than significant, the proposed project is expected to result in reductions in CO emissions providing beneficial air quality impacts. Therefore, operation emissions from the proposed project are not significant, not cumulatively considerable, and are not considered to contribute to cumulative significant impacts for operational emissions, ambient air quality, or exposure to TACs and no mitigation measures are required.

1.10.1.3 Greenhouse Gases

1.10.1.3.1 Greenhouse Gas Emissions from Construction

Construction equipment is assumed to be operational up to ten hours per day, five days per week during most of the construction period. Also, during peak construction periods, two 12-hour work shifts are expected seven days per week. Emission factors for construction equipment were taken from the Construction Equipment Emissions tables in CARB's Offroad Inventory Model. Estimated GHG emissions from construction equipment are included in Table 5.2-1, with more detailed calculations in Appendix B-1.

The project will also include construction equipment working off-site. Emission factors for off-site construction equipment were taken from CARB's EMFAC 2011 Inventory Model. The SCAQMD significance threshold for GHG emissions combines construction emissions amortized over 30 years with operational emissions. The total GHG construction emissions associated with the proposed project are estimated to be 23,173 metric tons over the entire construction period, or 772 metric tons per year amortized over 30 years, which is less than significant.

1.10.1.3.2 Greenhouse Gas Emissions from Operations

The proposed project will result in both GHG emission increases and reductions. GHG emission increases would be associated with the DCU H-100 duty bump, increased utilization of HCU H-300/301, the No. 51 Vacuum Unit Heater, the NHDS Heater, and the proposed new SARP. The reduction in GHG emissions are associated with the shutdown of the FCCU at the Wilmington

Operations. Indirect impacts from equipment potentially impacted by the proposed project were also calculated to determine their effect on the proposed project's overall GHG emissions including the annual increase in Wilmington Operations coke delivery emissions from 1,460 trucks per year to the Port of Long Beach. The proposed project is expected to result in an overall GHG emission reduction of approximately 68,175~~66,139~~ metric tons per year providing a reduction of local GHG emissions. However, per the requirements of AB 32, the number of GHG allowances in California's Cap- and-Trade Program is reduced each year by the California Air Resources Board. An individual project that reduces GHG emissions may reduce local GHG emissions, but will not have an impact on the overall pool of allowances in the GHG Cap-and-Trade Program. Thus, the proposed project is considered to have no effect on state-wide GHG emissions. CEQA Guideline §15130(a) indicates that an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. "The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable" (CEQA Guidelines §15064(h)(4)). Therefore the project's contribution to GHG emissions is not cumulatively considerable and thus not significant because the GHG emissions from the Refinery would be less than the existing emissions if the proposed project is implemented (CEQA Guidelines §15130).

1.10.2 HAZARDS AND HAZARDOUS MATERIALS

1.10.2.1 Environmental Impacts

1.10.2.1.1 Construction

A number of cumulative projects have the potential to uncover contaminated soils during construction activities. The construction hazard impacts were considered to be less than significant or mitigated to less than significant for all of the related cumulative projects.

1.10.2.1.2 Operations

All storage tanks are required to provide secondary containment facilities (e.g., berms) that would contain 110 percent of the volume of the storage tanks, which assures that spills remain on-site and not overlap with hazards at other facilities.

New units have the potential to generate off-site impacts that could potentially expose off-site receptors to new hazards, e.g., the SARP (exposure to SO_2), and the new crude storage tanks at the Carson Operations (pool fire), as well as the new Interconnecting Pipelines (flash fire), and modifications to the Naphtha Isomerization Unit (flash fire). Although the project-related hazard impacts would generally be limited to industrial areas, the hazards are potentially significant. Therefore, hazards from the proposed project are considered to be cumulatively considerable and, therefore, are considered to contribute to significant adverse cumulative hazard impacts during operation.

The proposed project would decrease the transportation hazards associated with sulfuric acid as sulfuric acid would be regenerated on-site. However, the proposed project will increase the transportation of LPG via rail and increase the transport of caustic and spent caustic via truck and rail. The proposed project was considered to be less than significant for the transport of hazardous materials by truck and rail. Therefore, the proposed project is not cumulatively considerable as it relates to hazardous material transport and does not contribute to significant adverse hazardous material transport impacts.

1.10.2.2 Mitigation Measures and Cumulative Impacts

The impacts of the proposed project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, and Interconnecting Pipelines are considered significant and are cumulatively considerable. Compliance with existing regulations (e.g., PSM, RMP, and CalARP requirements) and implementation of mitigation measure HHM-1 would further minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, cumulative hazard impacts would remain significant after implementing the mitigation measures identified for the proposed project.

1.10.3 HYDROLOGY AND WATER QUALITY

1.10.3.1 Environmental Impacts

Water quality impacts associated with the related projects are not expected to result in cumulative impacts. All projects would be required to comply with stormwater pollution prevention requirements during project operation and construction as well as NPDES requirements for commercial and industrial facilities required to obtain such permits. Compliance with existing stormwater and wastewater discharge requirements is expected to ensure cumulative water quality impacts are less than significant.

1.10.3.1.1 Water Demand

The proposed project is expected to increase water demand by about 191,275 gpd which is less than the significance threshold of 262,820 gpd. The incremental increase in water use from the proposed project is expected to be produced by the privately-owned wells (i.e., from the available 2.82 billion gallons per year of adjudicated water rights). The existing water supply can meet the water demand of the proposed project and the daily water use associated with the proposed project is less than 262,820 gpd. Therefore, the proposed project water supply impacts are expected to be less than significant.

Since the Refinery has sufficient adjudicated water rights to support the proposed project’s increase in water demand and water demand impacts are less than significant, the proposed project’s water demand impacts are not cumulatively considerable. Therefore, the proposed project impacts on water demand are not considered to contribute to cumulative water demand impacts.

1.10.3.1.2 Water Quality

The proposed project is expected to reduce overall wastewater generated at the Refinery. The proposed project will result in an estimated reduction in wastewater of over 79,000 gpd associated with the shutdown of the Wilmington Operations FCCU. Because the proposed project reduces wastewater and demand on wastewater treatment facilities, the proposed project impacts on water quality are not cumulatively considerable and do not contribute to cumulative water quality impacts.

1.10.3.2 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the impacts of the proposed project on water demand and water quality are not cumulatively considerable.

1.10.4 NOISE

1.10.4.1 Environmental Impacts

1.10.4.1.1 Construction

Construction noise is generally site-specific and localized to the vicinity of each related project. Construction of some of the cumulative projects that are near the proposed project could occur concurrently. The proposed increase in noise associated with the proposed project construction activities are expected to increase from 0.1 to 0.9 dBA depending on the location of the sensitive receptor (residential areas) and the time of day. The increase in noise would be less than the significance threshold of 3.0 dBA and less than significant. The Wilmington/Carson area in the vicinity of the proposed project contains a number of heavy industrial facilities, as well as transportation corridors that generate noise. Accordingly, because construction noise impacts are substantially less than the 3.0 dBA significance threshold, noise levels decrease with distance, and the cumulative projects are not expected to contribute to significant adverse cumulative construction noise impacts, and are not expected to overlap with noise in the immediate vicinity of the Refinery, construction noise impacts from the proposed project are not considered to be cumulatively considerable and, therefore, do not contribute to significant adverse cumulative construction noise impacts.

1.10.4.1.2 Operations

Operational noise is generally site-specific, and localized to the vicinity of each related project. Although a project's operations could affect the noise environment in its immediate vicinity, the cumulative projects are not expected to have a significant cumulative impact on ambient noise due to the distance between the projects.

The operational noise impacts associated with the proposed project modifications were determined to be less than significant. Equipment and activities related to the proposed project would increase overall CNEL sound levels by up to 0.1 dBA at the nearest residences, which shows that noise levels from the refinery equipment subsides quickly with distance from the Refinery. Operational noise is generally site-specific, and localized to the vicinity of each related project. Although a project's operations could affect the noise environment in its immediate vicinity, the cumulative projects are not expected to contribute to significant adverse cumulative noise impacts during operation due to the distance between the projects. Because operational noise impacts are substantially less than the 3.0 dBA noise significance threshold, noise impacts from the proposed project are not considered to be cumulatively considerable and do not contribute to significant adverse cumulative noise impacts during operation.

1.10.4.2 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the noise impacts of the proposed project are less than significant. No significant adverse cumulative noise impacts during operation are expected.

1.10.5 SOLID AND HAZARDOUS WASTE

1.10.5.1 Environmental Impacts

1.10.5.1.1 Construction

Solid Waste: The proposed project includes the demolition and removal of two existing storage tanks and affected existing piping at the Wilmington Operations. The tanks and piping are constructed of steel and are expected to be recycled. The concrete foundations that support the existing tanks would generate an estimated 265 cubic yards that would be transported off-site for crushing and recycling or disposal at inert or municipal landfills.

The proposed project has the potential to generate up to 206,953 cubic yards of non-hazardous construction soil waste, which can be disposed of in Class III landfills. The total remaining permitted Class III landfill capacity in southern California is estimated to be approximately 129.2 million tons (about 2,584 million cubic yards). Landfills in southern California have the capacity to accept the solid waste produced during the construction phase of the proposed project on a one-time basis. Therefore, because the proposed project's solid waste impacts during construction activities are less than significant, they are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative solid waste impacts.

Hazardous Waste: An estimated 83,213 cubic yards of soil from the proposed project may be considered hazardous waste. Tesoro would consider the type and extent of contamination and explore the variety of options available for disposal and remediation, which could include in situ, on-site, and off-site treatment (e.g., incineration, soil vapor extraction, bioremediation). In the event that the material still requires disposal (i.e., cannot be treated/remediated), the Kettleman Hills facility has sufficient available capacity (5,000,000 cubic yards) and the Clean Harbors Buttonwillow facility has available capacity (over 8,000,000 cubic yards) to accept the total amount of estimated one-time contaminated soil waste generated by construction activities associated with the proposed project. The proposed project impacts on solid/hazardous waste are not considered to be cumulatively considerable and are not considered to contribute to cumulative solid/hazardous waste impacts.

1.10.5.1.2 Operations

Solid Waste: The discussion of potential solid waste impacts from the proposed project in Section 4.6.3 indicated that the average annual amounts of solid waste are not expected to change because there would be no change in the number of refinery workers and refinery units do not typically generated solid waste. Therefore, solid waste impacts from the proposed project during operations are not considered to be cumulatively considerable and do not contribute to significant adverse solid waste impacts during operation.

Hazardous Waste: The proposed project will result in an increase in spent catalyst associated with the operation of the SARP and spent caustic associated with operation of the Wet Jet Treater and SARP. Both of these waste streams are expected to be recycled and, therefore, would not impact solid or hazardous waste landfill facilities. The operation of the proposed project may generate solid or hazardous waste streams, but those waste streams are expected to be reused or recycled into the DCUs. The operation of the proposed project is not expected to require additional waste disposal capacity and is not expected to interfere or undermine the Tesoro Refinery's ability to comply with existing federal, state, and local regulations for solid and hazardous waste handling and disposal. Therefore, the proposed project impacts on hazardous waste during operations are not considered to be cumulatively considerable and are not considered to contribute to significant adverse cumulative hazardous waste impacts.

1.10.5.2 Mitigation Measures and Cumulative Impacts

Mitigation is not required because the solid/hazardous waste impacts of the proposed project are less than significant. No significant adverse cumulative solid/hazardous waste impacts are expected.

1.10.6 TRANSPORTATION AND TRAFFIC

1.10.6.1 Environmental Impacts

1.10.6.1.1 Construction

The LOS at all intersections during the proposed project construction activities is expected to be LOS A, B or C at all intersections, except Wilmington Avenue/Interstate 405 SB Ramps during the morning peak hour. The construction-related trips are forecast to result in a significant impact during construction conditions at the Wilmington Avenue/Interstate 405 SB Ramps, as this intersection is currently under construction. Once the construction activities at the Wilmington Aveenue/Interstate 405 interchange itself are complete, traffic impacts due to construction of the proposed project would be less than significant. The proposed project assumes the interchange is under construction concurrently with construction of the proposed project, which results in significant impacts and mitigation measure TT-1 has been imposed.

Therefore, the proposed project traffic impacts during construction activities are mitigated to less than significant, are not cumulatively considerable, and are not considered to contribute to significant adverse cumulative traffic impacts during construction.

1.10.6.1.2 Operations

The proposed project operations would not increase the number of on-site workers after the construction phase, however approximately ~~nine~~ten additional truck round-trips per peak work day would result from the proposed project to support its operations. The cumulative impacts of the proposed project and related projects have been estimated in the traffic analysis (see Section 4.7 and Appendix E for further details). In year 2021, assuming a 0.4 percent growth in traffic, no intersections in the traffic study would operate below LOS C. Therefore, the proposed project operational traffic impacts, along with other related projects, are not cumulatively considerable and are not considered to contribute to cumulative significant adverse traffic impacts during operation of the proposed project.

1.10.6.2 Mitigation Measures and Cumulative Impacts

Mitigation measure TT-1 is required in order to reduce the proposed project's construction-related trips on the Wilmington Avenue/Interstate 405 SB Ramps intersection prior to the completion of the Interstate 405/Wilmington Avenue Interchange Project. TT-1 requires the applicant to implement a traffic management plan that requires project workers to avoid the Wilmington Avenue/Interstate 405 SB Ramps intersection during morning peak travel periods (while that onramp is under construction) by traveling either outside of the morning peak travel time or along alternative routes. The impacts of the proposed project on traffic and circulation are expected to be less than significant following implementation of mitigation measure TT-1. Therefore, construction traffic impacts from the proposed project are not cumulatively considerable and would not contribute to significant adverse cumulative construction traffic impacts.

1.11 EXECUTIVE SUMMARY CHAPTER 6: ALTERNATIVES ANALYSIS

1.11.1 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

Alternatives evaluated in the EIR included: Alternative 1 – No Project Alternative; Alternative 2 – Fluid Feed Hydrodesulfurization Fractionator at Carson Operations and a New Diesel Hydrotreater at Wilmington Operations; Alternative 3 – New Carson Hydrotreater at Carson Operations; Alternative 4 – Interconnecting Pipeline and New Gasoline Hydrotreater at Carson Operations; and Alternative 5 – Alternative Construction Schedule.

1.11.1.1 Alternative 1 – No Project Alternative

The No Project Alternative would not result in further integration of the Wilmington and Carson Operations. Under the No Project Alternative, modifications to the Wilmington Operations would not move forward including modifications to the HCU, CRU-3, HTU-1, HTU-2, HTU-4, DCU Heater H-100, and crude tanks. The new PSTU, and SARP also would not be constructed and the Wilmington Operations FCCU would not be shut down. Modifications to the Carson Operations would also not occur including modifications to No. 51 Vacuum Unit, HCU, LHU, NHDS Unit, Naphtha Isomerization Unit, Alkylation Unit, Mid-Barrel Distillate Treater. The new Wet Jet Treater and six new crude tanks at the Carson Operations would not be installed. Interconnecting pipelines, electrical connections and modifications to the LPG Rail Car Unloading facilities would also not occur.

The No Project Alternative would continue the operation of the Wilmington and Carson Operations under their current configurations and it would not achieve any of the proposed project objectives such as: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) improving the financial viability of the Refinery; better integration of the Carson and Wilmington Operations; and (6) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Not only would Alternative 1 not achieve any of the proposed project objectives, but because portions of Alternative 1 do not include the regulatory compliance projects, it may not be considered a feasible alternative as Tesoro would be in violation of regulatory mandates if not implemented.

Although Alternative 1 would eliminate all the significant and less than significant impacts that would occur under the proposed project, the locally beneficial impacts of the proposed project would also be eliminated. The Wilmington FCCU would not be shut down because none of the refinery modifications needed for that to occur would be implemented. Finally, the beneficial aspects of the proposed project associated with reduced annual ship emissions due to the increased crude offloading rate (see Table 4.2-9 and 4.2-11) would also be eliminated. Similarly, the overall reduction in wastewater generated during operation of the proposed project (over 79,000 gpd reduced) (see Table 4.4-2) would not occur. Consequently, Alternative 1 would continue current operational emissions, which would be substantially higher for most pollutants than operational emissions under the proposed project as the local emission reduction benefits associated with the proposed project would not be achieved (see Table 6.4-2).

1.11.1.2 Alternative 2 – Fluid Feed Hydrodesulfurization Fractionator at Carson Operations and a New Diesel Hydrotreater at Wilmington Operations

Alternative 2 includes installing one new Fractionator at the tail end of the Carson Operations Fluid Feed Hydrodesulfurization (FFHDS) Unit and one new Diesel Hydrotreater at Wilmington Operations to achieve the project objective of recovering and upgrading distillate range material from FCCU feed. The new FFHDS Fractionator and Diesel Hydrotreater would be constructed instead of making modifications to the Wilmington Operations HCU and HTU-4, and No. 51 Vacuum Unit and HCU at the Carson Operations. Under Alternative 2, the remainder of the proposed project components would remain unchanged, including the shutdown of the FCCU at the Wilmington Operations.

Alternative 2 would result in significant adverse impacts to air quality during construction and hazards during operation and would require the construction of two new refinery units (FFHDS Fractionator and Diesel Hydrotreater). Construction of the new Refinery units would potentially result in higher air quality, water quality, and hazard impacts than the proposed project. Alternative 2 would not reduce any of the potentially significant proposed project impacts to less than significant.

Alternative 2 would achieve most of the objectives of the proposed project, including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) improving the financial viability of the Refinery; (6) better integration of the Carson and Wilmington Operations; and (7) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. However, Alternative 2 would not achieve the objectives of reducing overall emissions from the Refinery as a whole, as would the proposed project.

1.11.1.3 Alternative 3 – New Hydrotreater at Carson Operations

Alternative 3 would include the installation of one new Gasoline Hydrotreater at Carson Operations as an option to achieve the project objective of meeting U.S. EPA Tier 3 gasoline specifications of 10 ppm average sulfur content. Under Alternative 3, the new Gasoline Hydrotreater/SHU would be built instead of making modifications to HTU-1 and HTU-2 at the Wilmington Operations and LHU, NHDS Unit, and the Mid-Barrel Treater at the Carson Operations. The remainder of the project components would remain unchanged, including the shutdown of the FCCU at the Wilmington Operations.

Alternative 3 would result in significant impacts to air quality during construction and would result in greater operational GHG and criteria pollutant emissions associated with the two new heaters as compared to the proposed project. In addition, Alternative 3 also would result in significant adverse hazard impacts during operation. Alternative 3 would have greater impacts than the proposed project on operational air quality and wastewater impacts and it would not reduce any of the potentially significant adverse impacts of the proposed project to less than significant.

Alternative 3 would achieve most of the objectives of the proposed project, including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) complying with federal, state, and local regulations; (5) better integration of the Carson and Wilmington Operations; and (6) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Alternative 3 would require the installation of two new heaters, which means that this alternative would not achieve as effectively as the proposed project the objective of reducing overall emissions from the Refinery as a whole, including GHG emissions.

1.11.1.4 Alternative 4 – Interconnecting Pipeline and New Gasoline Hydrotreater at Carson Operations

Alternative 4 would include the installation of the Interconnecting Pipeline and one new Gasoline Hydrotreater/SHU at Carson Operations as an option to achieve the project objective of meeting U.S. EPA Tier 3 gasoline specifications of 10 ppm average sulfur content. Alternative 4 would eliminate all of the other proposed project components and the Wilmington Operations FCCU would remain operational.

Alternative 4 would result in significant impacts to air quality during construction and hazards during operation; however, the impacts are expected to be less than the proposed project. Alternative 4 would eliminate the significant VOC construction air quality impacts and most of the hazard impacts. NOx emissions associated with the construction phase would remain significant under Alternative 4. The hazard impacts associated with the Interconnecting Pipelines would remain significant under Alternative 4; however, Alternative 4 would eliminate the potentially significant hazards associated with Naphtha Isomerization Unit, new crude tanks, and SARP. Alternative 4 would have greater impacts than the proposed project on operational air quality and wastewater impacts as the FCCU would not be shut down under Alternative 4 and it would not reduce any of the potentially significant adverse impacts of the proposed project to less than significant.

Alternative 4 would not accomplish the major objectives of the proposed project. Alternative 4 would meet the objective of better integration of the Carson and Wilmington Operations by constructing the Interconnecting Pipeline and complying with federal, state, and local regulations. However, Alternative 4 would not meet any of the other objectives of the proposed project including: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; and (4) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. The beneficial aspects of the proposed project associated with reduced ship emissions due to the increased crude offloading rate (see Table 4.2-9 and 4.2-11) would also be eliminated. Consequently, Alternative 4 would result in increased operational emissions over the proposed project as the local emissions benefits associated with the proposed project would not be achieved.

1.11.1.5 Alternative 5 – Alternative Construction Schedule

Alternative 5 includes a modified construction schedule (compare Figure 6.3-1 with Figure 2-18) so that construction of the proposed project components does not overlap as much as they do under the proposed project. Construction of a number of units would be delayed to later in the proposed project schedule. These units include the LPG Rail Unloading facilities, Naphtha HDS Unit, Mid-Barrel Treater, and HTU-1 and HTU-2 modifications. The shutdown of the Wilmington Operations FCCU would also be delayed another four years.

Alternative 5 would ultimately result in the same impacts as the proposed project in the areas of hazards, hydrology and water quality, noise, traffic and transportation, and solid and hazardous waste. Alternative 5 would reduce the peak construction emission impacts associated with the proposed project, but the construction emission impacts associated with NOx would remain significant. In addition, under Alternative 5 the Wilmington Operations FCCU would be shut down in 2021 instead of 2017, resulting in four additional years of operating the FCCU, which means that emissions from the FCCU would be unchanged from 2017 through 2021 and emissions would be substantially greater than what they would be under the proposed project. Alternative 5 would ultimately result in the same hazard impacts as the proposed project as all project components would be included in Alternative 5. Therefore, hazard impacts would remain significant. After all components of the proposed project are completed in 2021, Alternative 5 would have the same potentially less than significant and significant adverse environmental impacts as the proposed project.
Alternative 5 would achieve most the objectives of the proposed project, although there would be an approximately five-year delay in achieving some of the objectives, which would include: (1) improving the efficiency of the Refinery, allowing the shutdown of the Wilmington FCCU; (2) reducing overall emissions from the Refinery, including GHG emissions; (3) recovering and upgrading distillate range materials from FCCU feeds; (4) better integration of the Carson and Wilmington Operations; and (5) improving the efficiency of water-borne crude oil receipt and marine vessel unloading. Alternative 5 would not achieve the objective of improving the efficiency and enabling the shutdown of the Wilmington Operations FCCU by 2017. It would also delay a significant amount of local emission reductions, resulting in an additional five years of operation at increased emission rates. Under Alternative 5, it is assumed that the project components that would allow for the compliance with the U.S. EPA Tier 3 gasoline sulfur requirements would occur prior to 2017 so this objective would be achieved.

1.11.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires identification of the environmentally superior alternative in an EIR. There is no set methodology for comparing the alternatives or determining the environmentally superior alternative under CEQA. Therefore, the number of significant adverse impacts for each of the proposed project and alternatives are compared. The alternative with the least number of significant unavoidable impacts is considered the Environmentally Superior Alternative.

The proposed project and Alternatives 2 through 5 would result in significant adverse impacts on two environmental resource areas (air quality during construction and operational hazard impacts). Alternative 1, the No Project Alternative would eliminate all adverse significant impacts making it the environmentally superior alternative. But none of the project objectives will be achieved, including improving local air quality by shutting down the Wilmington Operations FCCU.

Alternatives 2 and 3 would likely result in equivalent or more significant environmental impacts than the proposed project as additional new Refinery units would be constructed. However, under Alternatives 2 and 3 the Wilmington Operations FCCU would be shutdown, which is expected to provide air emission, GHG, and waste water reductions. Both alternatives would also improve the efficiency of water-borne crude oil receipt and marine vessel unloading reducing the time it takes for marine vessels to unloading and reducing overall marine vessel emissions. After the No Project Alternative, Alternatives 2 and 3 would be the environmental superior alternatives.

The proposed project is preferred because it would most effectively attain all project objectives. None of the project alternatives would eliminate the potentially significant adverse construction air quality and hazard impacts, except Alternative 1, No Project Alternative. Alternative 3 would be similar in operational impacts to the proposed project and have less construction impacts, but would not eliminate significant project impacts or achieve all the project objectives.

1.12 EXECUTIVE SUMMARY – CHAPTER 7, 8, AND 9: REFERENCES, ACRONYMS AND GLOSSARY

Information on references cited (including organizations and persons consulted) and the acronyms and glossary are presented in Chapters 7 and 8, respectively. Chapter 9 contains a glossary of technical terms used in the EIR.

TABLE 1.9-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Air Quality		
The construction phase of the proposed project will exceed the regional significance thresholds for VOC and NOx.	A-1 Maintain a Construction Management Program, A-2 Prohibit vehicles from idling in excess of five minutes, A-3 All on-road heavy duty diesel trucks or equipment with a GVWR of 19,500 pounds or greater shall comply with EPA 2007 on-road emission standards, A-4 Prohibit construction equipment from idling longer than five minutes, A-5 Utilize electric welders in areas served by electricity. Electric power tools shall be used in areas when feasible and available. A-6 Utilize on-site power where available instead of temporary generators, A-7 For off-road equipment rated at greater than 50 hp, the project proponent shall use equipment that meets Tier 4 emission standards, A-8 Suspend all construction activities that generate air pollutant emissions during first stage smog alerts, and A-9 Tesoro will implement early SCR catalyst change-outs as specified in Table 4.2-14 to improve NOx reductions.	Construction emissions for VOC~~, CO,~~ and NOx are expected to remain significant following mitigation.

TABLE 1.9-1 (Continued)

Impact	Mitigation Measures	Residual Impacts
The construction emissions of CO, SOx, PM10 and PM2.5 will not exceed SCAQMD CEQA regional significant thresholds and are less than significant.	None required.	Construction emissions of CO, SOx, PM10, and PM2.5 are expected to remain less than significant following mitigation.
Construction impacts for NO_2 would exceed applicable localized significance thresholds.	See Mitigation Measures A-1 thru A-9 summarized above.	Concentrations of NO_2 from construction activities are expected to cause a significant impact to applicable localized significance thresholds and no additional mitigation has been identified that would reduce the localized air quality impacts during construction. Construction impacts for CO, PM10, and PM2.5 would be less than significant.
Operational emissions of CO, VOC, NOx, SOx, PM10 and PM2.5 are less than significant.	None required. Project emissions are controlled through BACT and emission offsets.	The proposed project is expected to result in a reduction in mass daily emissions of CO from stationary sources providing beneficial air quality impacts. VOC, NOx, SOx, PM10 and PM2.5 emission increases would be less than significant.
Ambient air quality modeling indicates that the project operational emissions of NO_2, CO, PM10, and PM2.5 will be less than the applicable localized significance threshold and are less than significant.	None required.	Project emissions of NO_2, CO, PM10, and PM2.5 associated with the operation of the proposed project will be less than the applicable localized significance thresholds and are less than significant.
The cancer risk due to the operation of the proposed project is expected to be less than the significance threshold of 10 per million, so that project impacts are less than significant.	None required.	Cancer risk impacts are less than significant.

TABLE 1.9-1 (Continued)

Impact	Mitigation Measures	Residual Impacts
The proposed project's impacts associated with exposure to non-carcinogenic TACs are expected to be less the chronic hazard index and the acute hazard index significance threshold of 1.0.	None required.	Non-carcinogenic health impacts are less than significant.
	Hazards and Hazardous Materials	
During construction, hazards and hazardous material impacts generated by excavation activities are expected to be less than significant.	None required.	Construction related hazards and hazardous material impacts are expected to be less than significant.
Hazard impacts of the proposed project during operation associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and Interconnecting Pipelines are expected to be significant.	HHM-1 Prior to the commencement of operations associated with new and modified project components, the applicant shall demonstrate to the Los Angeles City and County Fire Departments compliance with applicable hazardous material rules and regulations, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses.	Hazards and hazardous material impacts generated by the proposed project are expected to remain significant after mitigation.
	Hydrology and Water Quality	
Water demand during construction is limited to water applied for dust suppression and water needed to perform hydrostatic testing of new tanks and pipelines, and is expected to be less than significant.	None required.	Construction water demand impacts are less than significant.

TABLE 1.9-1 (Continued)

Impact	Mitigation Measures	Residual Impacts
The existing water supply can meet the water demand of the proposed project of 191,275 gpd and the daily water demand associated with operation of the proposed project is less than the significance threshold of 262,820 gpd.	None required.	Operational water demand impacts are less than significant.
Wastewater from construction of the proposed project is expected to be discharged in compliance with the existing IWDPs for the Refinery. Therefore, no water quality impacts are expected.	None required.	Construction wastewater impacts are less than significant.
Once operational, the proposed project would result in an overall reduction in wastewater of over 79,000 gpd, primarily due to the shutdown of the Wilmington Operations FCCU.	None required.	Operational wastewater impacts are less than significant.
Noise		
Construction activities would result in noise increases from 0.1 to 0.9 dBA which is less than the significance threshold of 3.0 dBA.	None required.	Construction noise impacts are less than significant.
Operational noise increases at all receptor locations are predicted to be a maximum of 0.1 dBA which is less than the 3.0 dBA significance threshold. Therefore, noise impacts associated with the operation of the proposed project would be less than significant.	None required.	Operational noise impacts are less than significant.

TABLE 1.9-1 (Concluded)

Impact	Mitigation Measures	Residual Impacts
Vibration impacts during construction and operational activities were evaluated and predicted to be less than the Federal Transit Administration vibration impact threshold.	None required.	Vibration impacts associated with construction and operational equipment are less than significant.
Solid and Hazardous Waste		
No significant solid or hazardous waste impacts associated with construction activities are expected as local landfills can handle the one-time receipt of solid or hazardous waste from construction.	None required.	Solid and hazardous waste impacts associated with construction activities are less than significant.
The operation of the proposed project may generate solid or hazardous waste streams, which are expected to be reused or recycled. No significant solid and hazardous waste impacts are expected.	None required.	Solid and hazardous waste impacts associated with operation of the proposed project are less than significant.
Transportation and Traffic		
Construction-related trips are forecast to result in a significant impact during construction conditions at the Wilmington Ave/Interstate 405 SB Ramps under their pre-construction configuration.	TT-1 Requires the Refinery to implement a traffic management plan to address project traffic impacts at the Wilmington Avenue/Interstate 405 Southbound Ramps intersection.	Construction traffic impacts are less than significant after mitigation.

APPENDIX B

CONSTRUCTION EMISSIONS CALCULATIONS

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Appendix B
Construction Emission Calculations

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Emission Summary

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Appendix B
Tesoro Integration and Compliance Project
Total Project Component
Construction Emission Summary

	Year 1												Year 2												Year 3											
Emissions from Equipment	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	25.22	23.32	21.24	26.07	28.29	27.86	21.77	21.77	20.01	15.77	13.45	12.27	12.21	13.08	4.70	11.06	10.24	5.17	15.42	15.44	9.65	9.00	6.43	4.12	4.52	4.52	6.71	5.67	6.20	6.20
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	217.54	190.00	171.22	211.07	233.67	230.01	183.89	183.89	172.24	143.79	117.32	108.27	107.40	116.66	44.05	104.31	101.05	53.46	155.60	160.05	96.04	86.71	59.03	37.96	41.43	41.43	64.39	54.19	59.04	59.04
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	242.41	200.39	185.53	241.50	263.03	260.77	193.21	193.21	182.84	159.53	136.48	126.31	125.32	135.10	55.35	115.03	113.01	55.02	147.64	155.07	93.18	86.97	59.48	38.00	40.18	40.18	64.85	53.80	54.35	54.35
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.43	0.39	0.52	0.57	0.56	0.45	0.45	0.43	0.38	0.31	0.29	0.29	0.31	0.13	0.29	0.29	0.15	0.41	0.47	0.25	0.23	0.15	0.10	0.10	0.10	0.16	0.14	0.14	0.14
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	14.04	12.76	11.68	14.55	15.78	15.58	11.66	11.66	10.87	8.94	7.63	7.03	6.99	7.46	2.79	6.20	5.88	2.91	8.18	8.22	5.12	4.82	3.38	2.20	2.38	2.38	3.77	3.08	3.28	3.28
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	13.90	12.63	11.57	14.41	15.63	15.43	11.54	11.54	10.76	8.86	7.55	6.96	6.92	7.38	2.76	6.14	5.82	2.88	8.10	8.14	5.07	4.77	3.34	2.18	2.36	2.36	3.74	3.05	3.24	3.24
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	14.14	10.27	9.39	12.41	13.68	13.57	10.72	10.72	10.33	9.04	7.58	7.02	6.93	7.56	3.22	6.88	6.89	3.49	9.84	11.30	6.06	5.54	3.65	2.31	2.43	2.43	3.96	3.42	3.47	3.47
CO_2 (tonnes/yr)												1652.95												2033.89												1302.43

	Year 1												Year 2												Year 3											
Emissions from Short Project Equipment	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	25.22	23.32	21.24	26.07	28.29	27.86	21.77	21.77	20.01	15.77	13.45	12.27	12.21	13.08	4.70	7.10	7.84	5.17	7.42	11.24	9.65	6.43	6.43	4.12	4.52	4.52	2.79	3.10	2.79	2.79
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	217.54	190.00	171.22	211.07	233.67	230.01	183.89	183.89	172.24	143.79	117.32	108.27	107.40	116.66	44.05	65.62	76.19	53.46	77.66	120.09	96.04	59.03	59.03	37.96	41.43	41.43	24.53	26.51	24.53	24.53
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	242.41	200.39	185.53	241.50	263.03	260.77	193.21	193.21	182.84	159.53	136.48	126.31	125.32	135.10	55.35	78.07	85.77	55.02	75.89	118.11	93.18	59.48	59.48	38.00	40.18	40.18	21.73	26.32	21.73	21.73
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.43	0.39	0.52	0.57	0.56	0.45	0.45	0.43	0.38	0.31	0.29	0.29	0.31	0.13	0.19	0.21	0.15	0.21	0.37	0.25	0.15	0.15	0.10	0.10	0.10	0.05	0.06	0.05	0.05
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	14.04	12.76	11.68	14.55	15.78	15.58	11.66	11.66	10.87	8.94	7.63	7.03	6.99	7.46	2.79	4.04	4.45	2.91	3.97	6.02	5.12	3.38	3.38	2.20	2.38	2.38	1.45	1.63	1.45	1.45
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	13.90	12.63	11.57	14.41	15.63	15.43	11.54	11.54	10.76	8.86	7.55	6.96	6.92	7.38	2.76	4.00	4.40	2.88	3.93	5.96	5.07	3.34	3.34	2.18	2.36	2.36	1.43	1.62	1.43	1.43
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	14.14	10.27	9.39	12.41	13.68	13.57	10.72	10.72	10.33	9.04	7.58	7.02	6.93	7.56	3.22	4.56	5.15	3.49	5.09	8.87	6.06	3.65	3.65	2.31	2.43	2.43	1.27	1.53	1.27	1.27

	Year 1												Year 2												Year 3											
Emissions from TAR Equipment	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.96	2.40	0.00	8.00	4.20	0.00	2.57	0.00	0.00	0.00	0.00	3.92	2.57	3.40	3.40
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.69	24.86	0.00	77.94	39.96	0.00	27.68	0.00	0.00	0.00	0.00	39.86	27.68	34.51	34.51
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.96	27.24	0.00	71.75	36.96	0.00	27.48	0.00	0.00	0.00	0.00	43.11	27.48	32.61	32.61
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.07	0.00	0.20	0.10	0.00	0.08	0.00	0.00	0.00	0.00	0.11	0.08	0.09	0.09
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	1.43	0.00	4.21	2.19	0.00	1.45	0.00	0.00	0.00	0.00	2.33	1.45	1.83	1.83
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.14	1.42	0.00	4.16	2.17	0.00	1.43	0.00	0.00	0.00	0.00	2.30	1.43	1.81	1.81
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.32	1.74	0.00	4.75	2.43	0.00	1.90	0.00	0.00	0.00	0.00	2.69	1.90	2.21	2.21

	Year 1												Year 2												Year 3											
Emissions from Carson Tanks	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 1												Year 2												Year 3											
Emission from Trips - Onsite/Offsite	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	7.03	7.08	6.68	6.89	6.06	5.94	4.73	5.82	5.75	5.88	5.76	5.71	3.64	3.77	3.31	2.61	2.64	2.51	2.46	2.42	2.34	2.28	2.03	2.03	2.03	0.94	0.79	0.79	0.51	0.51
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	76.49	78.36	73.42	79.96	83.64	82.78	64.19	71.98	69.25	68.63	63.99	62.41	47.59	52.82	34.93	31.57	32.92	27.82	27.40	30.23	29.68	27.47	25.65	25.65	25.65	20.26	14.09	14.09	12.13	12.13
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	154.96	155.26	146.81	147.93	119.56	116.47	86.59	110.02	109.60	112.99	112.25	111.98	67.41	68.26	65.36	49.60	49.78	48.95	45.76	43.80	42.10	41.73	36.59	36.59	36.59	13.50	12.49	12.49	6.93	6.93
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.45	0.42	0.44	0.40	0.39	0.39	0.46	0.45	0.46	0.44	0.43	0.30	0.31	0.25	0.21	0.21	0.19	0.19	0.20	0.20	0.19	0.17	0.17	0.17	0.10	0.08	0.08	0.06	0.06
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	30.42	30.61	28.89	29.54	25.27	24.72	24.06	29.61	29.24	29.87	29.24	29.03	18.49	19.19	16.79	13.25	13.43	12.74	12.92	12.83	12.41	12.07	10.76	10.76	10.76	5.22	4.29	4.29	2.88	2.88
Exhuast PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	5.70	5.76	5.43	5.64	5.10	5.01	4.46	5.28	5.16	5.21	5.01	4.94	3.38	3.61	2.83	2.35	2.41	2.18	2.22	2.31	2.24	2.14	1.94	1.94	1.94	1.19	0.90	0.90	0.69	0.69
Fugitive PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	24.72	24.84	23.46	23.90	20.17	19.71	19.60	24.33	24.08	24.65	24.23	24.09	15.11	15.58	13.96	10.90	11.02	10.56	10.69	10.52	10.16	9.93	8.82	8.82	8.82	4.03	3.39	3.39	2.18	2.18
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	9.90	9.98	9.42	9.71	8.53	8.36	7.79	9.42	9.26	9.40	9.13	9.04	5.95	6.25	5.20	4.20	4.28	3.98	4.04	4.10	3.97	3.83	3.44	3.44	3.44	1.88	1.48	1.48	1.06	1.06
Exhuast PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	5.70	5.76	5.43	5.64	5.10	5.01	4.46	5.28	5.16	5.21	5.01	4.94	3.38	3.61	2.83	2.35	2.41	2.18	2.22	2.31	2.24	2.14	1.94	1.94	1.94	1.19	0.90	0.90	0.69	0.69
Fugitive PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	4.20	4.22	3.99	4.06	3.43	3.35	3.33	4.14	4.09	4.19	4.12	4.10	2.57	2.65	2.37	1.85	1.87	1.79	1.82	1.79	1.73	1.69	1.50	1.50	1.50	0.68	0.58	0.58	0.37	0.37
CO_2 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	45996.84	46508.02	43811.57	45615.55	41533.04	40779.49	40308.82	47976.30	46966.51	47488.84	45757.86	45166.51	30581.44	32530.46	25863.91	21339.82	21828.93	19929.65	20218.57	20841.74	20268.75	19364.14	17559.16	17559.16	17559.16	10497.42	7985.00	7985.00	6037.46	6037.46
CO_2 (tonnes/yr)												2696.86												4345.06												1754.53

	Year 1												Year 2												Year 3											
Fugitive Earthmoving PM - Peak	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
PM10 (lb/day)(2)	0.00	0.00	0.00	0.00	0.00	0.00	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36
PM2.5 (lb/day)(1)(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68

	Year 1												Year 2												Year 3											
Offroad Fugitive PM - Peak	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
PM10 (lb/day)(2)	0.00	0.00	0.00	0.00	0.00	0.00	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
PM2.5 (lb/day)(1)(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

	Year 1												Year 2												Year 3											
Paint	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Year 1												Year 2												Year 3											
Total Emissions	**Thresholds**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
VOC (lb/day)	75	0.00	0.00	0.00	0.00	0.00	0.00	33.91	32.06	29.58	34.62	36.01	35.46	28.16	29.26	25.76	21.65	19.20	17.99	15.85	16.86	8.01	13.67	12.88	7.68	17.88	17.86	11.99	11.29	8.46	6.15	6.55	5.46	7.50	6.46	6.71	6.71
CO (lb/day)	550	0.00	0.00	0.00	0.00	0.00	0.00	294.03	268.36	244.64	291.03	317.30	312.79	248.08	255.87	241.49	212.42	181.30	170.68	154.99	169.48	78.98	135.87	133.97	81.29	182.99	190.28	125.73	114.19	84.67	63.60	67.07	61.68	78.48	68.28	71.17	71.17
NOx (lb/day)	100	0.00	0.00	0.00	0.00	0.00	0.00	397.38	355.65	332.34	389.43	382.59	377.24	279.80	303.23	292.44	272.53	248.73	238.29	192.73	203.36	120.70	164.63	162.79	103.97	193.40	198.87	135.28	128.70	96.07	74.59	76.76	53.68	77.34	66.30	61.27	61.27
SOx (lb/day)	150	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.87	0.81	0.95	0.97	0.96	0.83	0.91	0.88	0.83	0.76	0.73	0.58	0.63	0.38	0.49	0.50	0.34	0.60	0.67	0.45	0.42	0.32	0.27	0.27	0.20	0.24	0.22	0.20	0.20
PM10 (lb/day)(2)	150	0.00	0.00	0.00	0.00	0.00	0.00	50.62	49.52	46.74	50.26	47.22	46.46	41.88	47.43	46.27	44.97	43.03	42.23	31.64	32.81	25.74	25.61	25.47	21.81	27.26	27.21	23.68	23.05	20.30	19.12	19.31	13.77	14.23	13.53	12.31	12.31
PM2.5 (lb/day)(1)(2)	55	0.00	0.00	0.00	0.00	0.00	0.00	25.29	24.10	22.47	25.60	25.64	25.27	20.82	22.44	21.50	19.74	18.16	17.48	14.35	15.12	9.44	11.83	11.58	8.34	13.62	13.71	10.52	10.08	8.27	7.11	7.29	5.72	6.70	6.01	5.79	5.79
CO_2 (tonnes/day)	NA	0.00	0.00	0.00	0.00	0.00	0.00	35.00	31.36	29.27	33.10	32.52	32.07	29.01	32.49	31.64	30.58	28.34	27.50	20.80	22.31	14.96	16.56	16.79	12.53	19.01	20.76	15.25	14.33	11.61	10.28	10.39	7.19	7.58	7.04	6.21	6.21
CO_2 (tonnes/yr)	NA												4349.82												6378.95												3056.96

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls
(2) Mitigated PM.
Highlighted values are maximums.

Appendix B
Tesoro Integration and Compliance Project
Total Project Component
Construction Emission Summary

	Year 4											
Emissions from Equipment	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	6.65	10.46	11.09	6.45	3.74	3.78	3.70	3.70	3.70	6.50	3.70	3.70
CO (lb/day)	70.78	108.75	114.11	77.06	50.04	51.40	50.22	50.22	50.22	79.01	50.22	50.22
NOx (lb/day)	76.06	108.23	116.48	79.14	43.54	44.29	43.39	43.39	43.39	73.02	43.39	43.39
SOx (lb/day)	0.21	0.29	0.32	0.21	0.12	0.12	0.12	0.12	0.12	0.21	0.12	0.12
PM10 (lb/day)	8.05	10.00	10.32	8.26	6.68	6.69	6.63	6.63	6.63	8.12	6.63	6.63
PM2.5 (lb/day)[(1)]	4.68	6.61	6.92	4.88	3.32	3.33	3.27	3.27	3.27	4.75	3.27	3.27
CO_2 (MT/day)	4.95	7.01	7.63	5.16	2.91	3.00	2.95	2.95	2.95	4.96	2.95	2.95
CO_2 (tonnes/yr)												1133.96

	Year 5											
Emissions from Equipment	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	0.90	0.90	0.90	0.86	0.61	0.61	1.14	0.65	1.25	0.94	0.94	0.97
CO (lb/day)	22.95	19.86	19.86	18.52	13.92	13.92	16.58	13.75	19.10	22.78	22.78	24.13
NOx (lb/day)	20.14	15.36	15.36	14.64	11.31	11.31	17.33	11.43	18.88	20.25	20.25	20.97
SOx (lb/day)	0.07	0.05	0.05	0.05	0.04	0.04	0.06	0.04	0.06	0.06	0.06	0.07
PM10 (lb/day)	5.15	4.93	4.93	4.92	4.77	4.77	5.03	4.82	5.10	5.20	5.20	5.21
PM2.5 (lb/day)[(1)]	1.81	1.59	1.59	1.58	1.42	1.42	1.68	1.47	1.75	1.85	1.85	1.87
CO_2 (MT/day)	1.59	1.30	1.30	1.22	0.89	0.89	1.34	0.85	1.47	1.55	1.55	1.63
CO_2 (tonnes/yr)												351.03

	Year 6											
Emissions from Equipment	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.86	0.61	0.61
CO (lb/day)	22.69	22.69	22.69	22.69	22.69	22.69	22.69	19.63	19.63	18.30	13.75	13.75
NOx (lb/day)	20.14	20.14	20.14	20.14	20.14	20.14	20.14	15.36	15.36	14.64	11.31	11.31
SOx (lb/day)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.05	0.05	0.05	0.04	0.04
PM10 (lb/day)	5.15	5.15	5.15	5.15	5.15	5.15	5.15	4.93	4.93	4.92	4.77	4.77
PM2.5 (lb/day)[(1)]	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.59	1.59	1.58	1.42	1.42
CO_2 (MT/day)	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.30	1.30	1.22	0.89	0.89
CO_2 (tonnes/yr)												376.40

	Year 4											
Emissions from Short Project Equipment	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72
CO (lb/day)	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04
NOx (lb/day)	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30
SOx (lb/day)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
PM10 (lb/day)	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
PM2.5 (lb/day)[(1)]	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
CO_2 (MT/day)	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37

	Year 5											
Emissions from Short Project Equipment	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 6											
Emissions from Short Project Equipment	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 4											
Emissions from TAR Equipment	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	0.00	4.32	4.32	0.00	0.00	0.00	0.00	0.00	0.00	2.81	0.00	0.00
CO (lb/day)	0.00	40.80	40.80	0.00	0.00	0.00	0.00	0.00	0.00	28.79	0.00	0.00
NOx (lb/day)	0.00	38.78	38.78	0.00	0.00	0.00	0.00	0.00	0.00	29.62	0.00	0.00
SOx (lb/day)	0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
PM10 (lb/day)	0.00	2.19	2.19	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00
PM2.5 (lb/day)[(1)]	0.00	2.16	2.16	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	0.00
CO_2 (MT/day)	0.00	2.55	2.55	0.00	0.00	0.00	0.00	0.00	0.00	2.01	0.00	0.00

	Year 5											
Emissions from TAR Equipment	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 6											
Emissions from TAR Equipment	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 4											
Emissions from Carson Tanks	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	3.93	3.41	4.05	3.73	1.02	1.06	0.98	0.98	0.98	0.98	0.98	0.98
CO (lb/day)	43.74	40.91	46.27	50.02	23.00	24.36	23.18	23.18	23.18	23.18	23.18	23.18
NOx (lb/day)	54.76	48.15	56.40	57.84	22.24	22.99	22.10	22.10	22.10	22.10	22.10	22.10
SOx (lb/day)	0.15	0.13	0.15	0.16	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
PM10 (lb/day)	6.70	6.46	6.78	6.90	5.33	5.34	5.27	5.27	5.27	5.27	5.27	5.27
PM2.5 (lb/day)[(1)]	3.34	3.10	3.41	3.54	1.98	1.99	1.93	1.93	1.93	1.93	1.93	1.93
CO_2 (MT/day)	3.59	3.10	3.72	3.79	1.55	1.63	1.59	1.59	1.59	1.59	1.59	1.59

	Year 5											
Emissions from Carson Tanks	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	0.90	0.90	0.90	0.86	0.61	0.61	1.14	0.65	1.25	0.94	0.94	0.97
CO (lb/day)	22.95	19.86	19.86	18.52	13.92	13.92	16.58	13.75	19.10	22.78	22.78	24.13
NOx (lb/day)	20.14	15.36	15.36	14.64	11.31	11.31	17.33	11.43	18.88	20.25	20.25	20.97
SOx (lb/day)	0.07	0.05	0.05	0.05	0.04	0.04	0.06	0.04	0.06	0.06	0.06	0.07
PM10 (lb/day)	5.15	4.93	4.93	4.92	4.77	4.77	5.03	4.82	5.10	5.20	5.20	5.21
PM2.5 (lb/day)[(1)]	1.81	1.59	1.59	1.58	1.42	1.42	1.68	1.47	1.75	1.85	1.85	1.87
CO_2 (MT/day)	1.59	1.30	1.30	1.22	0.89	0.89	1.34	0.85	1.47	1.55	1.55	1.63

	Year 6											
Emissions from Carson Tanks	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.86	0.61	0.61
CO (lb/day)	22.69	22.69	22.69	22.69	22.69	22.69	22.69	19.63	19.63	18.30	13.75	13.75
NOx (lb/day)	20.14	20.14	20.14	20.14	20.14	20.14	20.14	15.36	15.36	14.64	11.31	11.31
SOx (lb/day)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.05	0.05	0.05	0.04	0.04
PM10 (lb/day)	5.15	5.15	5.15	5.15	5.15	5.15	5.15	4.93	4.93	4.92	4.77	4.77
PM2.5 (lb/day)[(1)]	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.59	1.59	1.58	1.42	1.42
CO_2 (MT/day)	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.30	1.30	1.22	0.89	0.89

	Year 4											
Emission from Trips - Onsite/Offsite	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	0.48	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
CO (lb/day)	11.33	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29	10.29
NOx (lb/day)	6.10	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44
SOx (lb/day)	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PM10 (lb/day)	2.80	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Exhuast PM (lb/day)	0.68	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Fugitive PM (lb/day)	2.12	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
PM2.5 (lb/day)[(1)]	1.04	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Exhuast PM (lb/day)	0.68	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Fugitive PM (lb/day)	0.36	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CO_2 (lb/day)	5957.09	4909.24	4909.24	4909.24	4909.24	4909.24	4909.24	4909.24	4909.24	4909.24	4909.24	4909.24
CO_2 (tonnes/yr)												611.94

	Year 5											
Emission from Trips - Onsite/Offsite	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
CO (lb/day)	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48
NOx (lb/day)	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57
SOx (lb/day)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PM10 (lb/day)	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Exhuast PM (lb/day)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Fugitive PM (lb/day)	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
PM2.5 (lb/day)[(1)]	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Exhuast PM (lb/day)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Fugitive PM (lb/day)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
CO_2 (lb/day)	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58	3398.58
CO_2 (tonnes/yr)												416.23

	Year 6											
Emission from Trips - Onsite/Offsite	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
CO (lb/day)	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02
NOx (lb/day)	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13
SOx (lb/day)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PM10 (lb/day)	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Exhuast PM (lb/day)	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Fugitive PM (lb/day)	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
PM2.5 (lb/day)[(1)]	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Exhuast PM (lb/day)	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Fugitive PM (lb/day)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
CO_2 (lb/day)	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76	2681.76
CO_2 (tonnes/yr)												328.44

	Year 4											
Fugitive Earthmoving PM - Peak	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
PM10 (lb/day)[(2)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)(2)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 5											
Fugitive Earthmoving PM - Peak	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
PM10 (lb/day)[(2)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)(2)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 6											
Fugitive Earthmoving PM - Peak	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
PM10 (lb/day)[(2)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)(2)]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 4											
Offroad Fugitive PM - Peak	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
PM10 (lb/day)[(2)]	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
PM2.5 (lb/day)[(1)(2)]	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

	Year 5											
Offroad Fugitive PM - Peak	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
PM10 (lb/day)[(2)]	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
PM2.5 (lb/day)[(1)(2)]	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

	Year 6											
Offroad Fugitive PM - Peak	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
PM10 (lb/day)[(2)]	3.80	3.80	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)[(1)(2)]	0.80	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 4											
Paint	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	0.00	0.00	0.00	62.25	62.25	62.25	0.00	0.00	0.00	0.00	0.00	0.00

	Year 5											
Paint	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.25	62.25	62.25

	Year 6											
Paint	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Year 4											
Total Emissions	**Thresholds**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
VOC (lb/day)	75	7.14	10.79	11.43	69.03	66.33	66.36	4.03	4.03	4.03	6.84	4.03	4.03
CO (lb/day)	550	82.11	119.04	124.40	87.35	60.33	61.69	60.51	60.51	60.51	89.30	60.51	60.51
NOx (lb/day)	100	82.16	111.67	119.92	82.58	46.98	47.73	46.84	46.84	46.84	76.46	46.84	46.84
SOx (lb/day)	150	0.26	0.34	0.36	0.26	0.17	0.17	0.17	0.17	0.17	0.25	0.17	0.17
PM10 (lb/day)[(2)]	150	14.66	15.85	16.16	14.10	12.52	12.54	12.47	12.47	12.47	13.97	12.47	12.47
PM2.5 (lb/day)[(1)(2)]	55	6.52	8.22	8.53	6.49	4.94	4.95	4.88	4.88	4.88	6.36	4.88	4.88
CO_2 (tonnes/day)	NA	7.66	9.24	9.86	7.38	5.14	5.23	5.18	5.18	5.18	7.19	5.18	5.18
CO_2 (tonnes/yr)	NA												1745.90
30yr amortized CO_2 (tonnes/yr)	NA												

	Year 5											
Total Emissions	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
VOC (lb/day)	1.14	1.14	1.14	1.11	0.85	0.85	1.39	0.89	1.50	63.43	63.43	63.47
CO (lb/day)	29.43	26.34	26.34	25.00	20.40	20.40	23.06	20.23	25.57	29.26	29.26	30.60
NOx (lb/day)	22.71	17.93	17.93	17.21	13.89	13.89	19.90	14.00	21.45	22.83	22.83	23.54
SOx (lb/day)	0.10	0.09	0.09	0.08	0.07	0.07	0.09	0.07	0.09	0.10	0.10	0.10
PM10 (lb/day)[(2)]	10.47	10.25	10.25	10.24	10.09	10.09	10.35	10.14	10.42	10.52	10.52	10.53
PM2.5 (lb/day)[(1)(2)]	3.18	2.97	2.97	2.96	2.80	2.80	3.06	2.85	3.13	3.23	3.23	3.24
CO_2 (tonnes/day)	3.13	2.85	2.85	2.76	2.44	2.44	2.88	2.40	3.01	3.09	3.09	3.17
CO_2 (tonnes/yr)												767.26
30yr amortized CO_2 (tonnes/yr)												

	Year 6											
Total Emissions	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
VOC (lb/day)	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.02	0.77	0.77
CO (lb/day)	27.71	27.71	27.71	27.71	27.71	27.71	27.71	24.65	24.65	23.32	18.77	18.77
NOx (lb/day)	22.27	22.27	22.27	22.27	22.27	22.27	22.27	17.48	17.48	16.77	13.44	13.44
SOx (lb/day)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.06	0.06
PM10 (lb/day)[(2)]	10.44	10.44	10.44	6.64	6.64	6.64	6.64	6.42	6.42	6.41	6.26	6.26
PM2.5 (lb/day)[(1)(2)]	3.15	3.15	3.15	2.35	2.35	2.35	2.35	2.14	2.14	2.13	1.97	1.97
CO_2 (tonnes/day)	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.52	2.52	2.44	2.11	2.11
CO_2 (tonnes/yr)												704.83
30yr amortized CO_2 (tonnes/yr)												566.79

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls
(2) Mitigated PM.
Highlighted values are maximums.

Appendix B
Tesoro Integration and Compliance Project
Total Project Component
Construction Emission Summary

	Year 7											
Emissions from Equipment	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	0.95	0.54	1.04	0.78	0.78	0.82	0.76	0.76	0.76	0.76	0.76	0.76
CO (lb/day)	16.38	13.54	18.87	22.49	22.49	23.82	22.65	22.65	22.65	22.65	22.65	22.65
NOx (lb/day)	13.49	9.30	14.87	16.45	16.45	17.11	16.40	16.40	16.40	16.40	16.40	16.40
SOx (lb/day)	0.06	0.04	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
PM10 (lb/day)	0.60	0.45	0.65	0.74	0.74	0.75	0.70	0.70	0.70	0.70	0.70	0.70
PM2.5 (lb/day)(1)	0.59	0.45	0.65	0.73	0.73	0.74	0.70	0.70	0.70	0.70	0.70	0.70
CO_2 (MT/day)	1.34	0.85	1.47	1.55	1.55	1.63	1.59	1.59	1.59	1.59	1.59	1.59
CO_2 (tonnes/yr)												403.38

	Year 7											
Emissions from Short Project Equipment	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 7											
Emissions from TAR Equipment	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (MT/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 7											
Emissions from Carson Tanks	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	0.95	0.54	1.04	0.78	0.78	0.82	0.76	0.76	0.76	0.76	0.76	0.76
CO (lb/day)	16.38	13.54	18.87	22.49	22.49	23.82	22.65	22.65	22.65	22.65	22.65	22.65
NOx (lb/day)	13.49	9.30	14.87	16.45	16.45	17.11	16.40	16.40	16.40	16.40	16.40	16.40
SOx (lb/day)	0.06	0.04	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
PM10 (lb/day)	0.60	0.45	0.65	0.74	0.74	0.75	0.70	0.70	0.70	0.70	0.70	0.70
PM2.5 (lb/day)(1)	0.59	0.45	0.65	0.73	0.73	0.74	0.70	0.70	0.70	0.70	0.70	0.70
CO_2 (MT/day)	1.34	0.85	1.47	1.55	1.55	1.63	1.59	1.59	1.59	1.59	1.59	1.59

	Year 7											
Emission from Trips - Onsite/Offsite	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exhuast PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exhuast PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2 (tonnes/yr)												0.00

	Year 7											
Fugitive Earthmoving PM - Peak	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
PM10 (lb/day)(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM2.5 (lb/day)(1)(2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Year 7											
Offroad Fugitive PM - Peak	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
PM10 (lb/day)(2)	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
PM2.5 (lb/day)(1)(2)	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

	Year 7											
Paint	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	62.25	62.25	62.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Year 7											
Total Emissions	**Thresholds**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
VOC (lb/day)	75	63.20	62.79	63.29	0.78	0.78	0.82	0.76	0.76	0.76	0.76	0.76	0.76
CO (lb/day)	550	16.38	13.54	18.87	22.49	22.49	23.82	22.65	22.65	22.65	22.65	22.65	22.65
NOx (lb/day)	100	13.49	9.30	14.87	16.45	16.45	17.11	16.40	16.40	16.40	16.40	16.40	16.40
SOx (lb/day)	150	0.06	0.04	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
PM10 (lb/day)(2)	150	4.40	4.25	4.45	4.54	4.54	4.55	4.50	4.50	4.50	4.50	4.50	4.50
PM2.5 (lb/day)(1)(2)	55	1.39	1.25	1.44	1.53	1.53	1.54	1.49	1.49	1.49	1.49	1.49	1.49
CO_2 (tonnes/day)	NA	1.34	0.85	1.47	1.55	1.55	1.63	1.59	1.59	1.59	1.59	1.59	1.59
CO_2 (tonnes/yr)	NA												403.38
30yr amortized CO_2 (tonnes/yr)	NA												580.24

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls
(2) Mitigated PM.

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Emission Factors for Single and Double Shift Equipment

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emission Rates

Equipment Type	Hp	2017 Emission Factors lb/hr[1] VOC	CO	NOx	SOx	PM10	CO2e[2]
<40 T Cranes	Composite	0.06537	0.4152	0.90923	0.00147	0.04291	0.03535
>40T Cranes	500	0.07236	0.4243	1.11689	0.00213	0.04535	0.05139
Pile/Drill Rig	Composite	0.04029	0.5013	0.67483	0.00244	0.02483	0.05882
Tractors	Composite	0.03046	0.3666	0.35832	0.00080	0.02366	0.0192
Welders	50	0.03579	0.2408	0.18867	0.00039	0.01662	0.00938
Light Plants	50	0.03579	0.3047	0.18867	0.00039	0.01662	0.00938
Genertors	120	0.04173	0.4728	0.45336	0.00074	0.03547	0.01794
Hydro Vacs/Pumps	120	0.04173	0.4802	0.45336	0.00074	0.03547	0.01794
Fork Lifts	Composite	0.01948	0.4522	0.29726	0.00089	0.01519	0.02146
Loader/Backhoe	Composite	0.03046	0.3666	0.35832	0.00080	0.02366	0.0192
Air Compressors	50	0.03579	0.2209	0.18867	0.00039	0.01662	0.00938
Manlifts	Composite	0.00586	0.1548	0.11635	0.00044	0.00353	0.01066

Equipment Type	Hp	2018 Emission Factors lb/hr[1] VOC	CO	NOx	SOx	PM10	CO2e[2]
<40 T Cranes	Composite	0.05782	0.4060	0.80171	0.00147	0.03738	0.03536
>40T Cranes	500	0.06523	0.4085	0.98933	0.00213	0.03992	0.05142
Pile/Drill Rig	Composite	0.03501	0.5011	0.56864	0.00243	0.02055	0.05865
Tractors	Composite	0.02557	0.3647	0.30639	0.00080	0.01923	0.01917
Welders	50	0.03361	0.2339	0.18349	0.00039	0.01563	0.00938
Light Plants	50	0.03361	0.2966	0.18349	0.00039	0.01563	0.00938
Genertors	120	0.03690	0.4694	0.40643	0.00075	0.03112	0.01796
Hydro Vacs/Pumps	120	0.03690	0.4767	0.40643	0.00075	0.03112	0.01796
Fork Lifts	Composite	0.01616	0.2173	0.24736	0.00089	0.01150	0.02146
Loader/Backhoe	Composite	0.02557	0.3647	0.30639	0.00080	0.01923	0.01917
Air Compressors	50	0.03361	0.2142	0.18349	0.00039	0.01563	0.00938
Manlifts	Composite	0.00499	0.1740	0.10274	0.00044	0.00238	0.01066

Equipment Type	Hp	2019 Emission Factors lb/hr[1] VOC	CO	NOx	SOx	PM10	CO2e[2]
<40 T Cranes	Composite	0.05255	0.3982	0.72435	0.00147	0.03337	0.03536
>40T Cranes	500	0.06159	0.3951	0.91722	0.00213	0.03694	0.05143
Pile/Drill Rig	Composite	0.03316	0.5009	0.51942	0.00243	0.01889	0.05862
Tractors	Composite	0.02277	0.3630	0.27390	0.00080	0.01634	0.01916
Welders	50	0.03313	0.2271	0.18111	0.00039	0.01522	0.00937
Light Plants	50	0.03313	0.2890	0.18111	0.00039	0.01522	0.00937
Genertors	120	0.03398	0.4663	0.37708	0.00075	0.02830	0.01796
Hydro Vacs/Pumps	120	0.03398	0.4736	0.37708	0.00075	0.02830	0.01796
Fork Lifts	Composite	0.01468	0.2166	0.22583	0.00089	0.00988	0.02146
Loader/Backhoe	Composite	0.02277	0.3630	0.27390	0.00080	0.01634	0.01916
Air Compressors	50	0.03313	0.2078	0.18111	0.00039	0.01522	0.00937
Manlifts	Composite	0.00475	0.1715	0.09788	0.00044	0.00194	0.01066

Equipment Type	Hp	2020 Emission Factors lb/hr[1] VOC	CO	NOx	SOx	PM10	CO2e[2]
<40 T Cranes	Composite	0.04866	0.3917	0.66105	0.00147	0.03031	0.03535
>40T Cranes	500	0.05656	0.3839	0.82455	0.00213	0.03305	0.05142
Pile/Drill Rig	Composite	0.07483	0.5008	0.93803	0.00277	0.03763	0.0668
Tractors	Composite	0.03343	0.6517	0.33335	0.00120	0.01797	0.029
Welders	50	0.03084	0.2219	0.17530	0.00039	0.01410	0.00937
Light Plants	50	0.03084	0.2833	0.17530	0.00039	0.01410	0.00937
Genertors	120	0.03204	0.4641	0.35638	0.00075	0.02642	0.01798
Hydro Vacs/Pumps	120	0.03204	0.4713	0.35638	0.00075	0.02642	0.01798
Fork Lifts	Composite	0.01383	0.2160	0.21047	0.00089	0.00873	0.02147
Loader/Backhoe	Composite	0.02060	0.3616	0.24635	0.00080	0.01403	0.01915
Air Compressors	50	0.03084	0.2030	0.17530	0.00039	0.01410	0.00937
Manlifts	Composite	0.00463	0.1696	0.09324	0.00044	0.00161	0.01066

(1) Off-Road 2011. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Carbon Dioxide Equivalents (CO_{EQ}) are based on default emission factors for diesel. Metric tons per hour.

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Emission Calculations for Single Shift Equipment

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Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	2017	1	2	3	4	5	6	7	8	9	10	11	12
<40 T Cranes	0.909	0.00	0.00	0.00	0.00	0.00	0.00	44.55	44.55	44.55	63.65	70.01	70.01
>40T Cranes	1.117	0.00	0.00	0.00	0.00	0.00	0.00	27.92	27.92	27.92	39.09	39.09	39.09
Pile/Drill Rig	0.675	0.00	0.00	0.00	0.00	0.00	0.00	53.99	5.40	5.40	16.20	16.20	16.20
Tractors	0.358	0.00	0.00	0.00	0.00	0.00	0.00	5.37	5.37	5.37	5.37	5.37	5.37
Welders	0.189	0.00	0.00	0.00	0.00	0.00	0.00	64.90	66.41	58.87	64.90	70.94	70.94
Light Plants	0.189	0.00	0.00	0.00	0.00	0.00	0.00	4.53	6.79	6.23	7.92	8.49	6.23
Genertors	0.453	0.00	0.00	0.00	0.00	0.00	0.00	8.16	9.52	9.52	10.88	10.88	10.88
Hydro Vacs/Pumps	0.453	0.00	0.00	0.00	0.00	0.00	0.00	4.53	4.53	2.27	4.53	4.53	4.53
Fork Lifts	0.297	0.00	0.00	0.00	0.00	0.00	0.00	7.13	5.95	5.95	5.95	7.13	7.13
Loader/Backhoe	0.358	0.00	0.00	0.00	0.00	0.00	0.00	3.58	3.58	3.58	3.58	5.37	5.37
Air Compressors	0.189	0.00	0.00	0.00	0.00	0.00	0.00	3.77	4.53	3.77	4.53	4.53	4.53
Manlifts	0.116	0.00	0.00	0.00	0.00	0.00	0.00	13.96	15.82	12.10	14.89	20.48	20.48
Total		0.00	0.00	0.00	0.00	0.00	0.00	242.41	200.39	185.53	241.50	263.03	260.77

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	7	0	0	0	0	0	0	7	7	7	10	11	11
>40T Cranes	5	0	0	0	0	0	0	5	5	5	7	7	7
Pile/Drill Rig	8	0	0	0	0	0	0	10	1	1	3	3	3
Tractors	5	0	0	0	0	0	0	3	3	3	3	3	3
Welders	8	0	0	0	0	0	0	43	44	39	43	47	47
Light Plants	3	0	0	0	0	0	0	8	12	11	14	15	11
Genertors	3	0	0	0	0	0	0	6	7	7	8	8	8
Hydro Vacs/Pumps	5	0	0	0	0	0	0	2	2	1	2	2	2
Fork Lifts	4	0	0	0	0	0	0	6	5	5	5	6	6
Loader/Backhoe	5	0	0	0	0	0	0	2	2	2	2	3	3
Air Compressors	4	0	0	0	0	0	0	5	6	5	6	6	6
Manlifts	8	0	0	0	0	0	0	15	17	13	16	22	22

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.065	0.00	0.00	0.00	0.00	0.00	0.00	3.20	3.20	3.20	4.58	5.03	5.03
>40T Cranes	0.072	0.00	0.00	0.00	0.00	0.00	0.00	1.81	1.81	1.81	2.53	2.53	2.53
Pile/Drill Rig	0.040	0.00	0.00	0.00	0.00	0.00	0.00	3.22	0.32	0.32	0.97	0.97	0.97
Tractors	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.46	0.46	0.46	0.46	0.46
Welders	0.036	0.00	0.00	0.00	0.00	0.00	0.00	12.31	12.60	11.17	12.31	13.46	13.46
Light Plants	0.036	0.00	0.00	0.00	0.00	0.00	0.00	0.86	1.29	1.18	1.50	1.61	1.18
Genertors	0.042	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.88	0.88	1.00	1.00	1.00
Hydro Vacs/Pumps	0.042	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.42	0.21	0.42	0.42	0.42
Fork Lifts	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.39	0.39	0.39	0.47	0.47
Loader/Backhoe	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.46	0.46
Air Compressors	0.036	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.86	0.72	0.86	0.86	0.86
Manlifts	0.006	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.80	0.61	0.75	1.03	1.03
Total		0.00	0.00	0.00	0.00	0.00	0.00	25.22	23.32	21.24	26.07	28.29	27.86

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Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.415	0.00	0.00	0.00	0.00	0.00	0.00	20.35	20.35	20.35	29.07	31.97	31.97
>40T Cranes	0.424	0.00	0.00	0.00	0.00	0.00	0.00	10.61	10.61	10.61	14.85	14.85	14.85
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	40.10	4.01	4.01	12.03	12.03	12.03
Tractors	0.367	0.00	0.00	0.00	0.00	0.00	0.00	5.50	5.50	5.50	5.50	5.50	5.50
Welders	0.241	0.00	0.00	0.00	0.00	0.00	0.00	82.85	84.78	75.14	82.85	90.56	90.56
Light Plants	0.305	0.00	0.00	0.00	0.00	0.00	0.00	7.31	10.97	10.06	12.80	13.71	10.06
Genertors	0.473	0.00	0.00	0.00	0.00	0.00	0.00	8.51	9.93	9.93	11.35	11.35	11.35
Hydro Vacs/Pumps	0.480	0.00	0.00	0.00	0.00	0.00	0.00	4.80	4.80	2.40	4.80	4.80	4.80
Fork Lifts	0.452	0.00	0.00	0.00	0.00	0.00	0.00	10.85	9.04	9.04	9.04	10.85	10.85
Loader/Backhoe	0.367	0.00	0.00	0.00	0.00	0.00	0.00	3.67	3.67	3.67	3.67	5.50	5.50
Air Compressors	0.221	0.00	0.00	0.00	0.00	0.00	0.00	4.42	5.30	4.42	5.30	5.30	5.30
Manlifts	0.155	0.00	0.00	0.00	0.00	0.00	0.00	18.57	21.05	16.09	19.81	27.24	27.24
Total		0.00	0.00	0.00	0.00	0.00	0.00	217.54	190.00	171.22	211.07	233.67	230.01

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.07	0.10	0.11	0.11
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.07	0.07	0.07
Pile/Drill Rig	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.02	0.02	0.06	0.06	0.06
Tractors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.14	0.12	0.13	0.15	0.15
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.01
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.05	0.06	0.08	0.08
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.43	0.39	0.52	0.57	0.56

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.043	0.00	0.00	0.00	0.00	0.00	0.00	2.10	2.10	2.10	3.00	3.30	3.30
>40T Cranes	0.045	0.00	0.00	0.00	0.00	0.00	0.00	1.13	1.13	1.13	1.59	1.59	1.59
Pile/Drill Rig	0.025	0.00	0.00	0.00	0.00	0.00	0.00	1.99	0.20	0.20	0.60	0.60	0.60
Tractors	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.35	0.35	0.35	0.35	0.35
Welders	0.017	0.00	0.00	0.00	0.00	0.00	0.00	5.72	5.85	5.18	5.72	6.25	6.25
Light Plants	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.60	0.55	0.70	0.75	0.55
Genertors	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.74	0.74	0.85	0.85	0.85
Hydro Vacs/Pumps	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.35	0.18	0.35	0.35	0.35
Fork Lifts	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.30	0.30	0.30	0.36	0.36
Loader/Backhoe	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24	0.24	0.24	0.35	0.35
Air Compressors	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.40	0.33	0.40	0.40	0.40
Manlifts	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.48	0.37	0.45	0.62	0.62
Total		0.00	0.00	0.00	0.00	0.00	0.00	14.04	12.76	11.68	14.55	15.78	15.58

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.035	0.00	0.00	0.00	0.00	0.00	0.00	1.73	1.73	1.73	2.47	2.72	2.72
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	1.28	1.28	1.28	1.80	1.80	1.80
Pile/Drill Rig	0.059	0.00	0.00	0.00	0.00	0.00	0.00	4.71	0.47	0.47	1.41	1.41	1.41
Tractors	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29	0.29
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	3.23	3.30	2.93	3.23	3.53	3.53
Light Plants	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.34	0.31	0.39	0.42	0.31
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.38	0.38	0.43	0.43	0.43
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.09	0.18	0.18	0.18
Fork Lifts	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.43	0.43	0.43	0.52	0.52
Loader/Backhoe	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19	0.19	0.19	0.29	0.29
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.23	0.19	0.23	0.23	0.23
Manlifts	0.011	0.00	0.00	0.00	0.00	0.00	0.00	1.28	1.45	1.11	1.36	1.88	1.88
Total		0.00	0.00	0.00	0.00	0.00	0.00	14.14	10.27	9.39	12.41	13.68	13.57

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	7	9	9	9	8	7	7	7	7	3	4	4	2
>40T Cranes	5	6	6	5	6	6	5	5	6	3	4	4	2
Pile/Drill Rig	8	1	1	2	1	1	1	1	1	1	1	1	1
Tractors	5	3	3	3	3	2	2	2	2	1	1	1	1
Welders	8	44	44	37	23	19	16	16	16	4	9	10	7
Light Plants	3	10	10	10	5	4	4	4	8	2	3	3	2
Genertors	3	5	5	6	6	6	6	6	6	1	1	2	1
Hydro Vacs/Pumps	5	1	1	1	2	1	1	1	1	1	1	1	1
Fork Lifts	4	5	5	5	5	4	4	3	4	1	2	3	2
Loader/Backhoe	5	2	2	2	3	2	2	2	2	1	1	1	1
Air Compressors	4	5	5	6	6	6	6	6	6	1	1	2	2
Manlifts	8	17	17	15	17	11	10	10	12	5	9	13	10

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.058	3.64	3.64	3.64	3.24	2.83	2.83	2.83	2.83	1.21	1.62	1.62	0.81
>40T Cranes	0.065	1.96	1.96	1.63	1.96	1.96	1.63	1.63	1.96	0.98	1.30	1.30	0.65
Pile/Drill Rig	0.035	0.28	0.28	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Tractors	0.026	0.38	0.38	0.38	0.38	0.26	0.26	0.26	0.26	0.13	0.13	0.13	0.13
Welders	0.034	11.83	11.83	9.95	6.19	5.11	4.30	4.30	4.30	1.08	2.42	2.69	1.88
Light Plants	0.034	1.01	1.01	1.01	0.50	0.40	0.40	0.40	0.81	0.20	0.30	0.30	0.20
Genertors	0.037	0.55	0.55	0.66	0.66	0.66	0.66	0.66	0.66	0.11	0.11	0.22	0.11
Hydro Vacs/Pumps	0.037	0.18	0.18	0.18	0.37	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Fork Lifts	0.016	0.32	0.32	0.32	0.32	0.26	0.26	0.19	0.26	0.06	0.13	0.19	0.13
Loader/Backhoe	0.026	0.26	0.26	0.26	0.38	0.26	0.26	0.26	0.26	0.13	0.13	0.13	0.13
Air Compressors	0.034	0.67	0.67	0.81	0.81	0.81	0.81	0.81	0.81	0.13	0.13	0.27	0.27
Manlifts	0.005	0.68	0.68	0.60	0.68	0.44	0.40	0.40	0.48	0.20	0.36	0.52	0.40
Total		21.77	21.77	20.01	15.77	13.45	12.27	12.21	13.08	4.70	7.10	7.84	5.17

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.406	25.57	25.57	25.57	22.73	19.89	19.89	19.89	19.89	8.52	11.37	11.37	5.68
>40T Cranes	0.409	12.26	12.26	10.21	12.26	12.26	10.21	10.21	12.26	6.13	8.17	8.17	4.09
Pile/Drill Rig	0.501	4.01	4.01	8.02	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01
Tractors	0.365	5.47	5.47	5.47	5.47	3.65	3.65	3.65	3.65	1.82	1.82	1.82	1.82
Welders	0.234	82.32	82.32	69.22	43.03	35.55	29.93	29.93	29.93	7.48	16.84	18.71	13.10
Light Plants	0.297	8.90	8.90	8.90	4.45	3.56	3.56	3.56	7.12	1.78	2.67	2.67	1.78
Genertors	0.469	7.04	7.04	8.45	8.45	8.45	8.45	8.45	8.45	1.41	1.41	2.82	1.41
Hydro Vacs/Pumps	0.477	2.38	2.38	2.38	4.77	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38
Fork Lifts	0.217	4.35	4.35	4.35	4.35	3.48	3.48	2.61	3.48	0.87	1.74	2.61	1.74
Loader/Backhoe	0.365	3.65	3.65	3.65	5.47	3.65	3.65	3.65	3.65	1.82	1.82	1.82	1.82
Air Compressors	0.214	4.28	4.28	5.14	5.14	5.14	5.14	5.14	5.14	0.86	0.86	1.71	1.71
Manlifts	0.174	23.67	23.67	20.88	23.67	15.31	13.92	13.92	16.71	6.96	12.53	18.10	13.92
Total		183.89	183.89	172.24	143.79	117.32	108.27	107.40	116.66	44.05	65.62	76.19	53.46

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.802	50.51	50.51	50.51	44.90	39.28	39.28	39.28	39.28	16.84	22.45	22.45	11.22
>40T Cranes	0.989	29.68	29.68	24.73	29.68	29.68	24.73	24.73	29.68	14.84	19.79	19.79	9.89
Pile/Drill Rig	0.569	4.55	4.55	9.10	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Tractors	0.306	4.60	4.60	4.60	4.60	3.06	3.06	3.06	3.06	1.53	1.53	1.53	1.53
Welders	0.183	64.59	64.59	54.31	33.76	27.89	23.49	23.49	23.49	5.87	13.21	14.68	10.28
Light Plants	0.183	5.50	5.50	5.50	2.75	2.20	2.20	2.20	4.40	1.10	1.65	1.65	1.10
Genertors	0.406	6.10	6.10	7.32	7.32	7.32	7.32	7.32	7.32	1.22	1.22	2.44	1.22
Hydro Vacs/Pumps	0.406	2.03	2.03	2.03	4.06	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03
Fork Lifts	0.247	4.95	4.95	4.95	4.95	3.96	3.96	2.97	3.96	0.99	1.98	2.97	1.98
Loader/Backhoe	0.306	3.06	3.06	3.06	4.60	3.06	3.06	3.06	3.06	1.53	1.53	1.53	1.53
Air Compressors	0.183	3.67	3.67	4.40	4.40	4.40	4.40	4.40	4.40	0.73	0.73	1.47	1.47
Manlifts	0.103	13.97	13.97	12.33	13.97	9.04	8.22	8.22	9.86	4.11	7.40	10.68	8.22
Total		193.21	193.21	182.84	159.53	136.48	126.31	125.32	135.10	55.35	78.07	85.77	55.02

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.001	0.09	0.09	0.09	0.08	0.07	0.07	0.07	0.07	0.03	0.04	0.04	0.02
>40T Cranes	0.002	0.06	0.06	0.05	0.06	0.06	0.05	0.05	0.06	0.03	0.04	0.04	0.02
Pile/Drill Rig	0.002	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Tractors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Welders	0.000	0.14	0.14	0.12	0.07	0.06	0.05	0.05	0.05	0.01	0.03	0.03	0.02
Light Plants	0.000	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Genertors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
Loader/Backhoe	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Manlifts	0.000	0.06	0.06	0.05	0.06	0.04	0.04	0.04	0.04	0.02	0.03	0.05	0.04
Total		0.45	0.45	0.43	0.38	0.31	0.29	0.29	0.31	0.13	0.19	0.21	0.15

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.037	2.36	2.36	2.36	2.09	1.83	1.83	1.83	1.83	0.79	1.05	1.05	0.52
>40T Cranes	0.040	1.20	1.20	1.00	1.20	1.20	1.00	1.00	1.20	0.60	0.80	0.80	0.40
Pile/Drill Rig	0.021	0.16	0.16	0.33	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Tractors	0.019	0.29	0.29	0.29	0.29	0.19	0.19	0.19	0.19	0.10	0.10	0.10	0.10
Welders	0.016	5.50	5.50	4.63	2.88	2.38	2.00	2.00	2.00	0.50	1.13	1.25	0.88
Light Plants	0.016	0.47	0.47	0.47	0.23	0.19	0.19	0.19	0.38	0.09	0.14	0.14	0.09
Genertors	0.031	0.47	0.47	0.56	0.56	0.56	0.56	0.56	0.56	0.09	0.09	0.19	0.09
Hydro Vacs/Pumps	0.031	0.16	0.16	0.16	0.31	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Fork Lifts	0.012	0.23	0.23	0.23	0.23	0.18	0.18	0.14	0.18	0.05	0.09	0.14	0.09
Loader/Backhoe	0.019	0.19	0.19	0.19	0.29	0.19	0.19	0.19	0.19	0.10	0.10	0.10	0.10
Air Compressors	0.016	0.31	0.31	0.38	0.38	0.38	0.38	0.38	0.38	0.06	0.06	0.13	0.13
Manlifts	0.002	0.32	0.32	0.29	0.32	0.21	0.19	0.19	0.23	0.10	0.17	0.25	0.19
Total		11.66	11.66	10.87	8.94	7.63	7.03	6.99	7.46	2.79	4.04	4.45	2.91

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.035	2.23	2.23	2.23	1.98	1.73	1.73	1.73	1.73	0.74	0.99	0.99	0.49
>40T Cranes	0.051	1.54	1.54	1.29	1.54	1.54	1.29	1.29	1.54	0.77	1.03	1.03	0.51
Pile/Drill Rig	0.059	0.47	0.47	0.94	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Tractors	0.019	0.29	0.29	0.29	0.29	0.19	0.19	0.19	0.19	0.10	0.10	0.10	0.10
Welders	0.009	3.30	3.30	2.78	1.73	1.43	1.20	1.20	1.20	0.30	0.68	0.75	0.53
Light Plants	0.009	0.28	0.28	0.28	0.14	0.11	0.11	0.11	0.23	0.06	0.08	0.08	0.06
Genertors	0.018	0.27	0.27	0.32	0.32	0.32	0.32	0.32	0.32	0.05	0.05	0.11	0.05
Hydro Vacs/Pumps	0.018	0.09	0.09	0.09	0.18	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Fork Lifts	0.021	0.43	0.43	0.43	0.43	0.34	0.34	0.26	0.34	0.09	0.17	0.26	0.17
Loader/Backhoe	0.019	0.19	0.19	0.19	0.29	0.19	0.19	0.19	0.19	0.10	0.10	0.10	0.10
Air Compressors	0.009	0.19	0.19	0.23	0.23	0.23	0.23	0.23	0.23	0.04	0.04	0.08	0.08
Manlifts	0.011	1.45	1.45	1.28	1.45	0.94	0.85	0.85	1.02	0.43	0.77	1.11	0.85
Total		10.72	10.72	10.33	9.04	7.58	7.02	6.93	7.56	3.22	4.56	5.15	3.49

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	7	3	4	4	3	3	2	2	2	1	1	1	1
>40T Cranes	5	3	3	3	2	2	1	1	1	0	1	0	0
Pile/Drill Rig	8	1	7	1	0	0	0	0	0	0	0	0	0
Tractors	5	2	4	4	3	3	3	3	3	2	2	2	2
Welders	8	12	16	16	11	11	6	6	6	4	4	4	4
Light Plants	3	4	4	4	2	2	1	5	5	4	4	4	4
Genertors	3	1	1	1	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	1	1	1	0	0	0	0	0	0	0	0	0
Fork Lifts	4	4	4	4	3	3	2	2	2	1	1	1	1
Loader/Backhoe	5	1	1	1	1	1	1	1	1	1	1	1	1
Air Compressors	4	1	5	5	5	5	5	5	5	4	4	4	4
Manlifts	8	15	16	16	8	8	4	4	4	1	1	1	1

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Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.053	1.10	1.47	1.47	1.10	1.10	0.74	0.74	0.74	0.37	0.37	0.37	0.37
>40T Cranes	0.062	0.92	0.92	0.92	0.62	0.62	0.31	0.31	0.31	0.00	0.31	0.00	0.00
Pile/Drill Rig	0.033	0.27	1.86	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.023	0.23	0.46	0.46	0.34	0.34	0.34	0.34	0.34	0.23	0.23	0.23	0.23
Welders	0.033	3.18	4.24	4.24	2.92	2.92	1.59	1.59	1.59	1.06	1.06	1.06	1.06
Light Plants	0.033	0.40	0.40	0.40	0.20	0.20	0.10	0.50	0.50	0.40	0.40	0.40	0.40
Genertors	0.034	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.034	0.17	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.015	0.23	0.23	0.23	0.18	0.18	0.12	0.12	0.12	0.06	0.06	0.06	0.06
Loader/Backhoe	0.023	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Air Compressors	0.033	0.13	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.53	0.53	0.53	0.53
Manlifts	0.005	0.57	0.61	0.61	0.30	0.30	0.15	0.15	0.15	0.04	0.04	0.04	0.04
Total		7.42	11.24	9.65	6.43	6.43	4.12	4.52	4.52	2.79	3.10	2.79	2.79

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.398	8.36	11.15	11.15	8.36	8.36	5.57	5.57	5.57	2.79	2.79	2.79	2.79
>40T Cranes	0.395	5.93	5.93	5.93	3.95	3.95	1.98	1.98	1.98	0.00	1.98	0.00	0.00
Pile/Drill Rig	0.501	4.01	28.05	4.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.363	3.63	7.26	7.26	5.45	5.45	5.45	5.45	5.45	3.63	3.63	3.63	3.63
Welders	0.227	21.81	29.07	29.07	19.99	19.99	10.90	10.90	10.90	7.27	7.27	7.27	7.27
Light Plants	0.289	3.47	3.47	3.47	1.73	1.73	0.87	4.34	4.34	3.47	3.47	3.47	3.47
Genertors	0.466	1.40	1.40	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.474	2.37	2.37	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.217	3.47	3.47	3.47	2.60	2.60	1.73	1.73	1.73	0.87	0.87	0.87	0.87
Loader/Backhoe	0.363	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
Air Compressors	0.208	0.83	4.16	4.16	4.16	4.16	4.16	4.16	4.16	3.33	3.33	3.33	3.33
Manlifts	0.172	20.58	21.95	21.95	10.98	10.98	5.49	5.49	5.49	1.37	1.37	1.37	1.37
Total		77.66	120.09	96.04	59.03	59.03	37.96	41.43	41.43	24.53	26.51	24.53	24.53

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.724	15.21	20.28	20.28	15.21	15.21	10.14	10.14	10.14	5.07	5.07	5.07	5.07
>40T Cranes	0.917	13.76	13.76	13.76	9.17	9.17	4.59	4.59	4.59	0.00	4.59	0.00	0.00
Pile/Drill Rig	0.519	4.16	29.09	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.274	2.74	5.48	5.48	4.11	4.11	4.11	4.11	4.11	2.74	2.74	2.74	2.74
Welders	0.181	17.39	23.18	23.18	15.94	15.94	8.69	8.69	8.69	5.80	5.80	5.80	5.80
Light Plants	0.181	2.17	2.17	2.17	1.09	1.09	0.54	2.72	2.72	2.17	2.17	2.17	2.17
Genertors	0.377	1.13	1.13	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.377	1.89	1.89	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.226	3.61	3.61	3.61	2.71	2.71	1.81	1.81	1.81	0.90	0.90	0.90	0.90
Loader/Backhoe	0.274	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37
Air Compressors	0.181	0.72	3.62	3.62	3.62	3.62	3.62	3.62	3.62	2.90	2.90	2.90	2.90
Manlifts	0.098	11.75	12.53	12.53	6.26	6.26	3.13	3.13	3.13	0.78	0.78	0.78	0.78
Total		75.89	118.11	93.18	59.48	59.48	38.00	40.18	40.18	21.73	26.32	21.73	21.73

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.001	0.03	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01
>40T Cranes	0.002	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.00	0.00
Pile/Drill Rig	0.002	0.02	0.14	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.04	0.05	0.05	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Manlifts	0.000	0.05	0.06	0.06	0.03	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Total		0.21	0.37	0.25	0.15	0.15	0.10	0.10	0.10	0.05	0.06	0.05	0.05

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.033	0.70	0.93	0.93	0.70	0.70	0.47	0.47	0.47	0.23	0.23	0.23	0.23
>40T Cranes	0.037	0.55	0.55	0.55	0.37	0.37	0.18	0.18	0.18	0.00	0.18	0.00	0.00
Pile/Drill Rig	0.019	0.15	1.06	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.016	0.16	0.33	0.33	0.25	0.25	0.25	0.25	0.25	0.16	0.16	0.16	0.16
Welders	0.015	1.46	1.95	1.95	1.34	1.34	0.73	0.73	0.73	0.49	0.49	0.49	0.49
Light Plants	0.015	0.18	0.18	0.18	0.09	0.09	0.05	0.23	0.23	0.18	0.18	0.18	0.18
Genertors	0.028	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.028	0.14	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.010	0.16	0.16	0.16	0.12	0.12	0.08	0.08	0.08	0.04	0.04	0.04	0.04
Loader/Backhoe	0.016	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Air Compressors	0.015	0.06	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.24	0.24
Manlifts	0.002	0.23	0.25	0.25	0.12	0.12	0.06	0.06	0.06	0.02	0.02	0.02	0.02
Total		3.97	6.02	5.12	3.38	3.38	2.20	2.38	2.38	1.45	1.63	1.45	1.45

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.035	0.74	0.99	0.99	0.74	0.74	0.50	0.50	0.50	0.25	0.25	0.25	0.25
>40T Cranes	0.051	0.77	0.77	0.77	0.51	0.51	0.26	0.26	0.26	0.00	0.26	0.00	0.00
Pile/Drill Rig	0.059	0.47	3.28	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.019	0.19	0.38	0.38	0.29	0.29	0.29	0.29	0.29	0.19	0.19	0.19	0.19
Welders	0.009	0.90	1.20	1.20	0.82	0.82	0.45	0.45	0.45	0.30	0.30	0.30	0.30
Light Plants	0.009	0.11	0.11	0.11	0.06	0.06	0.03	0.14	0.14	0.11	0.11	0.11	0.11
Genertors	0.018	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.09	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.34	0.34	0.34	0.26	0.26	0.17	0.17	0.17	0.09	0.09	0.09	0.09
Loader/Backhoe	0.019	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Air Compressors	0.009	0.04	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.15	0.15	0.15	0.15
Manlifts	0.011	1.28	1.36	1.36	0.68	0.68	0.34	0.34	0.34	0.09	0.09	0.09	0.09
Total		5.09	8.87	6.06	3.65	3.65	2.31	2.43	2.43	1.27	1.53	1.27	1.27

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	7	1	1	1	1	1	1	1	1	1	1	1	1
>40T Cranes	5	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	0	0	0	0	0	0	0	0	0	0	0	0
Tractors	5	2	2	2	2	2	2	2	2	2	2	2	2
Welders	8	4	4	4	4	4	4	4	4	4	4	4	4
Light Plants	3	4	4	4	4	4	4	4	4	4	4	4	4
Genertors	3	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0	0	0	0	0	0	0	0	0	0	0
Fork Lifts	4	1	1	1	1	1	1	1	1	1	1	1	1
Loader/Backhoe	5	1	1	1	1	1	1	1	1	1	1	1	1
Air Compressors	4	4	4	4	4	4	4	4	4	4	4	4	4
Manlifts	8	1	1	1	1	1	1	1	1	1	1	1	1

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.049	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
>40T Cranes	0.057	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.075	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.033	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Welders	0.031	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Light Plants	0.031	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Genertors	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.014	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Loader/Backhoe	0.021	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Air Compressors	0.031	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Manlifts	0.005	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Total		2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72

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Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	2020	37	38	39	40	41	42	43	44	45	46	47	48
<40 T Cranes	0.392	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74
>40T Cranes	0.384	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.652	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52
Welders	0.222	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10
Light Plants	0.283	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
Genertors	0.464	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.471	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.216	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Loader/Backhoe	0.362	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Air Compressors	0.203	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
Manlifts	0.170	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
Total		27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04	27.04

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.661	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63
>40T Cranes	0.825	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.938	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.333	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
Welders	0.175	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61
Light Plants	0.175	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
Genertors	0.356	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.356	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.210	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Loader/Backhoe	0.246	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
Air Compressors	0.175	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Manlifts	0.093	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total		21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30	21.30

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.030	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
>40T Cranes	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.038	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.018	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Welders	0.014	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Light Plants	0.014	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Genertors	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.009	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Loader/Backhoe	0.014	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Air Compressors	0.014	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Manlifts	0.002	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.035	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.067	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.029	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Welders	0.009	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Light Plants	0.009	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Loader/Backhoe	0.019	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Air Compressors	0.009	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Manlifts	0.011	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Total		1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37

Emission Calculations for Double Shift Equipment

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	7	0	0	0	0	0	0	0	0	0	0	0	0
>40T Cranes	5	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	0	0	0	0	0	0	0	0	0	0	0	0
Tractors	5	0	0	0	0	0	0	0	0	0	0	0	0
Welders	8	0	0	0	0	0	0	0	0	0	0	0	0
Light Plants	12	0	0	0	0	0	0	0	0	0	0	0	0
Genertors	12	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0	0	0	0	0	0	0	0	0	0	0
Fork Lifts	4	0	0	0	0	0	0	0	0	0	0	0	0
Loader/Backhoe	5	0	0	0	0	0	0	0	0	0	0	0	0
Air Compressors	4	0	0	0	0	0	0	0	0	0	0	0	0
Manlifts	8	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.065	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.072	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.040	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.036	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.036	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.042	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.042	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.036	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	2017	1	2	3	4	5	6	7	8	9	10	11	12
<40 T Cranes	0.415	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.424	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.367	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.241	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.305	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.473	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.480	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.452	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.367	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.221	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	2017	1	2	3	4	5	6	7	8	9	10	11	12
<40 T Cranes	0.909	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	1.117	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.675	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.358	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.453	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.453	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.297	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.358	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.116	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.043	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.045	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
<40 T Cranes	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	7	0	0	0	0	0	0	0	0	0	1	1	0
>40T Cranes	5	0	0	0	0	0	0	0	0	0	1	1	0
Pile/Drill Rig	8	0	0	0	0	0	0	0	0	0	1	1	0
Tractors	5	0	0	0	0	0	0	0	0	0	1	1	0
Welders	8	0	0	0	0	0	0	0	0	0	5	1	0
Light Plants	12	0	0	0	0	0	0	0	0	0	2	1	0
Genertors	12	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0	0	0	0	0	0	0	0	1	1	0
Fork Lifts	4	0	0	0	0	0	0	0	0	0	1	1	0
Loader/Backhoe	5	0	0	0	0	0	0	0	0	0	1	1	0
Air Compressors	4	0	0	0	0	0	0	0	0	0	1	1	0
Manlifts	8	0	0	0	0	0	0	0	0	0	4	2	0

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.058	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.40	0.00
>40T Cranes	0.065	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00
Pile/Drill Rig	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.00
Tractors	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00
Welders	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.27	0.00
Light Plants	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.40	0.00
Genertors	0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.00
Fork Lifts	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.00
Loader/Backhoe	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00
Air Compressors	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00
Manlifts	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.08	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.96	2.40	0.00

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Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	2018	13	14	15	16	17	18	19	20	21	22	23	24
<40 T Cranes	0.406	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.84	2.84	0.00
>40T Cranes	0.409	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	2.04	0.00
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01	4.01	0.00
Tractors	0.365	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	1.82	0.00
Welders	0.234	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.35	1.87	0.00
Light Plants	0.297	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.12	3.56	0.00
Genertors	0.469	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.477	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38	2.38	0.00
Fork Lifts	0.217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.87	0.00
Loader/Backhoe	0.365	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	1.82	0.00
Air Compressors	0.214	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.86	0.00
Manlifts	0.174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.57	2.78	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.69	24.86	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.802	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.61	5.61	0.00
>40T Cranes	0.989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.95	4.95	0.00
Pile/Drill Rig	0.569	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	4.55	0.00
Tractors	0.306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	1.53	0.00
Welders	0.183	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.34	1.47	0.00
Light Plants	0.183	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.40	2.20	0.00
Genertors	0.406	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.406	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03	2.03	0.00
Fork Lifts	0.247	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.99	0.00
Loader/Backhoe	0.306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	1.53	0.00
Air Compressors	0.183	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.73	0.00
Manlifts	0.103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.29	1.64	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.96	27.24	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Pile/Drill Rig	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00
Tractors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.07	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	2018	13	14	15	16	17	18	19	20	21	22	23	24
<40 T Cranes	0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.00
>40T Cranes	0.040	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.20	0.00
Pile/Drill Rig	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.00
Tractors	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00
Welders	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.13	0.00
Light Plants	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.19	0.00
Genertors	0.031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.00
Fork Lifts	0.012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00
Loader/Backhoe	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00
Air Compressors	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.00
Manlifts	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.04	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	1.43	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
<40 T Cranes	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.00
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.00
Pile/Drill Rig	0.059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.47	0.00
Tractors	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.08	0.00
Light Plants	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.11	0.00
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00
Fork Lifts	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00
Loader/Backhoe	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00
Manlifts	0.011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.17	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.32	1.74	0.00

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	7	2	1	0	1	0	0	0	0	2	1	1	1
>40T Cranes	5	2	1	0	1	0	0	0	0	2	1	1	1
Pile/Drill Rig	8	2	1	0	1	0	0	0	0	1	1	1	1
Tractors	5	2	1	0	1	0	0	0	0	1	1	1	1
Welders	8	13	8	0	2	0	0	0	0	3	2	5	5
Light Plants	12	3	1	0	1	0	0	0	0	1	1	1	1
Genertors	12	0	0	0	0	0	0	0	0	1	0	0	0
Hydro Vacs/Pumps	5	2	1	0	1	0	0	0	0	1	1	1	1
Fork Lifts	4	2	1	0	1	0	0	0	0	1	1	1	1
Loader/Backhoe	5	2	1	0	1	0	0	0	0	1	1	1	1
Air Compressors	4	2	1	0	1	0	0	0	0	1	1	1	1
Manlifts	8	8	4	0	3	0	0	0	0	3	3	4	4

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	2019	25	26	27	28	29	30	31	32	33	34	35	36
<40 T Cranes	0.053	0.74	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.74	0.37	0.37	0.37
>40T Cranes	0.062	0.62	0.31	0.00	0.31	0.00	0.00	0.00	0.00	0.62	0.31	0.31	0.31
Pile/Drill Rig	0.033	0.53	0.27	0.00	0.27	0.00	0.00	0.00	0.00	0.27	0.27	0.27	0.27
Tractors	0.023	0.23	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.11
Welders	0.033	3.45	2.12	0.00	0.53	0.00	0.00	0.00	0.00	0.80	0.53	1.33	1.33
Light Plants	0.033	1.19	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.40	0.40	0.40	0.40
Genertors	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00
Hydro Vacs/Pumps	0.034	0.34	0.17	0.00	0.17	0.00	0.00	0.00	0.00	0.17	0.17	0.17	0.17
Fork Lifts	0.015	0.12	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.06
Loader/Backhoe	0.023	0.23	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.11
Air Compressors	0.033	0.27	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.13	0.13	0.13	0.13
Manlifts	0.005	0.30	0.15	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.11	0.15	0.15
Total		8.00	4.20	0.00	2.57	0.00	0.00	0.00	0.00	3.92	2.57	3.40	3.40

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	2019	25	26	27	28	29	30	31	32	33	34	35	36
<40 T Cranes	0.398	5.57	2.79	0.00	2.79	0.00	0.00	0.00	0.00	5.57	2.79	2.79	2.79
>40T Cranes	0.395	3.95	1.98	0.00	1.98	0.00	0.00	0.00	0.00	3.95	1.98	1.98	1.98
Pile/Drill Rig	0.501	8.01	4.01	0.00	4.01	0.00	0.00	0.00	0.00	4.01	4.01	4.01	4.01
Tractors	0.363	3.63	1.82	0.00	1.82	0.00	0.00	0.00	0.00	1.82	1.82	1.82	1.82
Welders	0.227	23.62	14.54	0.00	3.63	0.00	0.00	0.00	0.00	5.45	3.63	9.09	9.09
Light Plants	0.289	10.40	3.47	0.00	3.47	0.00	0.00	0.00	0.00	3.47	3.47	3.47	3.47
Genertors	0.466	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.60	0.00	0.00	0.00
Hydro Vacs/Pumps	0.474	4.74	2.37	0.00	2.37	0.00	0.00	0.00	0.00	2.37	2.37	2.37	2.37
Fork Lifts	0.217	1.73	0.87	0.00	0.87	0.00	0.00	0.00	0.00	0.87	0.87	0.87	0.87
Loader/Backhoe	0.363	3.63	1.82	0.00	1.82	0.00	0.00	0.00	0.00	1.82	1.82	1.82	1.82
Air Compressors	0.208	1.66	0.83	0.00	0.83	0.00	0.00	0.00	0.00	0.83	0.83	0.83	0.83
Manlifts	0.172	10.98	5.49	0.00	4.12	0.00	0.00	0.00	0.00	4.12	4.12	5.49	5.49
Total		77.94	39.96	0.00	27.68	0.00	0.00	0.00	0.00	39.86	27.68	34.51	34.51

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.724	10.14	5.07	0.00	5.07	0.00	0.00	0.00	0.00	10.14	5.07	5.07	5.07
>40T Cranes	0.917	9.17	4.59	0.00	4.59	0.00	0.00	0.00	0.00	9.17	4.59	4.59	4.59
Pile/Drill Rig	0.519	8.31	4.16	0.00	4.16	0.00	0.00	0.00	0.00	4.16	4.16	4.16	4.16
Tractors	0.274	2.74	1.37	0.00	1.37	0.00	0.00	0.00	0.00	1.37	1.37	1.37	1.37
Welders	0.181	18.84	11.59	0.00	2.90	0.00	0.00	0.00	0.00	4.35	2.90	7.24	7.24
Light Plants	0.181	6.52	2.17	0.00	2.17	0.00	0.00	0.00	0.00	2.17	2.17	2.17	2.17
Genertors	0.377	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.52	0.00	0.00	0.00
Hydro Vacs/Pumps	0.377	3.77	1.89	0.00	1.89	0.00	0.00	0.00	0.00	1.89	1.89	1.89	1.89
Fork Lifts	0.226	1.81	0.90	0.00	0.90	0.00	0.00	0.00	0.00	0.90	0.90	0.90	0.90
Loader/Backhoe	0.274	2.74	1.37	0.00	1.37	0.00	0.00	0.00	0.00	1.37	1.37	1.37	1.37
Air Compressors	0.181	1.45	0.72	0.00	0.72	0.00	0.00	0.00	0.00	0.72	0.72	0.72	0.72
Manlifts	0.098	6.26	3.13	0.00	2.35	0.00	0.00	0.00	0.00	2.35	2.35	3.13	3.13
Total		71.75	36.96	0.00	27.48	0.00	0.00	0.00	0.00	43.11	27.48	32.61	32.61

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.001	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01
>40T Cranes	0.002	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01
Pile/Drill Rig	0.002	0.04	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02
Tractors	0.001	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.000	0.04	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02
Light Plants	0.000	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.03	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Total		0.20	0.10	0.00	0.08	0.00	0.00	0.00	0.00	0.11	0.08	0.09	0.09

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.033	0.47	0.23	0.00	0.23	0.00	0.00	0.00	0.00	0.47	0.23	0.23	0.23
>40T Cranes	0.037	0.37	0.18	0.00	0.18	0.00	0.00	0.00	0.00	0.37	0.18	0.18	0.18
Pile/Drill Rig	0.019	0.30	0.15	0.00	0.15	0.00	0.00	0.00	0.00	0.15	0.15	0.15	0.15
Tractors	0.016	0.16	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.08	0.08	0.08	0.08
Welders	0.015	1.58	0.97	0.00	0.24	0.00	0.00	0.00	0.00	0.37	0.24	0.61	0.61
Light Plants	0.015	0.55	0.18	0.00	0.18	0.00	0.00	0.00	0.00	0.18	0.18	0.18	0.18
Genertors	0.028	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
Hydro Vacs/Pumps	0.028	0.28	0.14	0.00	0.14	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.14
Fork Lifts	0.010	0.08	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04
Loader/Backhoe	0.016	0.16	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.08	0.08	0.08	0.08
Air Compressors	0.015	0.12	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.06
Manlifts	0.002	0.12	0.06	0.00	0.05	0.00	0.00	0.00	0.00	0.05	0.05	0.06	0.06
Total		4.21	2.19	0.00	1.45	0.00	0.00	0.00	0.00	2.33	1.45	1.83	1.83

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.035	0.50	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.50	0.25	0.25	0.25
>40T Cranes	0.051	0.51	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.51	0.26	0.26	0.26
Pile/Drill Rig	0.059	0.94	0.47	0.00	0.47	0.00	0.00	0.00	0.00	0.47	0.47	0.47	0.47
Tractors	0.019	0.19	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.10
Welders	0.009	0.97	0.60	0.00	0.15	0.00	0.00	0.00	0.00	0.22	0.15	0.37	0.37
Light Plants	0.009	0.34	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.11
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.18	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.09
Fork Lifts	0.021	0.17	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.09
Loader/Backhoe	0.019	0.19	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.10
Air Compressors	0.009	0.07	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04
Manlifts	0.011	0.68	0.34	0.00	0.26	0.00	0.00	0.00	0.00	0.26	0.26	0.34	0.34
Total		4.75	2.43	0.00	1.90	0.00	0.00	0.00	0.00	2.69	1.90	2.21	2.21

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

		Month											
Equipment (Pieces per Day)	**Hours (hr/day)**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	7	0	1	1	0	0	0	0	0	0	1	0	0
>40T Cranes	5	0	1	1	0	0	0	0	0	0	1	0	0
Pile/Drill Rig	8	0	1	1	0	0	0	0	0	0	1	0	0
Tractors	5	0	1	1	0	0	0	0	0	0	1	0	0
Welders	8	0	8	8	0	0	0	0	0	0	2	0	0
Light Plants	12	0	1	1	0	0	0	0	0	0	1	0	0
Genertors	12	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	1	1	0	0	0	0	0	0	1	0	0
Fork Lifts	4	0	1	1	0	0	0	0	0	0	1	0	0
Loader/Backhoe	5	0	1	1	0	0	0	0	0	0	1	0	0
Air Compressors	4	0	1	1	0	0	0	0	0	0	1	0	0
Manlifts	8	0	4	4	0	0	0	0	0	0	3	0	0

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.049	0.00	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00
>40T Cranes	0.057	0.00	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00
Pile/Drill Rig	0.075	0.00	0.60	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00
Tractors	0.033	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Welders	0.031	0.00	1.97	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00
Light Plants	0.031	0.00	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00
Genertors	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.032	0.00	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
Fork Lifts	0.014	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Loader/Backhoe	0.021	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
Air Compressors	0.031	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00
Manlifts	0.005	0.00	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
Total		0.00	4.32	4.32	0.00	0.00	0.00	0.00	0.00	0.00	2.81	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.392	0.00	2.74	2.74	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00
>40T Cranes	0.384	0.00	1.92	1.92	0.00	0.00	0.00	0.00	0.00	0.00	1.92	0.00	0.00
Pile/Drill Rig	0.501	0.00	4.01	4.01	0.00	0.00	0.00	0.00	0.00	0.00	4.01	0.00	0.00
Tractors	0.652	0.00	3.26	3.26	0.00	0.00	0.00	0.00	0.00	0.00	3.26	0.00	0.00
Welders	0.222	0.00	14.20	14.20	0.00	0.00	0.00	0.00	0.00	0.00	3.55	0.00	0.00
Light Plants	0.283	0.00	3.40	3.40	0.00	0.00	0.00	0.00	0.00	0.00	3.40	0.00	0.00
Genertors	0.464	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.471	0.00	2.36	2.36	0.00	0.00	0.00	0.00	0.00	0.00	2.36	0.00	0.00
Fork Lifts	0.216	0.00	0.86	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00
Loader/Backhoe	0.362	0.00	1.81	1.81	0.00	0.00	0.00	0.00	0.00	0.00	1.81	0.00	0.00
Air Compressors	0.203	0.00	0.81	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00
Manlifts	0.170	0.00	5.43	5.43	0.00	0.00	0.00	0.00	0.00	0.00	4.07	0.00	0.00
Total		0.00	40.80	40.80	0.00	0.00	0.00	0.00	0.00	0.00	28.79	0.00	0.00

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Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX (lb/day)	2020	37	38	39	40	41	42	43	44	45	46	47	48
<40 T Cranes	0.661	0.00	4.63	4.63	0.00	0.00	0.00	0.00	0.00	0.00	4.63	0.00	0.00
>40T Cranes	0.825	0.00	4.12	4.12	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.00	0.00
Pile/Drill Rig	0.938	0.00	7.50	7.50	0.00	0.00	0.00	0.00	0.00	0.00	7.50	0.00	0.00
Tractors	0.333	0.00	1.67	1.67	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.00	0.00
Welders	0.175	0.00	11.22	11.22	0.00	0.00	0.00	0.00	0.00	0.00	2.80	0.00	0.00
Light Plants	0.175	0.00	2.10	2.10	0.00	0.00	0.00	0.00	0.00	0.00	2.10	0.00	0.00
Genertors	0.356	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.356	0.00	1.78	1.78	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.00
Fork Lifts	0.210	0.00	0.84	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.00
Loader/Backhoe	0.246	0.00	1.23	1.23	0.00	0.00	0.00	0.00	0.00	0.00	1.23	0.00	0.00
Air Compressors	0.175	0.00	0.70	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.00
Manlifts	0.093	0.00	2.98	2.98	0.00	0.00	0.00	0.00	0.00	0.00	2.24	0.00	0.00
Total		0.00	38.78	38.78	0.00	0.00	0.00	0.00	0.00	0.00	29.62	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.001	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
>40T Cranes	0.002	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Pile/Drill Rig	0.003	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Tractors	0.001	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Welders	0.000	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Total		0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10 (lb/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.030	0.00	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00
>40T Cranes	0.033	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Pile/Drill Rig	0.038	0.00	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00
Tractors	0.018	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Welders	0.014	0.00	0.90	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00
Light Plants	0.014	0.00	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
Genertors	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.026	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
Fork Lifts	0.009	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Loader/Backhoe	0.014	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
Air Compressors	0.014	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
Manlifts	0.002	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
Total		0.00	2.19	2.19	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ (MT/day)	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.035	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
>40T Cranes	0.051	0.00	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
Pile/Drill Rig	0.067	0.00	0.53	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00
Tractors	0.029	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
Welders	0.009	0.00	0.60	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
Light Plants	0.009	0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Fork Lifts	0.021	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Loader/Backhoe	0.019	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
Air Compressors	0.009	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
Manlifts	0.011	0.00	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00
Total		0.00	2.55	2.55	0.00	0.00	0.00	0.00	0.00	0.00	2.01	0.00	0.00

Emission Calculations for Onsite Onroad Vehicles

Appendix B
Tesoro Integration and Compliance Project

Onsite Construction Vehicle Trip Emissions

		Month (Vehicles per day)											
Vehicle	**Miles per Day**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Cars	2	0	0	0	0	0	0	0	0	0	0	0	0
Pickup Trucks	2	0	0	0	0	0	0	78	78	71	90	112	112
Total Light Vehicle Miles		0	0	0	0	0	0	156	156	142	180	224	224
Water Truck	2	0	0	0	0	0	0	10	10	10	15	15	15
Delivery Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	2	0	0	0	0	0	0	7	8	7	10	12	12
Misc. MD Truck	5	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		0	0	0	0	0	0	34	36	34	50	54	54
Truck, Dump Ford LT8000	2	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Semi-Tractor, Diesel 20 Ton	2	0	0	0	0	0	0	0	0	0	0	0	0
Misc. HD Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Light Duty	0.0001035	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.02	0.02	0.02
Medium Duty	0.0003717	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02
Heavy Duty	0.0006131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.04	0.04	0.04

CO	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Light Duty	0.0033327	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.52	0.47	0.60	0.75	0.75
Medium Duty	0.0030301	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.11	0.10	0.15	0.16	0.16
Heavy Duty	0.0043046	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.63	0.58	0.75	0.91	0.91

NOx	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Light Duty	0.0005080	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.07	0.09	0.11	0.11
Medium Duty	0.0082326	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.30	0.28	0.41	0.44	0.44
Heavy Duty	0.0154328	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.38	0.35	0.50	0.56	0.56

SOx	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PM10	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Light Duty Exhaust	0.0001064	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02
Medium Duty Exhaust	0.0004787	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.03	0.03
Heavy Duty Exhaust	0.0004727	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.04	0.05	0.05
Light Duty Fugitive(2)	0.000221	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.04	0.05	0.05
Medium Duty Fugitve(2)	0.000467	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.03	0.03
Heavy Duty Fugitive(2)	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.06	0.07	0.07
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.09	0.08	0.11	0.12	0.12

CO_{2EQ}	**2017**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Light Duty	0.907	0.00	0.00	0.00	0.00	0.00	0.00	141.50	141.50	128.80	163.26	203.17	203.17
Medium Duty	2.261	0.00	0.00	0.00	0.00	0.00	0.00	76.88	81.40	76.88	113.05	122.10	122.10
Heavy Duty	3.768	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	218.37	222.89	205.67	276.32	325.27	325.27

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2017		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8956	2.2575	3.7642
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.907	2.261	3.768

Appendix B
Tesoro Integration and Compliance Project

Onsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day) 13	14	15	16	17	18	19	20	21	22	23	24
Cars	2	0	0	0	0	0	0	0	0	0	0	0	0
Pickup Trucks	2	94	94	94	99	89	77	76	86	31	38	38	26
Total Light Vehicle Miles		188	188	188	198	178	154	152	172	62	76	76	52
Water Truck	2	15	15	15	15	15	15	15	15	15	15	10	10
Delivery Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	2	9	9	10	11	10	8	8	10	4	5	6	4
Misc. MD Truck	5	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		48	48	50	52	50	46	46	50	38	40	32	28
Truck, Dump Ford LT8000	2	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Semi-Tractor, Diesel 20 Ton	2	0	0	0	0	0	0	0	0	0	0	0	0
Misc. HD Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2018**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Light Duty	0.0000636	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Medium Duty	0.0002639	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0005354	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01

CO	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0024424	0.46	0.46	0.46	0.48	0.43	0.38	0.37	0.42	0.15	0.19	0.19	0.13
Medium Duty	0.0019739	0.09	0.09	0.10	0.10	0.10	0.09	0.09	0.10	0.08	0.08	0.06	0.06
Heavy Duty	0.0038177	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.55	0.55	0.56	0.59	0.53	0.47	0.46	0.52	0.23	0.26	0.25	0.18

NOx	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0003881	0.07	0.07	0.07	0.08	0.07	0.06	0.06	0.07	0.02	0.03	0.03	0.02
Medium Duty	0.0053355	0.26	0.26	0.27	0.28	0.27	0.25	0.25	0.27	0.20	0.21	0.17	0.15
Heavy Duty	0.0114857	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.33	0.33	0.34	0.35	0.34	0.31	0.30	0.33	0.23	0.24	0.20	0.17

SOx	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000216	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PM10	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty Exhaust	0.0001058	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Medium Duty Exhaust	0.0004105	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Heavy Duty Exhaust	0.0004029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.02	0.02	0.02	0.02
Light Duty Fugitive(2)	0.000221	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.01	0.02	0.02	0.01
Medium Duty Fugitve(2)	0.000467	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Heavy Duty Fugitive(2)	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.03	0.04	0.03	0.02
Total		0.10	0.10	0.11	0.11	0.10	0.09	0.09	0.10	0.05	0.06	0.05	0.04

CO_{2EQ}	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.908	170.69	170.69	170.69	179.76	161.61	139.82	138.00	156.16	56.29	69.00	69.00	47.21
Medium Duty	2.256	108.27	108.27	112.78	117.30	112.78	103.76	103.76	112.78	85.72	90.23	72.18	63.16
Heavy Duty	3.759	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		278.96	278.96	283.47	297.06	274.39	243.58	241.76	268.94	142.01	159.23	141.18	110.37

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,

and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2018 Light	Medium	Heavy
CO2 (lb/mi)	0.8965	2.2522	3.7551
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.908	2.256	3.759

Onsite Construction Vehicle Trip Emissions

		Month (Vehicles per day)											
Vehicle	**Miles per Day**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Cars	2	0	0	0	0	0	0	0	0	0	0	0	0
Pickup Trucks	2	36	50	62	53	49	49	49	52	38	38	38	38
Total Light Vehicle Miles		72	100	124	106	98	98	98	104	76	76	76	76
Water Truck	2	12	12	12	12	12	12	12	12	12	12	12	12
Delivery Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	2	5	6	7	5	5	5	5	5	3	3	3	3
Misc. MD Truck	5	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		34	36	38	34	34	34	34	34	30	30	30	30
Truck, Dump Ford LT8000	2	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Semi-Tractor, Diesel 20 Ton	2	0	0	0	0	0	0	0	0	0	0	0	0
Misc. HD Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0000548	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Medium Duty	0.0002379	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0005283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

CO	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0022305	0.16	0.22	0.28	0.24	0.22	0.22	0.22	0.23	0.17	0.17	0.17	0.17
Medium Duty	0.0017339	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05
Heavy Duty	0.0037678	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.22	0.29	0.34	0.30	0.28	0.28	0.28	0.29	0.22	0.22	0.22	0.22

NOx	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0003585	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03
Medium Duty	0.0046291	0.16	0.17	0.18	0.16	0.16	0.16	0.16	0.16	0.14	0.14	0.14	0.14
Heavy Duty	0.0107049	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.18	0.20	0.22	0.20	0.19	0.19	0.19	0.19	0.17	0.17	0.17	0.17

SOx	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000357	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PM10	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty Exhaust	0.0001057	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Exhaust	0.0003940	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty Exhaust	0.0004031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Light Duty Fugitive(2)	0.000221	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Medium Duty Fugitve(2)	0.000467	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Heavy Duty Fugitive(2)	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.03	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03
Total		0.05	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05

CO_{2EQ}	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.906	65.26	90.63	112.38	96.07	88.82	88.82	88.82	94.26	68.88	68.88	68.88	68.88
Medium Duty	2.247	76.38	80.87	85.37	76.38	76.38	76.38	76.38	76.38	67.40	67.40	67.40	67.40
Heavy Duty	3.745	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		141.64	171.51	197.75	172.45	165.20	165.20	165.20	170.64	136.28	136.28	136.28	136.28

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)
(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,
and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310
where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.
where light vehicle are gasoline light duty trucks.
where medium/heavy duty vehicle are diesel heavy duty trucks.

	2019		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Appendix B
Tesoro Integration and Compliance Project

Onsite Construction Vehicle Trip Emissions

		Month (Vehicles per day)											
Vehicle	**Miles per Day**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Cars	2	0	0	0	0	0	0	0	0	0	0	0	0
Pickup Trucks	2	26	26	26	26	26	26	26	26	26	26	26	26
Total Light Vehicle Miles		52	52	52	52	52	52	52	52	52	52	52	52
Water Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Delivery Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	2	2	2	2	2	2	2	2	2	2	2	2	2
Misc. MD Truck	5	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		4	4	4	4	4	4	4	4	4	4	4	4
Truck, Dump Ford LT8000	2	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Semi-Tractor, Diesel 20 Ton	2	0	0	0	0	0	0	0	0	0	0	0	0
Misc. HD Truck	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)[1]	Month (lb/day)											
VOC	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0000500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0002070	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0005255	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0020822	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Medium Duty	0.0014978	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0037333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
NOx	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0003340	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Medium Duty	0.0036069	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0094828	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
SOx	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000357	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty Exhaust	0.0001057	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Exhaust	0.0003696	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Light Duty Fugitive[2]	0.000221	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Fugitve[2]	0.000467	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CO_{2EQ}	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.907	47.14	47.14	47.14	47.14	47.14	47.14	47.14	47.14	47.14	47.14	47.14	47.14
Medium Duty	2.244	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98
Heavy Duty	3.742	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		56.12	56.12	56.12	56.12	56.12	56.12	56.12	56.12	56.12	56.12	56.12	56.12

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2020		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8952	2.2405	3.7388
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.907	2.244	3.742

Appendix B
Tesoro Integration and Compliance Project

Onsite Construction Vehicle Trip Emissions

		Month (Vehicles per day)											
Vehicle	**Miles per Day**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Cars	2												
Pickup Trucks	2	12	12	12	12	12	12	12	12	12	12	12	12
Total Light Vehicle Miles		24	24	24	24	24	24	24	24	24	24	24	24
Water Truck	2	1	1	1	1	1	1	1	1	1	1	1	1
Delivery Truck	2												
1 Ton Truck	2	1	1	1	1	1	1	1	1	1	1	1	1
Misc. MD Truck	5												
Total Medium Truck Miles		4	4	4	4	4	4	4	4	4	4	4	4
Truck, Dump Ford LT8000	2												
Concrete Truck	2												
Semi-Tractor, Diesel 20 Ton	2												
Misc. HD Truck	2												
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0000468	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0001899	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0005326	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CO	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0019703	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Medium Duty	0.0013312	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0037449	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

NOx	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0003142	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty	0.0026402	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0082454	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

SOx	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000357	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PM10	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty Exhaust	0.0001057	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Exhaust	0.0003460	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Duty Fugitive(2)	0.000230	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Fugitve(2)	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive(2)	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

CO_{2EQ}	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.909	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82	21.82
Medium Duty	2.243	8.97	8.97	8.97	8.97	8.97	8.97	8.97	8.97	8.97	8.97	8.97	8.97
Heavy Duty	3.741	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		30.79	30.79	30.79	30.79	30.79	30.79	30.79	30.79	30.79	30.79	30.79	30.79

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2021		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8978	2.2393	3.7375
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.909	2.243	3.741

Appendix B
Tesoro Integration and Compliance Project

Onsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day)											
		61	62	63	64	65	66	67	68	69	70	71	72
Cars	2												
Pickup Trucks	2	12	12	12	12	12	12	12	12	12	12	12	12
Total Light Vehicle Miles		24	24	24	24	24	24	24	24	24	24	24	24
Water Truck	2	1	1	1	1	1	1	1	1	1	1	1	1
Delivery Truck	2												
1 Ton Truck	2	1	1	1	1	1	1	1	1	1	1	1	1
Misc. MD Truck	5												
Total Medium Truck Miles		4	4	4	4	4	4	4	4	4	4	4	4
Truck, Dump Ford LT8000	2												
Concrete Truck	2												
Semi-Tractor, Diesel 20 Ton	2												
Misc. HD Truck	2												
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)[1]	Month (lb/day)											
VOC	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0000334	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0001827	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0002879	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0015625	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Medium Duty	0.0047700	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Heavy Duty	0.0023005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
NOx	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0001816	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0026666	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0079545	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
SOx	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0000066	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000242	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000327	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty Exhaust	0.0001053	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Exhaust	0.0003687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0002447	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Duty Fugitive[2]	0.000230	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Fugitve[2]	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CO_{2EQ}	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.674	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18
Medium Duty	2.443	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77
Heavy Duty	3.567	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2022		
Chemical	Light	Medium	Heavy
CO2 (lb/mi)	0.6628	2.4390	3.5635
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.674	2.443	3.567

Appendix B
Tesoro Integration and Compliance Project

Onsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day) 73	74	75	76	77	78	79	80	81	82	83	84
Cars	2												
Pickup Trucks	2	12	12	12	12	12	12	12	12	12	12	12	12
Total Light Vehicle Miles		24	24	24	24	24	24	24	24	24	24	24	24
Water Truck	2	1	1	1	1	1	1	1	1	1	1	1	1
Delivery Truck	2												
1 Ton Truck	2	1	1	1	1	1	1	1	1	1	1	1	1
Misc. MD Truck	5												
Total Medium Truck Miles		4	4	4	4	4	4	4	4	4	4	4	4
Truck, Dump Ford LT8000	2												
Concrete Truck	2												
Semi-Tractor, Diesel 20 Ton	2												
Misc. HD Truck	2												
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0000334	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0001827	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0002879	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0015625	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Medium Duty	0.0047700	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Heavy Duty	0.0023005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
NOx	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0001816	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0026666	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty	0.0079545	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
SOx	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0000066	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000242	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000327	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty Exhaust	0.0001053	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Exhaust	0.0003687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0002447	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Duty Fugitive(2)	0.000230	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Medium Duty Fugitve(2)	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive(2)	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CO_{2EQ}	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.674	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18	16.18
Medium Duty	2.443	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77	9.77
Heavy Duty	3.567	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95	25.95

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2023 Light	Medium	Heavy
CO2 (lb/mi)	0.6628	2.4390	3.5635
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.674	2.443	3.567

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Emission Calculations for Offsite Onroad Vehicles

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Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day) 1	2	3	4	5	6	7	8	9	10	11	12
Tradesmen	29.4	0	0	0	0	0	0	309	328	301	366	488	488
Construction Staff	29.4						0	40	40	40	40	40	40
Total Light Vehicle Miles		0	0	0	0	0	0	10260.6	10819.2	10025.4	11936.4	15523.2	15523.2
Water Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Delivery Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Misc. MD Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40	0	0	0	0	0	0	0	0	0	0	0	0
Hazardous Dump Trucks	400	0	0	0	0	0	0	15	15	15	15	6	6
Non-Haz Dump Trucks	200	0	0	0	0	0	0	13	13	12	12	18	18
Misc. HD Truck	40	0	0	0	0	0	0	27	27	19	19	30	25
Total Heavy Truck Miles		0	0	0	0	0	0	9680	9680	9160	9160	7200	7000

	Emission Rate (lb/mi)[1]	Month (lb/day)											
VOC	2017	1	2	3	4	5	6	7	8	9	10	11	12
Light Duty	0.0001035	0.00	0.00	0.00	0.00	0.00	0.00	1.06	1.12	1.04	1.23	1.61	1.61
Medium Duty	0.0003717	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0006131	0.00	0.00	0.00	0.00	0.00	0.00	5.93	5.93	5.62	5.62	4.41	4.29
Total		0.00	0.00	0.00	0.00	0.00	0.00	7.00	7.05	6.65	6.85	6.02	5.90

CO	2017	1	2	3	4	5	6	7	8	9	10	11	12
Light Duty	0.0033327	0.00	0.00	0.00	0.00	0.00	0.00	34.20	36.06	33.41	39.78	51.73	51.73
Medium Duty	0.0030301	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0043046	0.00	0.00	0.00	0.00	0.00	0.00	41.67	41.67	39.43	39.43	30.99	30.13
Total		0.00	0.00	0.00	0.00	0.00	0.00	75.86	77.73	72.84	79.21	82.73	81.87

NOx	2017	1	2	3	4	5	6	7	8	9	10	11	12
Light Duty	0.0005080	0.00	0.00	0.00	0.00	0.00	0.00	5.21	5.50	5.09	6.06	7.89	7.89
Medium Duty	0.0082326	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0154328	0.00	0.00	0.00	0.00	0.00	0.00	149.39	149.39	141.36	141.36	111.12	108.03
Total		0.00	0.00	0.00	0.00	0.00	0.00	154.60	154.89	146.46	147.43	119.00	115.92

SOx	2017	1	2	3	4	5	6	7	8	9	10	11	12
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.10	0.09	0.11	0.14	0.14
Medium Duty	0.0000217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000359	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.35	0.33	0.33	0.26	0.25
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.45	0.42	0.44	0.40	0.39

PM10	2017	1	2	3	4	5	6	7	8	9	10	11	12
Light Duty Exhaust	0.0001064	0.00	0.00	0.00	0.00	0.00	0.00	1.09	1.15	1.07	1.27	1.65	1.65
Medium Duty Exhaust	0.0004787	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004727	0.00	0.00	0.00	0.00	0.00	0.00	4.58	4.58	4.33	4.33	3.40	3.31
Total Exhaust PM		0.00	0.00	0.00	0.00	0.00	0.00	5.67	5.73	5.40	5.60	5.05	4.96
Light Duty Fugitive[2]	0.000221	0.00	0.00	0.00	0.00	0.00	0.00	2.27	2.39	2.22	2.64	3.43	3.43
Medium Duty Fugitve[2]	0.000467	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	22.40	22.40	21.20	21.20	16.66	16.20
Total Fugitive PM		0.00	0.00	0.00	0.00	0.00	0.00	24.67	24.79	23.41	23.84	20.09	19.63
Total		0.00	0.00	0.00	0.00	0.00	0.00	30.34	30.52	28.81	29.44	25.15	24.59

CO_{2EQ}	2017	1	2	3	4	5	6	7	8	9	10	11	12
Light Duty	0.907	0.00	0.00	0.00	0.00	0.00	0.00	9306.64	9813.31	9093.31	10826.64	14079.96	14079.96
Medium Duty	2.261	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.768	0.00	0.00	0.00	0.00	0.00	0.00	36471.82	36471.82	34512.59	34512.59	27127.80	26374.25
Total		0.00	0.00	0.00	0.00	0.00	0.00	45778.46	46285.13	43605.90	45339.23	41207.76	40454.21

(1) Emfac2011 emission factors for the South Coast Air District.
(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011
$E = k(sL)^{0.91} \times (W)^{1.02}$
Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)
(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)
(3) Carbon Dioxide Equivalence (CQ) = $CO_2 + CH_4 * 21 + N2O*310$
where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.
where light vehicle are gasoline light duty trucks.
where medium/heavy duty vehicle are diesel heavy duty trucks.

	2017		
Chemical	Light	Medium	Heavy
CO2 (lb/mi)	0.8956	2.2575	3.7642
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.907	2.261	3.768

Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	13	14	15	16	17	18	19	20	21	22	23	24
		Month (Vehicles per day)											
Tradesmen	29.4	474	474	436	410	346	325	325	397	152	179	198	128
Construction Staff	29.4	40	40	40	40	40	40	40	40	40	40	40	40
Total Light Vehicle Miles		15111.6	15111.6	13994.4	13230	11348.4	10731	10731	12847.8	5644.8	6438.6	6997.2	4939.2
Water Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Delivery Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Misc. MD Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40	0	0	0	0	0	0	0	0	0	0	0	0
Hazardous Dump Trucks	400	6	9	9	9	9	9	4	4	4	1	1	1
Non-Haz Dump Trucks	200	18	20	20	20	20	20	10	10	10	6	6	6
Misc. HD Truck	40	25	36	36	44	44	44	47	47	47	62	62	62
Total Heavy Truck Miles		7000	9040	9040	9360	9360	9360	5480	5480	5480	4080	4080	4080

	Emission Rate (lb/mi)[1]	Month (lb/day)											
VOC	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0000636	0.96	0.96	0.89	0.84	0.72	0.68	0.68	0.82	0.36	0.41	0.44	0.31
Medium Duty	0.0002639	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0005354	3.75	4.84	4.84	5.01	5.01	5.01	2.93	2.93	2.93	2.18	2.18	2.18
Total		4.71	5.80	5.73	5.85	5.73	5.69	3.62	3.75	3.29	2.59	2.63	2.50

CO	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0024424	36.91	36.91	34.18	32.31	27.72	26.21	26.21	31.38	13.79	15.73	17.09	12.06
Medium Duty	0.0019739	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0038177	26.72	34.51	34.51	35.73	35.73	35.73	20.92	20.92	20.92	15.58	15.58	15.58
Total		63.63	71.42	68.69	68.05	63.45	61.94	47.13	52.30	34.71	31.30	32.67	27.64

NOx	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0003881	5.86	5.86	5.43	5.13	4.40	4.16	4.16	4.99	2.19	2.50	2.72	1.92
Medium Duty	0.0053355	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0114857	80.40	103.83	103.83	107.51	107.51	107.51	62.94	62.94	62.94	46.86	46.86	46.86
Total		86.26	109.70	109.26	112.64	111.91	111.67	67.11	67.93	65.13	49.36	49.58	48.78

SOx	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.0000090	0.14	0.14	0.13	0.12	0.10	0.10	0.10	0.12	0.05	0.06	0.06	0.04
Medium Duty	0.0000216	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000359	0.25	0.32	0.32	0.34	0.34	0.34	0.20	0.20	0.20	0.15	0.15	0.15
Total		0.39	0.46	0.45	0.45	0.44	0.43	0.29	0.31	0.25	0.20	0.21	0.19

PM10	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty Exhaust	0.0001058	1.60	1.60	1.48	1.40	1.20	1.14	1.14	1.36	0.60	0.68	0.74	0.52
Medium Duty Exhaust	0.0004105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004029	2.82	3.64	3.64	3.77	3.77	3.77	2.21	2.21	2.21	1.64	1.64	1.64
Total Exhaust PM		4.42	5.24	5.12	5.17	4.97	4.91	3.34	3.57	2.81	2.32	2.38	2.17
Light Duty Fugitive[2]	0.000221	3.34	3.34	3.09	2.92	2.51	2.37	2.37	2.84	1.25	1.42	1.55	1.09
Medium Duty Fugitve[2]	0.000467	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.002314	16.20	20.92	20.92	21.66	21.66	21.66	12.68	12.68	12.68	9.44	9.44	9.44
Total Fugitive PM		19.54	24.26	24.01	24.59	24.17	24.03	15.05	15.52	13.93	10.87	10.99	10.53
Total		23.96	29.50	29.14	29.76	29.14	28.94	18.40	19.09	16.73	13.19	13.37	12.70

CO_{2EQ}	2018	13	14	15	16	17	18	19	20	21	22	23	24
Light Duty	0.908	13719.85	13719.85	12705.55	12011.55	10303.24	9742.70	9742.70	11664.55	5124.93	5845.62	6352.77	4484.31
Medium Duty	2.256	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.759	26310.00	33977.49	33977.49	35180.23	35180.23	35180.23	20596.97	20596.97	20596.97	15334.97	15334.97	15334.97
Total		40029.86	47697.35	46683.04	47191.78	45483.47	44922.93	30339.67	32261.52	25721.90	21180.59	21687.75	19819.28

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CQ) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	Light (2018)	Medium (2018)	Heavy (2018)
CO2 (lb/mi)	0.8965	2.2522	3.7551
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.908	2.256	3.759

Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day) 25	26	27	28	29	30	31	32	33	34	35	36
Tradesmen	29.4	140	196	196	163	163	163	163	207	114	114	114	114
Construction Staff	29.4	40	40	40	40	40	40	40	40	40	40	40	40
Total Light Vehicle Miles		5292	6938.4	6938.4	5968.2	5968.2	5968.2	5968.2	7261.8	4527.6	4527.6	4527.6	4527.6
Water Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Delivery Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Misc. MD Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40	0	0	0	0	0	0	0	0	0	0	0	0
Hazardous Dump Trucks	400	1	1	1	1	2	2	2	1	1	1	0	0
Non-Haz Dump Trucks	200	6	4	4	4	1	1	1	1	1	1	1	1
Misc. HD Truck	40	62	66	62	62	55	55	55	10	10	10	7	7
Total Heavy Truck Miles		4080	3840	3680	3680	3200	3200	3200	1000	1000	1000	480	480

	Emission Rate (lb/mi)[1]	Month (lb/day)											
VOC	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0000548	0.29	0.38	0.38	0.33	0.33	0.33	0.33	0.40	0.25	0.25	0.25	0.25
Medium Duty	0.0002379	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0005283	2.16	2.03	1.94	1.94	1.69	1.69	1.69	0.53	0.53	0.53	0.25	0.25
Total		2.45	2.41	2.32	2.27	2.02	2.02	2.02	0.93	0.78	0.78	0.50	0.50
CO	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0022305	11.80	15.48	15.48	13.31	13.31	13.31	13.31	16.20	10.10	10.10	10.10	10.10
Medium Duty	0.0017339	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0037678	15.37	14.47	13.87	13.87	12.06	12.06	12.06	3.77	3.77	3.77	1.81	1.81
Total		27.18	29.94	29.34	27.18	25.37	25.37	25.37	19.97	13.87	13.87	11.91	11.91
NOx	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0003585	1.90	2.49	2.49	2.14	2.14	2.14	2.14	2.60	1.62	1.62	1.62	1.62
Medium Duty	0.0046291	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0107049	43.68	41.11	39.39	39.39	34.26	34.26	34.26	10.70	10.70	10.70	5.14	5.14
Total		45.57	43.59	41.88	41.53	36.40	36.40	36.40	13.31	12.33	12.33	6.76	6.76
SOx	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.0000090	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.07	0.04	0.04	0.04	0.04
Medium Duty	0.0000215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000357	0.15	0.14	0.13	0.13	0.11	0.11	0.11	0.04	0.04	0.04	0.02	0.02
Total		0.19	0.20	0.19	0.18	0.17	0.17	0.17	0.10	0.08	0.08	0.06	0.06
PM10	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty Exhaust	0.0001057	0.56	0.73	0.73	0.63	0.63	0.63	0.63	0.77	0.48	0.48	0.48	0.48
Medium Duty Exhaust	0.0003940	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004031	1.64	1.55	1.48	1.48	1.29	1.29	1.29	0.40	0.40	0.40	0.19	0.19
Total Exhaust PM		2.20	2.28	2.22	2.11	1.92	1.92	1.92	1.17	0.88	0.88	0.67	0.67
Light Duty Fugitive[2]	0.000230	1.22	1.60	1.60	1.38	1.38	1.38	1.38	1.67	1.04	1.04	1.04	1.04
Medium Duty Fugitve[2]	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.002314	9.44	8.89	8.52	8.52	7.41	7.41	7.41	2.31	2.31	2.31	1.11	1.11
Total Fugitive PM		10.66	10.49	10.12	9.89	8.78	8.78	8.78	3.99	3.36	3.36	2.15	2.15
Total		12.87	12.77	12.33	12.01	10.70	10.70	10.70	5.16	4.24	4.24	2.83	2.83
CO_{2EQ}	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
Light Duty	0.906	4796.24	6288.41	6288.41	5409.10	5409.10	5409.10	5409.10	6581.51	4103.45	4103.45	4103.45	4103.45
Medium Duty	2.247	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.745	15280.70	14381.83	13782.59	13782.59	11984.86	11984.86	11984.86	3745.27	3745.27	3745.27	1797.73	1797.73
Total		20076.94	20670.24	20071.00	19191.68	17393.96	17393.96	17393.96	10326.78	7848.72	7848.72	5901.18	5901.18

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,

and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO2) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019 Light	Medium	Heavy
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day) 37	38	39	40	41	42	43	44	45	46	47	48
Tradesmen	29.4	114	114	114	114	114	114	114	114	114	114	114	114
Construction Staff	29.4	40	40	40	40	40	40	40	40	40	40	40	40
Total Light Vehicle Miles		4527.6	4527.6	4527.6	4527.6	4527.6	4527.6	4527.6	4527.6	4527.6	4527.6	4527.6	4527.6
Water Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Delivery Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
1 Ton Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Misc. MD Truck	40	0	0	0	0	0	0	0	0	0	0	0	0
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40	0	0	0	0	0	0	0	0	0	0	0	0
Hazardous Dump Trucks	400	0	0	0	0	0	0	0	0	0	0	0	0
Non-Haz Dump Trucks	200	1	0	0	0	0	0	0	0	0	0	0	0
Misc. HD Truck	40	7	5	5	5	5	5	5	5	5	5	5	5
Total Heavy Truck Miles		480	200	200	200	200	200	200	200	200	200	200	200

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0000500	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Medium Duty	0.0002070	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0005255	0.25	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Total		0.48	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
CO	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0020822	9.43	9.43	9.43	9.43	9.43	9.43	9.43	9.43	9.43	9.43	9.43	9.43
Medium Duty	0.0014978	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0037333	1.79	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total		11.22	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17	10.17
NOx	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0003340	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51
Medium Duty	0.0036069	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0094828	4.55	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Total		6.06	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41
SOx	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.0000090	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Medium Duty	0.0000215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000357	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PM10	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty Exhaust	0.0001057	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Medium Duty Exhaust	0.0003696	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004016	0.19	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Total Exhaust PM		0.67	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Light Duty Fugitive(2)	0.000221	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium Duty Fugitve(2)	0.000467	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive(2)	0.002314	1.11	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total Fugitive PM		2.11	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46
Total		2.78	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
CO_{2EQ}	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
Light Duty	0.907	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66	4104.66
Medium Duty	2.244	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.742	1796.31	748.46	748.46	748.46	748.46	748.46	748.46	748.46	748.46	748.46	748.46	748.46
Total		5900.97	4853.13	4853.13	4853.13	4853.13	4853.13	4853.13	4853.13	4853.13	4853.13	4853.13	4853.13

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_2) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2020		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.8952	2.2405	3.7388
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.907	2.244	3.742

Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Month (Vehicles per day) 49	50	51	52	53	54	55	56	57	58	59	60
Tradesmen	29.4	58	58	58	58	58	58	58	58	58	58	58	58
Construction Staff	29.4	40	40	40	40	40	40	40	40	40	40	40	40
Total Light Vehicle Miles		2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2
Water Truck	40												
Delivery Truck	40												
1 Ton Truck	40												
Misc. MD Truck	40												
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40												
Hazardous Dump Trucks	400												
Non-Haz Dump Trucks	200												
Misc. HD Truck	40	5	5	5	5	5	5	5	5	5	5	5	5
Total Heavy Truck Miles		200	200	200	200	200	200	200	200	200	200	200	200

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0000468	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Medium Duty	0.0001899	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0005326	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Total		0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
CO	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0019703	5.68	5.68	5.68	5.68	5.68	5.68	5.68	5.68	5.68	5.68	5.68	5.68
Medium Duty	0.0013312	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0037449	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total		6.43	6.43	6.43	6.43	6.43	6.43	6.43	6.43	6.43	6.43	6.43	6.43
NOx	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0003142	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Medium Duty	0.0026402	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0082454	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Total		2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
SOx	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.0000090	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Medium Duty	0.0000215	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000357	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PM10	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty Exhaust	0.0001057	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Medium Duty Exhaust	0.0003460	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0004000	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Total Exhaust PM		0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Light Duty Fugitive(2)	0.000230	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Medium Duty Fugitve(2)	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive(2)	0.002314	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total Fugitive PM		1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Total		1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51
CO_{2EQ}	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
Light Duty	0.909	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58	2619.58
Medium Duty	2.243	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.741	748.21	748.21	748.21	748.21	748.21	748.21	748.21	748.21	748.21	748.21	748.21	748.21
Total		3367.79	3367.79	3367.79	3367.79	3367.79	3367.79	3367.79	3367.79	3367.79	3367.79	3367.79	3367.79

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_2) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2021 Light	Medium	Heavy
CO2 (lb/mi)	0.8978	2.2393	3.7375
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.909	2.243	3.741

Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

		Month (Vehicles per day)											
Vehicle	**Miles per Day**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Tradesmen	29.4	58	58	58	58	58	58	58	58	58	58	58	58
Construction Staff	29.4	40	40	40	40	40	40	40	40	40	40	40	40
Total Light Vehicle Miles		2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2
Water Truck	40												
Delivery Truck	40	0	0	0									
1 Ton Truck	40	0	0	0									
Misc. MD Truck	40	0	0	0									
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40	0	0	0									
Hazardous Dump Trucks	400	0	0	0	0								
Non-Haz Dump Trucks	200	0	0	0	0								
Misc. HD Truck	40	5	5	5	5	5	5	5	5	5	5	5	5
Total Heavy Truck Miles		200	200	200	200	200	200	200	200	200	200	200	200

	Emission Rate (lb/mi)(1)	Month (lb/day)											
VOC	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0000334	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Medium Duty	0.0001827	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0002879	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Total		0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
CO	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0015625	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Medium Duty	0.0047700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0023005	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total		4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96
NOx	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0001816	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Medium Duty	0.0026666	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0079545	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Total		2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11
SOx	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.0000066	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Medium Duty	0.0000242	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000327	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PM10	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty Exhaust	0.0001053	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Medium Duty Exhaust	0.0003687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0002447	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Total Exhaust PM		0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Light Duty Fugitive(2)	0.000230	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Medium Duty Fugitve(2)	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive(2)	0.002314	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total Fugitive PM		1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Total		1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
CO_{2EQ}	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
Light Duty	0.674	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41
Medium Duty	2.443	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.567	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40
Total		2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} x (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)
(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,
and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CO_2) = CO_2 + CH_4 * 21 + N2O*310
where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.
where light vehicle are gasoline light duty trucks.
where medium/heavy duty vehicle are diesel heavy duty trucks.

	2022		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.6628	2.4390	3.5635
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.674	2.443	3.567

Appendix B
Tesoro Integration and Compliance Project

Offsite Construction Vehicle Trip Emissions

		Month (Vehicles per day)											
Vehicle	**Miles per Day**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Tradesmen	29.4	58	58	58	58	58	58	58	58	58	58	58	58
Construction Staff	29.4	40	40	40	40	40	40	40	40	40	40	40	40
Total Light Vehicle Miles		2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2	2881.2
Water Truck	40												
Delivery Truck	40	0	0	0									
1 Ton Truck	40	0	0	0									
Misc. MD Truck	40	0	0	0									
Total Medium Truck Miles		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Dump Ford LT8000	40	0	0	0									
Hazardous Dump Trucks	400	0	0	0	0								
Non-Haz Dump Trucks	200	0	0	0	0								
Misc. HD Truck	40	5	5	5	5	5	5	5	5	5	5	5	5
Total Heavy Truck Miles		200	200	200	200	200	200	200	200	200	200	200	200

	Emission Rate (lb/mi)[1]	Month (lb/day)											
VOC	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0000334	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Medium Duty	0.0001827	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0002879	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Total		0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
CO	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0015625	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Medium Duty	0.0047700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0023005	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total		4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96
NOx	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0001816	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Medium Duty	0.0026666	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0079545	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Total		2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11
SOx	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.0000066	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Medium Duty	0.0000242	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000327	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PM10	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty Exhaust	0.0001053	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Medium Duty Exhaust	0.0003687	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Exhaust	0.0002447	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Total Exhaust PM		0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Light Duty Fugitive[2]	0.000230	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Medium Duty Fugitve[2]	0.000515	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty Fugitive[2]	0.002314	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total Fugitive PM		1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Total		1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
CO_{2EQ}	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
Light Duty	0.674	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41	1942.41
Medium Duty	2.443	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	3.567	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40	713.40
Total		2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81	2655.81

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(3) Carbon Dioxide Equivalence (CQ) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

	2023		
Chemical	**Light**	**Medium**	**Heavy**
CO2 (lb/mi)	0.6628	2.4390	3.5635
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.674	2.443	3.567

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Fugitive Dust Emission Calculations for Offroad Vehicles

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Appendix B
Tesoro Integration and Compliance Project

Offroad Construction Vehicle Dust Emissions

Vehicle	Miles/Trip	Trips/Day
Light Vehicles	0.05	10
Total Light Vehicle Miles		0.5
Delivey Trucks	0.05	0
Water Trucks	0.1	10
Total Medium Truck Miles		1
Concrete Truck	0.05	0
Dump Trucks	0.05	40
Total Heavy Truck Miles		2
Tractors	0.05	13
Fork Lifts	0.05	10
Loader/Backhoe	0.05	6
Total Heavy-Heavy Duty Miles		1.45

PM10	Emission Rate (lb/mi)[1]	Emissions (lb/day)
Light Duty	0.9021196	0.45
Medium Duty	1.2863357	1.29
Heavy Duty	2.1931267	4.39
Heavy Heavy Duty	2.4962390	3.62
Uncontrolled Total		9.74
Controlled Total[2]		3.80

(1) Based on Section 13.2.2 of EPA's Compilation of Air Pollutant Emission Factors (AP-42).
Emission Rate = 1.5((s/12)^.9)*((W/3)^.45)
s = silt content = 8.5%
W = Vehicle Weight (ton) =2.5 for light, 5.5 for medium, 15 for heavy,
and 24 for heavy heavy (EMFAC2007).

(2) Controlled Emissions assume that watering 3 times per day reduces emissions by 61 percent (Uncontrolled Emissions x 0.39)

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Coating Emissions

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Appendix B
Tesoro Integration and Compliance Project

Paint Emissions

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
Volume paint applied per day (gal)	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
VOC content (lb/gal)(1)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
VOC Emissions (lb/day)	0.0	0.0	0.0	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Month	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Volume paint applied per day (gal)			75.0	75.0	75.0																75.0	75.0	75.0													75.0	75.0	75.0
VOC content (lb/gal)(1)	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
VOC Emissions (lb/day)	0.0	0.0	62.3	62.3	62.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.3	62.3	62.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.3	62.3	62.3

(1) Based on SCAQMD Rule 1113 VOC limit of 100g/L for industrial maintenance coatings.

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Fugitive Dust Emissions from Earthmoving Operations

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Appendix B
Tesoro Integration and Compliance Project

Peak Monthly Fugitive PM Construction Emissions

Grading Operations	Average Pieces of Equipment Operating	Peak Pieces of Equipment Operating	Hours of Operation	PM10 Emission Factor (lb/hour)	Water Control Factor[5]	Controlled Emissions Average PM10 Emissions (lbs/day)	Controlled Emissions Peak PM10 Emissions (lbs/day)	Uncontrolled Emissions Average PM10 Emissions (lbs/day)	Uncontrolled Emissions Peak PM10 Emissions (lbs/day)	SCAQMD Emission Factor Source
Construction Activities[1]	2	2	8	0.348	0.39	2.17	2.17	5.56218435	5.56218435	Table A9-9-F

Stockpiles	Average Tons of Materials Handled Per Day	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor[5]	Controlled Emissions Average PM10 Emissions Pounds/day	Controlled Emissions Peak PM10 Emissions Pounds/day	Uncontrolled Emissions Average PM10 Emissions Pounds/day	Uncontrolled Emissions Peak PM10 Emissions Pounds/day	SCAQMD Emission Factor Source
Construction Activities[2]	1200	1200	0.00005	0.39	0.02411771	0.02411771	0.06184029	0.06184029	Table A9-9-G

Assumptions: 1cubic yard trench spoils = 1 ton

WIND EROSION Disturbed Area and Temporary Stockpiles	Days of Construction	Average Acreage Disturbed Per Day	Peak Acreage Disturbed Per Day	PM10 Emission Factor (lb/day/acre)	Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	Average PM10 Emissions Tons/Year	Peak PM10 Emissions Tons/Year	SCAQMD Emission Factor Source
Construction Activities[3]	20	1	1	0.120	0.120	0.120	0.001	0.001	Table A9-9-E

Filling and Dumping	Estimated Materials Handled Per Day (tons)	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor[5]	Controlled Emissions Average PM10 Emissions Pounds/day	Controlled Emissions Peak PM10 Emissions Pounds/day	Uncontrolled Emissions Average PM10 Emissions Pounds/day	Uncontrolled Emissions Peak PM10 Emissions Pounds/day	SCAQMD Emission Factor Source
Truck Filling[4]	1200.0	1200.0	5.15E-05	0.39	0.02411771	0.02411771	0.06184029	0.06184029	Table A9-9
Truck Dumping	1200.0	1200.0	5.15E-05	0.39	0.02411771	0.02411771	0.06184029	0.06184029	Table A9-9

TOTAL PM10 Pounds/day	Average	Peak
(Controlled Emissions)	2.3613	2.36133
(Uncontrolled Emissions)	5.749	5.749

(1) Emissions (lbs/hr) = [0.75 x $(G^{1.5})/(H^{1.4})$ x J
where G = silt content (7.5%), H = moisture content (15.0%) and J = hrs of operation (EPA AP-42 Table 11.9-1 for bulldozing overburden).
(2) Emissions (lbs/ton) = 0.00112 x $[(G/5)^{1.3}/(H/2)^{1.4}]$ x I/J
where G=mean wind speed (4.1 mph), H=moisture content of surface material (15%); I=lbs of dirt handled per day; and J=2,000 lbs/ton. Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.
(3) Emissions (lbs/day/acre) = 1.7 x [(G/1.5)*(365-H)/235] x I/15 x J
where G = silt content (7.5%); H = days with >0.01 inch of rain (34); I = percentage of time wind speed exceeds 12 mph (0.3%) and J= fraction of TSP (0.5). Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.
(4) Used SCAQMD Table 9-9 Default emission factors.
(5) Mitigated Emissions assume that watering 3 times per day controls emissions by 61 percent (Uncontrolled Emissions x 0.39). www.AQMD.gov/CEQA/handbook/mitigation/fugitive/Table XI-A.doc

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Emission Factors for Carson Crude Terminal Equipment

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Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emission Rates

		2019 Emission Factors lb/hr[1]					
Equipment Type	**Hp**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**CO2e[2]**
<40 T Cranes	Composite	0.05255	0.3982	0.72435	0.00147	0.03337	0.03536
>40T Cranes	500	0.06159	0.3951	0.91722	0.00213	0.03694	0.05143
Pile/Drill Rig	Composite	0.03316	0.5009	0.51942	0.00243	0.01889	0.05862
Tractors	Composite	0.02277	0.3630	0.27390	0.00080	0.01634	0.01916
Welders	50	0.03313	0.2271	0.18111	0.00039	0.01522	0.00937
Light Plants	50	0.03313	0.2890	0.18111	0.00039	0.01522	0.00937
Genertors	120	0.03398	0.4663	0.37708	0.00075	0.02830	0.01796
Hydro Vacs/Pumps	120	0.03398	0.4736	0.37708	0.00075	0.02830	0.01796
Fork Lifts	Composite	0.01468	0.2166	0.22583	0.00089	0.00988	0.02146
Loader/Backhoe	Composite	0.02277	0.3630	0.27390	0.00080	0.01634	0.01916
Air Compressors	50	0.03313	0.2078	0.18111	0.00039	0.01522	0.00937
Manlifts	Composite	0.00475	0.1715	0.09788	0.00044	0.00194	0.01066
Crawler Tractors	Composite	0.06860	0.5319	0.92566	0.00201	0.04558	0.04837
Scrapers	Composite	0.11433	0.8161	1.65588	0.00390	0.06690	0.09398
Rubber Tired Loaders	Composite	0.04734	0.4436	0.60035	0.00161	0.02688	0.0387
Graders	Composite	0.06321	0.5787	0.86117	0.00170	0.03744	0.0409
Rollers	Composite	0.02435	0.3859	0.23986	0.00068	0.01451	0.01636
Excavators	Composite	0.02485	0.5140	0.31031	0.00133	0.01294	0.03212

		2020 Emission Factors lb/hr[1]					
Equipment Type	**Hp**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**CO2e[2]**
<40 T Cranes	Composite	0.04866	0.3917	0.66105	0.00147	0.03031	0.03535
>40T Cranes	500	0.05656	0.3839	0.82455	0.00213	0.03305	0.05142
Pile/Drill Rig	Composite	0.07483	0.5008	0.93803	0.00277	0.03763	0.0668
Tractors	Composite	0.03343	0.6517	0.33335	0.00120	0.01797	0.029
Welders	50	0.03084	0.2219	0.17530	0.00039	0.01410	0.00937
Light Plants	50	0.03084	0.2833	0.17530	0.00039	0.01410	0.00937
Genertors	120	0.03204	0.4641	0.35638	0.00075	0.02642	0.01798
Hydro Vacs/Pumps	120	0.03204	0.4713	0.35638	0.00075	0.02642	0.01798
Fork Lifts	Composite	0.01383	0.2160	0.21047	0.00089	0.00873	0.02147
Loader/Backhoe	Composite	0.02060	0.3616	0.24635	0.00080	0.01403	0.01915
Air Compressors	50	0.03084	0.2030	0.17530	0.00039	0.01410	0.00937
Manlifts	Composite	0.00463	0.1696	0.09324	0.00044	0.00161	0.01066
Crawler Tractors	Composite	0.06477	0.5260	0.86009	0.00201	0.04230	0.04838
Scrapers	Composite	0.10693	0.7938	1.51072	0.00390	0.06101	0.09396
Rubber Tired Loaders	Composite	0.04449	0.4406	0.55197	0.00161	0.02448	0.03871
Graders	Composite	0.06068	0.5765	0.81642	0.00170	0.03517	0.04087
Rollers	Composite	0.02288	0.3837	0.22494	0.00068	0.01333	0.01636
Excavators	Composite	0.02341	0.5124	0.28128	0.00133	0.01158	0.03211

		2021 Emission Factors lb/hr[1]					
Equipment Type	**Hp**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**CO2e[2]**
<40 T Cranes	Composite	0.04494	0.3865	0.59772	0.00147	0.02738	0.03535
>40T Cranes	500	0.05211	0.3747	0.73491	0.00213	0.02957	0.05141
Pile/Drill Rig	Composite	0.07076	0.5007	0.84125	0.00277	0.03403	0.06676
Tractors	Composite	0.03012	0.6413	0.29307	0.00120	0.01547	0.029
Welders	50	0.02904	0.2163	0.17063	0.00039	0.01328	0.00936
Light Plants	50	0.02904	0.2789	0.17063	0.00039	0.01328	0.00936
Genertors	120	0.02973	0.4617	0.33282	0.00075	0.02416	0.01798
Hydro Vacs/Pumps	120	0.02973	0.4687	0.33282	0.00075	0.02416	0.01798
Fork Lifts	Composite	0.01279	0.2148	0.19482	0.00089	0.00757	0.02147
Loader/Backhoe	Composite	0.01858	0.3606	0.22118	0.00080	0.01191	0.01916
Air Compressors	50	0.02904	0.1979	0.17063	0.00039	0.01328	0.00936
Manlifts	Composite	0.00446	0.1677	0.08926	0.00044	0.00132	0.01066
Crawler Tractors	Composite	0.06067	0.5208	0.78831	0.00201	0.03885	0.04834
Scrapers	Composite	0.09948	0.7745	1.37187	0.00390	0.05517	0.094
Rubber Tired Loaders	Composite	0.04079	0.4381	0.48855	0.00161	0.02150	0.03874
Graders	Composite	0.05664	0.5747	0.75163	0.00170	0.03199	0.04084
Rollers	Composite	0.02085	0.3816	0.20626	0.00068	0.01180	0.01636
Excavators	Composite	0.02185	0.5113	0.24844	0.00133	0.01017	0.03209

		2022 Emission Factors lb/hr[1]					
Equipment Type	**Hp**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**CO2e[2]**
<40 T Cranes	Composite	0.04494	0.3822	0.59772	0.00147	0.02738	0.03535
>40T Cranes	500	0.05211	0.3670	0.73491	0.00213	0.02957	0.05141
Pile/Drill Rig	Composite	0.07076	0.5007	0.84125	0.00277	0.03403	0.06676
Tractors	Composite	0.03012	0.6320	0.29307	0.00120	0.01547	0.029
Welders	50	0.02904	0.2134	0.17063	0.00039	0.01328	0.00936
Light Plants	50	0.02904	0.2755	0.17063	0.00039	0.01328	0.00936
Genertors	120	0.02973	0.4606	0.33282	0.00075	0.02416	0.01798
Hydro Vacs/Pumps	120	0.02973	0.4676	0.33282	0.00075	0.02416	0.01798
Fork Lifts	Composite	0.01279	0.2087	0.19482	0.00089	0.00757	0.02147
Loader/Backhoe	Composite	0.01858	0.3599	0.22118	0.00080	0.01191	0.01916
Air Compressors	50	0.02904	0.1954	0.17063	0.00039	0.01328	0.00936
Manlifts	Composite	0.00446	0.1667	0.08926	0.00044	0.00132	0.01066
Crawler Tractors	Composite	0.06067	0.5163	0.78831	0.00201	0.03885	0.04834
Scrapers	Composite	0.09948	0.7579	1.37187	0.00390	0.05517	0.094
Rubber Tired Loaders	Composite	0.04079	0.4359	0.48855	0.00161	0.02150	0.03874
Graders	Composite	0.05664	0.5732	0.75163	0.00170	0.03199	0.04084
Rollers	Composite	0.02085	0.3799	0.20626	0.00068	0.01180	0.01636
Excavators	Composite	0.02185	0.5104	0.24844	0.00133	0.01017	0.03209

		2023					
Equipment Type	**Hp**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**CO2e[2]**
<40 T Cranes	Composite	0.03735	0.3786	0.46633	0.00147	0.02150	0.03534
>40T Cranes	500	0.04169	0.3610	0.53594	0.00213	0.02168	0.0514
Pile/Drill Rig	Composite	0.05863	0.5007	0.61260	0.00277	0.02400	0.06676
Tractors	Composite	0.02417	0.6238	0.23057	0.00120	0.01091	0.02901
Welders	50	0.02491	0.2111	0.15992	0.00039	0.01119	0.00939
Light Plants	50	0.02491	0.2727	0.15992	0.00039	0.01119	0.00939
Genertors	120	0.02505	0.4597	0.28310	0.00075	0.01933	0.01797
Hydro Vacs/Pumps	120	0.02505	0.4668	0.28310	0.00075	0.01933	0.01797
Fork Lifts	Composite	0.01089	0.2146	0.16645	0.00089	0.00545	0.02147
Loader/Backhoe	Composite	0.01520	0.3593	0.17723	0.00080	0.00827	0.01919
Air Compressors	50	0.02491	0.1936	0.15992	0.00039	0.01119	0.00939
Manlifts	Composite	0.00424	0.1658	0.08311	0.00044	0.00108	0.01066
Crawler Tractors	Composite	0.04970	0.5125	0.60111	0.00201	0.03001	0.04832
Scrapers	Composite	0.08435	0.7432	1.08106	0.00390	0.04351	0.09406
Rubber Tired Loaders	Composite	0.03277	0.4340	0.35351	0.00161	0.01526	0.03878
Graders	Composite	0.04711	0.5718	0.59123	0.00169	0.02490	0.0408
Rollers	Composite	0.01665	0.3784	0.17006	0.00068	0.00872	0.01636
Excavators	Composite	0.01829	0.5097	0.18481	0.00133	0.00722	0.0321

(1) Off-Road 2011. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Carbon Dioxide Equivalents (CO_{2e}) are based on default emission factors for diesel. Metric tons per hour.

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Emission Calculations for Carson Crude Terminal Equipment

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Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

		Month											
Equipment	**Hours (hr/day)**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	8	0	0	0	0	0	0	0	0	0	0	0	0
>40T Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	0	0	0	0	0	0	0	0	0	0	0	0
Tractors	5	0	0	0	0	0	0	0	0	0	0	0	0
Welders	8	0	0	0	0	0	0	0	0	0	0	0	0
Light Plants	3	0	0	0	0	0	0	0	0	0	0	0	0
Genertors	8	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0	0	0	0	0	0	0	0	0	0	0
Fork Lifts	8	0	0	0	0	0	0	0	0	0	0	0	0
Loader/Backhoe	8	0	0	0	0	0	0	0	0	0	0	0	0
Air Compressors	8	0	0	0	0	0	0	0	0	0	0	0	0
Manlifts	8	0	0	0	0	0	0	0	0	0	0	0	0
Crawler Tractors	8	0	0	0	0	0	0	0	0	0	0	0	0
Scrapers	8	0	0	0	0	0	0	0	0	0	0	0	0
Rubber Tired Loaders	8	0	0	0	0	0	0	0	0	0	0	0	0
Graders	10	0	0	0	0	0	0	0	0	0	0	0	0
Rollers	8	0	0	0	0	0	0	0	0	0	0	0	0
Excavators	8	0	0	0	0	0	0	0	0	0	0	0	0

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.053	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crawler Tractors	0.069	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.047	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.063	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO	2019	25	26	27	28	29	30	31	32	33	34	35	36
<40 T Cranes	0.398	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.395	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.363	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.227	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.289	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.466	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.474	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.363	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.208	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.172	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crawler Tractors	0.532	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.816	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.444	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.386	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.514	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.724	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.917	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.519	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.274	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.181	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.181	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.377	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.377	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.226	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.274	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.181	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.098	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crawler Tractors	0.926	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	1.656	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.861	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.240	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.310	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crawler Tractors	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.028	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.028	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crawler Tractors	0.046	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.067	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.027	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ	**2019**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
<40 T Cranes	0.035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.059	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crawler Tractors	0.048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

		Month											
Equipment	**Hours (hr/day)**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	8	1	1	1	2	2	2	2	2	2	2	2	2
>40T Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	1	0	1	0	0	0	0	0	0	0	0	0
Tractors	5	1	1	1	1	1	1	1	1	1	1	1	1
Welders	8	0	0	0	0	0	0	0	0	0	0	0	0
Light Plants	3	2	2	2	2	2	2	2	2	2	2	2	2
Genertors	8	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0
Fork Lifts	8	1	1	1	2	2	2	2	2	2	2	2	2
Loader/Backhoe	8	1	1	1	2	2	2	2	2	2	2	2	2
Air Compressors	8	0	0	0	0	0	0	0	0	0	0	0	0
Manlifts	8	0	0	1	1	1	2	2	2	2	2	2	2
Crawler Tractors	8	1	1	1	1	0	0	0	0	0	0	0	0
Scrapers	8	1	1	1	1	0	0	0	0	0	0	0	0
Rubber Tired Loaders	8	1	1	1	1	0	0	0	0	0	0	0	0
Graders	10	1	1	1	1	0	0	0	0	0	0	0	0
Rollers	8	1	1	1	1	0	0	0	0	0	0	0	0
Excavators	8	1	1	1	1	0	0	0	0	0	0	0	0

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.049	0.39	0.39	0.39	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
>40T Cranes	0.057	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.075	0.60	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.033	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Welders	0.031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.031	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Genertors	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.032	0.00	0.08	0.08	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.014	0.11	0.11	0.11	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Loader/Backhoe	0.021	0.16	0.16	0.16	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Air Compressors	0.031	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.005	0.00	0.00	0.04	0.04	0.04	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Crawler Tractors	0.065	0.52	0.52	0.52	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.107	0.86	0.86	0.86	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.044	0.36	0.36	0.36	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.061	0.61	0.61	0.61	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.023	0.18	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.023	0.19	0.19	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		3.93	3.41	4.05	3.73	1.02	1.06	0.98	0.98	0.98	0.98	0.98	0.98

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.392	3.13	3.13	3.13	6.27	6.27	6.27	6.27	6.27	6.27	6.27	6.27	6.27
>40T Cranes	0.384	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	4.01	0.00	4.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.652	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26
Welders	0.222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.283	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
Genertors	0.464	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.471	0.00	1.18	1.18	1.18	1.18	1.18	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.216	1.73	1.73	1.73	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46
Loader/Backhoe	0.362	2.89	2.89	2.89	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79
Air Compressors	0.203	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.170	0.00	0.00	1.36	1.36	1.36	2.71	2.71	2.71	2.71	2.71	2.71	2.71
Crawler Tractors	0.526	4.21	4.21	4.21	4.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.794	6.35	6.35	6.35	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.441	3.53	3.53	3.53	3.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.577	5.77	5.77	5.77	5.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.384	3.07	3.07	3.07	3.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.512	4.10	4.10	4.10	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		43.74	40.91	46.27	50.02	23.00	24.36	23.18	23.18	23.18	23.18	23.18	23.18

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.661	5.29	5.29	5.29	10.58	10.58	10.58	10.58	10.58	10.58	10.58	10.58	10.58
>40T Cranes	0.825	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.938	7.50	0.00	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.333	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67
Welders	0.175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.175	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Genertors	0.356	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.356	0.00	0.89	0.89	0.89	0.89	0.89	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.210	1.68	1.68	1.68	3.37	3.37	3.37	3.37	3.37	3.37	3.37	3.37	3.37
Loader/Backhoe	0.246	1.97	1.97	1.97	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94
Air Compressors	0.175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.093	0.00	0.00	0.75	0.75	0.75	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Crawler Tractors	0.860	6.88	6.88	6.88	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	1.511	12.09	12.09	12.09	12.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.552	4.42	4.42	4.42	4.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.816	8.16	8.16	8.16	8.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.225	1.80	1.80	1.80	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.281	2.25	2.25	2.25	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		54.76	48.15	56.40	57.84	22.24	22.99	22.10	22.10	22.10	22.10	22.10	22.10

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.001	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.003	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Loader/Backhoe	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Crawler Tractors	0.002	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.004	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.002	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.002	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.001	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.001	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.15	0.13	0.15	0.16	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.030	0.24	0.24	0.24	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
>40T Cranes	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.038	0.30	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.018	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Welders	0.014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.014	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Genertors	0.026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.026	0.00	0.07	0.07	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.009	0.07	0.07	0.07	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Loader/Backhoe	0.014	0.11	0.11	0.11	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Air Compressors	0.014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.002	0.00	0.00	0.01	0.01	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Crawler Tractors	0.042	0.34	0.34	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.061	0.49	0.49	0.49	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.024	0.20	0.20	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.035	0.35	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.013	0.11	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.012	0.09	0.09	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		2.47	2.24	2.55	2.68	1.10	1.12	1.05	1.05	1.05	1.05	1.05	1.05

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ	**2020**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
<40 T Cranes	0.035	0.28	0.28	0.28	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.067	0.53	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.029	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.009	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.17	0.17	0.17	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Loader/Backhoe	0.019	0.15	0.15	0.15	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.011	0.00	0.00	0.09	0.09	0.09	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Crawler Tractors	0.048	0.39	0.39	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.094	0.75	0.75	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.039	0.31	0.31	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.041	0.41	0.41	0.41	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.016	0.13	0.13	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.032	0.26	0.26	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		3.59	3.10	3.72	3.79	1.55	1.63	1.59	1.59	1.59	1.59	1.59	1.59

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

		Month											
Equipment	**Hours (hr/day)**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
<40 T Cranes	8	2	1	1	1	1	1	1	1	1	2	2	2
>40T Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	0	0	0	0	0	0	1	0	1	0	0	0
Tractors	5	1	1	1	1	1	1	1	1	1	1	1	1
Welders	8	0	0	0	0	0	0	0	0	0	0	0	0
Light Plants	3	2	2	2	2	2	2	2	2	2	2	2	2
Genertors	8	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0.5
Fork Lifts	8	2	2	2	2	1	1	1	1	1	2	2	2
Loader/Backhoe	8	2	2	2	2	1	1	1	1	1	2	2	2
Air Compressors	8	0	0	0	0	0	0	0	0	0	0	0	0
Manlifts	8	2	2	2	1	1	1	0	0	1	1	1	2
Crawler Tractors	8	0	0	0	0	0	0	0	0	0	0	0	0
Scrapers	8	0	0	0	0	0	0	0	0	0	0	0	0
Rubber Tired Loaders	8	0	0	0	0	0	0	0	0	0	0	0	0
Graders	10	0	0	0	0	0	0	0	0	0	0	0	0
Rollers	8	0	0	0	0	0	0	0	0	0	0	0	0
Excavators	8	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
<40 T Cranes	0.045	0.72	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.72	0.72	0.72
>40T Cranes	0.052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.071	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.57	0.00	0.00	0.00
Tractors	0.030	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Welders	0.029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.029	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Genertors	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.07	0.07	0.07
Fork Lifts	0.013	0.20	0.20	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.20	0.20	0.20
Loader/Backhoe	0.019	0.30	0.30	0.30	0.30	0.15	0.15	0.15	0.15	0.15	0.30	0.30	0.30
Air Compressors	0.029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.004	0.07	0.07	0.07	0.04	0.04	0.04	0.00	0.00	0.04	0.04	0.04	0.07
Crawler Tractors	0.061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.057	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.90	0.90	0.90	0.86	0.61	0.61	1.14	0.65	1.25	0.94	0.94	0.97

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO	2021	49	50	51	52	53	54	55	56	57	58	59	60
<40 T Cranes	0.387	6.18	3.09	3.09	3.09	3.09	3.09	3.09	3.09	3.09	6.18	6.18	6.18
>40T Cranes	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	4.01	0.00	4.01	0.00	0.00	0.00
Tractors	0.641	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21	3.21
Welders	0.216	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.279	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67
Genertors	0.462	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.469	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	1.17	1.17	1.17	1.17
Fork Lifts	0.215	3.44	3.44	3.44	3.44	1.72	1.72	1.72	1.72	1.72	3.44	3.44	3.44
Loader/Backhoe	0.361	5.77	5.77	5.77	5.77	2.88	2.88	2.88	2.88	2.88	5.77	5.77	5.77
Air Compressors	0.198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.168	2.68	2.68	2.68	1.34	1.34	1.34	0.00	0.00	1.34	1.34	1.34	2.68
Crawler Tractors	0.521	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.775	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.438	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.575	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.382	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.511	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		22.95	19.86	19.86	18.52	13.92	13.92	16.58	13.75	19.10	22.78	22.78	24.13

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
<40 T Cranes	0.598	9.56	4.78	4.78	4.78	4.78	4.78	4.78	4.78	4.78	9.56	9.56	9.56
>40T Cranes	0.735	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.841	0.00	0.00	0.00	0.00	0.00	0.00	6.73	0.00	6.73	0.00	0.00	0.00
Tractors	0.293	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
Welders	0.171	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.171	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Genertors	0.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.83	0.83	0.83	0.83
Fork Lifts	0.195	3.12	3.12	3.12	3.12	1.56	1.56	1.56	1.56	1.56	3.12	3.12	3.12
Loader/Backhoe	0.221	3.54	3.54	3.54	3.54	1.77	1.77	1.77	1.77	1.77	3.54	3.54	3.54
Air Compressors	0.171	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.089	1.43	1.43	1.43	0.71	0.71	0.71	0.00	0.00	0.71	0.71	0.71	1.43
Crawler Tractors	0.788	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	1.372	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.489	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.752	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.206	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.248	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		20.14	15.36	15.36	14.64	11.31	11.31	17.33	11.43	18.88	20.25	20.25	20.97

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
<40 T Cranes	0.001	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.003	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00
Tractors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Loader/Backhoe	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Crawler Tractors	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.07	0.05	0.05	0.05	0.04	0.04	0.06	0.04	0.06	0.06	0.06	0.07

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
<40 T Cranes	0.027	0.44	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.44	0.44	0.44
>40T Cranes	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.27	0.00	0.00	0.00
Tractors	0.015	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Welders	0.013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.013	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Genertors	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.06	0.06
Fork Lifts	0.008	0.12	0.12	0.12	0.12	0.06	0.06	0.06	0.06	0.06	0.12	0.12	0.12
Loader/Backhoe	0.012	0.19	0.19	0.19	0.19	0.10	0.10	0.10	0.10	0.10	0.19	0.19	0.19
Air Compressors	0.013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.001	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.02
Crawler Tractors	0.039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.055	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.93	0.71	0.71	0.70	0.54	0.54	0.80	0.59	0.88	0.98	0.98	0.99

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ	**2021**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
<40 T Cranes	0.035	0.57	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.57	0.57	0.57
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.067	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.53	0.00	0.00	0.00
Tractors	0.029	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.009	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04	0.04
Fork Lifts	0.021	0.34	0.34	0.34	0.34	0.17	0.17	0.17	0.17	0.17	0.34	0.34	0.34
Loader/Backhoe	0.019	0.31	0.31	0.31	0.31	0.15	0.15	0.15	0.15	0.15	0.31	0.31	0.31
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.011	0.17	0.17	0.17	0.09	0.09	0.09	0.00	0.00	0.09	0.09	0.09	0.17
Crawler Tractors	0.048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		1.59	1.30	1.30	1.22	0.89	0.89	1.34	0.85	1.47	1.55	1.55	1.63

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

		Month											
Equipment	**Hours (hr/day)**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
<40 T Cranes	8	2	2	2	2	2	2	2	1	1	1	1	1
>40T Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	0	0	0	0	0	0	0	0	0	0	0	0
Tractors	5	1	1	1	1	1	1	1	1	1	1	1	1
Welders	8	0	0	0	0	0	0	0	0	0	0	0	0
Light Plants	3	2	2	2	2	2	2	2	2	2	2	2	2
Genertors	8	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0	0	0	0	0	0	0	0	0	0	0
Fork Lifts	8	2	2	2	2	2	2	2	2	2	2	1	1
Loader/Backhoe	8	2	2	2	2	2	2	2	2	2	2	1	1
Air Compressors	8	0	0	0	0	0	0	0	0	0	0	0	0
Manlifts	8	2	2	2	2	2	2	2	2	2	1	1	1
Crawler Tractors	8	0	0	0	0	0	0	0	0	0	0	0	0
Scrapers	8	0	0	0	0	0	0	0	0	0	0	0	0
Rubber Tired Loaders	8	0	0	0	0	0	0	0	0	0	0	0	0
Graders	10	0	0	0	0	0	0	0	0	0	0	0	0
Rollers	8	0	0	0	0	0	0	0	0	0	0	0	0
Excavators	8	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
<40 T Cranes	0.045	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.36	0.36	0.36	0.36	0.36
>40T Cranes	0.052	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.071	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.030	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Welders	0.029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.029	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Genertors	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.013	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.10	0.10
Loader/Backhoe	0.019	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.15	0.15
Air Compressors	0.029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.004	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.04	0.04	0.04
Crawler Tractors	0.061	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.099	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.057	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.86	0.61	0.61

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
<40 T Cranes	0.382	6.11	6.11	6.11	6.11	6.11	6.11	6.11	3.06	3.06	3.06	3.06	3.06
>40T Cranes	0.367	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.632	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16	3.16
Welders	0.213	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.275	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Genertors	0.461	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.468	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.209	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	3.34	1.67	1.67
Loader/Backhoe	0.360	5.76	5.76	5.76	5.76	5.76	5.76	5.76	5.76	5.76	5.76	2.88	2.88
Air Compressors	0.195	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.167	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	1.33	1.33	1.33
Crawler Tractors	0.516	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.758	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.436	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.573	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.380	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.510	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		22.69	22.69	22.69	22.69	22.69	22.69	22.69	19.63	19.63	18.30	13.75	13.75

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
<40 T Cranes	0.598	9.56	9.56	9.56	9.56	9.56	9.56	9.56	4.78	4.78	4.78	4.78	4.78
>40T Cranes	0.735	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.841	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.293	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
Welders	0.171	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.171	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Genertors	0.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.333	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.195	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	1.56	1.56
Loader/Backhoe	0.221	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	3.54	1.77	1.77
Air Compressors	0.171	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.089	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	0.71	0.71	0.71
Crawler Tractors	0.788	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	1.372	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.489	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.752	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.206	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.248	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		20.14	20.14	20.14	20.14	20.14	20.14	20.14	15.36	15.36	14.64	11.31	11.31

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Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx	2022	61	62	63	64	65	66	67	68	69	70	71	72
<40 T Cranes	0.001	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Loader/Backhoe	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Crawler Tractors	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.05	0.05	0.05	0.04	0.04

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
<40 T Cranes	0.027	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.22	0.22	0.22	0.22	0.22
>40T Cranes	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.034	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.015	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Welders	0.013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.013	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Genertors	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.008	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.06	0.06
Loader/Backhoe	0.012	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.10	0.10
Air Compressors	0.013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.001	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
Crawler Tractors	0.039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.055	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.71	0.71	0.70	0.54	0.54

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ	**2022**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
<40 T Cranes	0.035	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.28	0.28	0.28	0.28	0.28
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.067	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.029	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.009	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.17	0.17
Loader/Backhoe	0.019	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.15	0.15
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.011	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.09	0.09	0.09
Crawler Tractors	0.048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.30	1.30	1.22	0.89	0.89

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

		Month											
Equipment	**Hours (hr/day)**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	8	1	1	1	2	2	2	2	2	2	2	2	2
>40T Cranes	0	0	0	0	0	0	0	0	0	0	0	0	0
Pile/Drill Rig	8	1	0	1	0	0	0	0	0	0	0	0	0
Tractors	5	1	1	1	1	1	1	1	1	1	1	1	1
Welders	8	0	0	0	0	0	0	0	0	0	0	0	0
Light Plants	3	2	2	2	2	2	2	2	2	2	2	2	2
Genertors	8	0	0	0	0	0	0	0	0	0	0	0	0
Hydro Vacs/Pumps	5	0	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0
Fork Lifts	8	1	1	1	2	2	2	2	2	2	2	2	2
Loader/Backhoe	8	1	1	1	2	2	2	2	2	2	2	2	2
Air Compressors	8	0	0	0	0	0	0	0	0	0	0	0	0
Manlifts	8	0	0	1	1	1	2	2	2	2	2	2	2
Crawler Tractors	8	0	0	0	0	0	0	0	0	0	0	0	0
Scrapers	8	0	0	0	0	0	0	0	0	0	0	0	0
Rubber Tired Loaders	8	0	0	0	0	0	0	0	0	0	0	0	0
Graders	10	0	0	0	0	0	0	0	0	0	0	0	0
Rollers	8	0	0	0	0	0	0	0	0	0	0	0	0
Excavators	8	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
VOC	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	0.037	0.30	0.30	0.30	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
>40T Cranes	0.042	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.059	0.47	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.024	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Welders	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.025	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Genertors	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.025	0.00	0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.011	0.09	0.09	0.09	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Loader/Backhoe	0.015	0.12	0.12	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Air Compressors	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.004	0.00	0.00	0.03	0.03	0.03	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Crawler Tractors	0.050	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.084	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.033	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.047	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.017	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.95	0.54	1.04	0.78	0.78	0.82	0.76	0.76	0.76	0.76	0.76	0.76

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
CO	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	0.379	3.03	3.03	3.03	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06	6.06
>40T Cranes	0.361	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.501	4.01	0.00	4.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.624	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12	3.12
Welders	0.211	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.273	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
Genertors	0.460	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.467	0.00	1.17	1.17	1.17	1.17	1.17	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.215	1.72	1.72	1.72	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43
Loader/Backhoe	0.359	2.87	2.87	2.87	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75
Air Compressors	0.194	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.166	0.00	0.00	1.33	1.33	1.33	2.65	2.65	2.65	2.65	2.65	2.65	2.65
Crawler Tractors	0.513	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.743	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.434	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.572	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.378	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.510	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		16.38	13.54	18.87	22.49	22.49	23.82	22.65	22.65	22.65	22.65	22.65	22.65

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
NOX	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	0.466	3.73	3.73	3.73	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46	7.46
>40T Cranes	0.536	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.613	4.90	0.00	4.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.231	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Welders	0.160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.160	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Genertors	0.283	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.283	0.00	0.71	0.71	0.71	0.71	0.71	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.166	1.33	1.33	1.33	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66
Loader/Backhoe	0.177	1.42	1.42	1.42	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84
Air Compressors	0.160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.083	0.00	0.00	0.66	0.66	0.66	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Crawler Tractors	0.601	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	1.081	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.354	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.591	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.185	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		13.49	9.30	14.87	16.45	16.45	17.11	16.40	16.40	16.40	16.40	16.40	16.40

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Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
SOx	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	0.001	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
>40T Cranes	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.003	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Welders	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Loader/Backhoe	0.001	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Crawler Tractors	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.06	0.04	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (lb/hr)	Month											
PM10	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	0.022	0.17	0.17	0.17	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
>40T Cranes	0.022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.024	0.19	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.011	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Welders	0.011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.011	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Genertors	0.019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.019	0.00	0.05	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.005	0.04	0.04	0.04	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Loader/Backhoe	0.008	0.07	0.07	0.07	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Air Compressors	0.011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.001	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Crawler Tractors	0.030	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.044	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.60	0.45	0.65	0.74	0.74	0.75	0.70	0.70	0.70	0.70	0.70	0.70

Appendix B
Tesoro Integration and Compliance Project

Crude Tank Construction Equipment Emissions

	Emission Rate (MT/hr)	Month											
CO2EQ	**2023**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**
<40 T Cranes	0.035	0.28	0.28	0.28	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
>40T Cranes	0.051	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile/Drill Rig	0.067	0.53	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tractors	0.029	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Welders	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Plants	0.009	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Genertors	0.018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs/Pumps	0.018	0.00	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.021	0.17	0.17	0.17	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Loader/Backhoe	0.019	0.15	0.15	0.15	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Air Compressors	0.009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.011	0.00	0.00	0.09	0.09	0.09	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Crawler Tractors	0.048	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scrapers	0.094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber Tired Loaders	0.039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graders	0.041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers	0.016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators	0.032	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		1.34	0.85	1.47	1.55	1.55	1.63	1.59	1.59	1.59	1.59	1.59	1.59

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Fugitive Dust Emission Calculations for Offroad Vehicles - CCT

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Appendix B
Tesoro Integration and Compliance Project

Crude Tank Offroad Construction Vehicle Dust Emissions

Vehicle	Miles/Trip	Trips/Day
Light Vehicles	0.1	2
Total Light Vehicle Miles		0.2
Delivey Trucks	0.1	0
Water Trucks	0.1	1
Total Medium Truck Miles		0.1
Concrete Truck	0.1	0
Dump Trucks	0.1	40
Total Heavy Truck Miles		4
Tractors	0.1	3
Fork Lifts	0.1	2
Loader/Backhoe	0.1	2
Total Heavy-Heavy Duty Miles		0.7

PM10	Emission Rate (lb/mi)(1)	Emissions (lb/day)
Light Duty	0.9021196	0.18
Medium Duty	1.2863357	0.13
Heavy Duty	2.1931267	8.77
Heavy Heavy Duty	2.4962390	1.75
Uncontrolled Total		10.83
Controlled Total(2)		4.22

(1) Based on Section 13.2.2 of EPA's Compilation of Air Pollutant Emission Factors (AP-42).
Emission Rate = 1.5((s/12)^.9)*((W/3)^.45)
s = silt content = 8.5%
W = Vehicle Weight (ton) =2.5 for light, 5.5 for medium, 15 for heavy,
and 24 for heavy heavy (EMFAC2007).

(2) Controlled Emissions assume that watering 3 times per day reduces emissions by 61 percent (Uncontrolled Emissions x 0.39)

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APPENDIX C

LOCALIZED SIGNIFICANCE THRESHOLDS ANALYSIS

Tesoro Refining & Marketing Company LLC
Addendum to the Los Angeles Refinery Integration and Compliance Project
South Coast AQMD Localized Significance Threshold Analysis

October 2019

Prepared for: Tesoro Refining & Marketing Company LLC

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INTRODUCTION

This Localized Significance Threshold (LST) analysis has been prepared to evaluate the potential impacts of the criteria pollutants carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM10), and particulate matter less than 2.5 microns in diameter (PM2.5) emitted by the construction activities associated with the proposed modifications to the Tesoro Refining & Marketing Company LLC Los Angeles Refinery (Refinery) Integration and Compliance (LARIC) Project.

Tesoro is currently proposing the following modifications: 1) relocate the propane recovery project component from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit; 2) include an increase to the throughput of the Carson Operations Tank 35; and, 3) update the toxic air contaminant (TAC) speciation for the six crude oil storage tanks at the CCT with additional data. The currently proposed modifications are for LARIC Project components that were approved in the May 2017 Final EIR, but have not yet been issued South Coast AQMD permits to construct. Additionally, due to delays, the construction schedule presented in the May 2017 Final EIR needs to be updated. Potential emission changes are evaluated and discussed in the Addendum to the May 2017 Final EIR (Addendum). The proposed modifications will not change the overall conclusions in the May 2017 Final EIR, result in any new significant adverse impacts, or make existing significant adverse environmental impacts substantially worse.

As part of the Addendum to the proposed project, Environmental Audit, Inc. (EAI) has calculated construction emissions to evaluate the potential impacts from construction activities associated with the changes to the proposed project. The LST analysis includes an air quality analysis of the criteria pollutants for the peak daily construction emissions from the LARIC Project. The results of this analysis are provided below.

FACILITY LOCATION

The proposed project will occur at both the Wilmington and Carson Operations of the Tesoro Los Angeles Refinery (see Figure C-1). Tesoro will more fully integrate the Carson Operations with the Wilmington Operations, to become a more efficient single entity owned and operated by Tesoro. The Refinery will be comprised of approximately 950 contiguous acres in size and operate within the Cities of Los Angeles (Wilmington District) and Carson, California.

The Wilmington Operations are located within Wilmington, a community under the jurisdiction of the City of Los Angeles, at 2101 East Pacific Coast Highway, Wilmington, Los Angeles County, California 90744. The Carson Operations are located at 2350 East 223rd Street, Carson, California, 90745. Both new and modified equipment, as well as connecting piping, will be located within portions of the Refinery under both the City of Carson jurisdiction and the City of Los Angeles jurisdiction.

The Wilmington Operations are bounded to the north by Sepulveda Boulevard (as well as other tank farms and refinery activities), to the west by Alameda Street (as well as the Alameda Corridor and other tank farms), to the south by railroad tracks (as well as tank farms and metal recycling/scrap yards), and to the east by the Dominguez Channel (as well as other tank farms and rail yard activities). The Wilmington Operations are bisected by Pacific Coast Highway, with the larger portion of the Wilmington Operations to the north of Pacific Coast Highway and the smaller portion to the south. The closest residential area to the Wilmington Operations is about 200 feet southwest of the Truck Loading Rack.

The Carson Operations are bounded by Wilmington Avenue to the west, 223rd Avenue to the north, Alameda Street to the east, and Sepulveda Boulevard to the south. The Dominguez Channel flows through the Carson Operations, dividing the property into two sections: Northeastern and Southern. Several industrial/commercial facilities and the 405 Freeway border the Carson Operations to the north. The Alameda Corridor and other industrial facilities, including the Tesoro Coke Barn, the Air Products Hydrogen Plant, and the Tesoro Sulfur Recovery Plant (SRP), are located to the east of the Carson Operations. Commercial and residential areas are located to the west of the Carson Operations. The Phillips 66 Refinery and tank farms occupy the area located to the south of the Carson Operations.

The Carson Operations and all adjacent facilities and properties are zoned manufacturing heavy (MH) according to the City of Carson's Land Use element of its General Plan. The closest residential area to the Carson Operations is approximately 250 feet southwest of the Refinery on the southwest corner of the Sepulveda Boulevard/Wilmington Avenue intersection.

Additionally, the SRP (considered to be a portion of the Wilmington Operations) is located at 23208 South Alameda Street in the City of Carson (see Figure 1). The SRP is zoned MH according to the City of Carson's Land Use element of its General Plan. Adjacent land uses to the SRP also are heavy industrial and include other refineries, a hydrogen plant, undeveloped lots, and container storage areas.

EMISSION ESTIMATES

Construction emission estimates for the peak day are calculated by each project component that will be under construction during that peak period for the proposed project. A summary of construction emissions is found on Table C-1. More detailed construction emissions can be found in Attachment A. Construction emissions vary based on activities and the worst-case scenario has been evaluated. It is expected that the calculated peak day emissions estimates will occur infrequently during the proposed project construction activities and, most of the time, construction emissions will be less.

Construction activities by month for the proposed project are calculated to determine the peak construction day, based on the updated construction schedule. Only on-site emissions sources are included, and though equipment (such as cranes) would be shared between project components, no equipment sharing was assumed for this LST analysis. The peak on-site construction day for most project components is spread over 12 hours and is expected to occur during Month 11 for all pollutants (CO, NO_2, PM10, and PM2.5). Construction activities included in this evaluation are the use of construction equipment and fugitive dust emissions from earth moving activities.

CRITERIA POLLUTANT IMPACT MODELING

In order to determine the groundlevel concentrations associated with the revised peak construction activities, the U.S. EPA AERMOD air dispersion model was used to model the peak day construction emissions (see Table C-1) and calculate the annual average and maximum 1-hour, 8-hour, and 24-hour concentrations. NO_2 emissions were estimated using the U.S. EPA recommended ambient ratio method (ARM), which converts NOx to NO_2 based on a fixed ratio (U.S EPA, 2014).

The location of the source is identified based on data provided by Tesoro and the Long Beach USGS Quadrangle (see Figure C-2). The dispersion model was run using the Long Beach meteorological data available from the South Coast AQMD and used regulatory defaults.

The model only includes area sources, which are not subject to building downwash effects. Therefore, the model was not set to include algorithms to model the effects of building downwash on emissions.

Terrain elevations were taken into account even though the facility and the vicinity are in a relatively flat area.

The AERMOD model was run using a coarse receptor grid of 500 meters that extends at least 1,000 meters in every cardinal direction from the boundaries of the Refinery, and a fine receptor grid of 100 meters in the residential area most affected by the construction emissions (see Figure C-2). The maximum impact location was determined for the applicable averaging periods from the AERMOD model output. The maximum groundlevel concentration and the Universal Transverse Mercator (NAD 83) coordinates for each maximum impact point at a sensitive receptor are presented in Table C-2.

MODELED CRITERIA POLLUTANT IMPACT ANALYSIS

The proposed project maximum groundlevel concentrations were compared to the localized significance thresholds to determine if the project would cause or contribute to a violation of any state ambient air quality standard. The ambient air quality data for South Coastal Los Angeles County (Station No. 033 and 077) was used to establish background levels of the pollutants. Table C-3 identifies the ambient air quality data for CO, $NO_{2,}$ PM10, and PM2.5 published by the South Coast AQMD in the last three years (2014, 2015, and 2016), as well as federal NO_2 ambient background concentration data published by South Coast AQMD.

The CO and NO_2 concentrations were combined with the ambient background concentrations and compared to the Most Stringent Air Quality Standard. The PM10 and PM2.5 24-hour, and PM10 and PM2.5 annual average concentrations were compared to the Significant Change in Air Quality Concentration thresholds. PM2.5 emissions were conservatively modeled as PM10 for this analysis. Impacts from other criteria pollutants are regional in nature or in attainment and, therefore, were not included as part of the localized air quality analysis. The maximum impact locations are shown in Figure 2.

State Standards

The maximum CO impact concentrations for 1-hour and 8-hour averages are 4,295.97 and 2,672.38 micrograms per cubic meter ($\mu g/m^3$), respectively. The maximum NO_2 impact concentrations for 1-hour and annual averages are 363.67 and 39.72 $\mu g/m^3$, respectively. The maximum PM10 impact concentrations for 24-hour and annual averages are 1.14 and 0.12 $\mu g/m^3$, respectively. The maximum PM2.5 impact concentrations for 24-hour and annual averages are 1.14 and 0.12 $\mu g/m^3$, respectively. Therefore, the proposed project modeling results only exceed State criteria pollutant significance thresholds for 1-hour NO_2. The results are presented in Table C-4.

Federal Standards

The maximum CO impact concentrations for 1-hour and 8-hour averages are 4,295.97 and 2,672.38 $\mu g/m^3$, respectively. The maximum NO_2 impact concentrations for 1-hour and annual averages are 216.16 and 39.72 $\mu g/m^3$, respectively. The maximum PM10 impact concentrations for 24-hour and annual averages are 1.14 and 0.12 $\mu g/m^3$, respectively. The maximum PM2.5 impact concentrations for 24-hour and annual averages are 1.14 and 0.12 $\mu g/m^3$, respectively. Therefore, the proposed project modeling results only exceed Federal criteria pollutant significance thresholds for 1-hour NO_2. The results are presented in Table C-4.

Comparison to May 2017 Final EIR

As shown in Table C-5, the impacts from modifications to the proposed project are less than the reported impacts in the May 2017 Final EIR for all pollutants. Therefore, no significant impact to local air quality is expected from the modification to the proposed project.

CONCLUSIONS

Impacts from modifications to the proposed project as analyzed in the Addendum are expected to be less than the LST impacts and do not change the significance determinations reported in the May 2017 Final EIR for all pollutants. However, the emission impacts from the modifications to the proposed project will remain significant for both state and federal air quality standards for 1-hour NO_2 during the peak of on-site construction. The emission impacts from the modifications to the proposed project will remain less than significant for CO, annual NO_2, or PM emissions during the construction phase. Therefore, no new significant and no substantial increases in an already significant impact to air quality are expected from the modifications to the proposed project.

TABLES

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Tesoro Integration and Compliance Project Addendum
Localized Significance Threshold Analysis

Table C-1. Onsite Construction Emission Summary for Month 12 - Peak NO2 and PM2.5

	Component							
Emissions from Equipment	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**W-HCU**	**C-LHU**	**W-HTU12**
VOC (lb/day)	4.14	3.60	3.60	3.61	2.49	3.02	1.87	3.05
CO (lb/day)	35.07	28.79	28.79	30.64	24.53	30.29	14.47	31.73
NOx (lb/day)	36.11	35.42	35.42	40.94	30.44	36.92	15.50	31.75
SOx (lb/day)	0.08	0.07	0.07	0.08	0.07	0.09	0.03	0.08
PM10 (lb/day)	2.29	2.13	2.13	2.24	1.61	1.87	1.01	1.79
PM2.5 (lb/day)(1)	2.25	2.09	2.09	2.19	1.58	1.83	0.99	1.76
CO_2 (lb/day)	1.88	1.65	1.65	1.98	1.71	2.28	0.75	1.96

	Component							
Emission from Trips - Onsite	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**W-HCU**	**C-LHU**	**W-HTU12**
VOC (lb/day)	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
CO (lb/day)	0.10	0.18	0.18	0.09	0.04	0.09	0.08	0.10
NOx (lb/day)	0.11	0.14	0.14	0.11	0.10	0.11	0.11	0.11
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.02	0.03	0.03	0.02	0.01	0.02	0.02	0.02
Exhuast PM (lb/day)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fugitive PM (lb/day)	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PM2.5 (lb/day)(1)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Exhuast PM (lb/day)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fugitive PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Component							
Fugitive Earthmoving PM - Peak	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**W-HCU**	**C-LHU**	**W-HTU12**
PM10 (lb/day)(2)		2.36	2.36	2.36				2.36
PM2.5 (lb/day)(1)(2)		1.37	1.37	1.37				1.37

	Component							
Offroad Fugitive PM - Peak	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**W-HCU**	**C-LHU**	**W-HTU12**
PM10 (lb/day)(2)		0.37	0.37	0.37				0.37
PM2.5 (lb/day)(1)(2)		0.08	0.08	0.08				0.08

		Component							
Total Emissions	**Thresholds**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**W-HCU**	**C-LHU**	**W-HTU12**
VOC (lb/day)	75	4.15	3.61	3.61	3.61	2.49	3.03	1.88	3.05
CO (lb/day)	550	35.17	28.97	28.97	30.73	24.57	30.38	14.55	31.83
NOx (lb/day)	100	36.22	35.55	35.55	41.05	30.54	37.02	15.61	31.85
SOx (lb/day)	150	0.08	0.07	0.07	0.08	0.07	0.10	0.03	0.08
PM10 (lb/day)(2)	150	2.31	4.89	4.89	4.98	1.62	1.88	1.03	4.54
PM2.5 (lb/day)(1)(2)	55	2.26	3.55	3.55	3.65	1.59	1.84	1.00	3.21
CO (lb/hr)	NA	2.93	2.41	2.41	2.56	2.05	2.53	1.21	2.65
NOx (lb/hr)	NA	3.02	2.96	2.96	3.42	2.54	3.09	1.30	2.65
SOx (lb/hr)	NA	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
PM10 (lb/hr)(2)	NA	0.19	0.41	0.41	0.42	0.14	0.16	0.09	0.38
PM2.5 (lb/hr)(1)(2)	NA	0.19	0.30	0.30	0.30	0.13	0.15	0.08	0.27

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls

(2) Mitigated PM.

Modeled Source	Pipe1	Pipe2	WILHTU4	CARLPGRAIL	LHU	WHTU
CO (lb/hr)	2.41	2.41	2.56	2.05	1.21	5.18
NOx (lb/hr)	2.96	2.96	3.42	2.54	1.30	5.74
SOx (lb/hr)	0.01	0.01	0.01	0.01	0.00	0.01
PM10 (lb/hr)(2)	0.41	0.41	0.42	0.14	0.09	0.54
PM2.5 (lb/hr)(1)(2)	0.30	0.30	0.30	0.13	0.08	0.42

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Tesoro Integration and Compliance Project Addendum
Localized Significance Threshold Analysis

Table C-2. Modeling Results

Criteria Pollutant	Averaging Period	Max (µg/m3)	UTME	UTMN	Construction Month
CO	1-hr	99.39	384900	3740000	Month 11
	8-hr	25.89	384900	3740000	Month 11
NO_2	1-hr	110.48	384900	3740000	Month 11
	1-hr (98%)	82.33	384900	3740000	Month 11
	Annual	1.15	385249.6	3739502.9	Month 11
PM10	24-hr	1.14	384900	3740000	Month 11
	Annual	0.12	385249.6	3739502.9	Month 11
PM2.5	24-hr	1.14	384900	3740000	Month 11
	Annual	0.12	385249.6	3739502.9	Month 11

Model results based on the last 5 years of available meterological data from SCAQMD for Long Beach.

Assumes PM2.5 is 100% of PM10.

Table C-3. Ambient Concentrations

Criteria Pollutant	Averaging Period	Concentration (ppm)			Max Conc.	
		2014	2015	2016	(ppm)	(µg/m^3)
CO	1-hr	3.7	3.3	3.3	3.7	4196.58
	8-hr	2.6	2.2	2.2	2.3	2646.49
NO_2	1-hr	0.1359	0.1018	0.0756	0.1359	253.19
	1-hr (98%)	0.0848	0.0644	0.0663	0.0718	133.83
	AAM	0.0207	0.0198	0.0185	0.0207	38.57
		Concentration (µg/m^3)				
PM10	24-hr	59	62	56		62.0
	AAM	26.6	26.5	27.8		27.8
PM2.5	24-hr	52.2	48.3	28.93		52.2
	AAM	10.72	10.26	9.62		10.7

Data from South Coastal LA County Station number 33 and 77. Missing PM2.5 substituted with PM10.

AAM = Annual Arithmetic Mean

Table C-4. Localized Significance Threshold Summary

Criteria Pollutant	Averaging Period	Max Modeled GLC Conc. (µg/m^3)	Background GLC Conc. (µg/m^3)	Total GLC Conc. (µg/m^3)	Most Stringent Air Quality Standard (µg/m^3)	Significant
CO	1-hour	99.39	4196.58	4295.97	23000	NO
	8-hour	25.89	2646.49	2672.38	10000	NO
NO_2	1-hour	110.48	253.19	363.67	339	YES
	1-hour (Federal)	82.33	133.83	216.16	188	YES
	Annual	1.15	38.57	39.72	57	NO
PM10	24-hour	1.14	--	--	10.4	NO
	Annual	0.12	--	--	1	NO
PM2.5	24-hour	1.14	--	--	10.4	NO
	Annual	0.12	--	--	1	NO

Tesoro Integration and Compliance Project Addendum
Localized Significance Threshold Analysis

Table C-5. Comparison of LST Summaries

Criteria Pollutant	Averaging Period	Proposed Modification ($\mu g/m^3$)	May 2017 FEIR ($\mu g/m^3$)
CO	1-hour	4295.97	8211.10
	8-hour	2672.38	4967.40
NO_2	1-hour	363.67	455.90
	1-hour (Federal)	216.16	302.80
	Annual	39.72	52.70
PM10	24-hour	1.14	3.46
	Annual	0.12	0.86
PM2.5	24-hour	1.14	3.46
	Annual	0.12	0.86

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FIGURES

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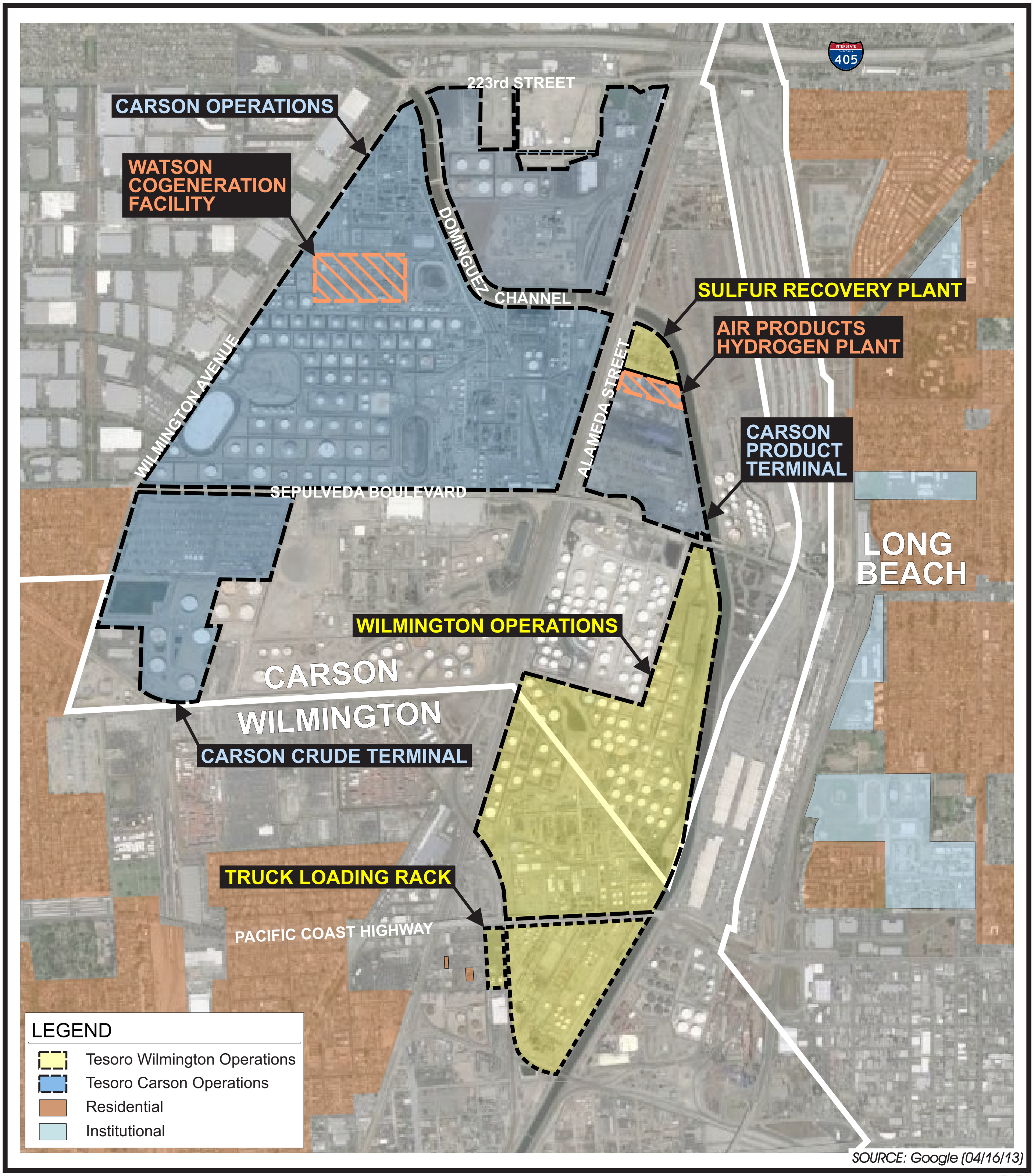

Environmental Audit, Inc.

FIGURE C-1
SITE LOCATION MAP
TESORO LOS ANGELES REFINERY

Project No. 2844

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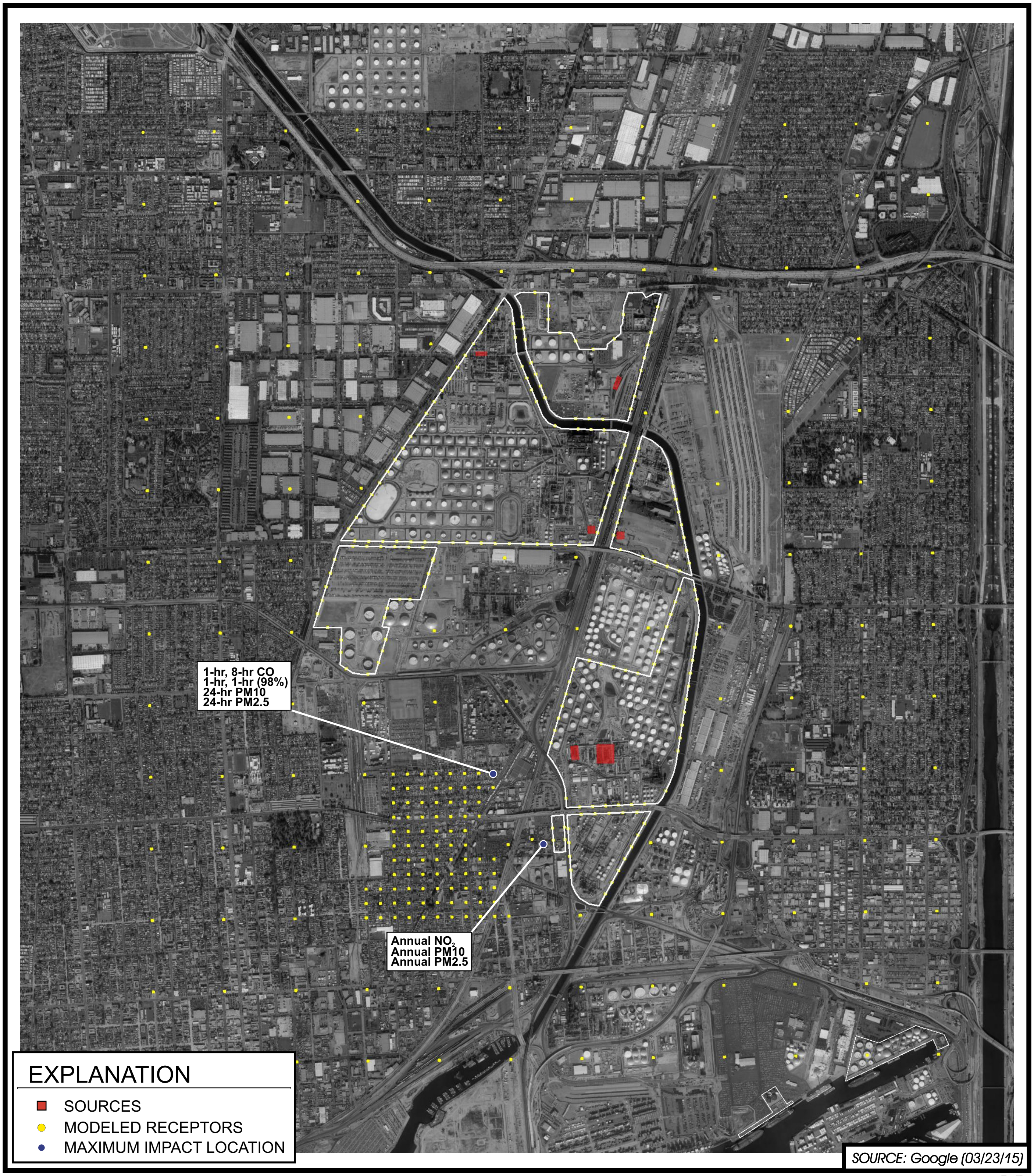

Environmental Audit, Inc.

FIGURE C-2
LST MAXIMUM IMPACT LOCATION MAP
TESORO LOS ANGELES REFINERY

Project No. 2844

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ATTACHMENTS

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Attachment A
Tesoro Integration and Compliance Project Addendum
Peak Project Component
Construction Emission Summary

	Component									
Emissions from Equipment	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
VOC (lb/day)	4.14	3.39	3.39	3.61	2.49	2.70	3.02	2.36	1.87	3.05
CO (lb/day)	35.07	26.96	26.96	30.64	24.53	26.28	30.29	23.12	14.47	31.73
NOx (lb/day)	36.11	34.28	34.28	40.94	30.44	31.52	36.92	29.08	15.50	31.75
SOx (lb/day)	0.08	0.07	0.07	0.08	0.07	0.08	0.09	0.07	0.03	0.08
PM10 (lb/day)	2.29	2.03	2.03	2.24	1.61	1.67	1.87	1.51	1.01	1.79
PM2.5 (lb/day)(1)	2.25	1.99	1.99	2.19	1.58	1.63	1.83	1.48	0.99	1.76
CO_2 (lb/day)	1.88	1.60	1.60	1.98	1.71	1.81	2.28	1.65	0.75	1.96

	Component									
Emission from Trips - Onsite	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
CO (lb/day)	0.10	0.18	0.18	0.09	0.04	0.08	0.09	0.08	0.08	0.10
NOx (lb/day)	0.11	0.14	0.14	0.11	0.10	0.11	0.11	0.11	0.11	0.11
SOx (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PM10 (lb/day)	0.02	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02
Exhuast PM (lb/day)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fugitive PM (lb/day)	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
PM2.5 (lb/day)(1)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Exhuast PM (lb/day)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fugitive PM (lb/day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Component									
Fugitive Earthmoving PM - Peak	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
PM10 (lb/day)(2)		2.36	2.36	2.36						2.36
PM2.5 (lb/day)(1)(2)		1.37	1.37	1.37						1.37

	Component									
Offroad Fugitive PM - Peak	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
PM10 (lb/day)(2)		0.37	0.37	0.37						0.37
PM2.5 (lb/day)(1)(2)		0.08	0.08	0.08						0.08

		Component									
Total Emissions	**Thresholds**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
VOC (lb/day)	75	4.15	3.39	3.39	3.61	2.49	2.70	3.02	2.37	1.88	3.05
CO (lb/day)	550	35.17	27.14	27.14	30.73	24.57	26.36	30.38	23.20	14.55	31.83
NOx (lb/day)	100	36.22	34.42	34.42	41.05	30.54	31.62	37.02	29.18	15.61	31.85
SOx (lb/day)	150	0.08	0.07	0.07	0.08	0.07	0.08	0.10	0.07	0.03	0.08
PM10 (lb/day)(2)	150	2.31	4.79	4.79	4.98	1.62	1.68	1.88	1.52	1.03	4.54
PM2.5 (lb/day)(1)(2)	55	2.26	3.45	3.45	3.65	1.59	1.64	1.84	1.48	1.00	3.21
CO (lb/hr)	NA	2.93	2.26	2.26	2.56	2.05	2.20	2.53	1.93	1.21	2.65
NOx (lb/hr)	NA	3.02	2.87	2.87	3.42	2.54	2.64	3.09	2.43	1.30	2.65
SOx (lb/hr)	NA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
PM10 (lb/hr)(2)	NA	0.19	0.40	0.40	0.42	0.14	0.14	0.16	0.13	0.09	0.38
PM2.5 (lb/hr)(1)(2)	NA	0.19	0.29	0.29	0.30	0.13	0.14	0.15	0.12	0.08	0.27

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls

(2) Mitigated PM.

Modeled Source	**CARALKY**	**Pipe1**	**Pipe2**	**WILHTU4**	**CARLPGRAI**	**LHU**	**WHTU**
CO (lb/hr)	7.06	2.26	2.26	2.56	2.05	1.21	5.18
NOx (lb/hr)	8.09	2.87	2.87	3.42	2.54	1.30	5.74
SOx (lb/hr)	0.02	0.01	0.01	0.01	0.01	0.00	0.01
PM10 (lb/hr)(2)	0.46	0.40	0.40	0.42	0.14	0.09	0.54
PM2.5 (lb/hr)(1)(2)	0.45	0.29	0.29	0.30	0.13	0.08	0.42

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment Emission Rates

Equipment Type	Hp	2017 Emission Factors lb/hr(1)					
		VOC	CO	NOx	SOx	PM10	CO2e(2)
<40 T Cranes	Composite	0.06537	0.4152	0.90923	0.00147	0.04291	0.03535
>40T Cranes	500	0.07236	0.4243	1.11689	0.00213	0.04535	0.05139
Pile Rig	Composite	0.04029	0.5013	0.67483	0.00244	0.02483	0.05882
Tractors	Composite	0.03046	0.3666	0.35832	0.00080	0.02366	0.0192
Welders	50	0.03579	0.2408	0.18867	0.00039	0.01662	0.00938
Light Plants	50	0.03579	0.3047	0.18867	0.00039	0.01662	0.00938
Genertors	120	0.04173	0.4728	0.45336	0.00074	0.03547	0.01794
Hydro Vacs	120	0.04173	0.4802	0.45336	0.00074	0.03547	0.01794
Fork Lifts	Composite	0.01948	0.4522	0.29726	0.00089	0.01519	0.02146
Loader/Backhoe	Composite	0.03046	0.3666	0.35832	0.00080	0.02366	0.0192
Air Compressors	50	0.03579	0.2209	0.18867	0.00039	0.01662	0.00938
Manlifts	Composite	0.00586	0.1548	0.11635	0.00044	0.00353	0.01066
Crawler Tractors	Composite	0.08013	0.5464	1.12114	0.00201	0.05470	0.04843
Scrapers	Composite	0.13882	0.8713	2.07961	0.00390	0.08569	0.094
Rubber Tired Loaders	Composite	0.05859	0.4510	0.77443	0.00161	0.03545	0.03869
Graders	Composite	0.07261	0.5844	1.01224	0.00170	0.04497	0.04101
Rollers	Composite	0.03177	0.3913	0.30830	0.00068	0.01994	0.01635
Excavators	Composite	0.03202	0.5184	0.42996	0.00133	0.01874	0.03212

(1) Off-Road 2011. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Carbon Dioxide Equivalents (CO_{EQ}) are based on default emission factors for diesel. Metric tons per hour.

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment

Equipment	C-51V	Pipe1	Pipe1	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
<40 T Cranes	1	1.5	1.5	2	0.25	0.48	0.8	0.5	0.5	1
>40T Cranes	1	1	1	2	0.25	0.48	0.6	0.5		
Pile Rig		0	0		0.5	0.1	2	0.1		0.1
Tractors	0.5	0.5	0.5	0.5	0.1	0.16	0.25	0.1		0.5
Welders	8	4	4	3	1	1.6	2	1	3	4
Light Plants	0.5	0	0	1	0.5	0.8	1	0.5	2	1
Genertors	0	2	2	1	1					
Hydro Vacs	0.5	0	0	0.25	0.25	0.5	0.25	0.1		0.5
Fork Lifts	0.75	1	1	0.5	0.25	0.4	1	0.25		1
Loader/Backhoe	0.1	0.5	0.5	0.2	0.1	0.16	0.2	0.1	0.1	0.5
Air Compressors	0.1	2	2	0.1	0.5	0.8	0.1	0.5	0.2	0.1
Manlifts	4	1	1	3	2	2.4	3	2	1	6
Crawler Tractors										
Scrapers										
Rubber Tired Loaders										
Graders										
Rollers										
Excavators										

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment Emissions

		Component									
Equipment	**Hours (hr/day)**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
<40 T Cranes	7	1	2	2	2	1	1	1	1	1	1
>40T Cranes	5	1	1	1	2	1	1	1	1	0	0
Pile Rig	8	0	0	0	0	1	1	2	1	0	1
Tractors	5	1	1	1	1	1	1	1	1	0	1
Welders	8	8	4	4	3	1	2	2	1	3	4
Light Plants	3	1	0	0	1	1	1	1	1	2	1
Genertors	3	0	2	2	1	1	0	0	0	0	0
Hydro Vacs	5	1	0	0	1	1	1	1	1	0	1
Fork Lifts	4	1	1	1	1	1	1	1	1	0	1
Loader/Backhoe	5	1	1	1	1	1	1	1	1	1	1
Air Compressors	4	1	2	2	1	1	1	1	1	1	1
Manlifts	8	4	1	1	3	2	3	3	2	1	6

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment Emissions

	Emission Rate (lb/hr)	Component									
VOC	2017	C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
<40 T Cranes	0.065	0.46	0.92	0.92	0.92	0.46	0.46	0.46	0.46	0.46	0.46
>40T Cranes	0.072	0.36	0.36	0.36	0.72	0.36	0.36	0.36	0.36	0.00	0.00
Pile Rig	0.040	0.00	0.00	0.00	0.00	0.32	0.32	0.64	0.32	0.00	0.32
Tractors	0.030	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.00	0.15
Welders	0.036	2.29	1.15	1.15	0.86	0.29	0.57	0.57	0.29	0.86	1.15
Light Plants	0.036	0.11	0.00	0.00	0.11	0.11	0.11	0.11	0.11	0.21	0.11
Genertors	0.042	0.00	0.25	0.25	0.13	0.13	0.00	0.00	0.00	0.00	0.00
Hydro Vacs	0.042	0.21	0.00	0.00	0.21	0.21	0.21	0.21	0.21	0.00	0.21
Fork Lifts	0.019	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.00	0.08
Loader/Backhoe	0.030	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Air Compressors	0.036	0.14	0.29	0.29	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Manlifts	0.006	0.19	0.05	0.05	0.14	0.09	0.14	0.14	0.09	0.05	0.28
Total		4.14	3.39	3.39	3.61	2.49	2.70	3.02	2.36	1.87	3.05

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment Emissions

CO	Emission Rate (lb/hr) 2017	Component C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
<40 T Cranes	0.415	2.91	5.81	5.81	5.81	2.91	2.91	2.91	2.91	2.91	2.91
>40T Cranes	0.424	2.12	2.12	2.12	4.24	2.12	2.12	2.12	2.12	0.00	0.00
Pile Rig	0.501	0.00	0.00	0.00	0.00	4.01	4.01	8.02	4.01	0.00	4.01
Tractors	0.367	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	0.00	1.83
Welders	0.241	15.41	7.71	7.71	5.78	1.93	3.85	3.85	1.93	5.78	7.71
Light Plants	0.305	0.91	0.00	0.00	0.91	0.91	0.91	0.91	0.91	1.83	0.91
Genertors	0.473	0.00	2.84	2.84	1.42	1.42	0.00	0.00	0.00	0.00	0.00
Hydro Vacs	0.480	2.40	0.00	0.00	2.40	2.40	2.40	2.40	2.40	0.00	2.40
Fork Lifts	0.452	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	0.00	1.81
Loader/Backhoe	0.367	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
Air Compressors	0.221	0.88	1.77	1.77	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Manlifts	0.155	4.95	1.24	1.24	3.71	2.48	3.71	3.71	2.48	1.24	7.43
Total		35.07	26.96	26.96	30.64	24.53	26.28	30.29	23.12	14.47	31.73

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment Emissions

	Emission Rate (lb/hr)	Component									
NOX	**2017**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
<40 T Cranes	0.909	6.36	12.73	12.73	12.73	6.36	6.36	6.36	6.36	6.36	6.36
>40T Cranes	1.117	5.58	5.58	5.58	11.17	5.58	5.58	5.58	5.58	0.00	0.00
Pile Rig	0.675	0.00	0.00	0.00	0.00	5.40	5.40	10.80	5.40	0.00	5.40
Tractors	0.358	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79	0.00	1.79
Welders	0.189	12.08	6.04	6.04	4.53	1.51	3.02	3.02	1.51	4.53	6.04
Light Plants	0.189	0.57	0.00	0.00	0.57	0.57	0.57	0.57	0.57	1.13	0.57
Genertors	0.453	0.00	2.72	2.72	1.36	1.36	0.00	0.00	0.00	0.00	0.00
Hydro Vacs	0.453	2.27	0.00	0.00	2.27	2.27	2.27	2.27	2.27	0.00	2.27
Fork Lifts	0.297	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	0.00	1.19
Loader/Backhoe	0.358	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.79
Air Compressors	0.189	0.75	1.51	1.51	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Manlifts	0.116	3.72	0.93	0.93	2.79	1.86	2.79	2.79	1.86	0.93	5.58
Total		36.11	34.28	34.28	40.94	30.44	31.52	36.92	29.08	15.50	31.75

Attachment A
Tesoro Integration and Compliance Project Addendum

Construction Equipment Emissions

	Emission Rate (lb/hr)	Component									
SOx	**2017**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
<40 T Cranes	0.001	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
>40T Cranes	0.002	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00
Pile Rig	0.002	0.00	0.00	0.00	0.00	0.02	0.02	0.04	0.02	0.00	0.02
Tractors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welders	0.000	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01
Light Plants	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Genertors	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydro Vacs	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lifts	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader/Backhoe	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Air Compressors	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manlifts	0.000	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.02
Total		0.08	0.07	0.07	0.08	0.07	0.08	0.09	0.07	0.03	0.08

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Construction Equipment Emissions

	Emission Rate (lb/hr)	Component									
PM10	**2017**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
<40 T Cranes	0.043	0.30	0.60	0.60	0.60	0.30	0.30	0.30	0.30	0.30	0.30
>40T Cranes	0.045	0.23	0.23	0.23	0.45	0.23	0.23	0.23	0.23	0.00	0.00
Pile Rig	0.025	0.00	0.00	0.00	0.00	0.20	0.20	0.40	0.20	0.00	0.20
Tractors	0.024	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.00	0.12
Welders	0.017	1.06	0.53	0.53	0.40	0.13	0.27	0.27	0.13	0.40	0.53
Light Plants	0.017	0.05	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.10	0.05
Genertors	0.035	0.00	0.21	0.21	0.11	0.11	0.00	0.00	0.00	0.00	0.00
Hydro Vacs	0.035	0.18	0.00	0.00	0.18	0.18	0.18	0.18	0.18	0.00	0.18
Fork Lifts	0.015	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.00	0.06
Loader/Backhoe	0.024	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Air Compressors	0.017	0.07	0.13	0.13	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Manlifts	0.004	0.11	0.03	0.03	0.08	0.06	0.08	0.08	0.06	0.03	0.17
Total		2.29	2.03	2.03	2.24	1.61	1.67	1.87	1.51	1.01	1.79

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Construction Equipment Emissions

	Emission Rate (MT/hr)	Component									
CO2EQ	**2017**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
<40 T Cranes	0.035	0.25	0.49	0.49	0.49	0.25	0.25	0.25	0.25	0.25	0.25
>40T Cranes	0.051	0.26	0.26	0.26	0.51	0.26	0.26	0.26	0.26	0.00	0.00
Pile Rig	0.059	0.00	0.00	0.00	0.00	0.47	0.47	0.94	0.47	0.00	0.47
Tractors	0.019	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.10
Welders	0.009	0.60	0.30	0.30	0.23	0.08	0.15	0.15	0.08	0.23	0.30
Light Plants	0.009	0.03	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.06	0.03
Genertors	0.018	0.00	0.11	0.11	0.05	0.05	0.00	0.00	0.00	0.00	0.00
Hydro Vacs	0.018	0.09	0.00	0.00	0.09	0.09	0.09	0.09	0.09	0.00	0.09
Fork Lifts	0.021	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.00	0.09
Loader/Backhoe	0.019	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Air Compressors	0.009	0.04	0.08	0.08	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Manlifts	0.011	0.34	0.09	0.09	0.26	0.17	0.26	0.26	0.17	0.09	0.51
Total		1.88	1.60	1.60	1.98	1.71	1.81	2.28	1.65	0.75	1.96

Attachment A
Tesoro Integration and Compliance Project Addendum

Onsite Construction Vehicle Trip Emissions

Vehicle	Miles per Day	Component (Vehicles per day)									
		C-51V			W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
Cars	2										
Pickup Trucks	2	10	21	21	8	0	7	8	7	7	10
Total Light Vehicle Miles		20	42	42	16	0	14	16	14	14	20
Water Truck	10	1	1	1	1	1	1	1	1	1	1
Delivery Truck	2										
1 Ton Truck	2	1	2	2	1	1	1	1	1	1	1
Misc. MD Truck	5										
Total Medium Truck Miles		12	14	14	12	12	12	12	12	12	12
Truck, Dump Ford LT8000	2	0	0	0	0	0	0	0	0	0	0
Concrete Truck	2	0	0	0	0	0	0	0	0	0	0
Semi-Tractor, Diesel 20 Ton	2	0	0	0	0	0	0	0	0	0	0
Misc. HD Truck	2	0	0	0	0	0	0	0	0	0	0
Total Heavy Truck Miles		0	0	0	0	0	0	0	0	0	0

	Emission Rate (lb/mi)(1)	Component (Vehicles per day)									
VOC	**2017**	**C-51V**	**Pipe1**	**Pipe2**	**W-HTU4**	**C-LPG**	**C-NHDS**	**W-HCU**	**C-Steam**	**C-LHU**	**W-HTU12**
Light Duty	0.0001035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0003717	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0006131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01

CO	2017	C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
Light Duty	0.0033327	0.07	0.14	0.14	0.05	0.00	0.05	0.05	0.05	0.05	0.07
Medium Duty	0.0030301	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Heavy Duty	0.0043046	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.10	0.18	0.18	0.09	0.04	0.08	0.09	0.08	0.08	0.10

NOx	2017	C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
Light Duty	0.0005080	0.01	0.02	0.02	0.01	0.00	0.01	0.01	0.01	0.01	0.01
Medium Duty	0.0082326	0.10	0.12	0.12	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Heavy Duty	0.0154328	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.11	0.14	0.14	0.11	0.10	0.11	0.11	0.11	0.11	0.11

SOx	2017	C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
Light Duty	0.0000090	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty	0.0000217	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Heavy Duty	0.0000359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PM10	2017	C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
Light Duty Exhaust	0.0001064	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Exhaust	0.0004787	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty Exhaust	0.0004727	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Exhaust PM		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Light Duty Fugitive(2)	0.000221	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medium Duty Fugitve(2)	0.000467	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Heavy Duty Fugitive(2)	0.002314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Fugitive PM		0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		0.02	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02

CO_{2EQ}	2017	C-51V	Pipe1	Pipe2	W-HTU4	C-LPG	C-NHDS	W-HCU	C-Steam	C-LHU	W-HTU12
Light Duty	0.907	18.14	38.10	38.10	14.51	0.00	12.70	14.51	12.70	12.70	18.14
Medium Duty	2.261	27.13	31.65	31.65	27.13	27.13	27.13	27.13	27.13	27.13	27.13
Heavy Duty	3.768	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		45.27	69.75	69.75	41.64	27.13	39.83	41.64	39.83	39.83	45.27

(1) Emfac2011 emission factors for the South Coast Air District.

(2) Emission Calculations for travel on paved roads from EPA AP-42 Section 13.2.1, December 2003

$E = k(sL/2)^{0.65} \times (W/3)^{1.5} - C$

Where: k = 0.016 lb/VMT for PM10, sL = road silt loading (gms/m2) from CARB Methodology 7.9 for paved roads (0.240 for local roads and 0.037 for major/collector roads), W = weight of vehicles (2.4 tons for light; 5 for medium trucks, and 20 for heavy trucks), and C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (0.00047 lbs/VMT).

(3) Carbon Dioxide Equivalence (CO_E) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2017		
	Light	Medium	Heavy
CO2 (lb/mi)	0.8956	2.2575	3.7642
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.907	2.261	3.768

Attachment A
Tesoro Integration and Compliance Project Addendum

Offroad Construction Vehicle Dust Emissions

Vehicle	Miles/Trip	Trips/Day
Light Vehicles	0.05	1
Total Light Vehicle Miles		0.05

Delivey Trucks	0.05	0
Water Trucks	0.1	1
Total Medium Truck Miles		0.1

Concrete Truck	0.05	0
Dump Trucks	0.05	10
Total Heavy Truck Miles		0.5

Tractors	0.05	1
Fork Lifts	0.05	2
Loader/Backhoe	0.05	2
Total Heavy-Heavy Duty Miles		0.25

PM10	Emission Rate (lb/mi)(1)	Emissions (lb/day)
Light Duty	0.9021196	0.05
Medium Duty	1.2863357	0.13
Heavy Duty	2.1931267	1.10
Heavy Heavy Duty	2.4962390	0.62
Uncontrolled Total		1.89
Controlled Total(2)		0.74

(1) Based on Section 13.2.2 of EPA's Compilation of Air Pollutant Emission Factors (AP-42).
Emission Rate = 1.5((s/12)^.9)*((W/3)^.45)
s = silt content = 8.5%
W = Vehicle Weight (ton) =2.5 for light, 5.5 for medium, 15 for heavy, and 24 for heavy heavy (EMFAC2007).

(2) Controlled Emissions assume that watering 3 times per day reduces emissions by 61 percent (Uncontrolled Emissions x 0.39)

Attachment A
Tesoro Integration and Compliance Project Addendum

Peak Monthly Fugitive PM Construction Emissions

Grading Operations	Average Pieces of Equipment Operating	Peak Pieces of Equipment Operating	Hours of Operation	PM10 Emission Factor (lb/hour)	Water Control Factor[5]	Controlled Emissions: Average PM10 Emissions (lbs/day)	Controlled Emissions: Peak PM10 Emissions (lbs/day)	Uncontrolled Emissions: Average PM10 Emissions (lbs/day)	Uncontrolled Emissions: Peak PM10 Emissions (lbs/day)	SCAQMD Emission Factor Source
Construction Activities[1]	2	2	8	0.348	0.39	2.17	2.17	5.56218435	5.56218435	Table A9-9-F

Stockpiles	Average Tons of Materials Handled Per Day	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor[5]	Controlled Emissions: Average PM10 Emissions Pounds/day	Controlled Emissions: Peak PM10 Emissions Pounds/day	Uncontrolled Emissions: Average PM10 Emissions Pounds/day	Uncontrolled Emissions: Peak PM10 Emissions Pounds/day	SCAQMD Emission Factor Source
Construction Activities[2]	1200	1200	0.00005	0.39	0.02411771	0.02411771	0.06184029	0.06184029	Table A9-9-G

Assumptions: 1cubic yard trench spoils = 1 ton

WIND EROSION Disturbed Area and Temporary Stockpiles	Days of Construction	Average Acreage Disturbed Per Day	Peak Acreage Disturbed Per Day	PM10 Emission Factor (lb/day/acre)	Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	Average PM10 Emissions Tons/Year	Peak PM10 Emissions Tons/Year	SCAQMD Emission Factor Source
Construction Activities[3]	20	0.25	1	0.120	0.030	0.120	0.000	0.001	Table A9-9-E

Filling and Dumping	Estimated Materials Handled Per Day (tons)	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor[5]	Controlled Emissions: Average PM10 Emissions Pounds/day	Controlled Emissions: Peak PM10 Emissions Pounds/day	Uncontrolled Emissions: Average PM10 Emissions Pounds/day	Uncontrolled Emissions: Peak PM10 Emissions Pounds/day	SCAQMD Emission Factor Source
Truck Filling[4]	1200.0	1200.0	5.153E-05	0.39	0.02411771	0.02411771	0.06184029	0.06184029	Table A9-9
Truck Dumping	1200.0	1200.0	5.153E-05	0.39	0.02411771	0.02411771	0.06184029	0.06184029	Table A9-9

TOTAL PM10 Pounds/day	Average	Peak
(Controlled Emissions)	2.2715	2.36133
(Uncontrolled Emissions)	5.748	5.749

(1) Emissions (lbs/hr) = $[0.75 \times (G^{1.5})/(H^{1.4}) \times J$
where G = silt content (7.5%), H = moisture content (15.0%) and J = hrs of operation (EPA AP-42 Table 11.9-1 for bulldozing overburden).
(2) Emissions (lbs/ton) = $0.00112 \times [(G/5)^{1.3}/(H/2)^{1.4}] \times I/J$
where G=mean wind speed (4.1 mph), H=moisture content of surface material (15%); I=lbs of dirt handled per day; and J=2,000 lbs/ton. Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.
(3) Emissions (lbs/day/acre) = 1.7 x [(G/1.5)*(365-H)/235] x I/15 x J
where G = silt content (7.5%); H = days with >0.01 inch of rain (34); I = percentage of time wind speed exceeds 12 mph (0.3%) and J= fraction of TSP (0.5). Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.
(4) Used SCAQMD Table 9-9 Default emission factors.
(5) Mitigated Emissions assume that watering 3 times per day controls emissions by 61 percent (Uncontrolled Emissions x 0.39). www.AQMD.gov/CEQA/handbook/mitigation/fugitive/Table XI-A.doc

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APPENDIX D

AIR QUALITY ANALYSIS ADDENDUM

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Tesoro Refining & Marketing Company, LLC

Air Quality Analysis - Addendum

Los Angeles Refinery Integration & Compliance Project

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April 2019

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PREFACE

This document evaluates the impact of operational emissions associated with the Tesoro Los Angeles Refinery Integration and Compliance (LARIC) project.

Summary of Changes to the Project

Following release of the May 2017 Tesoro Los Angeles Refinery Integration and Compliance (LARIC) Project Final Environmental Impact Report (FEIR), the following modifications were proposed for the project:

1. Carson C3 Splitter Unit: The propane recovery project was relocated from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit. Relocation of this project will result in less VOC and toxic emissions than originally proposed. A permit application was submitted to the SCAQMD requesting the necessary modifications to the C3 Splitter Unit.
2. Carson Storage Tank 35: Tesoro submitted a permit application to the SCAQMD requesting an increase to the maximum permitted throughput of this tank. The throughput increase will result in an emissions increase of VOC and toxic emissions.
3. Carson Crude Terminal: The toxic air contaminant (TAC) speciation of crude oils stored was updated to include additional toxic concentration data.
4. Construction Schedule: The schedule and associated diesel particulate matter (DPM) emissions were updated.

These changes are incorporated in this Air Quality Analysis (AQA) Addendum. Summaries of the emissions associated with this Addendum are included as **Attachments A and B** to this analysis.

Effect to the Criteria Pollutant Air Quality Analysis

The proposed changes affect only VOC and TAC emissions. VOC and TACs are not modeled for criteria pollutant air quality impacts and revision of the Criteria Pollutant Air Quality Analysis is not necessary.

Health Risk Assessment (HRA)

Project updates resulted in the following modifications to the May 2017 FEIR Health Risk Assessment (HRA):

1. Carson C3 Splitter Unit: Removal of the Carson Naphtha Isomerization Unit modification portion of the project and addition of the Carson Operations C3 Splitter Unit change the quantities, types and location of TACs emitted from the project.
2. Carson Storage Tank 35: The proposed modification will increase the emissions of toxics from the project.
3. Carson Crude Terminal: Update to the TAC speciation for the crude oil storage tanks at the CCT affects the cancer, chronic, and acute risks of the project.
4. Construction Schedule: Updates to the schedule and associated diesel particulate matter (DPM) emissions (see Section 4.3, below).

The described changes resulted in the need to revise the May 2017 FEIR HRA. A summary of the results of the revised HRA is included in this document, the complete HRA Addendum is included under separate cover as Appendix E to this EIR Addendum.

Note that following the release of the May 2017 FEIR, the SCAQMD updated the meteorological datasets; the new meteorological dataset was used in this AQA Addendum. This analysis demonstrates that project impacts are still expected to be less than significant.

This analysis demonstrates that project impacts are expected to remain less than significant while modeling with the original meteorological dataset as well as while modeling with the new meteorological dataset. **Table 1**, below shows the May 2017 FEIR values, the results of modeling the May 2017 FEIR emissions with the updated meteorological dataset, as well as results of the modeling of this FEIR Addendum.

Table 1. Summary of Toxic Risk Increase at Maximum FEIR Receptors

Receptor	Operations Only			Operations Plus Construction		
	FEIR sources (original, 06-11 met data)	FEIR sources (12-16 met data)	FEIR + CCT with updated ERs + T35 + C3 Splitter - NapIsom (12-16 met data)	FEIR sources + Construction (original, 06-11 met data)	FEIR sources + Construction (12-16 met data)	FEIR + CCT with updated ERs + T35 + C3 Splitter - NapIsom + Construction (12-16 met data)
Maximum cancer risk (per million)						
Residential receptor	3.7	2.8	2.9	5.7	4.7	4.7
Offsite workplace receptor	9.3	7.0	7.0	9.3	7.0	7.0
Sensitive receptor	2.1	2.4	2.4	4.2	4.1	4.1
Maximum chronic risk						
Residential receptor	0.030	0.021	0.024	0.033	0.023	0.025
Offsite workplace receptor	0.106	0.078	0.085	0.115	0.089	0.096
Sensitive receptor	0.025	0.019	0.019	0.027	0.019	0.019
Maximum 8-Hr chronic risk						
Residential receptor	0.006	0.005	0.005	0.006	0.005	0.005
Offsite workplace receptor	0.108	0.084	0.084	0.108	0.084	0.084
Sensitive receptor	0.005	0.006	0.006	0.005	0.006	0.006
Maximum acute risk						
Residential receptor	0.052	0.039	0.040	0.052	0.039	0.040
Offsite workplace receptor	0.052	0.076	0.076	0.052	0.076	0.076
Sensitive receptor	0.010	0.009	0.009	0.010	0.009	0.009

1. INTRODUCTION

Following release of the Final Environmental Impact Report (FEIR) in May 2017, the following modifications to the project were made:

1. Carson C3 Splitter Unit: The propane recovery project was relocated from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit. Relocation of this project will result in less VOC and toxic emissions than originally proposed. A permit application was submitted to the SCAQMD requesting the necessary modifications to the C3 Splitter Unit.
2. Carson Storage Tank 35: Tesoro submitted a permit application to the SCAQMD requesting an increase to the maximum permitted throughput of this tank. The throughput increase will result in an emissions increase of VOC and toxic emissions.
3. Carson Crude Terminal: The toxic air contaminant (TAC) speciation of crude oils stored was updated to include additional toxic concentration data.
4. Construction Schedule: The schedule and associated diesel particulate matter (DPM) emissions were updated.

Summaries of the updates in emissions are included as **Attachments A and B** to this analysis.

This document is an addendum to the Air Quality Analysis (AQA) provided in the May 2017 LARIC project FEIR (Appendix B-3 of the FEIR). The purpose of the analysis is to determine if project emissions pose a threat to ambient air quality standards. The approach used in this assessment is described in detail and are based on written SCAQMD guidelines and discussions with SCAQMD staff.

2. AIR QUALITY

With the exception of the changes described in this addendum, emissions calculation methodologies presented in the May 2017 FEIR remain unchanged and are not discussed further in this AQA Addendum. Calculation worksheets which have been updated to reflect the noted changes are provided in **Attachments A and B** to this AQA Addendum.

2.1 Emissions Calculation Methodology

C3 Splitter

VOC emissions were calculated based on changes to fugitive component counts, and using SCAQMD's approved fugitive component calculation methodology. Toxic emissions were estimated based on weight fractions of liquid streams affected by the proposed modification. Calculation sheets supporting this modification are included with **Attachment A** to this Addendum.

Carson Storage Tank 35

VOC and toxic emissions for each product from Tank 35 were calculated using EPA's TANKS 4.0.9d emissions estimating software. Reports showing the inputs, VOC emissions and toxic emission for each product are included as **Attachment B** to this Addendum.

Carson Crude Terminal
VOC and toxic emissions were calculated using EPA's TANKS 4.0.9d emissions estimating software. Reports showing the inputs, VOC emissions and toxic emissions for each product are included as **Attachment B** to this Addendum.

Construction Emissions
Construction emissions calculations are addressed in Appendices B and C to the Addendum.

2.2 Summary of Emissions Changes

2.2.1 Stationary Source Emissions

As described in the May 2017 FEIR AQA, operation of the proposed project will result in increased emissions from fugitive equipment leaks, storage tanks, coke handling and combustion units. **Table 2** and **Table 3**, below, present the estimated stationary source emissions associated with the proposed project. Note that, with the exception of the VOC values for the Naphtha Isomerization Unit, C3 Splitter and Tank 35, no other criteria pollutant values have changed as a result of this Addendum. Calculation worksheets which have been updated with this Addendum are provided in **Attachments A** and **B** to this Addendum.

Table 2. Summary of Emissions Changes (Pounds per Day)

	Emissions (lbs/day)				
NEW AND MODIFIED SOURCES	**NOx**	**SOx**	**CO**	**PM_{10}***	**VOC**
51 Vac Unit Heater	32.72	1.80	233.85	45.49	32.85
Naphtha HDS ULNB Conversion	1.87	0.64	10.23	5.56	1.73
DCU H-100 Heater Duty Bump	(171.03)	86.69	(5.14)	(0.98)	(0.43)
HC H-300 Heater Duty Bump	4.67	(14.98)	49.75	10.79	10.10
HC H-301 Heater Duty Bump (incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)
Sulfuric Acid Regen Plant Process Air Heater	6.99	0.28	16.37	3.51	3.27
Sulfuric Acid Regen Plant Decomp. Furnace	2.45	0.59	34.39	7.37	6.88
Sulfuric Acid Regen Plant Converter Heater	1.75	0.07	4.09	0.88	0.82
Sulfuric Acid Regen Plant Process Vent	-	31.12	-	6.00	-
Carson Crude Tank Emissions	-	-	-	-	112.51
Carson Tank 35 Emissions	-	-	-	-	7.89
Wilmington Tank Project Emissions	-	-	-	-	141.64
CARSON AND WILMINGTON FUGITIVE COMPONENT EMISSIONS					
51 Vac (Carson)	-	-	-	-	11.74
Alkylation (Carson)	-	-	-	-	18.88
Crude Tanks (Fug Ems) (Carson)	-	-	-	-	43.05
HCU Mods (Carson)	-	-	-	-	6.77
Interconnect Piping (Carson)	-	-	-	-	27.22
LHU Mods (Carson)	-	-	-	-	14.34
LPG Railcar Load/Unload (Carson)	-	-	-	-	26.85
Mid Barrel Distillate Treater (Carson)	-	-	-	-	2.15
~~Naphtha Isom (Carson)~~	~~-~~	~~-~~	~~-~~	~~-~~	~~9.46~~

C3 Splitter (Carson)	-	-	-	-	0.59
NHDS Mods (Carson)	-	-	-	-	15.21
PSTU (Carson)	-	-	-	-	15.44
Wet Jet Treater (Carson)	-	-	-	-	50.45
CRU 3 (Wilmington)	-	-	-	-	10.24
Crude Tanks (Fug Ems) (Wilmington)	-	-	-	-	3.61
HCU (Wilmington)	-	-	-	-	20.69
HTU 1 (Wilmington)	-	-	-	-	3.50
HTU 2 (Wilmington)	-	-	-	-	3.80
HTU 4 (Wilmington)	-	-	-	-	6.32
Interconnect Piping (Wilmington)	-	-	-	-	37.20
Sulfuric Acid Plant (Fug Ems) (Wilmington)	-	-	-	-	-
CARSON AND WILMINGTON INCREASED UTILIZATION EMISSIONS					
Carson FCCU Regenerator*	-	-	-	-	-
Carson FCCU Pre-Heater*	-	-	-	-	-
Carson Cogeneration Units 1-4	20.60	2.50	4.50	9.85	4.15
Carson HC Heater R-1	18.00	4.61	1.04	5.38	1.77
Carson HC Heater R-2	14.40	9.81	1.38	7.18	2.36
Carson LHU Heater	6.00	1.50	0.36	1.87	0.62
Wilmington DCU Heater H-101	19.00	7.58	4.36	0.83	0.83
Wilmington HTU #3 Heater H-30	7.87	2.53	0.38	1.97	1.59
Wilmington HTU #3 Heater H-21/22	12.69	1.33	2.76	0.59	0.61
Wilmington CRU Heater H-510	0.48	0.24	0.60	0.15	0.05
Wilmington CRU Heater H-501A, B, 502, 503/504	1.27	0.41	0.95	0.59	0.18
Wilmington Boilers 7 and 8	12.00	3.07	0.37	1.89	0.63
Wilmington Boilers 9 and 10	12.00	3.07	0.37	1.89	0.63
Wilmington Coke Handling**	--	--	--	--	--
SRP Boilers H-1601/1602	0.11	0.04	0.01	0.05	0.02
SRP Incinerators F-704	0.24	12.66	0.05	0.01	0.01
SRP Incinerators F-754	0.52	12.66	0.03	0.03	0.01
Carson Tank 14	-	-	-	-	0.54
Carson Tank 31	-	-	-	-	0.35
Carson Tank 62	-	-	-	-	17.58
Carson Tank 63	-	-	-	-	18.72
Carson Tank 64	-	-	-	-	0.32
Carson Tank 502	-	-	-	-	26.59
Carson Tank 959	-	-	-	-	0.26
Wilmington Tank 80044	-	-	-	-	3.02
Wilmington Tank 80074	-	-	-	-	0.15
Wilmington Tank 80211	-	-	-	-	0.32
Wilmington Tank 80215	-	-	-	-	0.31
Wilmington Tank 80217	-	-	-	-	0.31

* Daily operating rates of the FCCU regenerator and Pre-Heater will not increase above previous maximum daily rates; as such, daily emissions increases are listed as zero.
** Daily operating rates of the Wilmington Coke Handling will not increase above previous maximum daily rates; as such, daily emissions increases are listed as zero.

WILMINGTON FCCU SHUTDOWN (HISTORIC ACTUAL EMISSIONS)

FCCU	(343.31)	(387.50)	(incl w/CO Boiler)	(98.59)	(274.03)
CO Boiler	(incl w/FCCU)	(incl w/FCCU)	(909.62)	(22.71)	(16.43)
H2 Heater	(16.53)	(1.28)	(4.06)	(0.87)	(0.81)
H3/H4 Heater	(209.75)	(27.59)	(45.30)	(49.01)	(9.93)
H5 Heater	-	-	-	-	-
Startup Heater	(3.00)	(0.01)	(0.81)	(0.17)	(0.16)
Fugitive Components					(17.60)

Total Combined Emissions	**(567.98)**	**(248.15)**	**(599.06)**	**(60.43)**	**398.27**

*All PM emissions were conservatively assumed to be equal to PM_{10}, and those emissions were also conservatively assumed to be $PM_{2.5}$.

Table 3. Summary of Emissions Changes (Tons per Year)

	Emissions (tons/year)					
NEW AND MODIFIED SOURCES	**NOx**	**SOx**	**CO**	**PM_{10}***	**VOC**	**CO2e (MT/Yr)**
51 Vac Unit Heater	18.04	0.25	42.75	8.55	6.12	59,707
Naphtha HDS ULNB Conversion	0.18	0.11	1.86	1.07	0.32	3,910
DCU H-100 Heater Duty Bump	6.12	35.38	3.63	0.75	0.80	33,282
HC H-300 Heater Duty Bump	(0.10)	(1.24)	10.02	2.15	2.00	28,074
HC H-301 Heater Duty Bump (incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)	(incl with H-300)
Sulfuric Acid Regen Plant Process Air Heater	1.28	0.05	2.99	0.64	0.60	9,306
Sulfuric Acid Regen Plant Decomp. Furnace	0.45	0.11	6.28	1.34	1.26	19,542
Sulfuric Acid Regen Plant Converter Heater	0.32	0.01	0.75	0.16	0.15	2,326
Sulfuric Acid Regen Plant Process Vent	-	5.68	-	1.10	-	-
Carson Crude Tank Emissions	-	-	-	-	20.53	-
Carson Storage Tank 35 Emissions	-	-	-	-	1.44	-
Wilmington Tank Project Emissions	-	-	-	-	25.85	-
CARSON AND WILMINGTON FUGITIVE COMPONENT EMISSIONS						
51 Vac (Carson)	-	-	-	-	2.14	-
Alkylation (Carson)	-	-	-	-	3.45	-
Crude Tanks (Fug Ems) (Carson)	-	-	-	-	7.86	-
HCU Mods (Carson)	-	-	-	-	1.24	-
Interconnect Piping (Carson)	-	-	-	-	4.97	-
LHU Mods (Carson)	-	-	-	-	2.62	-
LPG Railcar Load/Unload	-	-	-	-	4.90	-

(Carson)						
Mid Barrel Distillate Treater (Carson)	-	-	-	-	0.39	-
~~Naphtha Isom (Carson)~~	-	-	-	-	~~1.73~~	-
C3 Splitter (Carson)	-	-	-	-	0.11	-
NHDS Mods (Carson)	-	-	-	-	2.78	-
PSTU (Carson)	-	-	-	-	2.82	-
Wet Jet Treater (Carson)	-	-	-	-	9.21	-
CRU 3 (Wilmington)	-	-	-	-	1.87	-
Crude Tanks (Fug Ems) (Wilmington)	-	-	-	-	0.66	-
HCU (Wilmington)	-	-	-	-	3.78	-
HTU 1 (Wilmington)	-	-	-	-	0.64	-
HTU 2 (Wilmington)	-	-	-	-	0.69	-
HTU 4 (Wilmington)	-	-	-	-	1.15	-
Interconnect Piping (Wilmington)	-	-	-	-	6.79	-
Sulfuric Acid Plant (Fug Ems) (Wilmington)	-	-	-	-	0.00	-
CARSON AND WILMINGTON INCREASED UTILIZATION EMISSIONS						
Carson FCCU Regenerator	14.58	20.99	18.24	7.44	0.68	99,938
Carson FCCU Pre-Heater	1.39	0.34	0.13	0.69	0.23	5,048
Carson Cogeneration Units 1-4	3.76	0.46	0.82	1.80	0.76	20,147
Carson HC Heater R-1	3.29	0.84	0.19	0.98	0.32	7,146
Carson HC Heater R-2	2.63	1.79	0.25	1.31	0.43	9,528
Carson LHU Heater	1.10	0.27	0.07	0.34	0.11	2,377
Wilmington DCU Heater H-101	3.47	1.38	0.80	0.15	0.15	3,414
Wilmington HTU #3 Heater H-30	1.44	0.46	0.07	0.36	0.29	2,001
Wilmington HTU #3 Heater H-21/22	2.32	0.24	0.50	0.11	0.11	1,998
Wilmington CRU Heater H-510	0.09	0.04	0.11	0.03	0.01	195
Wilmington CRU Heater H-501A, B, 502, 503/504	0.23	0.08	0.17	0.11	0.03	780
Wilmington Boilers 7 and 8	2.19	0.56	0.07	0.35	0.12	2,443
Wilmington Boilers 9 and 10	2.19	0.56	0.07	0.35	0.12	2,443
Wilmington Coke Handling	-	-	-	0.07	-	-
SRP Boilers H-1601/1602	0.02	0.01	0.00	0.01	0.00	53
SRP Incinerators F-704	0.04	2.31	0.01	0.00	0.00	33
SRP Incinerators F-754	0.10	2.31	0.01	0.01	0.00	33
Carson Tank 14	-	-	-	-	0.10	-
Carson Tank 31	-	-	-	-	0.06	-
Carson Tank 62	-	-	-	-	3.21	-
Carson Tank 63	-	-	-	-	3.42	-
Carson Tank 64	-	-	-	-	0.06	-
Carson Tank 502	-	-	-	-	4.85	-
Carson Tank 959	-	-	-	-	0.05	-
Wilmington Tank 80044	-	-	-	-	0.55	-
Wilmington Tank 80074	-	-	-	-	0.03	-
Wilmington Tank 80211	-	-	-	-	0.06	-
Wilmington Tank 80215	-	-	-	-	0.06	-

Wilmington Tank 80217	-	-	-	-	0.06	-
WILMINGTON FCCU SHUTDOWN (HISTORIC ACTUAL EMISSIONS)						
FCCU	(62.65)	(70.72)	(incl w/CO Boiler)	(17.99)	(50.01)	(247,466)
CO Boiler	(incl w/FCCU)	(incl w/FCCU)	(166.01)	(4.14)	(3.00)	(72,569)
H2 Heater	(3.02)	(0.23)	(0.74)	(0.16)	(0.15)	(2,838)
H3/H4 Heater	(38.28)	(5.03)	(8.27)	(8.94)	(1.81)	(60,739)
H5 Heater	-	-	-	-	-	-
Startup Heater	(0.55)	(0.00)	(0.15)	(0.03)	(0.03)	(433)
Fugitive Components	-	-	-	-	(3.21)	-
Total Combined Emissions	**(39.40)**	**(2.99)**	**(85.37)**	**(1.42)**	**74.76**	**(70,321.32)**

*All PM emissions were conservatively assumed to be equal to PM_{10}, and those emissions were also conservatively assumed to be $PM_{2.5}$.

3. CRITERIA POLLUTANT MODELING

Other than the change in VOC emissions rates from the Naphtha Isomerization Unit, C3 Splitter and Storage Tank 35, no other changes to criteria pollutant emissions occurs as part of this addendum. As VOC emissions do not require criteria pollutant modeling, an update to the criteria pollutant modeling provided in with the May 2017 FEIR is not required. Construction emissions and impacts are addressed in Appendices B and C to the Addendum.

4. HEALTH RISK ASSESSMENT

The May 2017 FEIR demonstrated a project cancer risk increase below 10 in one million and chronic and acute hazard indices below 1. This addendum to the HRA shows that the project continues to remain below the applicable risk thresholds. A summary of the methodology is presented below; the complete analysis is provided in the April 2019 Addendum to the HRA (Appendix E to this EIR Addendum).

4.1 Methodology

This health risk assessment was performed following the Office of Environmental Health Hazard Assessment (OEHHA), *Air Toxics Hot Spots Program Risk Assessment Guidelines*[1]. As recommended by this guideline, the California Air Resources Board (CARB) Hotspots Analysis and Reporting Program Version 2 (HARP2)[2] was used to perform a refined health risk assessment for the project's emission sources.

Consistent with SCAQMD modeling guidelines, the AMS/EPA Regulatory Model (AERMOD, v 18081) was used as the air dispersion model for this analysis. HARP2 includes AERMOD but also allows model runs to be performed with AERMOD outside of HARP2. For this project, AERMOD was run outside of HARP2, and the results were imported into HARP2 to complete the risk analysis. This HRA Addendum evaluates

[1] California Office of Environmental Health Hazard Assessment (OEHHA) 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015.

[2] HARP2 (Hotspots Analysis and Reporting Program) Air Dispersion Modeling & Risk Tool, v 17320.

risk following SCAQMD guidelines[3]. In addition to the addition of toxic emissions from Tank 35 and the C3 Splitter, the removal of fugitive emissions from the Naphtha Isomerization unit, and update to the toxic air contaminant (TAC) speciation for the crude oil storage tanks at the Carson Crude Terminal (CCT) to include additional toxic concentration data, modifications to the construction schedule and associated changes to the construction diesel particulate matter (DPM) emissions were made. The updated schedule and emissions were incorporated in the modeling analysis. No other changes to the HRA modeling approach were made as part of this Addendum. A complete description of the HRA modeling approach is provided in the HRA provided in the May 2017 FEIR, with updates included in the April 2019 HRA Addendum (Appendix E).

The modeled emission rates and source parameters are provided in the HRA of the May 2017 FEIR. Emission rates associated with the addition of Tank 35 and the C3 Splitter unit fugitives and the updated CCT emission rates are shown in **Table 4**, **Table 5**, and **Table 6**, below. The updated construction schedule and DPM emission rates are shown in **Table 7**. A detailed description of the construction emissions methodology is provided in Appendix B of this Addendum.

Table 4. Storage Tank 35 Modeled Emissions Rates

Pollutant	CAS Number	Emission Rate Increase	
		(lb/yr)	(lb/hr)
1,2,4-Trimethylbenzene	95636	12.42	1.42E-03
1,3-Butadiene	106990	0.07	7.99E-06
2,2,4Trimethylpentane	540841	60.94	6.96E-03
Benzene	71432	11.95	1.36E-03
Cresols (Mixtures of)	1319773	0.06	6.85E-06
Cumene	98828	4.31	4.92E-04
Cyclohexane	110827	13.49	1.54E-03
Ethyl Benzene	100414	9.12	1.04E-03
n-Hexane	110543	25.52	2.91E-03
Isoprene	78795	0.48	5.48E-05
Methanol	67561	0.01	1.14E-06
Naphthalene	91203	12.28	1.40E-03
Ammonia	7664417	0.02	2.28E-06
Phenanthrene	85018	0.96	1.10E-04
Phenol	108952	0.07	7.99E-06
Propylene (Propene)	115071	0.03	3.42E-06
Toluene	108883	66.55	7.60E-03
Xylenes (Mixed Isomers)	1330207	49.59	5.66E-03

[3] South Coast Air Quality Management District, Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act, June 5, 2015.

Table 5. C3 Splitter Modeled Emission Rates

Pollutant	CAS Number	Emission Rate[4] (lb/yr)	Emission Rate[4] (lb/hr)
1,3-Butadiene	106-99-0	3.01E-04	3.44E-08
Ethylene	74-85-1	0.25	2.85E-05
H_2S	7783-06-4	0.11	1.31E-05
Propylene (Propene)	115-07-1	0.27	3.06E-05
Carbonyl Sulfide	463-58-1	9.34E-03	1.07E-06
Arsine	7784-42-1	4.94E-04	5.64E-08

Table 6. CCT Modeled Emission Rates

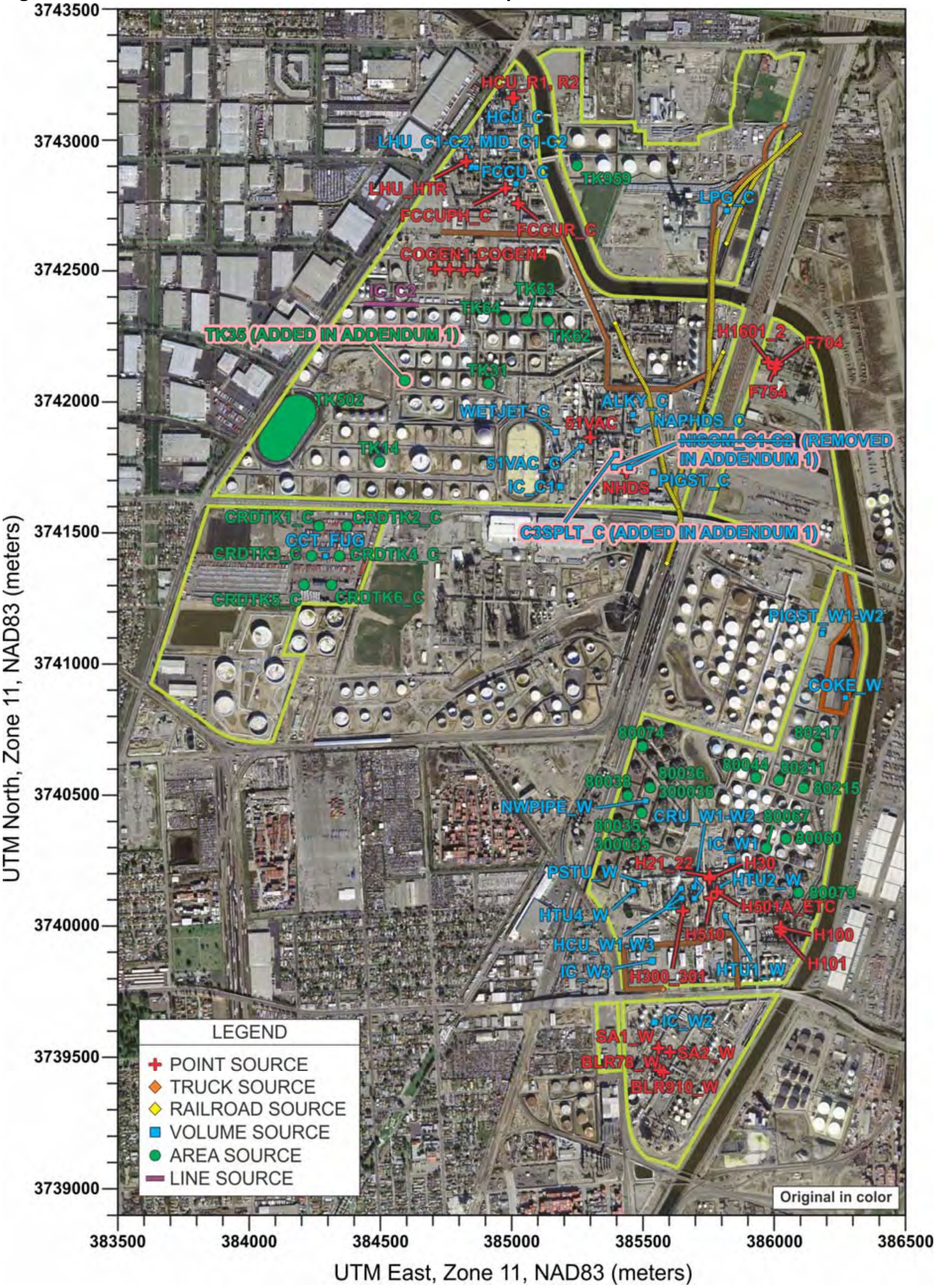
Pollutant	CAS Number	FEIR Emission Rates				FEIR Addendum Emission Rates			
		CCT Fugitive Components		CCT Storage Tank (Each)		CCT Fugitive Components		CCT Storage Tank (Each)	
		(lb/yr)	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	(lb/hr)
Benzo[a]pyrene	50-32-8	1.2E-01	1.3E-05	3.0E-02	3.4E-06	1.2E-01	1.3E-05	3.0E-02	3.4E-06
Dibenz[a,h]anthracene	53-70-3	3.9E-02	4.4E-06	1.0E-02	1.1E-06	3.9E-02	4.4E-06	1.0E-02	1.1E-06
Benz[a]anthracene	56-55-3	2.9E-01	3.3E-05	6.0E-02	6.9E-06	2.9E-01	3.3E-05	8.0E-02	9.1E-06
Benzene	71-43-2	7.4E+01	8.5E-03	2.9E+01	3.3E-03	7.4E+01	8.5E-03	2.9E+01	3.3E-03
Naphthalene	91-20-3	8.6E+00	9.9E-04	2.4E+00	2.7E-04	8.6E+00	9.9E-04	2.4E+00	2.7E-04
Cumene	98-82-8	6.9E+00	7.8E-04	1.9E+00	2.2E-04	6.9E+00	7.8E-04	1.9E+00	2.2E-04
Ethyl benzene	100-41-4	4.3E+01	4.9E-03	1.2E+01	1.4E-03	4.7E+01	5.4E-03	1.3E+01	1.5E-03
Toluene	108-88-3	1.3E+02	1.5E-02	4.1E+01	4.6E-03	1.9E+02	2.1E-02	5.7E+01	6.5E-03
Hexane	110-54-3	2.5E+02	2.9E-02	1.1E+02	1.3E-02	3.0E+02	3.4E-02	1.4E+02	1.6E-02
Benzo[b]fluoranthene	205-99-2	6.3E-01	7.2E-05	1.4E-01	1.6E-05	6.3E-01	7.2E-05	1.7E-01	1.9E-05
Chrysene	218-01-9	5.8E-01	6.6E-05	1.3E-01	1.5E-05	5.8E-01	6.6E-05	1.6E-01	1.8E-05
Xylene	1330-20-7	1.9E+02	2.1E-02	5.2E+01	6.0E-03	2.5E+02	2.9E-02	7.1E+01	8.1E-03
Hydrogen sulfide	7783-06-4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.1E-01	8.1E-05	1.2E+01	1.4E-03

[4] The modeled emission rates are the emission *increases* associated with the project.

Table 7. Summary of Construction Emissions

Construction Project	Duration (months)	Total DPM Emissions (lbs)
Wilmington	24	659
Wilmington Crude Tanks	12	169
SARP	14	201
Carson North	21	450
Carson South	29	569
Carson Crude Tanks	51	370
Pipeline	14	1,013
Electric	23	457

Figure 1. Addendum 1 Modeled Sources Location Map



Following the release of the May 2017 FEIR, the SCAQMD updated the meteorological dataset to be used for modeling projects in the Long Beach area. The new dataset, covering the years 2012-2016, was used in this analysis. To assess the impacts of the project changes for this addendum, modeling with the new meteorological dataset was performed for the May 2017 FEIR emission sources and for this FEIR Addendum. The results of both modeling exercises are presented here.

4.2 Summary of Results (Operations)

May 2017 FEIR Sources with 2012-2016 Meteorological Dataset

The predicted increases in health risks at maximally exposed offsite receptors based on modeling the May 2017 FEIR sources with the 2012-2016 meteorological dataset are summarized by category in **Table 8** and shown in **Figure 2**, **Figure 3**, and **Figure 4**. As can be seen, the highest calculated cancer, chronic and acute risk at residential, sensitive, and worker receptors are below a cancer risk of 10 in a million, as well as a hazard index of 1.

FEIR Addendum Sources with 2012-2016 Meteorological Dataset

The predicted increases in health risks at maximally exposed offsite receptors based on modeling the May 2017 FEIR sources plus the additional sources in this addendum, with the 2012-2016 meteorological dataset, are summarized by category in **Table 8** and shown in **Figure 5**, **Figure 6**, and **Figure 7**. As can be seen, the highest calculated cancer, chronic and acute risk at residential, sensitive, and worker receptors are below a cancer risk of 10 in a million, as well as a hazard index of 1.

The complete HRA analysis is provided separately as the April 2019 HRA Addendum (Appendix E to this Addendum).

Table 8. Summary of Maximum Offsite Cancer and Non-Cancer Risks

Location[a]	Cancer Risk			Chronic Risk			8-Hr Chronic Risk			Acute Risk[c]		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)		Easting (m)	Northing (m)		Easting (m)	Northing (m)
May 2017 FEIR (2006-2011 meteorological data)												
Residential receptor[b]	3.7	383700	3741400	0.030	385251	3739503	0.006	383700	3741400	0.052	385305	3742454
Offsite workplace receptor	9.3	386006	3742921	0.106	386153	3741128	0.108	386153	3741128	0.052	385305	3742454
Sensitive Receptor[b]	2.1	386721	3739987	0.025	387304	3739447	0.005	386721	3739987	0.010	386721	3739987
May 2017 FEIR (2012-2016 met data)												
Residential receptor[b]	2.8	383700	3741400	0.021	385251	3739503	0.005	383700	3741500	0.039	384329	3741584
Offsite workplace receptor	7.0	386019	3742969	0.078	386153	3741128	0.084	386153	3741128	0.076	386153	3741128
Sensitive Receptor[b]	2.4	386721	3739987	0.019	388750	3737361	0.006	386721	3739987	0.009	386721	3739987
FEIR Addendum (2012-2016 met data)												
Residential receptor[b]	2.9	383700	3741400	0.024	385251	3739503	0.005	383700	3741500	0.040	384329	3741584
Offsite workplace receptor	7.0	386019	3742969	0.085	386153	3741128	0.084	386153	3741128	0.076	386153	3741128
Sensitive Receptor[b]	2.4	386721	3739987	0.019	388750	3737361	0.006	386721	3739987	0.009	386721	3739987

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Fenceline receptors were conservatively included as potential residential and worker receptors for determination of maximum acute risk.

Figure 2. Location of Maximum Calculated Health Risks. FEIR Sources with 2012-2016 Meteorological Data

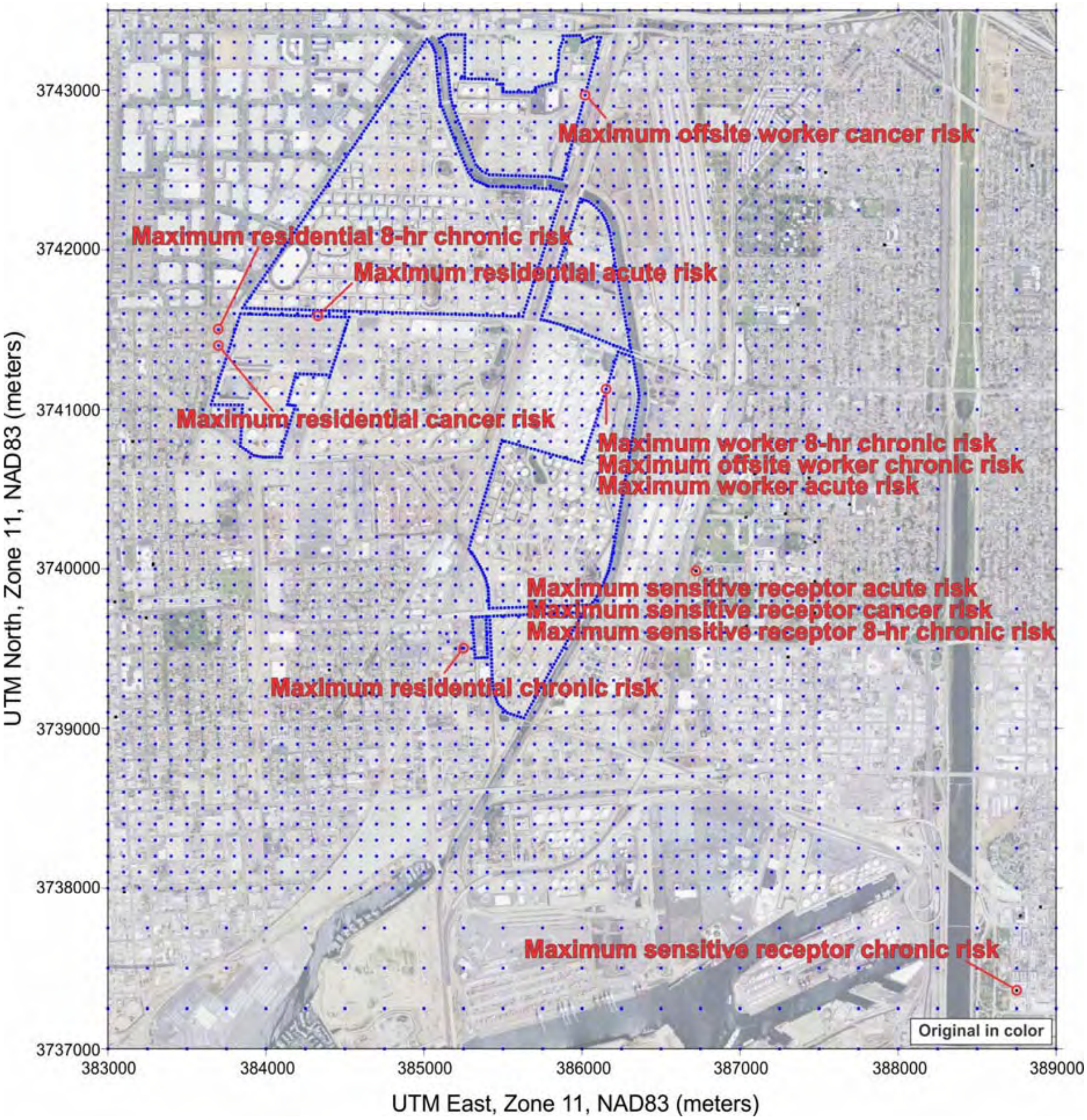


Figure 3. Contours of Residential Cancer Risk, per million exposed, FEIR Sources with 2012-2016 Meteorological Data

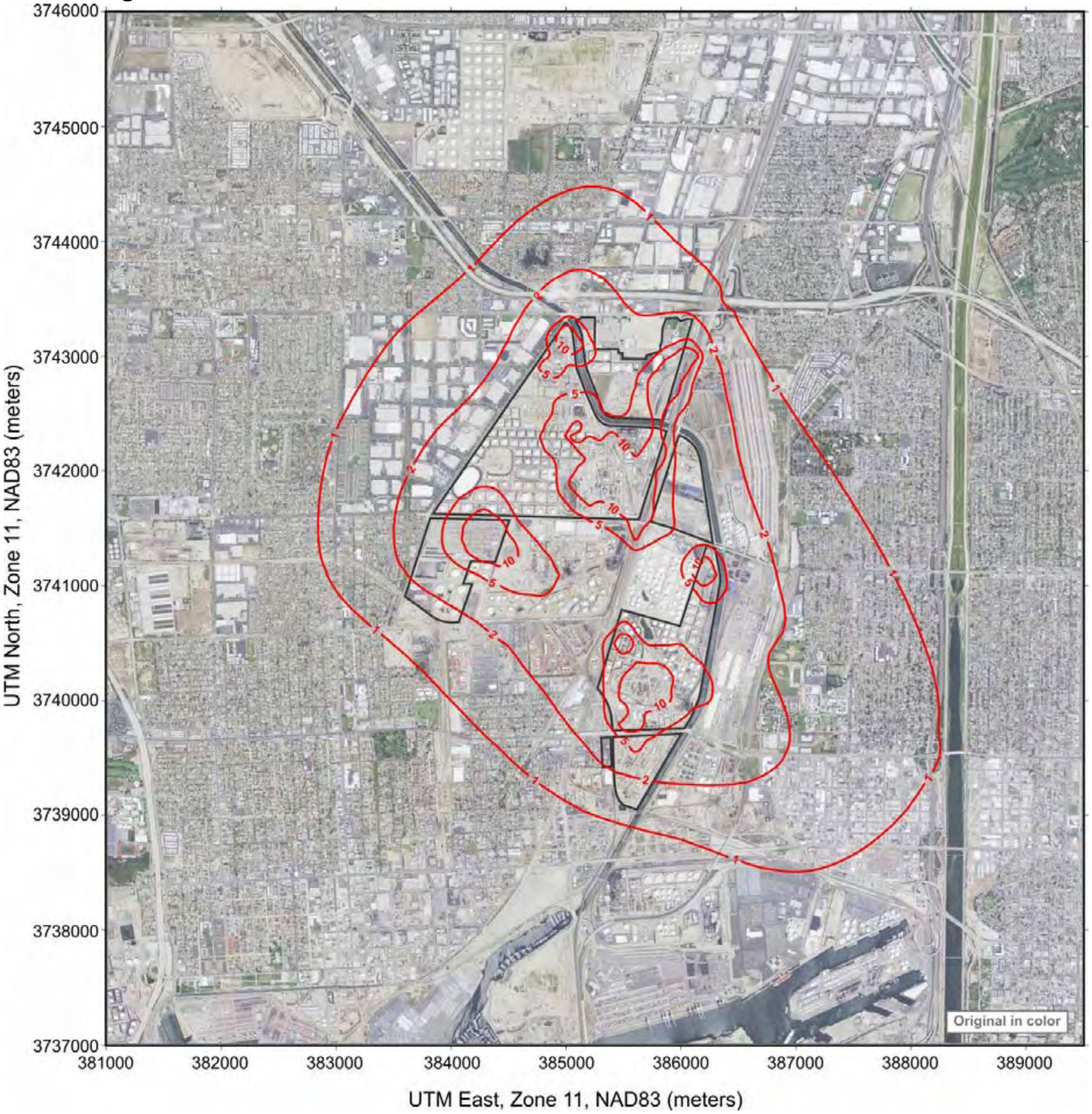


Figure 4. Contours of Worker Cancer Risk, per million exposed, FEIR Sources with 2012-2016 Meteorological Data

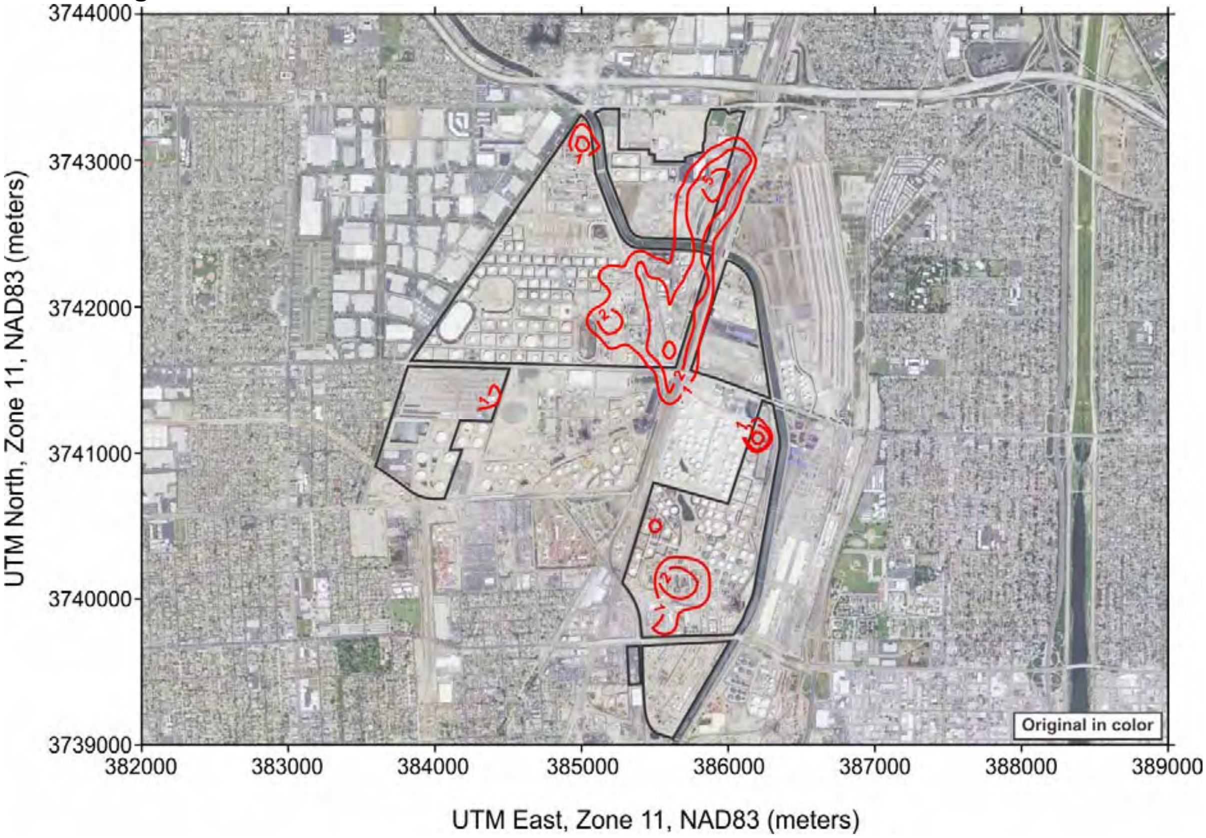


Figure 5. Location of Maximum Calculated Health Risks. FEIR Addendum Sources with 2012-2016 Meteorological Data

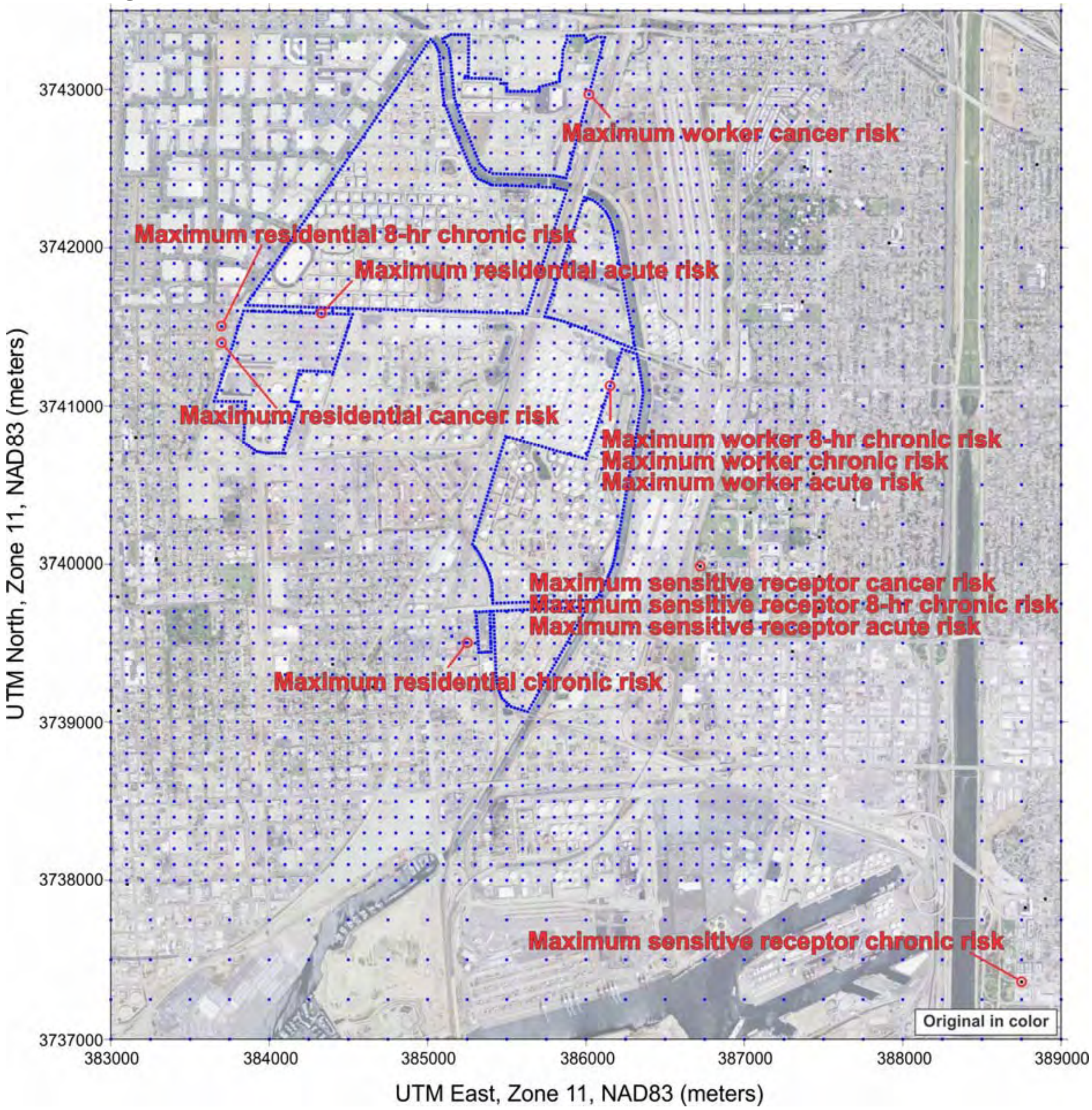


Figure 6. Contours of Residential Cancer Risk, per million exposed, FEIR Addendum Sources with 2012-2016 Meteorological Data

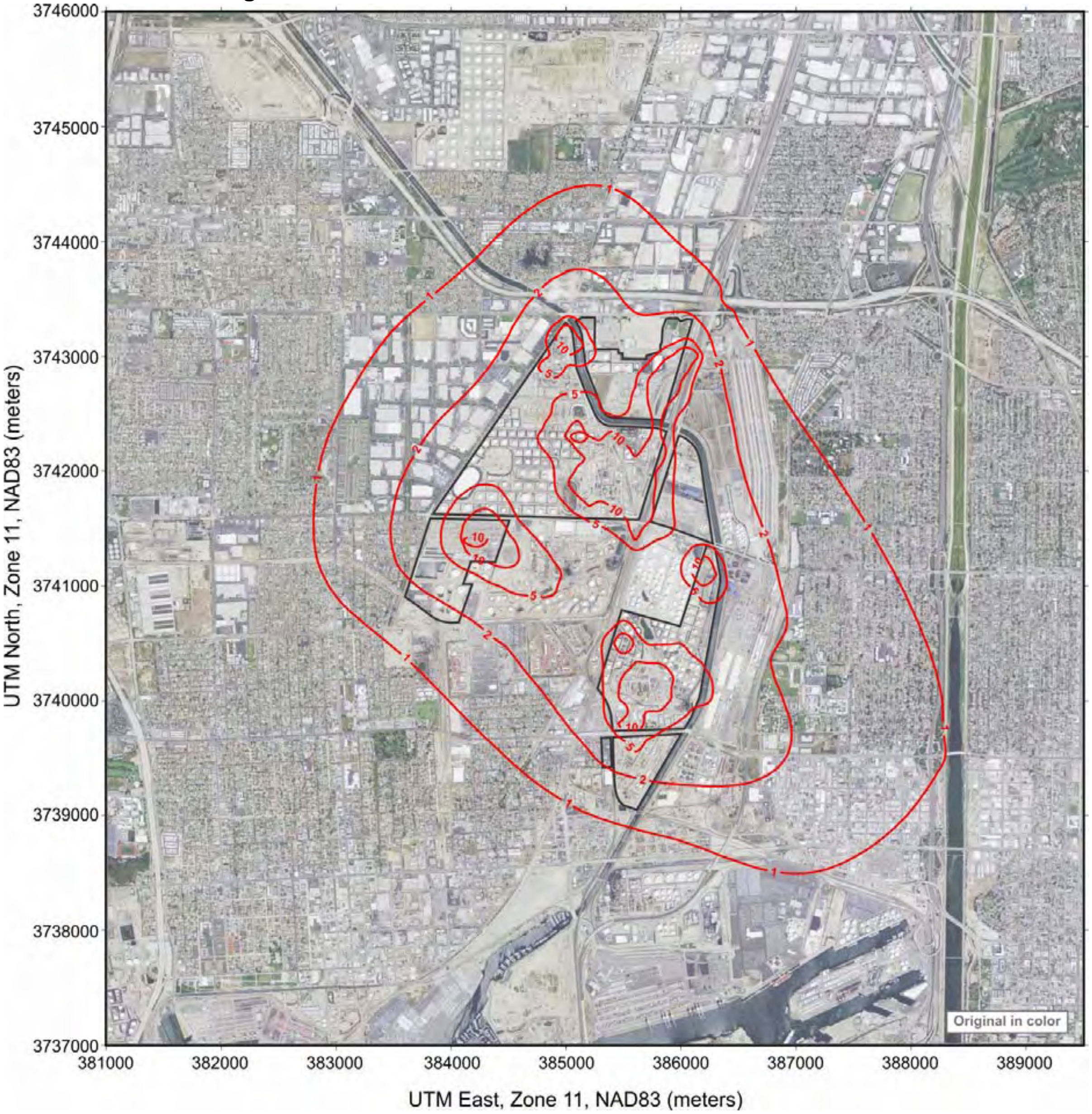
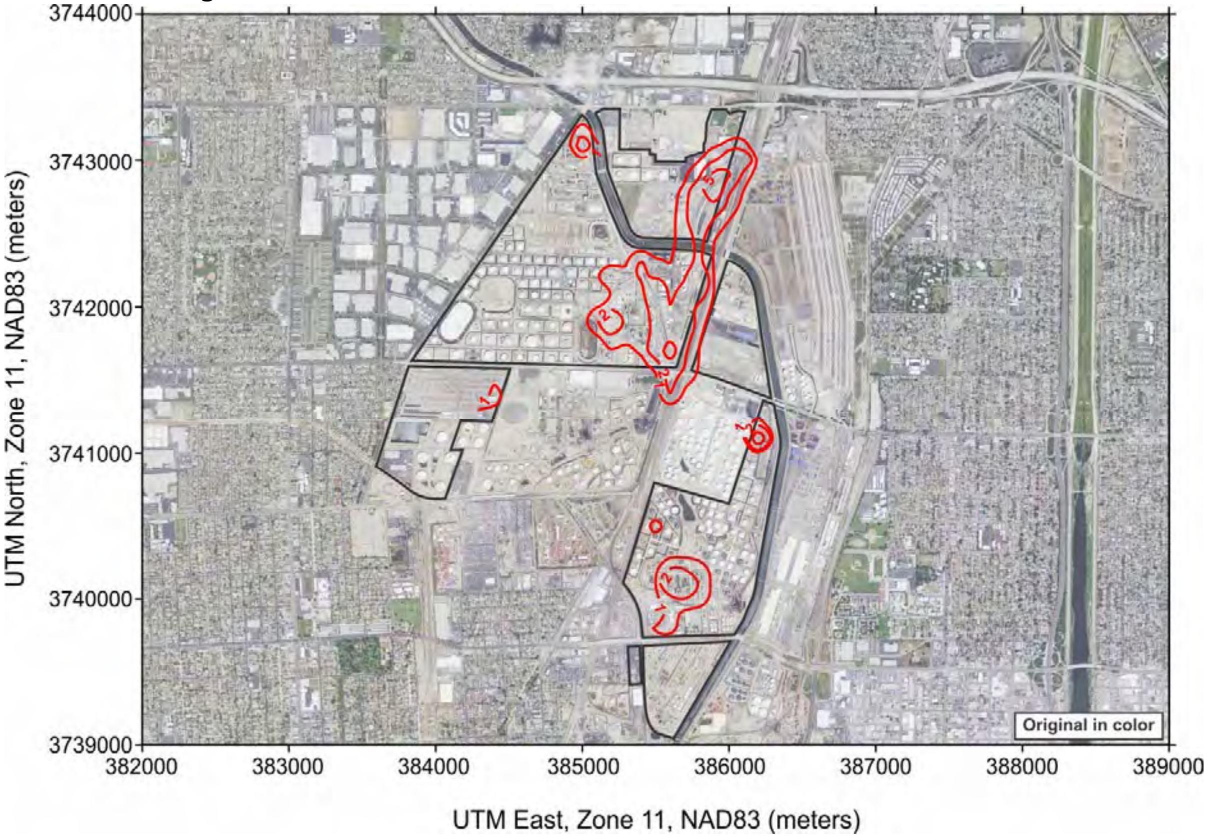


Figure 7. Contours of Worker Cancer Risk, per million exposed, FEIR Addendum Sources with 2012-2016 Meteorological Data



4.3 Summary of Results (Construction)

Acute and 8-hr chronic reference exposure levels do not exist for DPM, therefore, the health risk associated with construction emissions was only evaluated for cancer and chronic risk. The predicted increases in chronic and cancer risks at maximally exposed offsite receptors based on modeling the May 2017 FEIR sources plus the additional sources in this addendum *including* the construction DPM emissions, with the 2012-2016 meteorological dataset, are summarized in **Table 9**, **Table 10**, and **Table 11**, and shown in **Figure 8**, **Figure 9**, and **Figure 10**. As can be seen, the highest calculated cancer risk at residential, sensitive, and worker receptors is below 10 in a million, and the chronic risks are below a hazard index of 1.

The complete HRA analysis is provided separately as the April 2019 HRA Addendum (Appendix E to this Addendum).

Table 9: Summary of Maximum Project Offsite Cancer and Non-cancer Risks (Operation Sources Only)

Location[a]	Cancer Risk			Chronic Risk		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)
Residential receptor[b]	2.9	383700.0	3741400.0	0.024	385251.4	3739502.8
Offsite workplace receptor	7.0	386019.1	3742969.4	0.085	386152.5	3741127.8
Sensitive Receptor[b]	2.4	386720.8	3739987.2	0.019	388750.0	3737361.0

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Maximum sensitive receptors:
Cancer Risk: Bethune Mary School
Chronic Risk: Cesar Chavez Elementary School

Table 10: Summary of Maximum Project Offsite Cancer and Non-cancer Risks (Construction Sources Only)

Location[a]	Cancer Risk			Chronic Risk		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)
Residential receptor[b]	2.3	385000.0	3743600.0	0.002	385000.0	3743600.0
Offsite workplace receptor	1.1	385701.4	3741819.3	0.018	385701.4	3741819.3
Sensitive Receptor[b]	1.7	386720.8	3739987.2	0.001	386720.8	3739987.2

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Maximum sensitive receptors:
Cancer Risk: Bethune Mary School
Chronic Risk: Bethune Mary School

Table 11: Summary of Maximum Project Offsite Cancer and Non-cancer Risks (Operation Plus Construction Sources)[5]

Location[a]	Cancer Risk			Chronic Risk		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)
Residential receptor[b]	4.7	385000.0	3743600.0	0.025	385251.4	3739502.8
Offsite workplace receptor	7.0	386019.1	3742969.4	0.096	386152.5	3741127.8
Sensitive Receptor[b]	4.1	386720.8	3739987.2	0.019	388750.0	3737361.0

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Maximum sensitive receptors:
Cancer Risk: Bethune Mary School
Chronic Risk: Cesar Chavez Elementary School

[5] It should be noted that because the maximum risk associated with operational emissions does not necessarily occur at the same receptor location as the maximum risk associated with construction emissions, the combined risk may not be equal to the sum of each maximum value.

Figure 8. Location of Maximum Calculated Health Risks, FEIR Addendum Sources Plus Construction Sources with 2012-2016 Meteorological Data

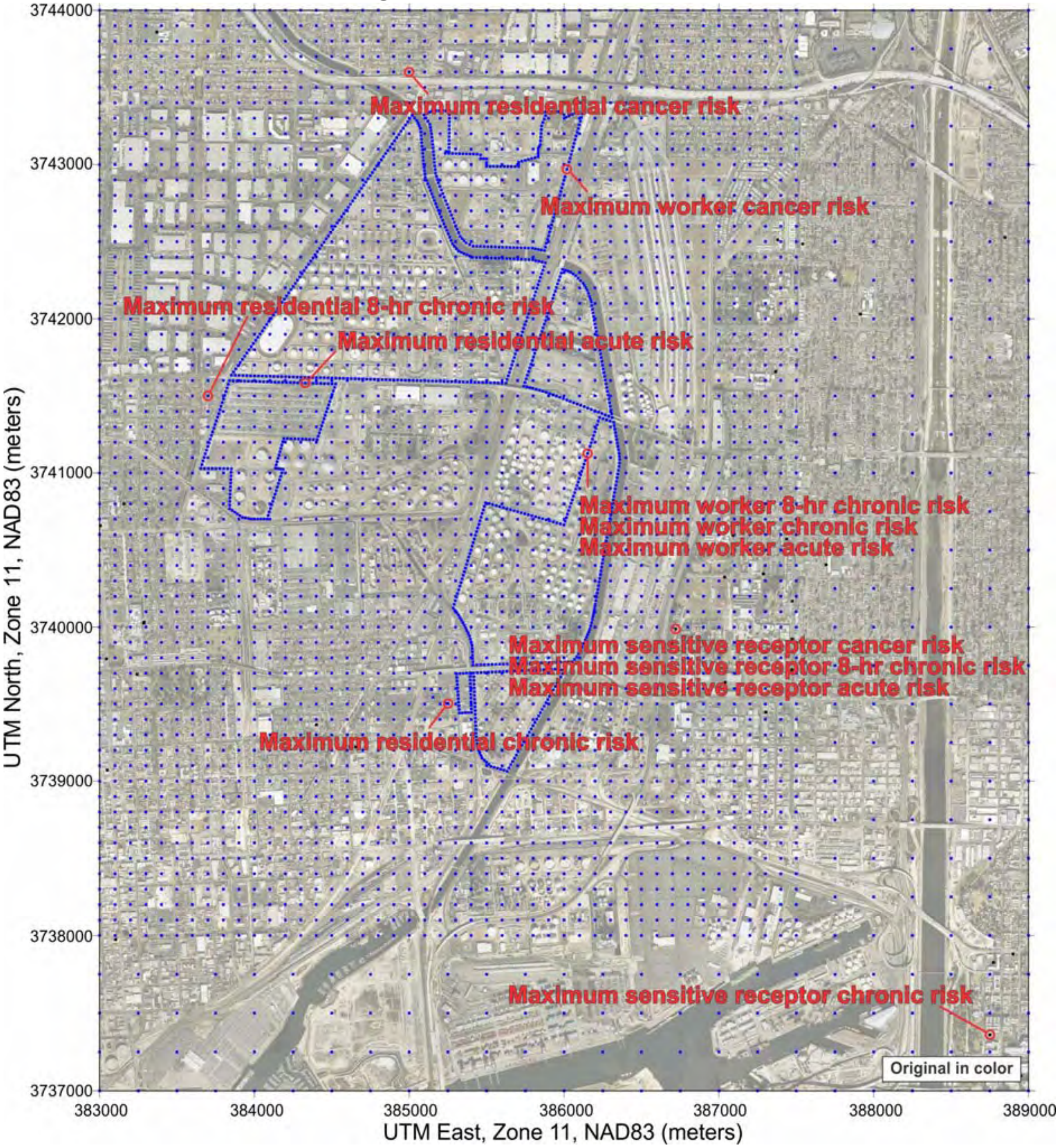


Figure 9. Contours of Residential Cancer Risk, per million exposed, FEIR Addendum Sources Plus Construction Sources with 2012-2016 Meteorological Data

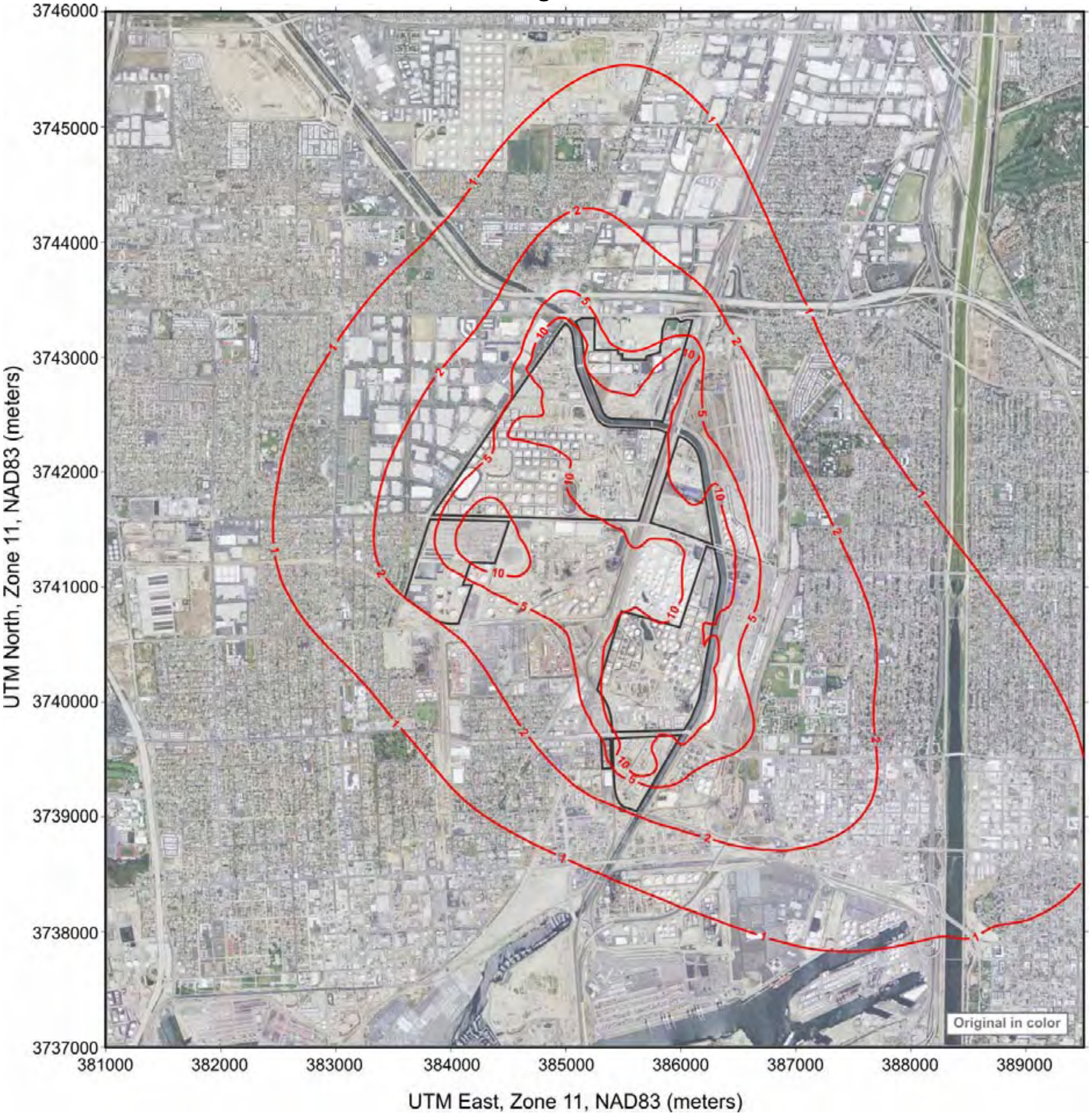
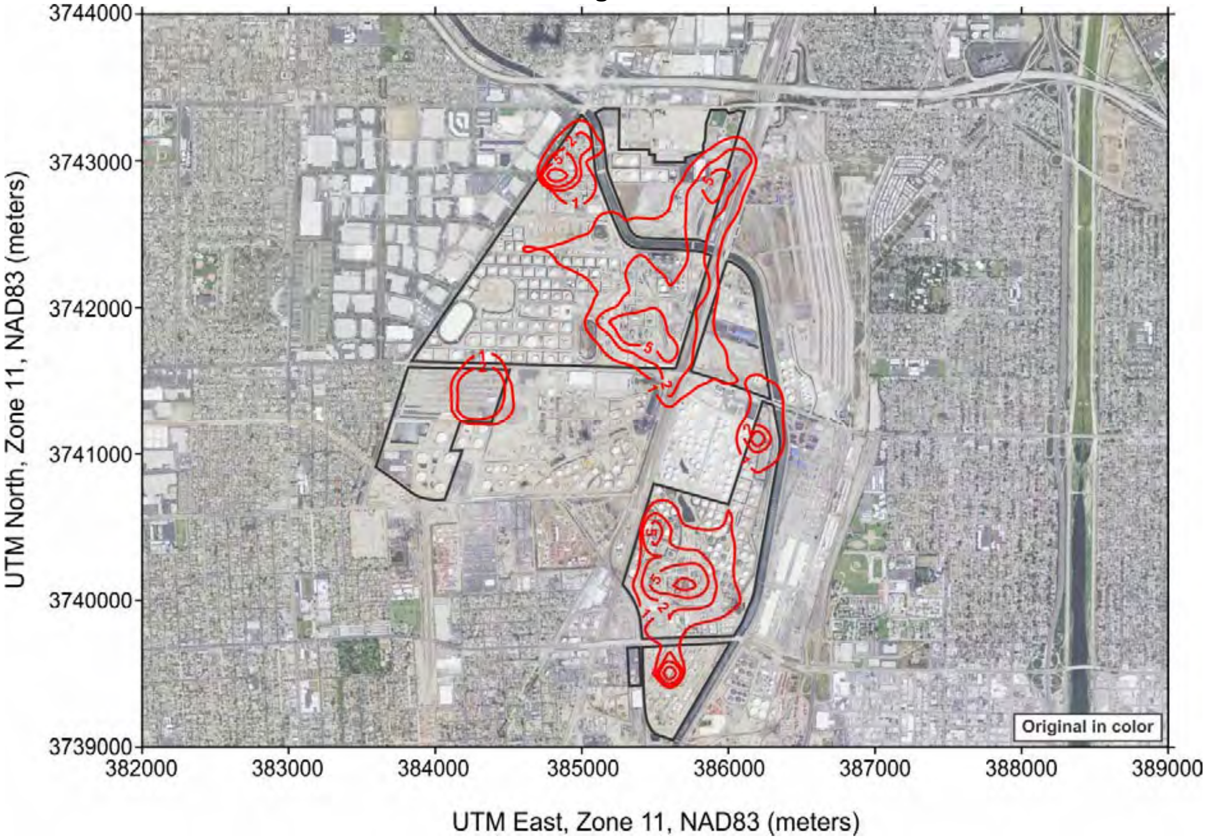


Figure 10. Contours of Worker Cancer Risk, per million exposed, FEIR Addendum Sources Plus Construction Sources with 2012-2016 Meteorological Data



5. GREENHOUSE GASES (GLOBAL CLIMATE CHANGE)

This section of the Air Quality Analysis provided in the May 2017 LARIC project FEIR is unaffected by this Addendum and remains unchanged.

6. REFERENCES

This section of the Air Quality Analysis provided in the May 2017 LARIC project FEIR is unaffected by this Addendum and remains unchanged.

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ATTACHMENT A: EMISSIONS SUMMARIES

The following tables were updated as part of this AQA Addendum. No other tables were changed from the May 2017 FEIR.

Table	Title
A-1	Summary of Emissions Changes
A-15	Fugitive Component Emissions (Increases of VOC)
A-16	Fugitive Component Emissions (Increases of Toxics)
A-17	Carson Storage Tank Emissions
A-19	Characteristic Stream Speciations
A-28	Storage Tank 35 Emission Summary

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Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-1: Summary of Emissions Changes

	Emissions (lbs/day)						Source
CARSON	**NOx**	**SOx**	**CO**	**PM10**	**VOC**	**CO2e****	**Table**
51 Vac Heater	32.72	1.80	233.85	45.49	32.85	360,634.76	A-6
Naphtha HDS ULNB Conversion	1.87	0.64	10.23	5.56	1.73	23,616.98	A-3
FCCU Regenerator (Increased Utilization)*	-	-	-	-	-	-	--
FCCU Pre-Heater (Increased Utilization)*	-	-	-	-	-	-	--
Cogeneration Units 1-4 (Increased Utilization)	20.60	2.50	4.50	9.85	4.15	121,688.67	A-22
HC R-1 Heater (Increased Utilization)	18.00	4.61	1.04	5.38	1.77	43,165.34	A-6
HC R-2 Heater (Increased Utilization)	14.40	9.81	1.38	7.18	2.36	57,548.98	A-6
LHU Heater (Increased Utilization)	6.00	1.50	0.36	1.87	0.62	14,355.47	A-6
Subtotals:	**93.59**	**20.86**	**251.37**	**75.34**	**43.48**	**621,010.19**	**--**

* Daily operations rates of the FCCU Regenerator and Pre-heater will not increase above previous maximum daily rates; as such, daily emissions increases are listed as zero.
** CO2e emissions calculated based on annual averages.

WILMINGTON							
HC H-300 Heater Duty Bump	4.67	(14.98)	49.75	10.79	10.10	169,568.20	A-3
HC H-301 Heater Duty Bump (incl with H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	--
H-100 Heater Duty Bump	(171.03)	86.69	(5.14)	(0.98)	(0.43)	201,024.40	A-3
Sulfuric Acid Regen Plant Process Air Heater	6.99	0.28	16.37	3.51	3.27	56,207.02	A-2
Sulfuric Acid Regen Plant Decomp. Furnace	2.45	0.59	34.39	7.37	6.88	118,034.73	A-2
Sulfuric Acid Regen Plant Converter Heater	1.75	0.07	4.09	0.88	0.82	14,051.75	A-2
Sulfuric Acid Regen Plant Process Vent	-	31.12	-	6.00	-	-	A-2
Subtotals:	**(155.17)**	**103.76**	**99.46**	**27.56**	**20.64**	**558,886.10**	**--**

WILMINGTON - CRUDE INCREASE EFFECTS							
H-101 Heater (Increased Utilization)	19.00	7.58	4.36	0.83	0.83	20,620.29	A-7
H-30 Heater (Increased Utilization)	7.87	2.53	0.38	1.97	1.59	12,084.95	A-7
H-21/22 (Increased Utilization)	12.69	1.33	2.76	0.59	0.61	12,070.83	A-7
H-510 (Increased Utilization)	0.48	0.24	0.60	0.15	0.05	1,176.76	A-7
H-501A, B, 502, 503/504 (Increased Utilization)	1.27	0.41	0.95	0.59	0.18	4,714.05	A-7
Boilers 7 & 8 (Increased Utilization)	12.00	3.07	0.37	1.89	0.63	14,754.81	A-7
Boilers 9 & 10 (Increased Utilization)	12.00	3.07	0.37	1.89	0.63	14,755.24	A-7
Coke Handling (Increased Utilization)*	--	--	--	--	--	--	A-27
SRP Boilers H-1601/1602 (Increased Utilization)	0.11	0.04	0.01	0.05	0.02	320.87	A-7
SRP Incinerator F-704 (Increased Sulfur Load)	0.24	12.66	0.05	0.01	0.01	198.89	A-7
SRP Incinerator F-754 (Increased Sulfur Load)	0.52	12.66	0.03	0.03	0.01	202.02	A-7
Subtotals:	**66.19**	**43.60**	**9.89**	**8.02**	**4.57**	**80,898.70**	--

* Daily operations rates of the Wilmington Operations Coke Handling Operations will not increase above previous maximum daily rates; as such, daily emissions increases are listed as zero.

WILMINGTON FCCU SHUTDOWN (HISTORIC ACTUAL EMISSIONS)							
FCCU (CO emissions included with CO Boiler)	(343.31)	(387.50)	-	(98.59)	(274.03)	(1,494,717.26)	A-12
CO Boiler (NOx and SOx emissions included with FCCU)	-	-	(909.62)	(22.71)	(16.43)	(438,323.76)	A-12
H2 Heater	(16.53)	(1.28)	(4.06)	(0.87)	(0.81)	(17,144.70)	A-12
H3/H4 Heater	(209.75)	(27.59)	(45.30)	(49.01)	(9.93)	(366,866.89)	A-12
H5 Heater	-	-	-	-	-	-	A-12
Startup Heater	(3.00)	(0.01)	(0.81)	(0.17)	(0.16)	(2,615.34)	A-12
Fugitive Components	-	-	-	-	(17.60)	-	A-12
Subtotals:	**(572.59)**	**(416.38)**	**(959.78)**	**(171.35)**	**(318.96)**	**(2,319,667.94)**	--

FUGITIVE COMPONENT EMISSIONS							
51 Vac (Carson)	-	-	-	-	11.74	-	A-15
Alkylation (Carson)	-	-	-	-	18.88	-	A-15
Crude Tanks (Fug Ems) (Carson)	-	-	-	-	43.05	-	A-15
HCU Mods (Carson)	-	-	-	-	6.77	-	A-15
Interconnect Piping (Carson)	-	-	-	-	27.22	-	A-15
LHU Mods (Carson)	-	-	-	-	14.34	-	A-15
LPG Railcar Load/Unload (Carson)	-	-	-	-	26.85	-	A-15
Mid Barrel Distillate Treater (Carson)	-	-	-	-	2.15	-	A-15
~~Naphtha Isom (Carson)~~	~~-~~	~~-~~	~~-~~	~~-~~	~~9.46~~	~~-~~	~~A-15~~
Propane C3 Splitter (Carson)	-	-	-	-	0.83	-	A-15
NHDS Mods (Carson)	-	-	-	-	15.21	-	A-15
Wet Jet Treater (Carson)	-	-	-	-	50.45	-	A-15
PSTU (Wilmington)	-	-	-	-	15.44	-	A-15
CRU 3 (Wilmington)	-	-	-	-	10.24	-	A-15
Crude Tanks (Fug Ems) (Wilmington)	-	-	-	-	3.61	-	A-15
HCU (Wilmington)	-	-	-	-	20.69	-	A-15
HTU 1 (Wilmington)	-	-	-	-	3.50	-	A-15
HTU 2 (Wilmington)	-	-	-	-	3.80	-	A-15
HTU 4 (Wilmington)	-	-	-	-	6.32	-	A-15
Interconnect Piping (Wilmington)	-	-	-	-	37.20	-	A-15
Sulfuric Acid Plant (Fug Ems) (Wilmington)	-	-	-	-	-	-	A-15
Subtotals:	**-**	**-**	**-**	**-**	**318.28**	**-**	--

STORAGE TANK EMISSIONS							
Carson Tank Emissions - New	-	-	-	-	112.51	-	A-17
Carson Tank Emissions - Modified (Tank 35)	-	-	-	-	7.89	-	A-28
Carson Tank Emissions - Increased Utilization	-	-	-	-	64.35	-	A-17
Wilimington Tank Emissions - New/Modified	-	-	-	-	141.64	-	A-17
Wilmington Tank Emissions - Increased Utilization	-	-	-	-	4.12	-	A-17
Subtotals:	**-**	**-**	**-**	**-**	**330.50**	**-**	--

Onsite Mobil Source Train Emissions:	**11.65**	**0.01**	**2.01**	**0.25**	**0.66**	**754.66**
Onsite Mobil Truck Emissions:	**2.25E+00**	**1.53E-03**	**5.85E-01**	**1.09E-02**	**1.73E-01**	**4.21E+02**

Total Emissions (Excl. Mobil Source Truck and Train Emissions):	**(567.98)**	**(248.15)**	**(599.06)**	**(60.43)**	**398.51**	**(1,058,872.94)**

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-1: Summary of Emissions Changes

	Emissions (tons/year)						tonnes/yr	Source
CARSON	**NOx**	**SOx**	**CO**	**PM10**	**VOC**	**CO2e**	**CO2e**	**Table**
51 Vac Heater	18.04	0.25	42.75	8.55	6.12	65,815.84	59,706.82	A-4
Naphtha HDS ULNB Conversion	0.18	0.11	1.86	1.07	0.32	4,310.10	3,910.04	A-4
FCCU Regenerator (Increased Utilization)*	14.58	20.99	18.24	7.44	0.68	110,163.35	99,937.99	A-5
FCCU Pre-Heater (Increased Utilization)*	1.39	0.34	0.13	0.69	0.23	5,564.56	5,048.06	A-5
Cogeneration Units 1-4	3.76	0.46	0.82	1.80	0.76	22,208.18	20,146.82	A-22
HC R-1 Heater (Increased Utilization)	3.29	0.84	0.19	0.98	0.32	7,877.67	7,146.47	A-6
HC R-2 Heater (Increased Utilization)	2.63	1.79	0.25	1.31	0.43	10,502.69	9,527.83	A-6
LHU Heater (Increased Utilization)	1.10	0.27	0.07	0.34	0.11	2,619.87	2,376.70	A-6
Subtotals:	**44.96**	**25.06**	**64.32**	**22.17**	**8.97**	**229,062.28**	**207,800.72**	**--**
WILMINGTON								
HC H-300 Heater Duty Bump	(0.10)	(1.24)	10.02	2.15	2.00	30,946.20	28,073.77	A-4
HC H-301 Heater Duty Bump (incl with H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	(see H-300)	--
H-100 Heater Duty Bump	6.12	35.38	3.63	0.75	0.80	36,686.95	33,281.67	A-4
Sulfuric Acid Regen Plant Process Air Heater	1.28	0.05	2.99	0.64	0.60	10,257.78	9,305.65	A-2
Sulfuric Acid Regen Plant Decomp. Furnace	0.45	0.11	6.28	1.34	1.26	21,541.34	19,541.87	A-2
Sulfuric Acid Regen Plant Converter Heater	0.32	0.01	0.75	0.16	0.15	2,564.45	2,326.41	A-2
Sulfuric Acid Regen Plant Process Vent	-	5.68	-	1.10	-	-	-	A-2
Subtotals:	**8.06**	**39.98**	**23.66**	**6.14**	**4.81**	**101,996.71**	**92,529.38**	--
WILMINGTON - CRUDE INCREASE EFFECTS								
H-101 Heater (Increased Utilization)	3.47	1.38	0.80	0.15	0.15	3,763.20	3,413.90	A-7
H-30 Heater (Increased Utilization)	1.44	0.46	0.07	0.36	0.29	2,205.50	2,000.79	A-7
H-21/22 (Increased Utilization)	2.32	0.24	0.50	0.11	0.11	2,202.93	1,998.45	A-7
H-510 (Increased Utilization)	0.09	0.04	0.11	0.03	0.01	214.76	194.82	A-7
H-501A, B, 502, 503/504 (Increased Utilization)	0.23	0.08	0.17	0.11	0.03	860.31	780.46	A-7
Boilers 7 & 8 (Increased Utilization)	2.19	0.56	0.07	0.35	0.12	2,692.75	2,442.81	A-7
Boilers 9 & 10 (Increased Utilization)	2.19	0.56	0.07	0.35	0.12	2,692.83	2,442.88	A-7
Coke Handling (Increased Utilization)	--	--	--	0.07	--	--	--	A-27
SRP Boilers H-1601/1602 (Increased Utilization)	0.02	0.01	0.00	0.01	0.00	58.56	53.12	A-7
SRP Incinerator F-704 (Increased Sulfur Load)	0.04	2.31	0.01	0.00	0.00	36.30	32.93	A-7
SRP Incinerator F-754 (Increased Sulfur Load)	0.10	2.31	0.01	0.01	0.00	36.87	33.45	A-7
Subtotals:	**12.08**	**7.96**	**1.81**	**1.54**	**0.83**	**14,764.01**	**13,393.62**	--
WILMINGTON FCCU SHUTDOWN (HISTORIC ACTUAL EMISSIONS)								
FCCU (CO emissions included with CO Boiler)	(62.65)	(70.72)	-	(17.99)	(50.01)	(272,785.90)	(247,465.91)	A-12
CO Boiler (NOx and SOx emissions included with FCCU)	-	-	(166.01)	(4.14)	(3.00)	(79,994.09)	(72,569.03)	A-12
H2 Heater	(3.02)	(0.23)	(0.74)	(0.16)	(0.15)	(3,128.91)	(2,838.48)	A-12
H3/H4 Heater	(38.28)	(5.03)	(8.27)	(8.94)	(1.81)	(66,953.21)	(60,738.61)	A-12
H5 Heater	-	-	-	-	-	-	-	A-12
Startup Heater	(0.55)	(0.00)	(0.15)	(0.03)	(0.03)	(477.30)	(433.00)	A-12
Fugitive Components	-	-	-	-	(3.21)	-	-	A-12
Subtotals:	**(104.50)**	**(75.99)**	**(175.16)**	**(31.27)**	**(58.21)**	**(423,339.40)**	**(384,045.04)**	--
FUGITIVE COMPONENT EMISSIONS								
51 Vac (Carson)	-	-	-	-	2.14	-	-	A-15
Alkylation (Carson)	-	-	-	-	3.45	-	-	A-15
Crude Tanks (Fug Ems) (Carson)	-	-	-	-	7.86	-	-	A-15
HCU Mods (Carson)	-	-	-	-	1.24	-	-	A-15
Interconnect Piping (Carson)	-	-	-	-	4.97	-	-	A-15
LHU Mods (Carson)	-	-	-	-	2.62	-	-	A-15
LPG Railcar Load/Unload (Carson)	-	-	-	-	4.90	-	-	A-15
Mid Barrel Distillate Treater (Carson)	-	-	-	-	0.39	-	-	A-15
~~Naphtha Isom (Carson)~~	~~-~~	~~-~~	~~-~~	~~-~~	~~1.73~~	~~-~~	~~-~~	~~A-15~~
Propane C3 Splitter (Carson)	-	-	-	-	0.15	-	-	A-15
NHDS Mods (Carson)	-	-	-	-	2.78	-	-	A-15
PSTU (Wilmington)	-	-	-	-	2.82	-	-	A-15
Wet Jet Treater (Carson)	-	-	-	-	9.21	-	-	A-15
CRU 3 (Wilmington)	-	-	-	-	1.87	-	-	A-15
Crude Tanks (Fug Ems) (Wilmington)	-	-	-	-	0.66	-	-	A-15
HCU (Wilmington)	-	-	-	-	3.78	-	-	A-15
HTU 1 (Wilmington)	-	-	-	-	0.64	-	-	A-15
HTU 2 (Wilmington)	-	-	-	-	0.69	-	-	A-15
HTU 4 (Wilmington)	-	-	-	-	1.15	-	-	A-15
Interconnect Piping (Wilmington)	-	-	-	-	6.79	-	-	A-15
Sulfuric Acid Plant (Fug Ems) (Wilmington)	-	-	-	-	-	-	-	A-15
Subtotals:	**-**	**-**	**-**	**-**	**58.09**	**-**	**-**	--
STORAGE TANK EMISSIONS								
Carson Tank Emissions - New	-	-	-	-	20.53	-	-	A-17
Carson Tank Emissions - Modified (Tank 35)	-	-	-	-	1.44	-	-	A-28
Carson Tank Emissions - Increased Utilization	-	-	-	-	11.74	-	-	A-17
Wilmington Tank Emissions - New/Modified	-	-	-	-	25.85	-		A-17
Wilmington Tank Emissions - Increased Utilization	-	-	-	-	0.75	-	-	A-17
	-	**-**	**-**	**-**	**60.32**	**-**	-	--
Onsite Mobil Source Train Emissions:	**2.13**	**0.00**	**0.37**	**0.05**	**0.12**	**137.72**	**124.94**	
Onsite Mobil Source Truck Emissions:	**0.48**	**0.00**	**0.12**	**0.00**	**0.04**	**88.83**	**80.58**	
Total Emissions (Excl. Mobil Source Truck and Train Emissions):	**(39.40)**	**(2.99)**	**(85.37)**	**(1.42)**	**74.80**	**(77,516.39)**	**(70,321.32)**	

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-15: Fugitive Component Emissions (Increases of VOC)

Screening Value (ppmv): 500

			Carson							
			LPG Railcar Load/Unload		HCU Mods		Interconnect Piping		Mid Barrel Distillate	
Component Type	CAS #	VOC EF (lbs/comp/ year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)
Valves	BSV	-	176	-	-	-	143	-	23	-
	GV	4.55	159	722.77	-	-	-	-	-	-
	LL	4.55	158	718.23	-	-	375	1,704.65	8	36.37
	HL	4.55	-	-	128	581.85	125	568.22	-	-
Pumps	Sealles	-	-	-	-	-	-	-	-	-
	Dbl Mech Seal or Equiv	46.83	3	140.48	-	-	-	-	-	-
	Single Mech Seal	46.83	-	-	3	140.48	-	-	-	-
Compressor	GV	9.09	-	-	-	-	-	-	-	-
Pressure Relief Valves	All	-	8	-	-	-	39	-	-	-
Flanges	GV and LL	6.99	761	5,319.53	-	-	124	866.78	68	475.33
Connectors	GV and LL	2.86	1,000	2,861.38	-	-	810	2,317.72	23	65.81
Other	GV and LL	9.09	4	36.36	-	-	34	309.05	23	209.06
Process Drain w/P-Trap or Seal Pot	All	9.09	-	-	2	18.18	-	-	-	-
Flanges	HL	6.99	-	-	173	1,209.30	245	1,712.60	-	-
Connectors	HL	2.86	-	-	170	486.44	357	1,021.51	-	-
Other	HL	9.09	-	-	4	36.36	18	163.61	-	-
		Totals:		9,798.75		2,472.61		8,664.14		786.57

			Carson				Project Emissions - Carson (lbs/yr)							
			LHU Mods		NHDS Mods		~~Naphtha Isom~~		Propane C3 Splitter		Alkylation		Wet Jet Treater	
Component Type	CAS #	VOC EF (lbs/comp/ year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	~~Comp. Count Increase~~	~~VOC Emissions (lbs/year)~~	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)
Valves	BSV	-	123	-	200	-	~~152~~	~~-~~	-	-	174	-	-	-
	GV	4.55	23	104.55	45	204.56	~~-~~	~~-~~	19	86.37	58	263.65	-	-
	LL	4.55	195	886.42	135	613.68	~~53~~	~~240.92~~	-	-	205	931.88	-	-
	HL	4.55	-	-	-	-	~~-~~	~~-~~	-	-	-	-	1,005	4,568.47
Pumps	Sealles	-	-	-	-	-	~~-~~	~~-~~	-	-	-	-	-	-
	Dbl Mech Seal or Equiv	46.83	-		-	-	~~-~~	~~-~~	-	-	-	-	-	-
	Single Mech Seal	46.83	-	-	-	-	~~-~~	~~-~~	-	-	-	-	4	187.30
Compressor	GV	9.09	-	-	-	-	~~-~~	~~-~~		-	-	-	-	-
Pressure Relief Valves	All	-	4	-	10	-	~~5~~	~~-~~	2	-	5	-	26	-
Flanges	GV and LL	6.99	409	2,858.99	430	3,005.78	~~289~~	~~2,020.16~~	25	174.75	559	3,907.51	25	174.75
Connectors	GV and LL	2.86	439	1,256.15	483	1,382.05	~~366~~	~~1,047.27~~	14	40.06	533	1,525.12	-	-
Other	GV and LL	9.09	13	118.16	38	345.40	~~16~~	~~145.43~~	-	-	28	254.51	-	-
Process Drain w/P-Trap or Seal Pot	All	9.09	1	9.09	-	-	~~-~~	~~-~~	-	-	1	9.09	7	63.63
Flanges	HL	6.99	-	-	-	-	~~-~~	~~-~~	-	-	-	-	1,286	8,989.38
Connectors	HL	2.86	-	-	-	-	~~-~~	~~-~~	-	-	-	-	1,348	3,857.14
Other	HL	9.09	-	-	-	-	~~-~~	~~-~~	-	-	-	-	63	572.64
		Totals:		5,233.36		5,551.46		~~3,453.79~~		301.18		6,891.76		18,413.32

			Carson (cont)					
			51 Vac		Interconnect at FCCU		Crude Tanks (Fug	
Component Type	CAS #	VOC EF (lbs/comp/ year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)
Valves	BSV	-	92	-	-	-	-	-
	GV	4.55	-	-	-	-	-	-
	LL	4.55	24	109.10	-	-	-	-
	HL	4.55	165	750.05	72	327.29	722	3,282.03
Pumps	Sealles	-	-	-	-	-	-	-
	Dbl Mech Seal or Equiv	46.83	-	-	-	-	-	-
	Single Mech Seal	46.83	3	140.48	-	-	6	280.95
Compressor	GV	9.09	-	-	-	-	-	-
Pressure Relief Valves	All	-	-	-	2	-	50	-
Flanges	GV and LL	6.99	36	251.65	-	-	96	671.06
Connectors	GV and LL	2.86	51	145.93	-	-	-	-
Other	GV and LL	9.09	-	-	-	-	-	-
Process Drain w/P-Trap or Seal Pot	All	9.09	2	18.18	-	-	3	27.27
Flanges	HL	6.99	248	1,733.57	100	699.02	1,090	7,619.30
Connectors	HL	2.86	378	1,081.60	63	180.27	866	2,477.96
Other	HL	9.09	6	54.54	7	63.63	149	1,354.35
		Totals:		4,285.08		1,270.21		15,712.91

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-15: Fugitive Component Emissions (Increases of VOC)

			Wilmington																		
			FCCU S/D	PSTU		HCU		HTU 1		HTU 2		HTU 4		Interconnect		Crude Tanks (Fug Ems)		CRU 3		Sulfuric Acid Plant	
Component Type	CAS #	VOC EF (lbs/comp/ year)	FCCU S/D	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Comp. Count Increase	VOC Emissions (lbs/year)	Sulfuric Acid Plant (Fug Ems)	VOC Emissions (lbs/year)
Valves	BSV	-	See FCCU (W) Calcs	275	-	215	-	44	-	50	-	18	-	217	-	60.00	-	251.00	-	NA	NA
	GV	4.55	See FCCU (W) Calcs	26	118.19	6	27.27	8	36.37	35	159.10	-	-	-	-	-	-	(8.00)	(36.37)	NA	NA
	LL	4.55	See FCCU (W) Calcs	60	272.74	5	22.73	32	145.46	24	109.10	-	-	450	2,045.58	48.00	218.20	1.00	4.55	NA	NA
	HL	4.55	See FCCU (W) Calcs	-	-	166	754.59	-	-	-	-	110	500.03	167	759.14	-	-	-	-	NA	NA
Pumps	Sealles	-	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA
	Dbl Mech Seal or Equiv	46.83	See FCCU (W) Calcs	6	280.95	1	46.83	3	140.48	-	-	-	-	4	187.30	-	-	7.00	327.78	NA	NA
	Single Mech Seal	46.83	See FCCU (W) Calcs	-	-	1	46.83	-	-	-	-	-	-	4	187.30	6.00	280.95	-	-	NA	NA
Compressor	GV	9.09	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA
Pressure Relief Valves	All	-	See FCCU (W) Calcs	8	-	9	-	2	-	2	-	6	-	36	-	-	-	4.00	-	NA	NA
Flanges	GV and LL	6.99	See FCCU (W) Calcs	582	4,068.29	381	2,663.26	75	524.26	100	699.02	2	13.98	564	3,942.46	117.00	817.85	404.00	2,824.03	NA	NA
Connectors	GV and LL	2.86	See FCCU (W) Calcs	125	357.67	124	354.81	129	369.12	140	400.59	-	-	949	2,715.45	-	-	108.00	309.03	NA	NA
Other	GV and LL	9.09	See FCCU (W) Calcs	44	399.94	19	172.70	7	63.63	2	18.18	2	18.18	123	1,118.02	-	-	24.00	218.15	NA	NA
Process Drain w/P-Trap or Seal Pot	All	9.09	See FCCU (W) Calcs	15	136.34	2	18.18	-	-	-	-	1	9.09	2	18.18	-	-	10.00	90.90	NA	NA
Flanges	HL	6.99	See FCCU (W) Calcs	-	-	290	2,027.15	-	-	-	-	163	1,139.40	223	1,558.81	-	-	-	-	NA	NA
Connectors	HL	2.86	See FCCU (W) Calcs	-	-	496	1,419.25	-	-	-	-	158	452.10	324	927.09	-	-	-	-	NA	NA
Other	HL	9.09	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	19	172.70	13	118.16	-	-	-	-	NA	NA
		Totals:	-		5,634.13		7,553.60		1,279.32		1,385.99		2,305.48		13,577.50		1,317.00		3,738.07		-

Notes:
1) Coker Bottom Heads project will not affect fugitive component emissions.
2) ATS Plant project fugitive components are not expected to contain VOC in the process streams.
3) Sulfuric Acid Regeneration Plant project fugitive components are not expected to contain VOC in the process streams.
4) Calculations based on SCAQMD Guidelines for Fugitive Emissions Calculations, June 2003 (reference to CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, February 1999), evaluated at 500 ppmv.

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-16: Fugitive Component Emissions (Increases of Toxics)

		Project Emissions - Carson (lbs/yr)					Project Emissions - Carson (lbs/yr)									
Chemical	CAS #	LPG Railcar Load/Unload	HCU Mods	Mid Barrel Distillate Treater	LHU Mods	NHDS Mods	Naphtha Isom	Propane C3 Splitter	Alkylation	51 Vac	Interconnect Piping - Pigging Station	Interconnect Piping - OSBL 1	Interconnect Piping - OSBL 2	Interconnect Piping - FCCU	Wet Jet Treater	Crude Tanks (Fug Ems)
1,3-Butadiene	106-99-0	7.84	-	-	0.01	0.02	~~0.40~~	0.00	0.22	-	8.57	0.36	0.32	-	-	-
Acetaldehyde	75-07-0	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Ammonia	7664-41-7	-	-	-	0.00	0.00	~~0.02~~	-	-	-	-	-	-	-	-	-
Benzene	71-43-2	0.46	-	10.24	5.41	5.53	~~-~~	-	0.01	0.03	39.87	1.68	1.50	0.01	-	74.16
Chloroform	67-66-3	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Cresols (mixtures of) {cresylic acid}	1319-77-3	-	0.12	0.02	-	-	~~-~~	-	-	0.30	0.38	0.03	0.02	0.09	1.84	-
diethanolamine	111-42-2	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Ethylbenzene	100-41-4	-	1.84	4.98	-	-	~~-~~	-	-	0.62	57.91	2.44	2.18	0.18	4.05	47.30
Ethylene Glycol	107-21-1	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Hydrogen cyanide	74-90-8	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Hydrogen sulfide	7783-06-4	3.12	-	-	102.60	106.98	~~0.78~~	0.11	2.11	-	0.00	0.00	0.00	-	-	0.71
Methanol	67-56-1	-	-	-	-	-	~~-~~	-	-	-	0.03	0.00	0.00	-	-	-
Methyl tert-butyl ether	1634-04-4	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Naphthalene	91-20-3	-	90.42	0.02	-	-	~~-~~	-	-	2.46	8.39	0.35	0.32	0.73	127.05	8.64
n-Hexane	110-54-3	0.42	-	24.19	8.27	9.33	~~25.90~~	-	0.10	-	63.57	2.68	2.39	-	-	300.27
PAHs, total, with individ. components also reported	1150	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Phenol	108-95-2	-	0.12	0.02	-	-	~~-~~	-	-	0.35	0.24	0.01	0.01	0.10	1.29	-
Propylene	115-07-1	7,920.76	-	-	0.73	1.42	~~23.96~~	0.27	5.64	-	3,891.85	164.10	146.36	-	-	-
Tetrachloroethylene	127-18-4	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Toluene	108-88-3	-	0.65	15.40	255.59	261.19	~~0.95~~	-	0.53	0.66	347.30	14.64	13.06	0.20	3.87	186.20
Xylenes (mixed)	1330-20-7	-	12.74	17.16	15.68	-	~~-~~	-	-	2.72	232.42	9.80	8.74	0.81	22.10	251.41
1,2,4-Trimethylbenzene	95-63-6	-	15.44	5.00	-	-	~~-~~	-	-	31.11	88.81	3.74	3.34	9.22	101.27	-
2,2,4-Trimethylpentane	540-84-1	-	-	0.14	-	-	~~-~~	-	0.60	-	272.22	11.48	10.24	-	-	-
2,4-Dimethylphenol	105-67-9	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Acetone	67-64-1	-	-	-	-	-	~~-~~	-	-	-	-	-	-	-	-	-
Carbonyl sulfide	463-58-1	-	-	-	-	-	~~-~~	0.01	-	-	0.02	0.00	0.00	-	-	-
Cumene	98-82-8	-	0.12	0.15	-	-	~~-~~	-	-	-	3.61	0.15	0.14	-	-	6.87
Cyclohexane	110-82-7	0.10	-	37.27	85.33	87.19	~~-~~	-	0.53	-	48.59	2.05	1.83	-	-	-
Ethylene	74-85-1	2.24	-	-	0.18	0.34	~~5.81~~	0.25	1.51	-	0.10	0.00	0.00	-	-	-
Isoprene	78-79-5	-	-	-	-	-	~~-~~	-	1.92	-	0.53	0.02	0.02	-	-	-
Phenanthrene	85-01-8	-	0.06	-	-	-	~~-~~	-	-	4.18	2.83	0.38	0.26	1.24	-	-
Benz[a]anthracene	56-55-3	--	--	--	--	--	--	-	--	--	--	--	--	--	--	0.29
Chrysene	218-01-9	--	--	--	--	--	--	-	--	--	--	--	--	--	--	0.58
Benzo[b]fluoranthene	205-99-2	--	--	--	--	--	--	-	--	--	--	--	--	--	--	0.63
Benzo(a)pyrene	50-32-8	--	--	--	--	--	--	-	--	--	--	--	--	--	--	0.12
Dibenzo[a,h]anthracene	53-70-3	--	--	--	--	--	--	-	--	--	--	--	--	--	--	0.04
Sulfuric Acid	7664-93-9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-
Arsine	7784-42-1	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	-

Appendix D

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-16: Fugitive Component Emissions (Increases of Toxics)

		Project Emissions - Wilmington (lbs/yr)												
Chemical	CAS #	FCCU S/D	PSTU	HCU	HTU 1	HTU 2	HTU 4	Interconnect Piping - Pigging Station	Interconnect Piping - OSBL 1	Interconnect Piping - OSBL 2	Interconnect Piping - Propane Area	Crude Tanks (Fug Ems)	CRU 3	Sulfuric Acid Plant (Fug Ems)
1,3-Butadiene	106-99-0	See FCCU (W) Calcs	0.00	-	-	0.06	-	7.63	1.10	1.21	7.91	-	0.19	NA
1,3-Butadiene	106-99-0	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Acetaldehyde	75-07-0	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Ammonia	7664-41-7	See FCCU (W) Calcs	-	93.11	-	19.67	0.02	35.51	5.10	5.63	36.80	6.22	-	NA
Benzene	71-43-2	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Chloroform	67-66-3	See FCCU (W) Calcs	-	0.21	0.13	-	0.16	0.31	0.07	0.07	0.22	-	-	NA
Cresols (mixtures of) {cresylic acid}	1319-77-3	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
diethanolamine	111-42-2	See FCCU (W) Calcs	-	98.10	0.28	1.76	0.33	51.57	7.40	8.18	53.45	3.62	-	NA
Ethylbenzene	100-41-4	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Ethylene Glycol	107-21-1	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Hydrogen cyanide	74-90-8	See FCCU (W) Calcs	1.80	-	-	0.03	-	0.00	0.00	0.00	0.00	-	8.24	NA
Hydrogen sulfide	7783-06-4	See FCCU (W) Calcs	-	-	-	-	-	0.03	0.00	0.00	0.03	-	-	NA
Methanol	67-56-1	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Methyl tert-butyl ether	1634-04-4	See FCCU (W) Calcs	-	157.33	8.83	0.03	1.32	7.47	1.07	1.19	7.75	0.72	-	NA
Naphthalene	91-20-3	See FCCU (W) Calcs	-	58.27	-	121.54	-	56.62	8.13	8.98	58.68	20.94	37.38	NA
n-Hexane	110-54-3	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
PAHs, total, with individ. components also reported	1150	See FCCU (W) Calcs	-	0.21	0.09	-	0.19	0.21	0.03	0.03	0.22	-	-	NA
Phenol	108-95-2	See FCCU (W) Calcs	4.78	-	-	-	-	3,465.98	497.61	549.88	3,592.26	-	0.35	NA
Propylene	115-07-1	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Tetrachloroethylene	127-18-4	See FCCU (W) Calcs	-	716.80	0.27	16.64	0.36	309.29	44.41	49.07	320.56	11.17	-	NA
Toluene	108-88-3	See FCCU (W) Calcs	-	587.90	1.54	37.12	1.46	206.99	29.72	32.84	214.53	15.54	-	NA
Xylenes (mixed)	1330-20-7	See FCCU (W) Calcs	-	113.20	7.04	2.67	16.74	79.09	11.36	12.55	81.97	-	-	NA
1,2,4-Trimethylbenzene	95-63-6	See FCCU (W) Calcs	-	0.29	-	7.76	-	242.43	34.81	38.46	251.26	-	-	NA
2,2,4-Trimethylpentane	540-84-1	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
2,4-Dimethylphenol	105-67-9	See FCCU (W) Calcs	-	-	-	-	-	-	-	-	-	-	-	NA
Acetone	67-64-1	See FCCU (W) Calcs	-	-	-	-	-	0.02	0.00	0.00	0.02	-	-	NA
Carbonyl sulfide	463-58-1	See FCCU (W) Calcs	-	3.61	-	0.20	-	3.21	0.46	0.51	3.33	0.58	-	NA
Cumene	98-82-8	See FCCU (W) Calcs	-	2.74	-	34.79	-	43.27	6.21	6.87	44.85	-	-	NA
Cyclohexane	110-82-7	See FCCU (W) Calcs	1.29	-	-	-	-	0.09	0.01	0.01	0.09	-	0.04	NA
Ethylene	74-85-1	See FCCU (W) Calcs	-	-	-	1.07	-	0.47	0.07	0.07	0.49	-	-	NA
Isoprene	78-79-5	See FCCU (W) Calcs	-	0.12	-	-	2.25	1.98	0.78	0.78	-	-	-	NA
Phenanthrene	85-01-8	--	--	--	--	--	--	--	--	--	--	0.02	--	--
Benz[a]anthracene	56-55-3	--	--	--	--	--	--	--	--	--	--	0.05	--	--
Chrysene	218-01-9	--	--	--	--	--	--	--	--	--	--	0.05	--	--
Benzo[b]fluoranthene	205-99-2	--	--	--	--	--	--	--	--	--	--	0.01	--	--
Benzo(a)pyrene	50-32-8	--	--	--	--	--	--	--	--	--	--	0.00	--	--
Dibenzo[a,h]anthracene	53-70-3	--	--	--	--	--	--	--	--	--	--	-	--	--

Notes:
1) Coker Bottom Heads project will not affect fugitive component emissions.
2) ATS Plant project fugitive components are not expected to contain VOC in the process streams.
3) Sulfuric Acid Regeneration Plant project fugitive components are not expected to contain VOC in the process streams.

Tesoro Los Angeles Refinery Integration and Compliance Project
Appendix A: Summary of Emissions

Table A-17: Carson Storage Tank Emissions

CRUDE TANKS
Number of New Tanks: 6

Tank 500,000 BBL - New (lbs/year Each Tank)

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
Post Project Emissions (lbs/year):	6,844.20	28.58	0.08	0.03	0.17	0.16	-	1.91	-	0.01	13.42	-	136.23	12.44	-	-	2.35	-	-	56.90	-	-	70.85
Total Emission Increase (lbs/year):	41,065.20	171.48	0.48	0.18	1.02	0.96	-	11.46	-	0.06	80.52	-	817.38	74.64	-	-	14.10	-	-	341.40	-	-	425.10
Total Emission Increase (lbs/day):	112.51	0.47	0.00	0.00	0.00	0.00	-	0.03	-	0.00	0.22	-	2.24	0.20	-	-	0.04	-	-	0.94	-	-	1.16

OTHER TANKS (INCREASED UTILIZATION)

Tank 14 (lbs/year) - Domed External Floating Roof Tank

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	89.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	-	-	-	-	-
2013	130.32	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.25	-	-	-	-	-
Baseline Emissions (lbs/year)	109.82	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.21	-	-	-	-	-
Baseline Emissions (lbs/day)	0.30	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
Post Project Emissions (lbs/year):	306.66	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-	-	0.60	-	-	-	-	-
Emissions Increase (lbs/year):	196.84	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-	-	0.39	-	-	-	-	-

Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.

Tank 31 (lbs/year) - Domed External Floating Roof Tank

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	744.23	4.66	-	-	-	-	-	-	-	-	1.83	-	-	-	-	-	-	-	-	18.86	-	-	8.55
2013	1,110.85	6.77	-	-	-	-	-	0.01	0.98	-	1.03	-	5.26	-	0.74	-	0.08	-	4.65	10.28	0.52	0.03	4.01
Baseline Emissions (lbs/year)	927.54	5.72	-	-	-	-	-	0.01	0.49	-	1.43	-	2.63	-	0.37	-	0.04	-	2.33	14.57	0.26	0.02	6.28
Baseline Emissions (lbs/day)	2.54	0.02	-	-	-	-	-	0.00	0.00	-	0.00	-	0.01	-	0.00	-	0.00	-	0.01	0.04	0.00	0.00	0.02
Post Project Emissions (lbs/year):	1,055.88	8.08	-	-	-	-	-	0.03	1.03	-	3.79	-	5.39	-	0.75	-	0.22	-	4.90	23.56	1.16	0.04	18.46
Emissions Increase (lbs/year):	128.34	2.37	-	-	-	-	-	0.03	0.54	-	2.36	-	2.76	-	0.38	-	0.18	-	2.58	8.99	0.90	0.03	12.18

Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.

Tank 62 (lbs/year) - Fixed Roof Tank on VRS

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	66.22	1.87	-	-	-	-	-	-	0.06	-	0.20	-	1.85	-	-	-	-	-	-	4.35	0.04	-	1.10
2013	142.69	4.40	-	-	-	-	-	0.01	0.13	-	0.47	-	4.38	-	-	-	-	-	-	10.16	0.09	0.01	2.19
Baseline Emissions (lbs/year)	104.46	3.14	-	-	-	-	-	0.01	0.10	-	0.34	-	3.12	-	-	-	-	-	-	7.26	0.07	0.01	1.65
Baseline Emissions (lbs/day)	0.29	0.01	-	-	-	-	-	0.00	0.00	-	0.00	-	0.01	-	-	-	-	-	-	0.02	0.00	0.00	0.00
Post Project Emissions (lbs/year):	6,521.09	157.50	-	-	-	-	-	0.28	4.80	-	16.25	-	158.18	-	-	-	0.01	-	-	356.60	2.98	0.26	76.93
Emissions Increase (lbs/year):	6,416.63	154.37	-	-	-	-	-	0.28	4.70	-	15.92	-	155.06	-	-	-	0.01	-	-	349.34	2.91	0.25	75.28

*Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.
**VRS control efficiency conservatively estimated at 99%

Tank 63 (lbs/year) - Fixed Roof Tank on VRS

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	71.80	2.06	-	-	-	-	-	-	0.06	-	0.23	-	2.03	-	-	-	-	-	-	4.83	0.04	-	1.24
2013	151.35	4.80	-	-	-	-	-	0.01	0.14	-	0.53	-	4.75	-	-	-	-	-	-	11.22	0.10	0.01	2.45
Baseline Emissions (lbs/year)	111.58	3.43	-	-	-	-	-	0.01	0.10	-	0.38	-	3.39	-	-	-	-	-	-	8.03	0.07	0.01	1.85
Baseline Emissions (lbs/day)	0.31	0.01	-	-	-	-	-	0.00	0.00	-	0.00	-	0.01	-	-	-	-	-	-	0.02	0.00	0.00	0.01
Post Project Emissions (lbs/year):	6,944.84	154.27	-	-	-	-	-	0.28	4.79	-	16.23	-	157.94	-	-	-	0.01	-	-	356.06	2.97	0.26	76.81
Emissions Increase (lbs/year):	6,833.26	150.84	-	-	-	-	-	0.28	4.69	-	15.85	-	154.55	-	-	-	0.01	-	-	348.04	2.90	0.25	74.97

*Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.
**VRS control efficiency conservatively estimated at 99%

Tesoro Los Angeles Refinery Integration and Compliance Project
Appendix A: Summary of Emissions

Table A-17: Carson Storage Tank Emissions

Tank 64 (lbs/year) - Domed External Floating Roof Tank

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	462.48	-	-	-	-	-	-	0.03	-	-	0.01	-	-	-	-	-	-	-	-	-	-	123.21	-
2013	614.59	-	-	-	-	-	-	0.06	-	-	0.02	-	-	-	-	-	0.01	-	-	-	0.01	166.00	0.02
Baseline Emissions (lbs/year)	538.54	-	-	-	-	-	-	0.05	-	-	0.02	-	-	-	-	-	0.01	-	-	-	0.01	144.61	0.01
Baseline Emissions (lbs/day)	1.48	-	-	-	-	-	-	0.00	-	-	0.00	-	-	-	-	-	0.00	-	-	-	0.00	0.40	0.00
Post Project Emissions (lbs/year):	653.64	-	-	-	-	-	-	0.07	-	-	0.02	-	-	-	-	-	0.02	-	-	-	0.01	145.53	0.03
Emissions Increase (lbs/year):	115.11	-	-	-	-	-	-	0.03	-	-	0.01	-	-	-	-	-	0.02	-	-	-	0.01	0.93	0.02

Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.

Tank 502 (lbs/year) - Fixed Roof Tank

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	13,337.86	-	-	-	-	-	1.28	-	-	-	-	-	-	-	-	-	-	0.21	-	-	-	-	-
2013	13,715.97	-	-	-	-	-	1.31	-	-	-	-	-	-	-	-	-	-	0.22	-	-	-	-	-
Baseline Emissions (lbs/year)	13,526.92	-	-	-	-	-	1.30	-	-	-	-	-	-	-	-	-	-	0.22	-	-	-	-	-
Baseline Emissions (lbs/day)	37.06	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
Post Project Emissions (lbs/year):	23,230.99	-	-	-	-	-	1.74	-	-	-	-	-	-	-	-	-	-	0.26	-	-	-	-	-
Emissions Increase (lbs/year):	9,704.08	-	-	-	-	-	0.45	-	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-

Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.

Tank 959 (lbs/year) - Fixed Roof Tank on VRS

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
2012	0.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	1.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Baseline Emissions (lbs/year)	0.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Baseline Emissions (lbs/day)	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Post Project Emissions (lbs/year):	95.19	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-
Emissions Increase (lbs/year):	94.34	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-

*Tank will not be physically modified or require permitting with the SCAQMD; however, tank will likely experience an increase in utilization as a result of the project.
**VRS control efficiency conservatively estimated at 99%

TOTAL PROJECT EMISSIONS INCREASE

	VOC	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Cresols	Cumene	Cyclohexane	Dibenzo(a,h)anthracene	Ethylbenzene	Ethylene	n-Hexane	Hydrogen Sulfide	Isoprene	Methanol	Naphthalene	Phenanthrene	Propylene	Toluene	1,2,4 Trimethylbenzene	2,2,4 Trimethylbenzene	Xylenes (mixed)
Total Baseline Emissions (lbs/year):	15,319.69	12.28	-	-	-	-	1.30	0.06	0.69	-	2.16	-	9.14	-	0.37	-	0.05	0.43	2.33	29.85	0.40	144.63	9.78
Total Project Emissions (lbs/year):	79,873.48	491.33	0.48	0.18	1.02	0.96	1.77	12.13	10.61	0.06	116.81	-	1,138.89	74.64	0.75	-	14.37	0.86	4.90	#######	7.12	146.09	597.33
Emissions Increase (lbs/year):	64,553.79	479.05	0.48	0.18	1.02	0.96	0.47	12.07	9.93	0.06	114.65	-	1,129.76	74.64	0.38	-	14.32	0.44	2.58	######	6.72	1.46	587.55
Emissions Increase (lbs/day):	176.86	1.31	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.31	-	3.10	0.20	0.00	-	0.04	0.00	0.01	2.87	0.02	0.00	1.61

** EPA TANKS 4.0.9d was used to estimate emissions from storage tanks; all inputs and calculations were performed in accordance with the User's Guide to TANKS. **

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-19: Characteristic Stream Speciations

								Naphtha Isom	Hybrid		Hybrid				Hybrid	Hybrid			
MSDS Number		APPC656	CCT	CCT (updated)	NA	Propane C3 Splitter	APPC878	RS004	RS004RS119	RS006	RS006RS030	RS008	RS022	RS030	RS030RS099RS123	APPC656RS030RS006	RS099	RS101	RS108
Stream Name		Propylene	CCT	CCT (updated)	NA	Propane C3 Splitter	B-B Stock	Refinery Fuel Gas (C1-C5)	Max of Refinery Fuel Gas (C1-C5) & Naphtha/H2 Mixed Phase Refinery Stream	Sweet Butanes	Max of Sweet Butanes &	Plant Hydrogen	Sour Refinery Gas	Refinery Propane Stream (C2-C4)	Max of Refinery Propane Stream (C2-C4) & Sweet Pentane-Isopentane & Iso-Octene	Max of Propylene & Sweet Butanes & Refinery Propane Stream (C2-C4)	Sweet Pentane-Isopentane	Sour Naphtha Gasoline	Jet Cut Bottoms
Data Source		MSDS	Wort case analysis of crudes (Sept 2014)	Wort case analysis of crudes - Updated 2019	NA	Engineering Estimate	Winbliss Speciations-13.xls	Winbliss Speciations-13.xls & MSDS	Hybrid	speciations-13.xls	Hybrid	Winbliss Speciations-13.xls & MSDS	Winbliss Speciations-13.xls & MSDS	Winbliss Speciations-13.xls	Hybrid	Hybrid	speciations-13.xls	speciations-13.xls	speciations-13.xls
Chemical	CAS No.	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21778	0.63520
1,3-Butadiene	106-99-0	-	-	-	-	0.00010	0.17801	0.01155	0.01155	0.08000	0.08000	0.00497	0.03791	0.00007	0.00007	0.08000	-	0.00487	
2,2,4-Trimethylpentane	540-84-1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00900	-	0.00900	0.63233	0.01820
2,4-Dimethylphenol	105-67-9	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	
Acetaldehyde	75-07-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Acetone	67-64-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ammonia	7664-41-7	-	-	-	-	-	-	0.00050	0.00050	-	-	-	-	-	-	-	-	-	
Benzene	71-43-2	-	0.47200	0.47200	-	-	-	-	0.10340	0.00467	0.00467	-	-	-	-	0.00467	-	1.58978	1.30140
Chloroform	67-66-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbonyl sulfide	463-58-1	-	-	-	-	0.00310	0.00040	-	-	-	-	-	-	-	-	-	-	-	
Cresols (mixtures of) {cresylic acid}	1319-77-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00200
Cumene	98-82-8	-	0.04370	0.04370	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01656	0.01940
Cyclohexane	110-82-7	-	-	-	-	-	-	-	1.63059	0.00100	0.00100	-	-	-	0.00800	0.00100	0.00800	2.62429	4.73870
diethanolamine	111-42-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ethylbenzene	100-41-4	-	0.27500	0.30100	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14333	0.63360
Ethylene	74-85-1	-	-	-	-	0.08300	0.00206	0.16832	0.16832	-	-	0.00117	0.00898	0.02281	0.02281	0.02281	-	-	
Ethylene Glycol	107-21-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hydrogen cyanide	74-90-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hydrogen sulfide	7783-06-4	-	-	0.0045	-	0.03800	0.00005	0.02264	0.02264	-	-	0.22044	0.05816	0.03186	0.03186	0.03186	-	-	
Isoprene	78-79-5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02892	-	0.02892	0.08747	
Methanol	67-56-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Methyl tert-butyl ether	1634-04-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Naphthalene	91-20-3	-	0.05500	0.05500	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00233	0.00310
n-Hexane	110-54-3	-	1.59000	1.91100	-	-	-	0.75000	0.75000	0.00433	0.00433	1.00000	0.50000	-	0.00130	0.00433	0.00130	9.88765	3.07500
PAHs, total, with individ. components also reported	1150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Phenanthrene	85-01-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Phenol	108-95-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00200
Propylene	115-07-1	80.83443	-	-	-	0.08900	0.52368	0.69364	0.69364	0.00500	0.00500	0.00949	0.01346	0.08490	0.08490	80.83443	0.00400	-	
Tetrachloroethylene	127-18-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Toluene	108-88-3	-	0.84800	1.18500	-	-	-	0.02750	4.88385	-	-	-	-	-	0.00800	-	0.00800	0.72307	1.95790
Xylenes (mixed)	1330-20-7	-	1.18000	1.60000	-	-	-	-	15.00000	-	-	-	-	-	-	-	-	1.08067	2.18210
Benz[a]anthracene	56-55-3	-	0.00185	0.00185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	218-01-9	-	0.00369	0.00369	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[b]fluoranthene	205-99-2	-	0.00399	0.00399	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene	50-32-8	-	0.00074	0.00074	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo[a,h]anthracene	53-70-3	-	0.00025	0.00025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsine	7784-42-1	-	-	-	-	0.00016	-	-	-	-	-	-	-	-	-	-	-	-	-

Tesoro Los Angeles Refinery Integration and Compliance Project
Attachment A: Summary of Emissions

Table A-19: Characteristic Stream Speciations

						Hybrid					Hybrid		Hybrid				
MSD	RS110	RS119	RS120	RS123	RS140	RS140APPC656APPC878	RS197	RS203	RS205	RS206	RS206RS905	RS207	RS206RS207	RS307	RS905	RS925	RS937
Str	Sweet Naphtha (High Benzene)	Naphtha/H2 Mixed Phase Refinery Stream	Sour Naphtha/H2 Mixed Phase Refinery Stream	Iso-Octene	Unleaded Gasoline	Max of Unleaded Gasoline & Propylene &	Crude Oil	Sweet Distillate {FCC Jet Cut Bttms}	Light Cycle Oil	Stove Oil w/Sulfur	Max of Stove Oil w/Sulfur & Spent Caustic	Distillates w/Sulfur Compounds	Max of Stove Oil w/Sulfur & Distillates w/Sulfur Compounds	Gas Oil	Spent Caustic	Rich Amines	Lean Amines
D	speciations-13.xls	Winbliss Speciations-13.xls & MSDS	Winbliss Speciations-13.xls & MSDS	MSDS (No Toxics)	speciations-13.xls & EDMS	Hybrid	crude speciation-13.xls	speciations-13.xls & EDMS	Toxic Studies	Toxic Studies	Hybrid	Toxic Studies	Hybrid	2000 EDMS & MSDS	MSDS	Toxic Studies	Toxic Studies
Chemical	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%
1,2,4-Trimethylbenzene	2.64396	-	-	-	1.84459	1.84459	0.12911	0.62433	0.41600	0.55000	0.55000	0.72600	0.72600	-	-	-	-
1,3-Butadiene	-	-	-	-	0.00050	0.17801	-	-	-	-	-	-	-	-	-	-	-
2,2,4-Trimethylpentane	0.00892	-	-	-	5.65395	5.65395	0.00039	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetaldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	2.84007	0.10340	0.10340	-	0.82809	0.82809	0.19908	-	-	-	-	0.00080	0.00080	-	-	-	-
Chloroform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonyl sulfide	-	-	-	-	-	0.00040	-	-	-	-	-	-	-	-	-	-	-
Cresols (mixtures of) {cresylic acid}	-	-	-	-	0.00500	0.00500	0.00050	0.00500	0.00500	0.01000	0.01000	0.00694	0.01000	0.00500	-	-	-
Cumene	0.10355	-	-	-	0.07491	0.07491	0.02067	0.00500	-	-	-	-	-	-	-	-	-
Cyclohexane	0.08352	1.63059	1.63059	-	1.00918	1.00918	0.51380	-	-	-	-	-	-	-	-	-	-
diethanolamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.00000	-
Ethylbenzene	2.89587	-	-	-	1.20273	1.20273	0.13140	0.07433	0.00200	0.02200	0.02200	0.01450	0.02200	-	-	-	-
Ethylene	-	-	-	-	-	0.00206	-	-	-	-	-	-	-	-	-	-	-
Ethylene Glycol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrogen cyanide	-	-	-	-	-	-	-	-	0.00001	-	-	-	-	-	-	-	-
Hydrogen sulfide	-	0.02000	2.00000	-	-	0.00005	-	-	-	-	-	-	-	-	0.80000	3.38000	0.05410
Isoprene	-	-	-	-	0.01101	0.01101	-	-	-	-	-	-	-	-	-	-	-
Methanol	-	-	-	-	0.00059	0.00059	-	-	-	-	-	-	-	-	-	-	-
Methyl tert-butyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	0.06063	-	-	-	0.17430	0.17430	0.06800	3.65700	0.28000	0.69000	0.69000	0.05740	0.69000	-	-	-	-
n-Hexane	1.77734	0.14586	0.14586	-	1.32045	1.32045	1.07333	-	-	-	-	-	-	-	-	-	-
PAHs, total, with individ. components also reported	-	-	-	-	-	-	0.20100	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	0.00230	0.31740	-	-	0.09760	0.09760	0.10000	-	-	-
Phenol	-	-	-	-	0.00500	0.00500	0.00500	0.00500	-	0.00700	0.00700	0.00813	0.00813	-	-	-	-
Propylene	-	-	-	-	0.00300	80.83443	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	21.82951	4.88385	4.88385	-	7.21341	7.21341	0.38463	0.02633	-	0.02100	0.02100	0.01550	0.02100	-	-	-	-
Xylenes (mixed)	17.26414	15.00000	-	-	4.82736	4.82736	0.63467	0.51533	-	0.12000	0.12000	0.06340	0.12000	-	-	-	-
Benz[a]anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[b]fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo[a]pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo[a,h]anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tesoro Los Angeles Refinery Integration and Compliance Project
Appendix A: Summary of Emissions

Table A-28: Storage Tank 35 Emissions Summary

		Baseline (lbs/year)[1]			Post Project (lbs/year)[2]						Increase[3]
		2012	2013	Average	Gasoline	Diesel	Jet	Gas Oil	Wastewater	Maximum	(lbs/year)
VOC	**CAS**	**93.78**	**80.84**	**87.31**	**2,966.50**	**893.93**	**864.38**	**964.42**	**2,091.23**	**2,966.50**	**2,879.19**
Benzene	71432			-	11.95	0.01				11.95	**11.95**
1,2,4 Trimethylbenzene	95636	0.54	0.45	0.50	12.91	6.54	4.78			12.91	**12.42**
2,2,4 Trimethylpentane	25551137			-	60.94					60.94	**60.94**
1,3-Butadiene	106990			-	0.07					0.07	**0.07**
Cresols (Mixtures of)	1319773			-	0.04	0.06	0.04	0.05		0.06	**0.06**
Cyclohexane	110827			-	13.49					13.49	**13.49**
Ethylbenzene	100414	0.77	0.60	0.69	9.80	0.14	4.57			9.80	**9.12**
Isoprene	78795			-	0.48					0.48	**0.48**
n-Hexane	110543			-	25.52					25.52	**25.52**
Methanol	67561			-	0.01					0.01	**0.01**
Phenanthrene	85018			-		0.87		0.96		0.96	**0.96**
Phenol	108952			-	0.04	0.07	0.04			0.07	**0.07**
Naphthalene	91203	0.68	0.58	0.63	1.23	0.51	12.91			12.91	**12.28**
Propylene (Propene)	115071			-	0.03					0.03	**0.03**
Toluene	108883			-	66.55	0.17				66.55	**66.55**
Xylenes (Mixed Isomers)	1330207	0.71	0.56	0.64	50.22	0.60	4.96			50.22	**49.59**
Ammonia	7664417			-					0.02	0.02	**0.02**
Cumene	98828	0.62	0.50	0.56	0.55		4.87			4.87	**4.31**

1) Baseline year data as reported in the SCAQMD 2012 and 2013 Annual Emissions Reports.
2) Post project emissions based on TANKS 4.09b emissions estimates for 1 million barrels per month.
3) Increase is calculated based on the "maximum" of the post project estimated emissions minus the average of the reported 2012/2013 emissions.

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ATTACHMENT B: STORAGE TANK 35 AND CCT EMISSIONS CALCULATIONS

EPA TANKS 4.0.9d reports for Storage Tank 35 and Carson Crude Terminal Tanks have been included with this Addendum. The remaining items from Attachment B of the Air Quality Analysis provided in the May 2017 LARIC project FEIR are unaffected by this Addendum.

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Storage Tank 35 Emission Calculations

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TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	035 (2004 Diesel @ 1MM bbl/mo)
City:	Carson
State:	California
Company:	Tesoro
Type of Tank:	Domed External Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	135.00
Volume (gallons):	4,200,000.00
Turnovers:	120.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Riveted
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Fixed	30
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Los Angeles C.O., California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

035 (2004 Diesel @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, 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
TK 957 - RS207 Distillate with Sulfur	Jan	63.80	59.36	68.25	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0238	N/A	N/A	120.1900	0.0073	0.0133	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2965	N/A	N/A	78.1100	0.0000	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1237	N/A	N/A	106.1700	0.0001	0.0014	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0051	N/A	N/A	128.1700	0.0006	0.0002	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0091	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.3712	N/A	N/A	92.1300	0.0002	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0157	N/A	N/A	130.6485	0.9901	0.9751	160.50	
Xylenes (mixed isomers)						0.0978	N/A	N/A	106.1700	0.0006	0.0048	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Feb	64.91	60.15	69.67	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0248	N/A	N/A	120.1900	0.0073	0.0139	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3361	N/A	N/A	78.1100	0.0000	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0014	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1285	N/A	N/A	106.1700	0.0001	0.0014	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0053	N/A	N/A	128.1700	0.0006	0.0002	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0095	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.3840	N/A	N/A	92.1300	0.0002	0.0046	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0157	N/A	N/A	130.6736	0.9901	0.9740	160.50	
Xylenes (mixed isomers)						0.1017	N/A	N/A	106.1700	0.0006	0.0050	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Mar	65.68	60.69	70.68	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0073	0.0143	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3645	N/A	N/A	78.1100	0.0000	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1319	N/A	N/A	106.1700	0.0001	0.0015	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0055	N/A	N/A	128.1700	0.0006	0.0002	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0098	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.3932	N/A	N/A	92.1300	0.0002	0.0047	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0157	N/A	N/A	130.6918	0.9901	0.9733	160.50	
Xylenes (mixed isomers)						0.1044	N/A	N/A	106.1700	0.0006	0.0051	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Apr	67.37	61.82	72.91	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0273	N/A	N/A	120.1900	0.0073	0.0152	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4276	N/A	N/A	78.1100	0.0000	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0016	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1396	N/A	N/A	106.1700	0.0001	0.0016	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0058	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0104	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4136	N/A	N/A	92.1300	0.0002	0.0049	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0157	N/A	N/A	130.7327	0.9901	0.9717	160.50	
Xylenes (mixed isomers)						0.1106	N/A	N/A	106.1700	0.0006	0.0054	106.17	Option 2: A=7.005, B=1466, C=215

TK 957 - RS207 Distillate with Sulfur	May	68.64	63.30	73.97	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0287	N/A	N/A	120.1900	0.0073	0.0160	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.4769	N/A	N/A	78.1100	0.0000	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0017	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1457	N/A	N/A	106.1700	0.0001	0.0016	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0061	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0109	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4297	N/A	N/A	92.1300	0.0002	0.0051	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0156	N/A	N/A	130.7650	0.9901	0.9704	160.50	
Xylenes (mixed isomers)						0.1155	N/A	N/A	106.1700	0.0006	0.0056	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Jun	70.44	64.85	76.03	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0307	N/A	N/A	120.1900	0.0073	0.0172	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5491	N/A	N/A	78.1100	0.0000	0.0010	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0019	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1547	N/A	N/A	106.1700	0.0001	0.0017	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0065	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0117	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4533	N/A	N/A	92.1300	0.0002	0.0054	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0156	N/A	N/A	130.8131	0.9901	0.9684	160.50	
Xylenes (mixed isomers)						0.1227	N/A	N/A	106.1700	0.0006	0.0060	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Jul	72.67	66.46	78.87	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0334	N/A	N/A	120.1900	0.0073	0.0187	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.6426	N/A	N/A	78.1100	0.0000	0.0010	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1665	N/A	N/A	106.1700	0.0001	0.0019	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0071	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0128	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4842	N/A	N/A	92.1300	0.0002	0.0058	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0156	N/A	N/A	130.8765	0.9901	0.9658	160.50	
Xylenes (mixed isomers)						0.1322	N/A	N/A	106.1700	0.0006	0.0064	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Aug	72.78	66.93	78.64	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0336	N/A	N/A	120.1900	0.0073	0.0187	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.6477	N/A	N/A	78.1100	0.0000	0.0010	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1671	N/A	N/A	106.1700	0.0001	0.0019	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0071	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0128	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4859	N/A	N/A	92.1300	0.0002	0.0058	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0155	N/A	N/A	130.8800	0.9901	0.9657	160.50	
Xylenes (mixed isomers)						0.1327	N/A	N/A	106.1700	0.0006	0.0065	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Sep	71.62	66.36	76.88	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0073	0.0179	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5981	N/A	N/A	78.1100	0.0000	0.0010	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0020	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0001	0.0018	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0068	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0123	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4695	N/A	N/A	92.1300	0.0002	0.0056	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0156	N/A	N/A	130.8462	0.9901	0.9671	160.50	
Xylenes (mixed isomers)						0.1276	N/A	N/A	106.1700	0.0006	0.0062	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Oct	69.38	64.44	74.33	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0295	N/A	N/A	120.1900	0.0073	0.0165	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.5065	N/A	N/A	78.1100	0.0000	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0018	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1494	N/A	N/A	106.1700	0.0001	0.0017	106.17	Option 2: A=6.975, B=1424.255, C=213.21

Naphthalene						0.0063	N/A	N/A	128.1700	0.0006	0.0003	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0113	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.4394	N/A	N/A	92.1300	0.0002	0.0052	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0156	N/A	N/A	130.7846	0.9901	0.9696	160.50	
Xylenes (mixed isomers)						0.1184	N/A	N/A	106.1700	0.0006	0.0058	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Nov	65.99	61.40	70.59	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0259	N/A	N/A	120.1900	0.0073	0.0145	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3759	N/A	N/A	78.1100	0.0000	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1333	N/A	N/A	106.1700	0.0001	0.0015	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0055	N/A	N/A	128.1700	0.0006	0.0002	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0099	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.3969	N/A	N/A	92.1300	0.0002	0.0047	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0157	N/A	N/A	130.6992	0.9901	0.9730	160.50	
Xylenes (mixed isomers)						0.1055	N/A	N/A	106.1700	0.0006	0.0051	106.17	Option 2: A=7.005, B=1466, C=215
TK 957 - RS207 Distillate with Sulfur	Dec	63.72	59.31	68.12	65.99	0.0160	N/A	N/A	130.0000			160.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0073	0.0132	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2935	N/A	N/A	78.1100	0.0000	0.0008	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1234	N/A	N/A	106.1700	0.0001	0.0014	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Naphthalene						0.0051	N/A	N/A	128.1700	0.0006	0.0002	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0090	N/A	N/A	94.1100	0.0001	0.0001	94.11	Option 3: A=49644, B=8.587
Toluene						0.3703	N/A	N/A	92.1300	0.0002	0.0044	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						0.0157	N/A	N/A	130.6465	0.9901	0.9751	160.50	
Xylenes (mixed isomers)						0.0976	N/A	N/A	106.1700	0.0006	0.0048	106.17	Option 2: A=7.005, B=1466, C=215

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

035 (2004 Diesel @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388
Seal Factor A (lb-mole/ft-yr):	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
Value of Vapor Pressure Function:	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731	73.9731
Net Throughput (gal/mo.):	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600	7.0600
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Roof Fitting Losses (lb):	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821
Value of Vapor Pressure Function:	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940	74.4940

Roof Fitting/Status	Quantity	KFa(lb-mole/yr)	Roof Fitting Loss Factors KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00	0.00	0.1702
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	0.0993
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	0.0167
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	0.0638
Roof Leg (3-in. Diameter)/Fixed	30	0.00	0.00	0.00	0.0000
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1	11.00	9.90	0.89	0.3900
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.2198
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	0.0252

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

035 (2004 Diesel @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
TK 957 - RS207 Distillate with Sulfur	5.27	887.68	0.98	0.00	893.93
1,2,4-Trimethylbenzene	0.08	6.44	0.02	0.00	6.54
Benzene	0.00	0.01	0.00	0.00	0.01
Cresols (mixed isomers)	0.00	0.06	0.00	0.00	0.06
Ethylbenzene	0.01	0.13	0.00	0.00	0.14
Naphthalene	0.00	0.51	0.00	0.00	0.51
Phenanthrene	0.00	0.87	0.00	0.00	0.87
Phenol	0.00	0.07	0.00	0.00	0.07
Toluene	0.03	0.14	0.00	0.00	0.17
Unidentified Components	5.11	878.89	0.96	0.00	884.95
Xylenes (mixed isomers)	0.03	0.56	0.01	0.00	0.60

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	035 (2004 Gas Oil @ 1MM bbl/mo)
City:	Carson
State:	California
Company:	Tesoro
Type of Tank:	Domed External Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	135.00
Volume (gallons):	4,200,000.00
Turnovers:	120.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Riveted
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Fixed	30
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Los Angeles C.O., California (Avg Atmospheric Pressure = 14.67 psia)

Appendix D

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

035 (2004 Gas Oil @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, 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
TK 959 - RS307 Gas Oils (C20-C50)	Jan	63.80	59.36	68.25	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0020	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Feb	64.91	60.15	69.67	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0014	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0022	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Mar	65.68	60.69	70.68	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0023	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Apr	67.37	61.82	72.91	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0016	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0025	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	May	68.64	63.30	73.97	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0017	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0027	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Jun	70.44	64.85	76.03	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP70 = .01 VP80 = .01
Cresols (mixed isomers)						0.0019	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0029	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Jul	72.67	66.46	78.87	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP70 = .01 VP80 = .01
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0033	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Aug	72.78	66.93	78.64	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP70 = .01 VP80 = .01
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0033	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Sep	71.62	66.36	76.88	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP70 = .01 VP80 = .01
Cresols (mixed isomers)						0.0020	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0031	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Oct	69.38	64.44	74.33	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0018	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0028	0.9990	1.0000	400.55	
TK 959 - RS307 Gas Oils (C20-C50)	Nov	65.99	61.40	70.59	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0023	0.9990	1.0000	400.55	

TK 959 - RS307 Gas Oils (C20-C50)	Dec	63.72	59.31	68.12	65.99	0.0100	N/A	N/A	190.0000			400.00	Option 1: VP60 = .01 VP70 = .01
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0010	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Unidentified Components						0.0100	N/A	N/A	190.0020	0.9990	1.0000	400.55	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

035 (2004 Gas Oil @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007	0.4007
Seal Factor A (lb-mole/ft-yr):	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
Value of Vapor Pressure Function:	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Vapor Molecular Weight (lb/lb-mole):	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931	79.8931
Net Throughput (gal/mo.):	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250	7.6250
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Roof Fitting Losses (lb):	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750	0.0750
Value of Vapor Pressure Function:	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Molecular Weight (lb/lb-mole):	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000	190.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687	80.3687

		Roof Fitting Loss Factors			
Roof Fitting/Status	Quantity	KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00	0.00	0.1554
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	0.0907
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	0.0152
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	0.0583
Roof Leg (3-in. Diameter)/Fixed	30	0.00	0.00	0.00	0.0000
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1	11.00	9.90	0.89	0.3562
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.2008
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	0.0230

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

035 (2004 Gas Oil @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
TK 959 - RS307 Gas Oils (C20-C50)	4.81	958.72	0.90	0.00	964.42
Cresols (mixed isomers)	0.00	0.05	0.00	0.00	0.05
Phenanthrene	0.00	0.96	0.00	0.00	0.96
Unidentified Components	4.81	957.71	0.90	0.00	963.42

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	035 (2004 Gasoline @ 1MM bbl/mo)
City:	Carson
State:	California
Company:	Tesoro
Type of Tank:	Domed External Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	135.00
Volume (gallons):	4,200,000.00
Turnovers:	120.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Riveted
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Fixed	30
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Los Angeles C.O., California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

035 (2004 Gasoline @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, 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
Gasoline Max True Vapor Pressure 8 psia	Jan	63.80	59.36	68.25	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0238	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						32.6950	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.6640	N/A	N/A	114.2300	0.0609	0.0070	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.2965	N/A	N/A	78.1100	0.0093	0.0021	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.3416	N/A	N/A	84.1600	0.0104	0.0024	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1237	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1105	N/A	N/A	86.1700	0.0156	0.0057	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						8.4339	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0589	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.6239	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0051	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0091	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						156.9932	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.3712	N/A	N/A	92.1300	0.0764	0.0049	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4808	N/A	N/A	65.5208	0.7266	0.9760	89.08	
Xylenes (mixed isomers)						0.0978	N/A	N/A	106.1700	0.0671	0.0011	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Feb	64.91	60.15	69.67	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0248	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						33.5485	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.6851	N/A	N/A	114.2300	0.0609	0.0073	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3361	N/A	N/A	78.1100	0.0093	0.0022	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0014	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.3816	N/A	N/A	84.1600	0.0104	0.0025	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1285	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1709	N/A	N/A	86.1700	0.0156	0.0059	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						8.6541	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0613	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.6803	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0053	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0095	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						159.7108	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.3840	N/A	N/A	92.1300	0.0764	0.0051	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4752	N/A	N/A	65.5052	0.7266	0.9753	89.08	
Xylenes (mixed isomers)						0.1017	N/A	N/A	106.1700	0.0671	0.0012	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Mar	65.68	60.69	70.68	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						34.1485	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.7002	N/A	N/A	114.2300	0.0609	0.0074	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3645	N/A	N/A	78.1100	0.0093	0.0022	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.4103	N/A	N/A	84.1600	0.0104	0.0026	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1319	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21

Hexane (-n)						2.2142	N/A	N/A	86.1700	0.0156	0.0060	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						8.8088	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0631	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.7209	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0055	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0098	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						161.6427	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.3932	N/A	N/A	92.1300	0.0764	0.0052	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4711	N/A	N/A	65.4939	0.7266	0.9747	89.08	
Xylenes (mixed isomers)						0.1044	N/A	N/A	106.1700	0.0671	0.0012	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Apr	67.37	61.82	72.91	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0273	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						35.4462	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.7339	N/A	N/A	114.2300	0.0609	0.0078	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4276	N/A	N/A	78.1100	0.0093	0.0023	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0016	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.4739	N/A	N/A	84.1600	0.0104	0.0027	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1396	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3101	N/A	N/A	86.1700	0.0156	0.0063	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						9.1435	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0670	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.8117	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0058	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0104	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						165.8806	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4136	N/A	N/A	92.1300	0.0764	0.0055	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4621	N/A	N/A	65.4688	0.7266	0.9735	89.08	
Xylenes (mixed isomers)						0.1106	N/A	N/A	106.1700	0.0671	0.0013	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	May	68.64	63.30	73.97	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0287	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						36.4268	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.7602	N/A	N/A	114.2300	0.0609	0.0081	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4769	N/A	N/A	78.1100	0.0093	0.0024	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0017	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.5236	N/A	N/A	84.1600	0.0104	0.0028	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1457	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3849	N/A	N/A	86.1700	0.0156	0.0065	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						9.3964	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0702	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.8830	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0061	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0109	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						169.1384	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4297	N/A	N/A	92.1300	0.0764	0.0057	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4550	N/A	N/A	65.4492	0.7266	0.9725	89.08	
Xylenes (mixed isomers)						0.1155	N/A	N/A	106.1700	0.0671	0.0013	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Jun	70.44	64.85	76.03	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP70 = 8 VP80 = 8
1,2,4-Trimethylbenzene						0.0307	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						37.8165	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP70 = 37.48 VP80 = 45.21
2,2,4-Trimethylpentane						0.7989	N/A	N/A	114.2300	0.0609	0.0085	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5491	N/A	N/A	78.1100	0.0093	0.0025	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0019	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.5964	N/A	N/A	84.1600	0.0104	0.0029	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1547	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4942	N/A	N/A	86.1700	0.0156	0.0068	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						9.7564	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP70 = 9.668 VP80 = 11.699
Isopropyl benzene						0.0748	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.9881	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0065	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0117	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587

Propylene						173.8355	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4533	N/A	N/A	92.1300	0.0764	0.0060	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4447	N/A	N/A	65.4202	0.7266	0.9712	89.08	
Xylenes (mixed isomers)						0.1227	N/A	N/A	106.1700	0.0671	0.0014	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Jul	72.67	66.46	78.87	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP70 = 8 VP80 = 8
1,2,4-Trimethylbenzene						0.0334	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						39.5403	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP70 = 37.48 VP80 = 45.21
2,2,4-Trimethylpentane						0.8491	N/A	N/A	114.2300	0.0609	0.0090	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.6426	N/A	N/A	78.1100	0.0093	0.0027	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.6905	N/A	N/A	84.1600	0.0104	0.0031	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1665	N/A	N/A	106.1700	0.0129	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.6354	N/A	N/A	86.1700	0.0156	0.0072	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						10.2093	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP70 = 9.668 VP80 = 11.699
Isopropyl benzene						0.0810	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						2.1252	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0071	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0128	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						179.7914	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4842	N/A	N/A	92.1300	0.0764	0.0064	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4313	N/A	N/A	65.3826	0.7266	0.9694	89.08	
Xylenes (mixed isomers)						0.1322	N/A	N/A	106.1700	0.0671	0.0015	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Aug	72.78	66.93	78.64	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP70 = 8 VP80 = 8
1,2,4-Trimethylbenzene						0.0336	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						39.6324	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP70 = 37.48 VP80 = 45.21
2,2,4-Trimethylpentane						0.8518	N/A	N/A	114.2300	0.0609	0.0090	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.6477	N/A	N/A	78.1100	0.0093	0.0027	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.6957	N/A	N/A	84.1600	0.0104	0.0031	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1671	N/A	N/A	106.1700	0.0129	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.6431	N/A	N/A	86.1700	0.0156	0.0072	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						10.2335	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP70 = 9.668 VP80 = 11.699
Isopropyl benzene						0.0813	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						2.1327	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0071	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0128	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						180.1140	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4859	N/A	N/A	92.1300	0.0764	0.0065	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4305	N/A	N/A	65.3805	0.7266	0.9693	89.08	
Xylenes (mixed isomers)						0.1327	N/A	N/A	106.1700	0.0671	0.0016	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Sep	71.62	66.36	76.88	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP70 = 8 VP80 = 8
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						38.7305	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP70 = 37.48 VP80 = 45.21
2,2,4-Trimethylpentane						0.8252	N/A	N/A	114.2300	0.0609	0.0088	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5981	N/A	N/A	78.1100	0.0093	0.0026	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0020	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.6457	N/A	N/A	84.1600	0.0104	0.0030	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0129	0.0004	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5683	N/A	N/A	86.1700	0.0156	0.0070	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						9.9966	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP70 = 9.668 VP80 = 11.699
Isopropyl benzene						0.0780	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						2.0598	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0068	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0123	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						176.9747	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4695	N/A	N/A	92.1300	0.0764	0.0062	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4377	N/A	N/A	65.4005	0.7266	0.9702	89.08	
Xylenes (mixed isomers)						0.1276	N/A	N/A	106.1700	0.0671	0.0015	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Oct	69.38	64.44	74.33	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0295	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56

1,3-Butadiene						37.0030	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.7761	N/A	N/A	114.2300	0.0609	0.0082	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5065	N/A	N/A	78.1100	0.0093	0.0025	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0018	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.5535	N/A	N/A	84.1600	0.0104	0.0028	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1494	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4298	N/A	N/A	86.1700	0.0156	0.0066	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						9.5450	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0721	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.9260	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0063	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0113	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						171.0749	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.4394	N/A	N/A	92.1300	0.0764	0.0058	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4508	N/A	N/A	65.4373	0.7266	0.9720	89.08	
Xylenes (mixed isomers)						0.1184	N/A	N/A	106.1700	0.0671	0.0014	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Nov	65.99	61.40	70.59	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0259	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						34.3880	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.7063	N/A	N/A	114.2300	0.0609	0.0075	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3759	N/A	N/A	78.1100	0.0093	0.0022	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.4218	N/A	N/A	84.1600	0.0104	0.0026	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1333	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2316	N/A	N/A	86.1700	0.0156	0.0061	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						8.8706	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0638	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.7374	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0055	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0099	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						162.4187	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.3969	N/A	N/A	92.1300	0.0764	0.0053	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4695	N/A	N/A	65.4894	0.7266	0.9745	89.08	
Xylenes (mixed isomers)						0.1055	N/A	N/A	106.1700	0.0671	0.0012	106.17	Option 2: A=7.005, B=1466, C=215
Gasoline Max True Vapor Pressure 8 psia	Dec	63.72	59.31	68.12	65.99	8.0000	N/A	N/A	66.0000			92.00	Option 1: VP60 = 8 VP70 = 8
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0181	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
1,3-Butadiene						32.6289	N/A	N/A	54.0900	0.0000	0.0000	54.09	Option 1: VP60 = 29.76 VP70 = 37.48
2,2,4-Trimethylpentane						0.6624	N/A	N/A	114.2300	0.0609	0.0070	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.2935	N/A	N/A	78.1100	0.0093	0.0021	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Cyclohexane						1.3386	N/A	N/A	84.1600	0.0104	0.0024	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1234	N/A	N/A	106.1700	0.0129	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1059	N/A	N/A	86.1700	0.0156	0.0057	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isoprene						8.4169	N/A	N/A	68.1100	0.0001	0.0002	68.11	Option 1: VP60 = 7.677 VP70 = 9.668
Isopropyl benzene						0.0587	N/A	N/A	120.2000	0.0007	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.6196	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Naphthalene						0.0051	N/A	N/A	128.1700	0.0017	0.0000	128.17	Option 3: A=47362, B=7.927
Phenol						0.0090	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Propylene						156.7841	N/A	N/A	42.0800	0.0000	0.0000	42.08	Option 3: A=19693, B=7.4463
Toluene						0.3703	N/A	N/A	92.1300	0.0764	0.0049	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.4813	N/A	N/A	65.5220	0.7266	0.9761	89.08	
Xylenes (mixed isomers)						0.0976	N/A	N/A	106.1700	0.0671	0.0011	106.17	Option 2: A=7.005, B=1466, C=215

Appendix D

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

035 (2004 Gasoline @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222	158.8222
Seal Factor A (lb-mole/ft-yr):	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
Value of Vapor Pressure Function:	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000	8.0000
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756	58.6756
Net Throughput (gal/mo.):	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Roof Fitting Losses (lb):	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110	29.7110
Value of Vapor Pressure Function:	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945	0.1945
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087	247.2087

Roof Fitting/Status	Quantity	KFa(lb-mole/yr)	Roof Fitting Loss Factors KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00	0.00	61.6038
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	35.9355
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	6.0320
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	23.1014
Roof Leg (3-in. Diameter)/Fixed	30	0.00	0.00	0.00	0.0000
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1	11.00	9.90	0.89	141.1753
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	79.5715
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	9.1122

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

035 (2004 Gasoline @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Gasoline Max True Vapor Pressure 8 psia	1,905.87	704.11	356.53	0.00	2,966.50
1,2,4-Trimethylbenzene	0.17	12.71	0.03	0.00	12.91
1,3-Butadiene	0.06	0.00	0.01	0.00	0.07
2,2,4-Trimethylpentane	15.20	42.90	2.84	0.00	60.94
Benzene	4.53	6.57	0.85	0.00	11.95
Cresols (mixed isomers)	0.00	0.04	0.00	0.00	0.04
Cyclohexane	5.20	7.32	0.97	0.00	13.49
Ethylbenzene	0.62	9.07	0.12	0.00	9.80
Hexane (-n)	12.23	11.00	2.29	0.00	25.52
Isoprene	0.34	0.08	0.06	0.00	0.48
Isopropyl benzene	0.02	0.53	0.00	0.00	0.55
Methyl alcohol	0.00	0.00	0.00	0.00	0.01
Naphthalene	0.00	1.23	0.00	0.00	1.23
Phenol	0.00	0.04	0.00	0.00	0.04
Propylene	0.03	0.00	0.01	0.00	0.03
Toluene	10.76	53.78	2.01	0.00	66.55
Unidentified Components	1,854.18	511.63	346.86	0.00	2,712.67
Xylenes (mixed isomers)	2.54	47.21	0.47	0.00	50.22

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	035 (2004 Jet @ 1MM bbl/mo)
City:	Carson
State:	California
Company:	Tesoro
Type of Tank:	Domed External Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	135.00
Volume (gallons):	4,200,000.00
Turnovers:	120.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Riveted
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Fixed	30
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Los Angeles C.O., California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

035 (2004 Jet @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, 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
TK 034 - APPC463 Jet Fuel A	Jan	63.80	59.36	68.25	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0238	N/A	N/A	120.1900	0.0055	0.0082	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1237	N/A	N/A	106.1700	0.0050	0.0387	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0589	N/A	N/A	120.2000	0.0055	0.0202	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0051	N/A	N/A	128.1700	0.0150	0.0048	128.17	Option 3: A=47362, B=7.927
Phenol						0.0091	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0146	N/A	N/A	132.7645	0.9634	0.8945	130.47	
Xylenes (mixed isomers)						0.0978	N/A	N/A	106.1700	0.0055	0.0336	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Feb	64.91	60.15	69.67	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0248	N/A	N/A	120.1900	0.0055	0.0085	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0014	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1285	N/A	N/A	106.1700	0.0050	0.0402	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0613	N/A	N/A	120.2000	0.0055	0.0211	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0053	N/A	N/A	128.1700	0.0150	0.0050	128.17	Option 3: A=47362, B=7.927
Phenol						0.0095	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0145	N/A	N/A	132.8888	0.9634	0.8903	130.47	
Xylenes (mixed isomers)						0.1017	N/A	N/A	106.1700	0.0055	0.0349	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Mar	65.68	60.69	70.68	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0055	0.0088	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1319	N/A	N/A	106.1700	0.0050	0.0412	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0631	N/A	N/A	120.2000	0.0055	0.0217	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0055	N/A	N/A	128.1700	0.0150	0.0051	128.17	Option 3: A=47362, B=7.927
Phenol						0.0098	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0145	N/A	N/A	132.9796	0.9634	0.8872	130.47	
Xylenes (mixed isomers)						0.1044	N/A	N/A	106.1700	0.0055	0.0359	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Apr	67.37	61.82	72.91	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0273	N/A	N/A	120.1900	0.0055	0.0094	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0016	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1396	N/A	N/A	106.1700	0.0050	0.0436	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0670	N/A	N/A	120.2000	0.0055	0.0230	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0058	N/A	N/A	128.1700	0.0150	0.0055	128.17	Option 3: A=47362, B=7.927
Phenol						0.0104	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0143	N/A	N/A	133.1861	0.9634	0.8804	130.47	
Xylenes (mixed isomers)						0.1106	N/A	N/A	106.1700	0.0055	0.0380	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	May	68.64	63.30	73.97	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0287	N/A	N/A	120.1900	0.0055	0.0099	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0017	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1457	N/A	N/A	106.1700	0.0050	0.0455	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0702	N/A	N/A	120.2000	0.0055	0.0241	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0061	N/A	N/A	128.1700	0.0150	0.0057	128.17	Option 3: A=47362, B=7.927
Phenol						0.0109	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0142	N/A	N/A	133.3518	0.9634	0.8750	130.47	

Xylenes (mixed isomers)						0.1155	N/A	N/A	106.1700	0.0055	0.0397	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Jun	70.44	64.85	76.03	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0307	N/A	N/A	120.1900	0.0055	0.0106	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0019	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1547	N/A	N/A	106.1700	0.0050	0.0483	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0748	N/A	N/A	120.2000	0.0055	0.0257	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0065	N/A	N/A	128.1700	0.0150	0.0061	128.17	Option 3: A=47362, B=7.927
Phenol						0.0117	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0141	N/A	N/A	133.6020	0.9634	0.8671	130.47	
Xylenes (mixed isomers)						0.1227	N/A	N/A	106.1700	0.0055	0.0422	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Jul	72.67	66.46	78.87	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0334	N/A	N/A	120.1900	0.0055	0.0115	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1665	N/A	N/A	106.1700	0.0050	0.0520	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0810	N/A	N/A	120.2000	0.0055	0.0278	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0071	N/A	N/A	128.1700	0.0150	0.0066	128.17	Option 3: A=47362, B=7.927
Phenol						0.0128	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0139	N/A	N/A	133.9393	0.9634	0.8566	130.47	
Xylenes (mixed isomers)						0.1322	N/A	N/A	106.1700	0.0055	0.0454	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Aug	72.78	66.93	78.64	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0336	N/A	N/A	120.1900	0.0055	0.0115	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0022	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1671	N/A	N/A	106.1700	0.0050	0.0522	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0813	N/A	N/A	120.2000	0.0055	0.0280	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0071	N/A	N/A	128.1700	0.0150	0.0066	128.17	Option 3: A=47362, B=7.927
Phenol						0.0128	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0138	N/A	N/A	133.9583	0.9634	0.8560	130.47	
Xylenes (mixed isomers)						0.1327	N/A	N/A	106.1700	0.0055	0.0456	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Sep	71.62	66.36	76.88	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP70 = .016 VP80 = .016
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0055	0.0110	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0020	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0050	0.0503	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0780	N/A	N/A	120.2000	0.0055	0.0268	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0068	N/A	N/A	128.1700	0.0150	0.0064	128.17	Option 3: A=47362, B=7.927
Phenol						0.0123	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0140	N/A	N/A	133.7769	0.9634	0.8616	130.47	
Xylenes (mixed isomers)						0.1276	N/A	N/A	106.1700	0.0055	0.0439	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Oct	69.38	64.44	74.33	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0295	N/A	N/A	120.1900	0.0055	0.0101	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0018	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1494	N/A	N/A	106.1700	0.0050	0.0467	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0721	N/A	N/A	120.2000	0.0055	0.0248	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0063	N/A	N/A	128.1700	0.0150	0.0059	128.17	Option 3: A=47362, B=7.927
Phenol						0.0113	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0142	N/A	N/A	133.4533	0.9634	0.8718	130.47	
Xylenes (mixed isomers)						0.1184	N/A	N/A	106.1700	0.0055	0.0407	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Nov	65.99	61.40	70.59	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0259	N/A	N/A	120.1900	0.0055	0.0089	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0015	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1333	N/A	N/A	106.1700	0.0050	0.0417	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0638	N/A	N/A	120.2000	0.0055	0.0219	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0055	N/A	N/A	128.1700	0.0150	0.0052	128.17	Option 3: A=47362, B=7.927
Phenol						0.0099	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components						0.0144	N/A	N/A	133.0167	0.9634	0.8860	130.47	
Xylenes (mixed isomers)						0.1055	N/A	N/A	106.1700	0.0055	0.0363	106.17	Option 2: A=7.005, B=1466, C=215
TK 034 - APPC463 Jet Fuel A	Dec	63.72	59.31	68.12	65.99	0.0160	N/A	N/A	130.0000			130.00	Option 1: VP60 = .016 VP70 = .016
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0055	0.0081	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Cresols (mixed isomers)						0.0013	N/A	N/A	108.1400	0.0001	0.0000	108.14	Option 2: A=7.151, B=1601, C=175
Ethylbenzene						0.1234	N/A	N/A	106.1700	0.0050	0.0386	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Isopropyl benzene						0.0587	N/A	N/A	120.2000	0.0055	0.0202	120.20	Option 2: A=6.963, B=1460.793, C=207.78

Naphthalene	0.0051	N/A	N/A	128.1700	0.0150	0.0048	128.17	Option 3: A=47362, B=7.927
Phenol	0.0090	N/A	N/A	94.1100	0.0001	0.0000	94.11	Option 3: A=49644, B=8.587
Unidentified Components	0.0146	N/A	N/A	132.7551	0.9634	0.8948	130.47	
Xylenes (mixed isomers)	0.0976	N/A	N/A	106.1700	0.0055	0.0335	106.17	Option 2: A=7.005, B=1466, C=215

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

035 (2004 Jet @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388	0.4388
Seal Factor A (lb-mole/ft-yr):	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
Value of Vapor Pressure Function:	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108	71.5108
Net Throughput (gal/mo.):	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250	6.8250
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Roof Fitting Losses (lb):	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821	0.0821
Value of Vapor Pressure Function:	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317	72.0317

Roof Fitting/Status	Quantity	KFa(lb-mole/yr)	Roof Fitting Loss Factors KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00	0.00	0.1702
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	0.0993
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	0.0167
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	0.0638
Roof Leg (3-in. Diameter)/Fixed	30	0.00	0.00	0.00	0.0000
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1	11.00	9.90	0.89	0.3900
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.2198
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	0.0252

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

035 (2004 Jet @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
TK 034 - APPC463 Jet Fuel A	5.27	858.13	0.98	0.00	864.38
1,2,4-Trimethylbenzene	0.05	4.72	0.01	0.00	4.78
Cresols (mixed isomers)	0.00	0.04	0.00	0.00	0.04
Ethylbenzene	0.24	4.29	0.04	0.00	4.57
Isopropyl benzene	0.13	4.72	0.02	0.00	4.87
Naphthalene	0.03	12.87	0.01	0.00	12.91
Phenol	0.00	0.04	0.00	0.00	0.04
Unidentified Components	4.62	826.72	0.86	0.00	832.20
Xylenes (mixed isomers)	0.21	4.72	0.04	0.00	4.96

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	035 (Wastewater @ 1MM bbl/mo)
City:	Carson
State:	California
Company:	Tesoro
Type of Tank:	Domed External Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	135.00
Volume (gallons):	4,200,000.00
Turnovers:	120.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Riveted
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Fixed	30
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Los Angeles C.O., California (Avg Atmospheric Pressure = 14.67 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

035 (Wastewater @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, 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
TK 035 (Untreated Wastewater)	Jan	63.80	59.36	68.25	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0238	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.2267	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.2965	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						2.6919	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1237	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						252.2440	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0589	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.6239	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.5584	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0051	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0091	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2342	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.3712	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.0978	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Feb	64.91	60.15	69.67	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0248	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.3181	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.3361	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						2.7703	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1285	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						256.2724	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0613	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.6803	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.6568	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0053	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0095	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2426	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.3840	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1017	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Mar	65.68	60.69	70.68	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0256	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.3836	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.3645	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						2.8265	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03

Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1319	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						259.1048	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0631	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.7209	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.7259	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0055	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0098	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2487	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.3932	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1044	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Apr	67.37	61.82	72.91	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0273	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.5288	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.4276	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						2.9511	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1396	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						265.2299	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0670	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.8117	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.8755	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0058	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0104	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2623	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4136	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1106	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	May	68.64	63.30	73.97	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0287	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.6420	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.4769	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						3.0482	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1457	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						269.8588	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0702	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.8830	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.9886	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0061	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0109	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2730	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4297	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1155	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Jun	70.44	64.85	76.03	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP70 = 3.093 VP80 = 3.093
1,2,4-Trimethylbenzene						0.0307	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.8074	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 274.83
Benzene						1.5491	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						3.1900	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP70 = .011157319 VP80 = .011157319
Ethylbenzene						0.1547	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						276.5782	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 314.99

Isopropyl benzene						0.0748	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.9881	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						4.1566	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Naphthalene						0.0065	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0117	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2888	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4533	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1227	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Jul	72.67	66.46	78.87	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP70 = 3.093 VP80 = 3.093
1,2,4-Trimethylbenzene						0.0334	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						4.0208	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 274.83
Benzene						1.6426	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						3.3731	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP70 = .011157319 VP80 = .011157319
Ethylbenzene						0.1665	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						285.5337	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 314.99
Isopropyl benzene						0.0810	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						2.1252	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						4.3952	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Naphthalene						0.0071	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0128	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.3094	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4842	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1322	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Aug	72.78	66.93	78.64	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP70 = 3.093 VP80 = 3.093
1,2,4-Trimethylbenzene						0.0336	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						4.0324	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 274.83
Benzene						1.6477	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						3.3831	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP70 = .011157319 VP80 = .011157319
Ethylbenzene						0.1671	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						286.0124	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 314.99
Isopropyl benzene						0.0813	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						2.1327	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						4.4079	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP70 = 4.11 VP80 = 5.18
Naphthalene						0.0071	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0128	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.3105	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4859	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1327	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Sep	71.62	66.36	76.88	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP70 = 3.093 VP80 = 3.093
1,2,4-Trimethylbenzene						0.0321	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.9193	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 274.83
Benzene						1.5981	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						3.2861	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP70 = .011157319 VP80 = .011157319
Ethylbenzene						0.1608	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						281.3266	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP70 = 274.83 VP80 = 314.99
Isopropyl benzene						0.0780	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						2.0598	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						4.2831	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP70 = 4.11 VP80 = 5.18

Naphthalene						0.0068	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP70 = .00000447 VP80 = .00000447
Phenol						0.0123	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2995	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4695	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1276	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Oct	69.38	64.44	74.33	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0295	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.7098	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.5065	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						3.1064	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1494	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						272.5786	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0721	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.9260	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						4.0550	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0063	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0113	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2794	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.4394	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1184	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Nov	65.99	61.40	70.59	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0259	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.4100	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.3759	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						2.8492	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1333	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						260.2353	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0638	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.7374	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.7535	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0055	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0099	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587
Tetrachloroethylene						0.2512	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene						0.3969	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)						0.1055	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215
TK 035 (Untreated Wastewater)	Dec	63.72	59.31	68.12	65.99	3.0930	N/A	N/A	100.0000			18.00	Option 1: VP60 = 3.093 VP70 = 3.093
1,2,4-Trimethylbenzene						0.0237	N/A	N/A	120.1900	0.0000	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Acetone						3.2198	N/A	N/A	58.0800	0.0000	0.0000	58.08	Option 2: A=7.117, B=1210.595, C=229.664
Ammonia						274.8300	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 274.83 VP70 = 274.83
Benzene						1.2935	N/A	N/A	78.1100	0.0000	0.0000	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Chloroform						2.6859	N/A	N/A	119.3900	0.0000	0.0000	119.39	Option 2: A=6.493, B=929.44, C=196.03
Diethanolamine (DEA)						0.0112	N/A	N/A	105.1400	0.0000	0.0000	105.14	Option 1: VP60 = .011157319 VP70 = .011157319
Ethylbenzene						0.1234	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hydrogen Sulfide						251.9319	N/A	N/A	34.0800	0.0000	0.0000	34.08	Option 1: VP60 = 238.39 VP70 = 274.83
Isopropyl benzene						0.0587	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Methyl alcohol						1.6196	N/A	N/A	32.0400	0.0000	0.0000	32.04	Option 2: A=7.897, B=1474.08, C=229.13
Methyl-tert-butyl ether (MTBE)						3.5507	N/A	N/A	88.1500	0.0000	0.0000	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0051	N/A	N/A	128.1700	0.0000	0.0000	128.17	Option 3: A=47362, B=7.927
Phenanthrene						0.0000	N/A	N/A	178.2300	0.0000	0.0000	178.23	Option 1: VP60 = .00000447 VP70 = .00000447
Phenol						0.0090	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 3: A=49644, B=8.587

Tetrachloroethylene	0.2335	N/A	N/A	165.8300	0.0000	0.0000	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Toluene	0.3703	N/A	N/A	92.1300	0.0000	0.0000	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	3.0928	N/A	N/A	100.0038	1.0000	1.0000	18.00	
Xylenes (mixed isomers)	0.0976	N/A	N/A	106.1700	0.0000	0.0000	106.17	Option 2: A=7.005, B=1466, C=215

Appendix D

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

035 (Wastewater @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472	73.1472
Seal Factor A (lb-mole/ft-yr):	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
Value of Vapor Pressure Function:	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930	3.0930
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Vapor Molecular Weight (lb/lb-mole):	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381	87.4381
Net Throughput (gal/mo.):	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000	42,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451	8.3451
Tank Diameter (ft):	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000	135.0000
Roof Fitting Losses (lb):	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837	13.6837
Value of Vapor Pressure Function:	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591
Vapor Molecular Weight (lb/lb-mole):	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800	27.7800
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690	174.2690

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00	0.00	28.3723
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	16.5505
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.7781
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	10.6396
Roof Leg (3-in. Diameter)/Fixed	30	0.00	0.00	0.00	0.0000
Slotted Guide-Pole/Sample Well/Gask Sliding Covr, w. Float,Sleeve,Wiper	1	11.00	9.90	0.89	65.0198
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	36.6475
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	4.1967

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

035 (Wastewater @ 1MM bbl/mo) - Domed External Floating Roof Tank
Carson, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
TK 035 (Untreated Wastewater)	877.77	1,049.26	164.20	0.00	2,091.23
1,2,4-Trimethylbenzene	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00
Ammonia	0.02	0.00	0.00	0.00	0.02
Benzene	0.00	0.00	0.00	0.00	0.00
Chloroform	0.00	0.00	0.00	0.00	0.00
Diethanolamine (DEA)	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00
Isopropyl benzene	0.00	0.00	0.00	0.00	0.00
Methyl alcohol	0.00	0.00	0.00	0.00	0.00
Methyl-tert-butyl ether (MTBE)	0.00	0.00	0.00	0.00	0.00
Naphthalene	0.00	0.00	0.00	0.00	0.00
Phenanthrene	0.00	0.00	0.00	0.00	0.00
Phenol	0.00	0.00	0.00	0.00	0.00
Tetrachloroethylene	0.00	0.00	0.00	0.00	0.00
Toluene	0.00	0.00	0.00	0.00	0.00
Unidentified Components	877.75	1,049.25	164.20	0.00	2,091.20
Xylenes (mixed isomers)	0.00	0.00	0.00	0.00	0.00

Carson Crude Tank Emission Calculations

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TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	EIR- CCT (Jan 2019 - Updated Toxics)
City:	Long Beach
State:	California
Company:	Tesoro
Type of Tank:	Domed External Floating Roof Tank
Description:	New

Tank Dimensions

Diameter (ft):	240.00
Volume (gallons):	21,000,000.00
Turnovers:	51.10

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	Gray/Light
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	5
Automatic Gauge Float Well/Bolted Cover, Gasketed	2
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Sock	34
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Sock	101
Sample Pipe or Well (24-in. Diam.)/Slotted Pipe-Sliding Cover, Gask.	4
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meterological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

EIR- CCT (Jan 2019 - Updated Toxics) - Domed External Floating Roof Tank
Long Beach, 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
TSO Light Crude Oil (RVP 10.5 psia)	Jan	65.62	58.33	72.92	66.55	8.7251	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.3622	N/A	N/A	78.1100	0.0047	0.0030	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP60 = .000000003 VP70 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP60 = .0000000016 VP70 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP60 = .000000000000406 VP70 = .000000000000406
Ethylbenzene						0.1317	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2108	N/A	N/A	86.1700	0.0191	0.0199	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0053	34.00	Option 1: VP60 = 252 VP70 = 252
Isopropyl benzene						0.0629	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0032	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.3924	N/A	N/A	92.1300	0.0119	0.0022	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.7194	N/A	N/A	49.5673	0.9442	0.9686	220.68	
Xylenes (mixed isomers)						0.1098	N/A	N/A	106.1700	0.0160	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Feb	67.37	59.29	75.45	66.55	8.9707	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.4278	N/A	N/A	78.1100	0.0047	0.0031	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP60 = .000000003 VP70 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP60 = .0000000016 VP70 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP60 = .000000000000406 VP70 = .000000000000406
Ethylbenzene						0.1396	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3104	N/A	N/A	86.1700	0.0191	0.0202	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0052	34.00	Option 1: VP60 = 252 VP70 = 252
Isopropyl benzene						0.0670	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0034	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.4137	N/A	N/A	92.1300	0.0119	0.0022	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.9924	N/A	N/A	49.5535	0.9442	0.9683	220.68	
Xylenes (mixed isomers)						0.1166	N/A	N/A	106.1700	0.0160	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Mar	69.41	60.32	78.50	66.55	9.2643	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.5076	N/A	N/A	78.1100	0.0047	0.0031	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP60 = .000000003 VP70 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP60 = .0000000016 VP70 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP60 = .000000000000406 VP70 = .000000000000406
Ethylbenzene						0.1495	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.4315	N/A	N/A	86.1700	0.0191	0.0206	86.17	Option 2: A=6.876, B=1171.17, C=224.41

Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0050	34.00	Option 1: VP60 = 252 VP70 = 252
Isopropyl benzene						0.0721	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0037	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.4397	N/A	N/A	92.1300	0.0119	0.0023	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.3186	N/A	N/A	49.5373	0.9442	0.9679	220.68	
Xylenes (mixed isomers)						0.1249	N/A	N/A	106.1700	0.0160	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Apr	72.51	61.77	83.24	66.55	9.7236	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.6358	N/A	N/A	78.1100	0.0047	0.0033	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.1656	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.6251	N/A	N/A	86.1700	0.0191	0.0212	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0048	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.0805	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0043	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.4819	N/A	N/A	92.1300	0.0119	0.0024	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.8286	N/A	N/A	49.5129	0.9442	0.9672	220.68	
Xylenes (mixed isomers)						0.1385	N/A	N/A	106.1700	0.0160	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	May	74.48	63.71	85.25	66.55	10.0253	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.7221	N/A	N/A	78.1100	0.0047	0.0033	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.1766	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.7549	N/A	N/A	86.1700	0.0191	0.0215	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0046	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.0863	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0046	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.5106	N/A	N/A	92.1300	0.0119	0.0025	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.1634	N/A	N/A	49.4973	0.9442	0.9668	220.68	
Xylenes (mixed isomers)						0.1478	N/A	N/A	106.1700	0.0160	0.0010	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Jun	76.44	65.30	87.59	66.55	10.3327	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.8117	N/A	N/A	78.1100	0.0047	0.0034	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.1882	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.8893	N/A	N/A	86.1700	0.0191	0.0219	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0045	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.0924	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0050	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.5405	N/A	N/A	92.1300	0.0119	0.0025	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.5042	N/A	N/A	49.4818	0.9442	0.9664	220.68	
Xylenes (mixed isomers)						0.1576	N/A	N/A	106.1700	0.0160	0.0010	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Jul	79.23	67.05	91.41	66.55	10.7812	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.9454	N/A	N/A	78.1100	0.0047	0.0035	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270

Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.2058	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.0893	N/A	N/A	86.1700	0.0191	0.0225	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0043	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.1017	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0056	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.5855	N/A	N/A	92.1300	0.0119	0.0026	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						12.0013	N/A	N/A	49.4598	0.9442	0.9658	220.68	
Xylenes (mixed isomers)						0.1725	N/A	N/A	106.1700	0.0160	0.0010	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Aug	79.03	67.58	90.49	66.55	10.7489	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.9357	N/A	N/A	78.1100	0.0047	0.0035	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.2045	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						3.0748	N/A	N/A	86.1700	0.0191	0.0224	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0043	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.1010	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0056	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.5822	N/A	N/A	92.1300	0.0119	0.0026	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.9655	N/A	N/A	49.4614	0.9442	0.9658	220.68	
Xylenes (mixed isomers)						0.1714	N/A	N/A	106.1700	0.0160	0.0010	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Sep	76.38	66.46	86.31	66.55	10.3233	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.8089	N/A	N/A	78.1100	0.0047	0.0034	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.1878	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.8852	N/A	N/A	86.1700	0.0191	0.0219	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0045	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.0922	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0050	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.5395	N/A	N/A	92.1300	0.0119	0.0025	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						11.4938	N/A	N/A	49.4823	0.9442	0.9664	220.68	
Xylenes (mixed isomers)						0.1573	N/A	N/A	106.1700	0.0160	0.0010	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Oct	72.86	64.16	81.56	66.55	9.7779	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.6512	N/A	N/A	78.1100	0.0047	0.0033	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP70 = .000000003 VP80 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP70 = .0000000016 VP80 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP70 = .000000000000406 VP80 = .000000000000406
Ethylbenzene						0.1676	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.6483	N/A	N/A	86.1700	0.0191	0.0212	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0048	34.00	Option 1: VP70 = 252 VP80 = 252
Isopropyl benzene						0.0815	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0043	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61

Toluene						0.4870	N/A	N/A	92.1300	0.0119	0.0024	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.8888	N/A	N/A	49.5100	0.9442	0.9672	220.68	
Xylenes (mixed isomers)						0.1401	N/A	N/A	106.1700	0.0160	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Nov	68.45	60.79	76.12	66.55	9.1259	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.4697	N/A	N/A	78.1100	0.0047	0.0031	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP60 = .000000003 VP70 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP60 = .0000000016 VP70 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP60 = .000000000000406 VP70 = .000000000000406
Ethylbenzene						0.1448	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3742	N/A	N/A	86.1700	0.0191	0.0204	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0051	34.00	Option 1: VP60 = 252 VP70 = 252
Isopropyl benzene						0.0697	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0036	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.4274	N/A	N/A	92.1300	0.0119	0.0023	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1648	N/A	N/A	49.5449	0.9442	0.9681	220.68	
Xylenes (mixed isomers)						0.1209	N/A	N/A	106.1700	0.0160	0.0009	106.17	Option 2: A=7.009, B=1462.266, C=215.11
TSO Light Crude Oil (RVP 10.5 psia)	Dec	65.40	58.35	72.46	66.55	8.6945	N/A	N/A	50.0000			205.00	Option 4: RVP=10.5
Benzene						1.3542	N/A	N/A	78.1100	0.0047	0.0030	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Benzo(a)anthracene						0.0000	N/A	N/A	228.3000	0.0000	0.0000	228.30	Option 1: VP60 = .000000003 VP70 = .000000003
Benzo(a)pyrene						0.0000	N/A	N/A	252.3100	0.0000	0.0000	252.31	Option 2: A=9.3, B=3700, C=270
Benzo(b)fluoroanthene						0.0000	N/A	N/A	252.3000	0.0000	0.0000	252.30	Option 1: VP60 = .0000000016 VP70 = .0000000016
Chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Dibenzo(a,h)anthracene						0.0000	N/A	N/A	278.3000	0.0000	0.0000	278.30	Option 1: VP60 = .000000000000406 VP70 = .000000000000406
Ethylbenzene						0.1307	N/A	N/A	106.1700	0.0030	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1985	N/A	N/A	86.1700	0.0191	0.0198	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hydrogen Sulfide						252.0000	N/A	N/A	34.0000	0.0000	0.0053	34.00	Option 1: VP60 = 252 VP70 = 252
Isopropyl benzene						0.0624	N/A	N/A	120.2000	0.0004	0.0000	120.20	Option 2: A=6.963, B=1460.793, C=207.78
Naphthalene						0.0031	N/A	N/A	128.2000	0.0006	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Toluene						0.3898	N/A	N/A	92.1300	0.0119	0.0022	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						9.6854	N/A	N/A	49.5690	0.9442	0.9686	220.68	
Xylenes (mixed isomers)						0.1090	N/A	N/A	106.1700	0.0160	0.0008	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

EIR- CCT (Jan 2019 - Updated Toxics) - Domed External Floating Roof Tank
Long Beach, California

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	53.1055	55.4944	58.4707	63.4233	66.8972	70.6398	76.5257	76.0836	70.5227	64.0346	57.0502	52.8148
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.2213	0.2312	0.2436	0.2643	0.2787	0.2943	0.3189	0.3170	0.2938	0.2668	0.2377	0.2201
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.7251	8.9707	9.2643	9.7236	10.0253	10.3327	10.7812	10.7489	10.3233	9.7779	9.1259	8.6945
Tank Diameter (ft):	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852	356.3852
Net Throughput (gal/mo.):	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000	89,425,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000	240.0000
Roof Fitting Losses (lb):	125.1187	130.7472	137.7594	149.4280	157.6127	166.4302	180.2978	179.2561	166.1544	150.8683	134.4127	124.4338
Value of Vapor Pressure Function:	0.2213	0.2312	0.2436	0.2643	0.2787	0.2943	0.3189	0.3170	0.2938	0.2668	0.2377	0.2201
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700	339.2700
Average Wind Speed (mph):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Losses (lb):	534.6094	542.6269	552.6154	569.2366	580.8951	593.4553	613.2088	611.7250	593.0624	571.2882	547.8481	533.6338

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	5	1.60	0.00	0.00	42.5367
Automatic Gauge Float Well/Bolted Cover, Gasketed	2	2.80	0.00	0.00	29.7757
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	32.9659
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.4990
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Sock	34	1.20	0.14	0.65	216.9370
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Sock	101	0.49	0.16	0.14	263.1424
Sample Pipe or Well (24-in. Diam.)/Slotted Pipe-Sliding Cover, Gask.	4	43.00	0.00	0.00	914.5382
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	3.7751
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	297.7566

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

EIR- CCT (Jan 2019 - Updated Toxics) - Domed External Floating Roof Tank
Long Beach, California

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
TSO Light Crude Oil (RVP 10.5 psia)	765.06	4,276.62	1,802.52	0.00	6,844.20
Benzene	2.50	20.19	5.89	0.00	28.58
Benzo(a)anthracene	0.00	0.08	0.00	0.00	0.08
Benzo(a)pyrene	0.00	0.03	0.00	0.00	0.03
Benzo(b)fluoroanthene	0.00	0.17	0.00	0.00	0.17
Chrysene	0.00	0.16	0.00	0.00	0.16
Dibenzo(a,h)anthracene	0.00	0.01	0.00	0.00	0.01
Ethylbenzene	0.16	12.87	0.38	0.00	13.42
Hexane (-n)	16.24	81.73	38.27	0.00	136.23
Hydrogen Sulfide	3.65	0.19	8.60	0.00	12.44
Isopropyl benzene	0.01	1.87	0.03	0.00	1.91
Naphthalene	0.00	2.35	0.00	0.00	2.35
Toluene	1.85	50.68	4.37	0.00	56.90
Unidentified Components	739.92	4,037.87	1,743.28	0.00	6,521.07
Xylenes (mixed isomers)	0.72	68.43	1.70	0.00	70.85

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APPENDIX E

HEALTH RISK ASSESSMENT ADDENDUM

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HEALTH RISK ASSESSMENT ADDENDUM

FOR THE

TESORO LOS ANGELES REFINERY INTEGRATION AND COMPLIANCE PROJECT

CARSON AND WILMINGTON, CALIFORNIA

Prepared by:
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APRIL 2019

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LIST OF ATTACHMENTS

Attachment A **Windroses**

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[1] Available separately from South Coast AQMD.

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1.0 EXECUTIVE SUMMARY

The Los Angeles Refinery Integration and Compliance (LARIC) project is intended to further integrate the Carson Operations with the adjacent Tesoro Wilmington Operations to form the Tesoro Los Angeles Refinery (Refinery). Toxic pollutant modeling was conducted to support the Environmental Impact Report required by the California Environmental Quality Act (CEQA) for this project. The purpose of the analysis was to determine if project toxic chemical emissions exceed significance thresholds.

Following release of the May 2017 Final Environmental Impact Report (FEIR), Tesoro proposes three modifications to project components of the FEIR. Specifically, Tesoro is proposing to: 1) relocate propane recovery from the Carson Operations Naphtha Isomerization Unit to the Carson Operations C3 Splitter Unit; 2) include increased throughput of the Carson Operations Tank 35, and, 3) update the toxic air contaminant (TAC) speciation for the crude oil storage tanks at the Carson Crude Terminal (CCT) with additional data. This HRA Addendum also incorporates modifications to the construction schedule and associated changes to the construction diesel particulate matter emissions. Additionally, this HRA Addendum evaluates these emissions using an updated meteorological dataset which was released after certification of the May 2017 FEIR.

This analysis demonstrates that health risk associated with the project is still expected to be less than significant. **Table 1** below summarizes the May 2017 FEIR health risks modeled with the original and updated meteorological datasets, as well as the proposed changes modeled with the updated meteorological dataset.

Table 1. Summary of Toxic Risk Increase

Receptor	Operations Only			Operations Plus Construction		
	FEIR sources (original, 06-11 met data)	FEIR sources (12-16 met data)	FEIR + CCT with updated ERs + T35 + C3 Splitter - NapIsom (12-16 met data)	FEIR sources + Construction (original, 06-11 met data)	FEIR sources + Construction (12-16 met data)	FEIR + CCT with updated ERs + T35 + C3 Splitter - NapIsom + Construction (12-16 met data)
Maximum cancer risk (per million)						
Residential receptor	3.7	2.8	2.9	5.7	4.7	4.7
Offsite workplace receptor	9.3	7.0	7.0	9.3	7.0	7.0
Sensitive receptor	2.1	2.4	2.4	4.2	4.1	4.1
Maximum chronic risk						
Residential receptor	0.030	0.021	0.024	0.033	0.023	0.025
Offsite workplace receptor	0.106	0.078	0.085	0.115	0.089	0.096
Sensitive receptor	0.025	0.019	0.019	0.027	0.019	0.019
Maximum 8-Hr chronic risk						
Residential receptor	0.006	0.005	0.005	0.006	0.005	0.005
Offsite workplace receptor	0.108	0.084	0.084	0.108	0.084	0.084
Sensitive receptor	0.005	0.006	0.006	0.005	0.006	0.006

Receptor	Operations Only			Operations Plus Construction		
	FEIR sources (original, 06-11 met data)	**FEIR sources (12-16 met data)**	**FEIR + CCT with updated ERs + T35 + C3 Splitter - NapIsom (12-16 met data)**	**FEIR sources + Construction (original, 06-11 met data)**	**FEIR sources + Construction (12-16 met data)**	**FEIR + CCT with updated ERs + T35 + C3 Splitter - NapIsom + Construction (12-16 met data)**
Maximum acute risk						
Residential receptor	0.052	0.039	0.040	0.052	0.039	0.040
Offsite workplace receptor	0.052	0.076	0.076	0.052	0.076	0.076
Sensitive receptor	0.010	0.009	0.009	0.010	0.009	0.009

The complete health risk assessment is presented below.

2.0 INTRODUCTION

This HRA Addendum is being conducted to support the FEIR Addendum for the proposed project as required by CEQA. The purpose of the analysis is to determine if project emissions result in an unacceptable level of cancer, chronic, or acute health risk. The approach used in this assessment is described later in this report and is based on written SCAQMD guidelines and discussions with SCAQMD staff.

This HRA Addendum demonstrates that the proposed project modifications do not change the original conclusion that project emissions will not cause a significant increase in health risk in the vicinity of the refinery.

Figure 1. Tesoro Los Angeles Refinery

3.0 BACKGROUND

3.1 HEALTH EFFECTS

A background discussion of cancer and non-cancer risk health effects is provided in Section 4.1 of Appendix B-4 of the May 2017 FEIR.

3.2 SIGNIFICANCE CRITERIA

Risks for the entire project that are less than the following regulatory thresholds are not considered to be significant and, therefore, acceptable:

- Cancer risk equal to or less than 10 in one million

- Chronic hazard index equal to or less than 1
- 8-hr chronic hazard index equal to or less than 1
- Acute hazard index equal to or less than 1
- Cancer burden equal to or less than 0.5

The cancer risk and hazard index metrics are generally applied to the maximally exposed individual (MEI). There are separate MEIs for residential exposure (i.e., residential areas) and for worker exposure (i.e., offsite work places).

4.0 RISK ASSESSMENT APPROACH

This health risk assessment was performed following the Office of Environmental Health Hazard Assessment (OEHHA), *Air Toxics Hot Spots Program Risk Assessment Guidelines*[2]. As recommended by this guideline, the California Air Resources Board (CARB) Hotspots Analysis and Reporting Program Version 2 (HARP2)[3] was used to perform a refined health risk assessment for the project's emission sources.

Consistent with SCAQMD modeling guidelines, the AMS/EPA Regulatory Model (AERMOD, v 18081) was used as the air dispersion model for this analysis. HARP2 includes AERMOD but also allows model runs to be performed with AERMOD outside of HARP2. For this project, AERMOD was run outside of HARP2, and the results were imported into HARP2 to complete the risk analysis. This HRA evaluates risk following SCAQMD guidelines[4]. Further discussion of AERMOD is provided in Section 4.2.1 of Appendix B-4 of the FEIR.

In general, risk assessment involves four steps:

1. Hazard identification
2. Exposure assessment
3. Dose-response assessment
4. Risk characterization

Hazard identification involves identifying the toxic pollutants and whether the pollutant is a carcinogen or is associated with other types of adverse health effects. Toxic emissions from project sources are then quantified. Exposure assessment includes air dispersion modeling, identification of exposure routes, and estimation of exposure levels (dose). Dose-response requires identifying the relationship between exposure to a pollutant and the incidence of an adverse health effect in exposed populations. Finally, risk characterization combines the hazard identification, exposure assessment, and dose-response assessment to estimate total cancer and non-cancer risk. The details of these four steps are provided in Sections 4.0 and 5.0 of Appendix B-4 of the May 2017 FEIR.

---

[2] California Office of Environmental Health Hazard Assessment (OEHHA) 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015.
[3] HARP2 (Hotspots Analysis and Reporting Program) Air Dispersion Modeling & Risk Tool, v 18159.
[4] South Coast Air Quality Management District, Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act, June 5, 2015.

4.1 EMISSION SOURCES

The only changes in toxic emission sources from the FEIR are the following:

- Addition of Tank 35 emissions increases due to the throughput increase
- Addition of fugitive emissions from piping changes at the C3 Splitter unit
- Removal of fugitive emissions from the Naphtha Isomerization unit
- Update to the toxic emissions from the Carson Crude Tank terminal to incorporate additional toxic concentration data.
- Updates to the construction schedule and associated diesel particulate matter (DPM) emissions (addressed in Section 6.0, below).

The TACs emitted by the project, and included in the analysis[5], are:

Chemical	CAS #	Chemical	CAS #
1,2,4-Trimethylbenzene*	95-63-6	Hexane	110-54-3
1,3-Butadiene	106-99-0	Hydrochloric acid	7647-01-0
2,2,4-Trimethylpentane*	540-84-1	Hydrogen cyanide	74-90-8
2-Methylnaphthalene*	91-57-6	Hydrogen sulfide	7783–06–4
3-Methylchloranthrene	56-49-5	Indeno(1,2,3-cd)pyrene	193-39-5
Acenaphthene*	83-32-9	Isoprene*	78-79-5
Acenaphthylene*	208-96-8	Lead	7439-92-1
Acetaldehyde	75-07-0	Manganese	7439-96-5
Acrolein	107-02-8	Mercury	7439-97-6
Ammonia	7664-41-7	Methanol	67-56-1
Anthracene*	120-12-7	Molybdenum Trioxide*	1313-27-5
Antimony*	7440-36-0	Naphthalene	91-20-3
Arsenic	7440-38-2	Nickel	7440-02-0
Barium*	7440-39-3	PAHs, total reported	1150
Benzene	71-43-2	Perylene*	198-55-0
Benzo(a)anthracene	56-55-3	Phenanthrene*	85-01-8
Benzo(a)pyrene	50-32-8	Phenol	108-95-2
Benzo(b)fluoranthene	205-99-2	Phosphorus*	7723-14-0
Benzo(g,h,i)perylene*	191-24-2	Propylene	115-07-1
Benzo(k)fluoranthene	207-08-9	Pyrene*	129-00-0
Benzo[e]pyrene*	192-97-2	Selenium	7782-49-2
Beryllium	7440-41-7	Silver*	7440-22-4
Cadmium	7440-43-9	Sulfuric Acid	7664-93-9
Biphenyl*	92-52-4	Thallium*	7440-28-0
Carbon Disulfide	75-15-0	Toluene	108-88-3
Carbonyl sulfide	463-58-1	Trimethylbenzene* (mixed isomers)	25551-13-7
Chromium*	7440-47-3	Vanadium	7440-62-2
Chromium (hexavalent)	18540-29-9	Xylenes (mixed)	1330-20-7

[5] TACs that were emitted but did not have any OEHHA/ARB approved cancer, chronic, or acute risk assessment health values are indicated with an asterisk (*).

Chemical	CAS #	Chemical	CAS #
Chrysene	218-01-9	Zinc*	7440-66-6
Copper	7440-50-8	Cyanide compounds	57-12-5
Cresols (mixtures of) {cresylic acid}	1319-77-3	Cyclohexane*	110-82-7
Cumene*	98-82-8	Dibenz(a,h)anthracene	53-70-3
Ethylene*	74-85-1	Dioxin and dioxin-like compounds	N150
Fluoranthene*	206-44-0	Ethylbenzene	100-41-4
Fluorene*	86-73-7	Diesel exhaust particulate matter	--
Formaldehyde	50-00-0		
Chlorine	7782-50-5		

Figure 2 shows the modeled source locations with the changes from the FEIR highlighted in pink.

Tank 35 was modeled as a circular area ("AREACIRC") source with the diameter equal to the diameter of the tank and the release height equal to the height of the tank. The source parameters are shown in **Table 2** below.

Table 2. Tank 35 Circular Area Source Parameters

Source Description	Model ID	Release Height Above Ground		Radius of Circle		UTM Coordinates[a] Easting/ Northing	
		(ft)	(m)	(ft)	(m)	(m)	(m)
Tank 35	TK35	41.0	12.5	67.5	20.6	384593.3	3742082.8

Emission rates were calculated using the EPA TANKS program. The modeled emission rates are shown in **Table 3** below.

Table 3. Tank 35 Modeled Emission Rates

Pollutant	CAS Number	Emission Rate Increase	
		(lb/yr)	(lb/hr)
1,2,4-Trimethylbenzene	95-63-6	12.42	1.42E-03
1,3-Butadiene	106-99-0	0.07	7.99E-06
2,2,4Trimethylpentane	540-84-1	60.94	6.96E-03
Benzene	71-43-2	11.95	1.36E-03
Cresols (Mixtures of)	1319-77-3	0.06	6.85E-06
Cumene	98-82-8	4.31	4.92E-04
Cyclohexane	110-82-7	13.49	1.54E-03
Ethyl Benzene	100-41-4	9.12	1.04E-03
n-Hexane	110-54-3	25.52	2.91E-03
Isoprene	78-79-5	0.48	5.48E-05

Pollutant	CAS Number	Emission Rate Increase	
		(lb/yr)	(lb/hr)
Methanol	67-56-1	0.01	1.14E-06
Naphthalene	91-20-3	12.28	1.40E-03
Ammonia	7664-41-7	0.02	2.28E-06
Phenanthrene	85-01-8	0.96	1.10E-04
Phenol	108-95-2	0.07	7.99E-06
Propylene (Propene)	115-07-1	0.03	3.42E-06
Toluene	108-88-3	66.55	7.60E-03
Xylenes (Mixed Isomers)	1330-20-7	49.59	5.66E-03

Fugitive emissions from the C3 Splitter unit were modeled in the same manner as other process unit piping component fugitive sources – as a volume source with a release height equal to 10 feet and lateral dimensions appropriate to the physical extents of the unit. The source parameters are shown in **Table 4** below.

Table 4. C3 Splitter Volume Source Parameters

Source Description	Model ID	Release Height Above Ground		Initial Horizontal Dimension (σ_{yo})		Initial Vertical Dimension (σ_{zo})		UTM Coordinates[a] Easting/ Northing	
		(ft)	(m)	(ft)	(m)	(ft)	(m)	(m)	(m)
C3 Splitter fugitives	C3SPLT_C	10.0	3.0	19.1	5.8	9.3	2.8	385399.3	3741799.5

[a] Center of volume source

Emissions rates were calculated based on the number of components, SCAQMD approved emission factors, and HAP concentration of the C3 Splitter material. The modeled emission rates are shown in **Table 5** below.

Table 5. C3 Splitter Modeled Emission Rates

Pollutant	CAS Number	Emission Rate[6]	
		(lb/yr)	(lb/hr)
1,3-Butadiene	106-99-0	3.01E-04	3.44E-08
Ethylene	74-85-1	0.25	2.85E-05
H_2S	7783-06-4	0.11	1.31E-05
Propylene (Propene)	115-07-1	0.27	3.06E-05
Carbonyl Sulfide	463-58-1	9.34E-03	1.07E-06
Arsine	7784-42-1	4.94E-04	5.64E-08

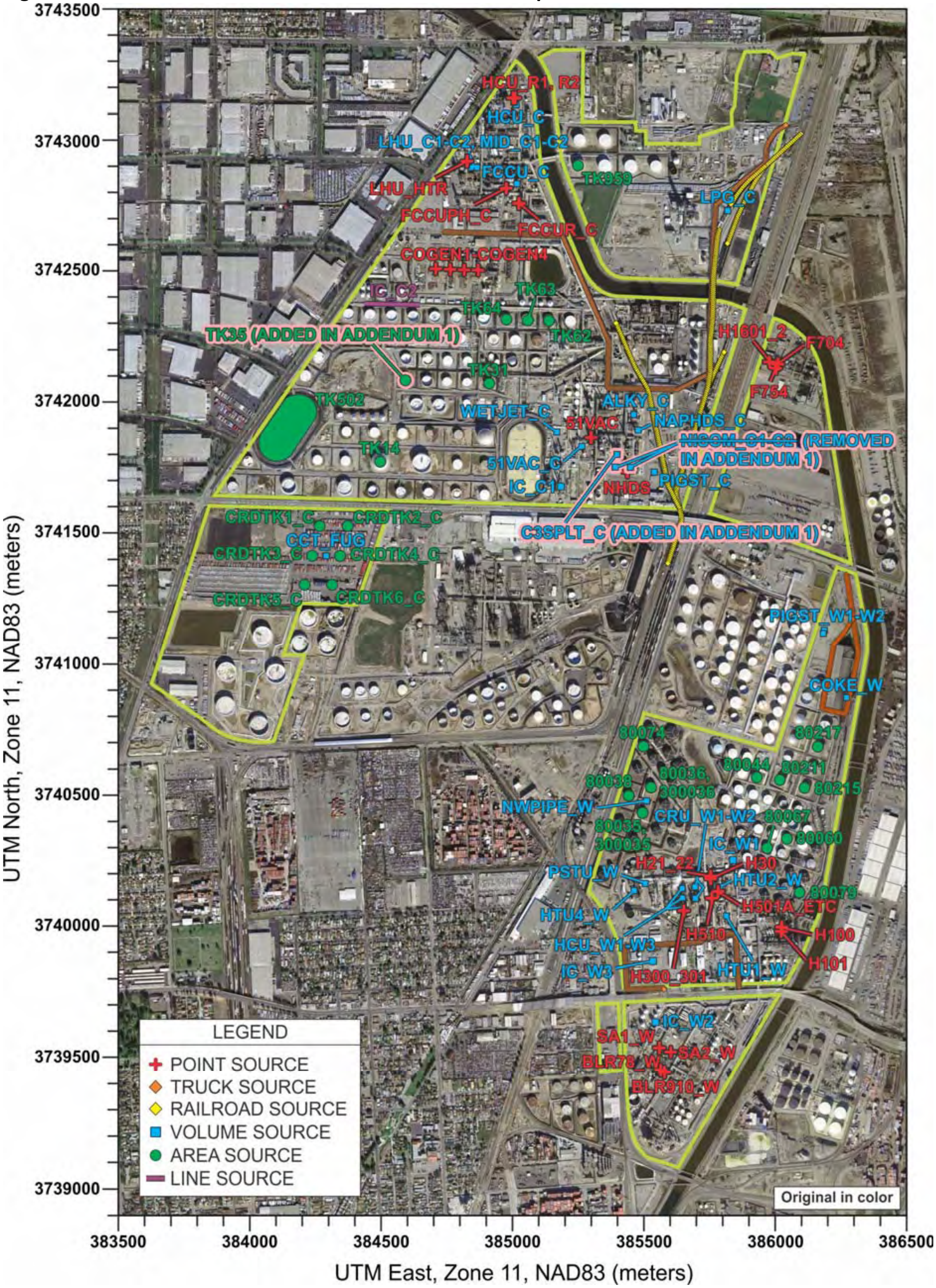
[6] The modeled emission rates are the emission *increases* associated with the project.

Maximum potential toxic emissions from the Carson Crude Terminal were updated for this analysis based on additional available data. The original and updated emission rates are shown in **Table 6** below. Other than the updated emissions, no other parameters were changed for the Carson Crude Terminal emission sources.

Table 6. CCT Modeled Emission Rates

Pollutant	CAS Number	FEIR Emission Rates				FEIR Addendum Emission Rates			
		CCT Fugitive Components		CCT Storage Tank (Each)		CCT Fugitive Components		CCT Storage Tank (Each)	
		(lb/yr)	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	(lb/hr)
Benzo[a]pyrene	50-32-8	1.2E-01	1.3E-05	3.0E-02	3.4E-06	1.2E-01	1.3E-05	3.0E-02	3.4E-06
Dibenz[a,h]anthracene	53-70-3	3.9E-02	4.4E-06	1.0E-02	1.1E-06	3.9E-02	4.4E-06	1.0E-02	1.1E-06
Benz[a]anthracene	56-55-3	2.9E-01	3.3E-05	6.0E-02	6.9E-06	2.9E-01	3.3E-05	8.0E-02	9.1E-06
Benzene	71-43-2	7.4E+01	8.5E-03	2.9E+01	3.3E-03	7.4E+01	8.5E-03	2.9E+01	3.3E-03
Naphthalene	91-20-3	8.6E+00	9.9E-04	2.4E+00	2.7E-04	8.6E+00	9.9E-04	2.4E+00	2.7E-04
Cumene	98-82-8	6.9E+00	7.8E-04	1.9E+00	2.2E-04	6.9E+00	7.8E-04	1.9E+00	2.2E-04
Ethyl benzene	100-41-4	4.3E+01	4.9E-03	1.2E+01	1.4E-03	4.7E+01	5.4E-03	1.3E+01	1.5E-03
Toluene	108-88-3	1.3E+02	1.5E-02	4.1E+01	4.6E-03	1.9E+02	2.1E-02	5.7E+01	6.5E-03
Hexane	110-54-3	2.5E+02	2.9E-02	1.1E+02	1.3E-02	3.0E+02	3.4E-02	1.4E+02	1.6E-02
Benzo[b]fluoranthene	205-99-2	6.3E-01	7.2E-05	1.4E-01	1.6E-05	6.3E-01	7.2E-05	1.7E-01	1.9E-05
Chrysene	218-01-9	5.8E-01	6.6E-05	1.3E-01	1.5E-05	5.8E-01	6.6E-05	1.6E-01	1.8E-05
Xylene	1330-20-7	1.9E+02	2.1E-02	5.2E+01	6.0E-03	2.5E+02	2.9E-02	7.1E+01	8.1E-03
Hydrogen sulfide	7783-06-4	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.1E-01	8.1E-05	1.2E+01	1.4E-03

Figure 2. Addendum 1 Modeled Sources Location Map



4.2 EXPOSURE ASSESSMENT

The exposure assessment includes air dispersion modeling, identification of exposure routes, and estimation of exposure levels. The methodology followed the same approach as described in Appendix B-4 of the May 2017 FEIR. Dispersion modeling for the May 2017 FEIR was performed using a meteorological dataset developed by SCAQMD that covered the years 2006, 2007, 2008, 2009, and 2011 for the Long Beach, CA monitoring station. The SCAQMD updated the available meteorological datasets in 2017. Modeling for this addendum was performed using the updated Long Beach dataset which covered the years 2012 through 2016. The original Long Beach station was located about 2.5 miles east-northeast of the facility and the new Long Beach station is located about 4.5 miles east of the facility at the Long Beach airport. Windroses for the two datasets are provided in Appendix A.

Two exposure assessments were performed. The first assessment was remodeling of the same sources and emissions rates that were used in the May 2017 FEIR but with the latest versions of AERMOD and HARP and using the 2012-2016 meteorological dataset. The second assessment considered the changes for this addendum: the Tank 35 emissions increase, the addition of fugitive piping component emissions from the C3 splitter unit, the removal of emissions from the Naphtha Isomerization unit fugitive piping component emissions, and the updated toxic emissions from the Carson Crude Terminal. The second assessment used the latest versions of AERMOD and HARP and the 2012-2016 meteorological dataset.

5.0 HEALTH RISK RESULTS - OPERATIONS

5.1 CANCER RISK

The predicted increase in cancer risk at maximally exposed offsite receptors is summarized by category in **Table 8**. The table shows the original May 2017 FEIR highest calculated cancer risks at residential, sensitive, and worker receptors as well as the values and locations for the highest cancer risks using the latest models and meteorological dataset for the May 2017 FEIR sources, and the source changes of this addendum.

5.1.1 FEIR Sources with 2012-2016 Meteorological Dataset

The highest cancer risk at a residential receptor is a cancer risk value of 2.8 in one million. The receptor is located just west of the western boundary of the refinery nearest to the proposed new crude tanks (same location as the FEIR) – see **Figure 3**. Contours showing the aerial distribution of calculated cancer risks for worst-case residential exposure are shown on **Figure 4**. The highest calculated cancer risk at a sensitive receptor was 2.4 in one million, at Bethune Mary School located about 500 meters east of the eastern boundary of the Wilmington Operations area (same location as the FEIR). **Table 9** provides a list of the highest sensitive receptors in terms of cancer risk.

The receptor with the highest calculated worker exposure cancer risk is located near the railroad tracks at the northeastern boundary of the refinery – see **Figure 3**. The receptor is in the immediate vicinity of the location where a locomotive engine enters and exits the facility boundary when moving LPG railcars (similar location as in the FEIR). The worst-case worker cancer risk at this receptor is 7.0 in one million. This receptor is located along the fenceline where long-term (multi-decade) 40 hour/week exposure is highly unlikely to occur. Contours showing the areal distribution of calculated cancer risks for worst-case worker exposure are shown on **Figure 5**.

5.1.2 FEIR Addendum Sources with 2012-2016 Meteorological Dataset

The highest cancer risks at a residential receptor, a worker receptor, and a sensitive receptor are slightly higher values than the FEIR sources with 2012-2016 meteorological dataset at the same locations described above (see **Figure 6**). The impacts from the changes associated with the addendum caused very small increases in cancer risk (<0.1 per million). Based on the number of decimal places reported, only the residential cancer risk was different (2.9 per million versus 2.8). Contours showing the areal distribution of calculated cancer risks for worst-case residential and worker exposure are shown on **Figure 7** and **Figure 8**.

Table 10 and **Table 12** provide the contributions of DPM and other toxics to the total cancer risks shown in **Table 1**. DPM is the primary source of cancer risk for the maximum offsite worker receptor, but only a small contributor to cancer risk for the maximum residential and sensitive receptors. **Table 11** and **Table 13** identify the contribution to total cancer risk by source.

5.2 CHRONIC AND ACUTE RISK

The predicted increase in chronic and acute health risks at maximally exposed offsite receptors are summarized by category in **Table 8**. The table shows the original May FEIR highest calculated chronic and acute risks at residential, sensitive, and worker receptors as well as the values and locations for the highest chronic and acute risks using the latest models and meteorological dataset for the May FEIR sources, as well as the source changes of this addendum.

5.2.1 FEIR Sources with 2012-2016 Meteorological Dataset

The maximum chronic hazard index (worker or residential) of 0.078 was predicted at a receptor just west of the Wilmington operations refinery interconnect system. The maximum 8-hr chronic hazard index (worker or residential) of 0.084 was predicted at the same receptor. The maximum acute hazard index value was predicted to be 0.076 at the same receptor. The maximum chronic HI and acute HI receptors are shown in **Figure 3**. All maximum residential and worker chronic and acute HI receptors were in close proximity to or along facility boundaries.

5.2.2 FEIR Addendum Sources with 2012-2016 Meteorological Dataset

The maximum chronic hazard index (worker or residential) of 0.085 was predicted at a receptor just west of the Wilmington operations refinery interconnect system (same as without the addendum source changes). The maximum 8-hr chronic hazard index (worker or residential) of 0.084 was predicted at the same receptor. The maximum acute hazard index value was predicted to be 0.076 at the same receptor. The maximum chronic HI and acute HI receptors are shown in **Figure 6**. All maximum residential and worker chronic and acute HI receptors were in close proximity to or along facility boundaries.

Table 14 and **Table 16** identify the contribution to total chronic and acute risk by pollutant. **Table 15** and **Table 17** identify the contribution to total chronic and acute risk by source.

5.3 CANCER BURDEN

Rule 1401 Risk Assessment Procedures[7] require that cancer burden (increase in cancer cases in the population) be calculated whenever the maximum individual cancer risk (MICR) exceeds one in a million. Since both the maximum residential receptor and maximum worker receptor exceeded one in a million, a calculation was performed to determine if cancer burden could exceed 0.5. Cancer burden was calculated for the FEIR addendum sources[8] using the 2012-2016 meteorological data. A conservative approach was used as a screening calculation. Using the default population density of 4,000 persons per square kilometer, the cumulative area (in square kilometers) of all residential areas within the one in a million isopleth line based on 70 year residential exposure, and the highest calculated cancer risk between the residential and worker receptors, cancer burden is estimated as shown in **Table 7** below:

Table 7. Cancer Burden Calculation

Parameter	May 2017 FEIR	FEIR Addendum
Residential area within 1 in million cancer risk isopleth line (km^2)	12.8	7.0
Population density (persons/km^2)	4,000	4,000
Cancer risk	9.3E-06	7.0E-06
Cancer burden (total cancer cases)	0.47	0.19

Since the cancer burden is less than 0.5, no further analysis is necessary.

[7] South Coast Air Quality Management District, Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.0, June 5, 2015.
[8] FEIR sources plus the addition of Tank 35 emissions, the addition of fugitive piping component emissions from the C3 splitter unit, the removal of emissions from the Naphtha Isomerization unit fugitive piping component emissions, and the updated toxic emissions from the Carson Crude Terminal

Table 8. Summary of Maximum Offsite Cancer and Non-Cancer Risks

Location[a]	Cancer Risk			Chronic Risk			8-Hr Chronic Risk			Acute Risk[c]		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)		Easting (m)	Northing (m)		Easting (m)	Northing (m)
FEIR, 2006-2011 meteorological data												
Residential receptor[b]	3.7	383700	3741400	0.030	385251	3739503	0.006	383700	3741400	0.052	385305	3742454
Offsite workplace receptor	9.3	386006	3742921	0.106	386153	3741128	0.108	386153	3741128	0.052	385305	3742454
Sensitive Receptor[b]	2.1	386721	3739987	0.025	387304	3739447	0.005	386721	3739987	0.010	386721	3739987
FEIR, 2012-2016 meteorological data												
Residential receptor[b]	2.8	383700	3741400	0.021	385251	3739503	0.005	383700	3741500	0.039	384329	3741584
Offsite workplace receptor	7.0	386019	3742969	0.078	386153	3741128	0.084	386153	3741128	0.076	386153	3741128
Sensitive Receptor[b]	2.4	386721	3739987	0.019	388750	3737361	0.006	386721	3739987	0.009	386721	3739987
FEIR Addendum, 2012-2016 meteorological data												
Residential receptor[b]	2.9	383700	3741400	0.024	385251	3739503	0.005	383700	3741500	0.040	384329	3741584
Offsite workplace receptor	7.0	386019	3742969	0.085	386153	3741128	0.084	386153	3741128	0.076	386153	3741128
Sensitive Receptor[b]	2.4	386721	3739987	0.019	388750	3737361	0.006	386721	3739987	0.009	386721	3739987

[a] Excluding onsite grid receptors

[b] Worst-case residential exposure

[c] Fenceline receptors were conservatively included as potential residential and worker receptors for determination of maximum acute risk.

Figure 3. Location of Maximum Calculated Health Risks, FEIR Sources with 2012-2016 Meteorological Data

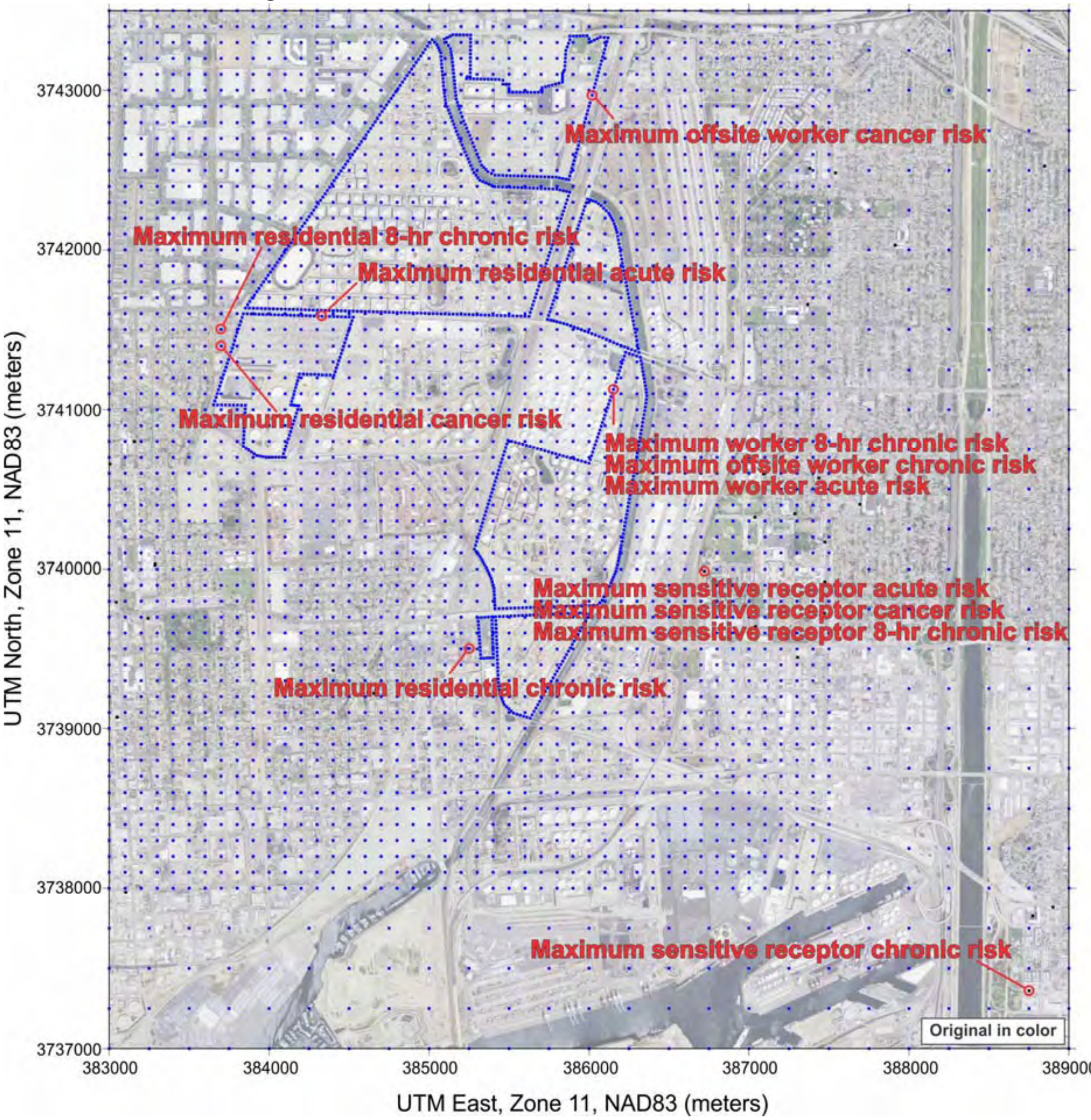


Figure 4. Contours of Residential Cancer Risk, per million exposed, FEIR Sources with 2012-2016 Meteorological Data

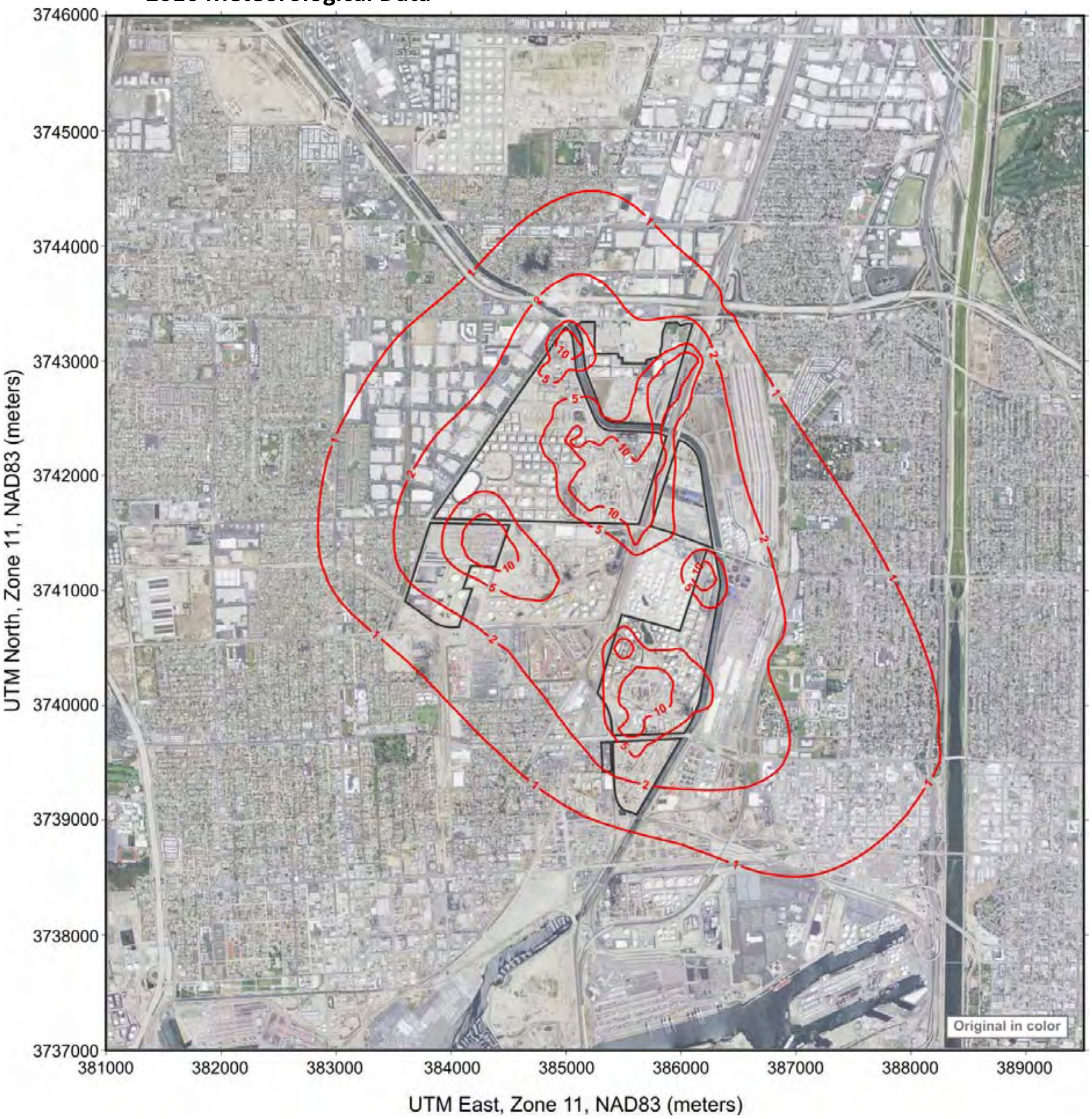


Figure 5. Contours of Worker Cancer Risk, per million exposed, FEIR Sources with 2012-2016 Meteorological Data

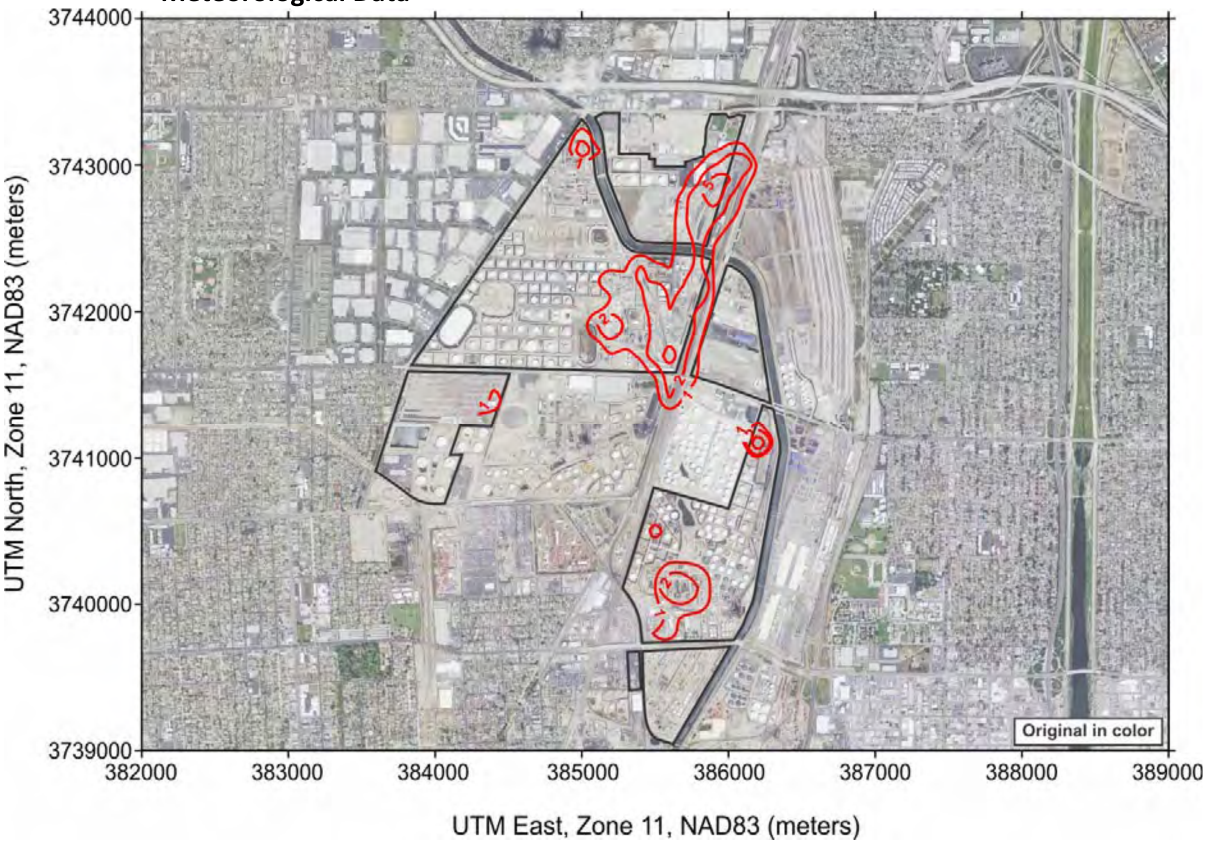


Figure 6. Location of Maximum Calculated Health Risks, FEIR Addendum Sources with 2012-2016 Meteorological Data

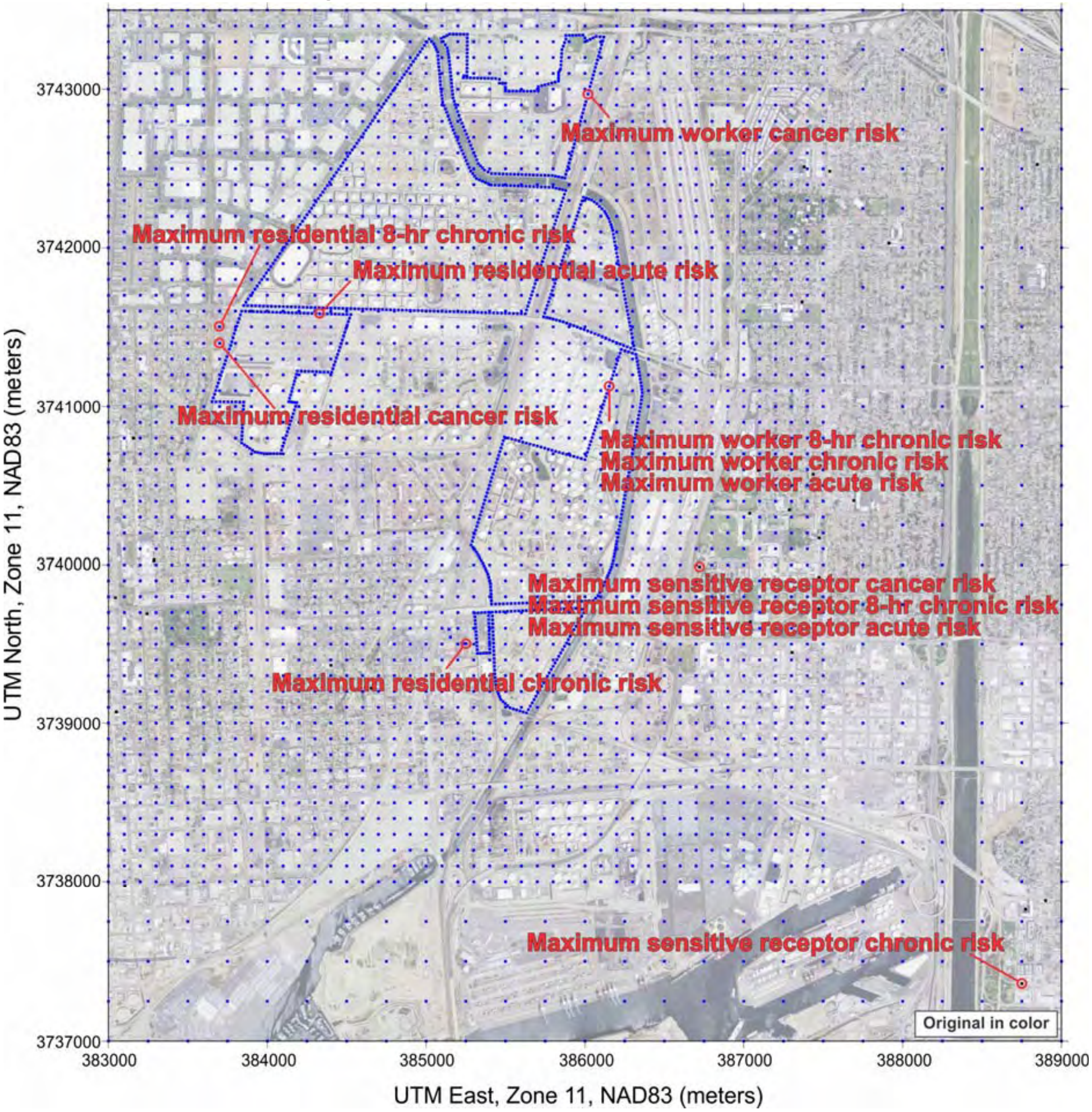


Figure 7. Contours of Residential Cancer Risk, per million exposed, FEIR Addendum Sources with 2012-2016 Meteorological Data

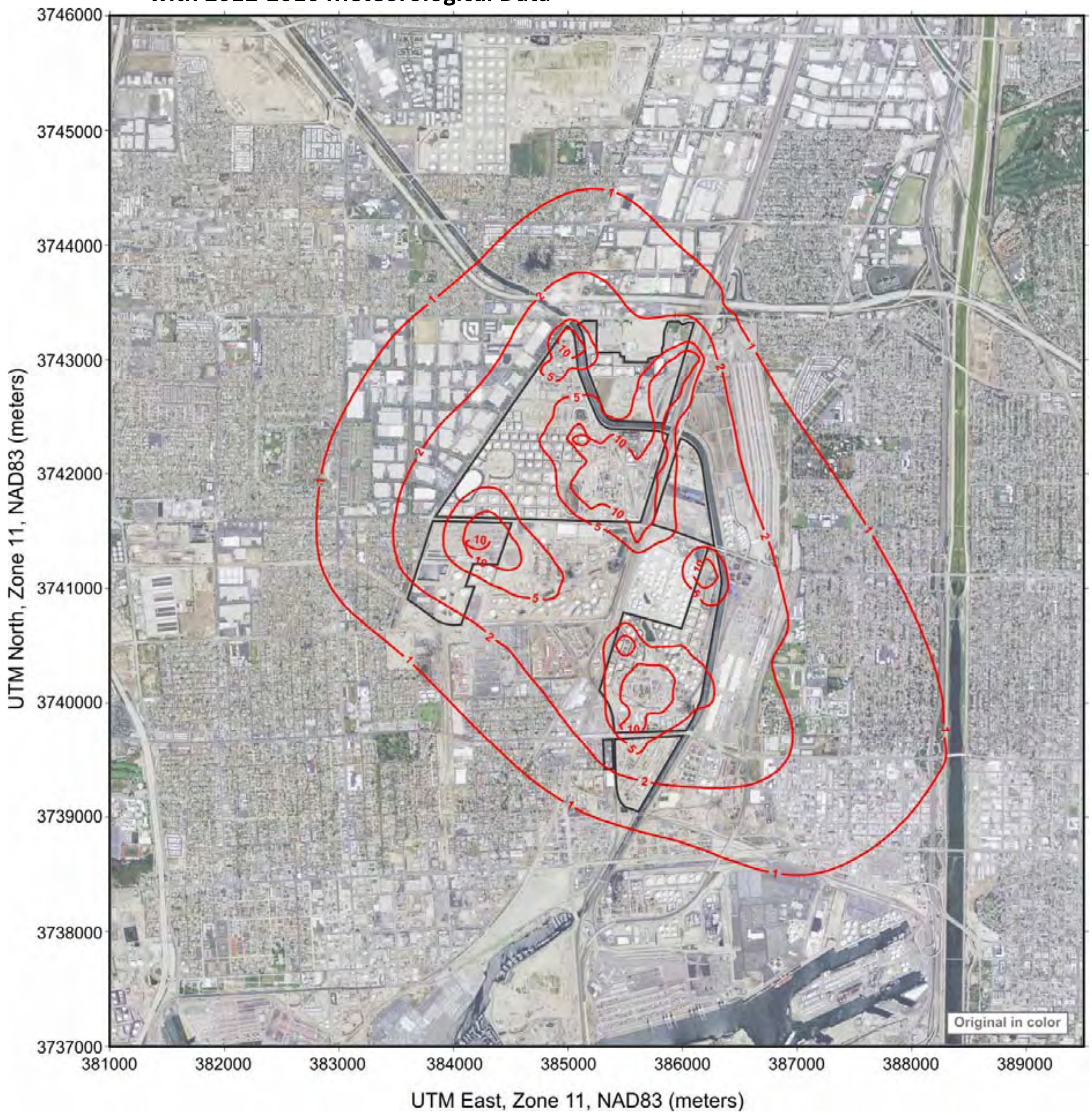


Figure 8. Contours of Worker Cancer Risk, per million exposed, FEIR Addendum Sources with 2012-2016 Meteorological Data

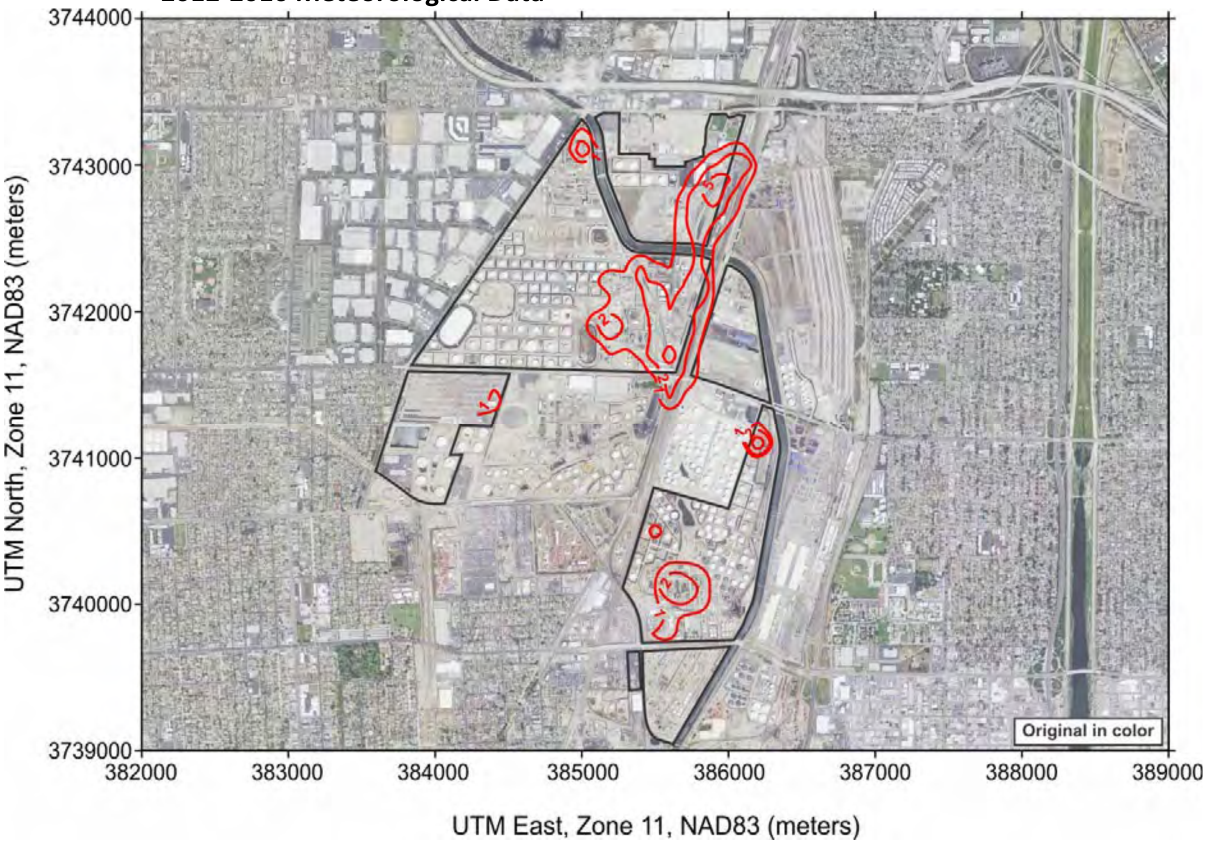


Table 9. Summary of Project Cancer Risks at the Most Exposed Sensitive Receptors

Sensitive Receptor Name	UTM Coordinates (NAD83)		Increased Cancer Cases (in-one-million)	
	Easting (m)	Northing (m)	FEIR sources, 12-16 met data	FEIR Addendum sources, 12-16 met data
Bethune Mary School	386721	3739987	2.37	2.41
Wyo Tech National Institute of Tech	387041	3739640	1.85	1.88
Elizabeth Hudson Elementary School	387091	3740595	1.74	1.76
Will J. Reid High School	387037	3740324	1.73	1.76
Long Beach Child Development	387287	3740345	1.53	1.56
Long Beach Japanese School	387304	3739447	1.51	1.54
St. Lucy's School	387437	3740571	1.40	1.42
West Child Development Center	387474	3740168	1.39	1.41
Long Beach Job Corp Dynamic Educational	387472	3739724	1.38	1.41
Cabrillo High School	387473	3739922	1.37	1.40
Garfield Head Start Elementary School	387692	3740405	1.24	1.26
William Logan Stephens Junior High	387367	3741657	1.12	1.12
Broad Avenue Elementary School	383158	3740800	1.01	1.04

Table 10. Cancer Risk by Pollutant at MEIR (FEIR Addendum Sources)

Pollutant	CAS Number	Total risk	Fraction
Benzene	71-43-2	9.1E-07	31.1%
Benzo[a]pyrene	50-32-8	7.4E-07	25.2%
Benzo[b]fluoranthene	205-99-2	4.1E-07	13.9%
Naphthalene	91-20-3	2.7E-07	9.3%
Benz[a]anthracene	56-55-3	1.9E-07	6.5%
Diesel exhaust particulate matter	9901	1.2E-07	4.0%
Dioxin and dioxin-like compounds	N150	1.1E-07	3.6%
Dibenz[a,h]anthracene	53-70-3	8.5E-08	2.9%
1,3-Butadiene	106-99-0	6.3E-08	2.1%
Arsenic	7440-38-2	5.2E-08	1.8%
Ethyl benzene	100-41-4	4.1E-08	1.4%
Chromium, hexavalent (& compounds)	18540-29-9	3.8E-08	1.3%
Chrysene	218-01-9	3.8E-08	1.3%
Formaldehyde	50-00-0	3.6E-09	0.1%
Nickel	7440-02-0	2.2E-09	0.1%
Acetaldehyde	75-07-0	1.0E-09	0.0%
Beryllium	7440-41-7	6.4E-10	0.0%
Lead	7439-92-1	4.1E-10	0.0%
Indeno[1,2,3-cd]pyrene	193-39-5	1.3E-10	0.0%
Benzo[k]fluoranthene	207-08-9	3.5E-11	0.0%
3-Methylcholanthrene	56-49-5	-6.1E-09	-0.2%
Cadmium	7440-43-9	-1.3E-07	-4.5%
Total		2.9E-06	100.0%

Table 11. Cancer Risk by Source at MEIR (FEIR Addendum Sources)

Source Description	Source ID	Total risk	Fraction
Carson New 500 MBBL Crude Tanks	CRDTK1_C to CRDTK6_C	1.3E-06	46.0%
Crude Tank Farm - Pipeline Component Fugitives	CCT_FUG	8.0E-07	27.7%
Locomotives	RRB_0001 to RRB_0098, RRG_0001 to RRG_0303	1.0E-07	3.5%
Carson FCCU Regenerator	FCCUR_C	9.8E-08	3.4%
Wilmington Hydrocracker Unit	HCU_W1 to HCU_W3	9.0E-08	3.1%
Carson Wet Jet Treater (New)	WETJET_C	8.1E-08	2.8%
Carson Tank 63	TK63	6.2E-08	2.1%
Carson Tank 62	TK62	6.2E-08	2.1%
Carson Side Pig Station - Piping Interconnect	PIGST_C	4.2E-08	1.4%
Wilmington Tank 300036 (replaces 80036)	300036	3.2E-08	1.1%
Wilmington Tank 300035 (replaces 80035)	300035	3.2E-08	1.1%
Carson HCU	HCU_C	3.1E-08	1.1%
Wilmington Interconnect Piping - PSTU	IC_W3	2.9E-08	1.0%
Wilmington Side Pig Station - Piping Interconnect	PIGST_W1 to PIGST_W2	2.3E-08	0.8%
Wilmington HTU3 Unit H-21/H-22 Heaters Stack	H21_22	2.2E-08	0.8%
Wilmington Tank 80060	80060	1.7E-08	0.6%
Onsite Trucks	CAR_0001 to CAR_0417, WLM_0001 to WLM_0154, COK_0001 to COK_0165	1.6E-08	0.5%
Wilmington Boilers 7 & 8 Stack	BLR78_W	1.4E-08	0.5%
Wilmington - Sulfuric Acid Regen Plant Stk 2 - Decomp Furnace	SA2_W	1.2E-08	0.4%
Wilmington - Sulfuric Acid Regen Plant Stk 1 - Process Air & Converter Htr	SA1_W	1.1E-08	0.4%
Wilmington Tank 80067	80067	1.1E-08	0.4%
Carson Naphtha HDS Heater Stack (D1433)	NHDS	1.1E-08	0.4%
Carson LPG Rail Car Loading/Unloading	LPG_C	1.0E-08	0.4%
Wilmington Tank 80079	80079	9.4E-09	0.3%
Carson 51 Vacuum Unit Heater Stack (D63)	51VAC	9.2E-09	0.3%
Wilmington - New Piping for Tanks 300035-300036	NWPIPE_W	9.1E-09	0.3%
Wilmington Interconnect Piping - OSBL	IC_W1 to IC_W2	7.8E-09	0.3%
Wilmington HTU3 Unit H-30 Heater Stack	H30	6.5E-09	0.2%
Wilmington Hydrotreater Unit No. 2	HTU2_W	5.7E-09	0.2%
Wilmington Boilers 9 & 10 Stack	BLR910_W	4.8E-09	0.2%
Wilmington H100 Heater Stack	H100	4.6E-09	0.2%
Carson Hydrocracker R1 Heater Stack (D625)	HCU_R1	4.4E-09	0.2%

Source Description	Source ID	Total risk	Fraction
Carson Interconnect Piping - OSBL	IC_C1 to IC_C2	4.3E-09	0.1%
Carson Hydrocracker R2 Heater Stack (D627)	HCU_R2	4.1E-09	0.1%
Carson Mid Barrel Distillate Treater	MID_C1 to MID_C2	3.8E-09	0.1%
Wilmington Hydrotreater Unit No. 1	HTU1_W	2.9E-09	0.1%
Carson Cogeneration Unit 4 Turbine and Duct Burner Stack (D1239/D1240)	COGEN4	2.4E-09	0.1%
Carson Cogeneration Unit 1 Turbine and Duct Burner Stack (D1226/D1227)	COGEN1	2.3E-09	0.1%
Carson Cogeneration Unit 2 Turbine and Duct Burner Stack (D1233/D1234)	COGEN2	2.3E-09	0.1%
Carson Cogeneration Unit 3 Turbine and Duct Burner Stack (D1236/D1237)	COGEN3	2.3E-09	0.1%
Carson Naphtha HDS	NAPHDS_C	2.3E-09	0.1%
Wilmington Coker Heater H101	H101	1.7E-09	0.1%
Carson Tank 31	TK31	1.7E-09	0.1%
Carson No. 51 Vacuum Unit	51VAC_C	1.5E-09	0.1%
Wilmington Tank 80044	80044	1.5E-09	0.1%
Wilmington CRU2 Unit H-510 Heater Stack	H510	1.1E-09	0.0%
Carson Light Hydro Unit	LHU_C1 to LHU_C2	9.9E-10	0.0%
Wilmington Tank 80217	80217	8.2E-10	0.0%
Wilmington Coke Handling Emissions	COKE_W	6.3E-10	0.0%
Wilmington Hydrotreater Unit No. 4	HTU4_W	5.6E-10	0.0%
Carson Alkylation Unit	ALKY_C	5.2E-10	0.0%
Wilmington CRU2 Unit H-501A/B 502 503 504 Heaters Stack	H501A_ET	3.8E-10	0.0%
Wilmington CRU	CRU_W1 to CRU_W2	3.4E-10	0.0%
Carson FCCU	FCCU_C	3.1E-10	0.0%
Wilmington Sulfur Plant Combined H-1601/1602 Stack	H1601_2	1.2E-10	0.0%
Wilmington Tank 80074	80074	1.2E-10	0.0%
Wilmington Tank 80211	80211	1.1E-10	0.0%
Carson Light Hydrotreating Unit Heater (D425)	LHU_HTR	1.0E-10	0.0%
Carson FCCU Pre-Heater	FCCUPH_C	5.7E-11	0.0%
Wilmington Propane Sales Treating Unit	PSTU_W	8.5E-12	0.0%
Carson Tank 64	TK64	7.7E-12	0.0%
Wilmington Sulfur Plant Incinerator Stack 2	F754	4.0E-12	0.0%
Wilmington Sulfur Plant Incinerator Stack 1	F704	3.3E-12	0.0%
C3 Splitter Fugitives	C3SPLT_C	5.7E-13	0.0%
Carson Tank 14	TK14	0.0E+00	0.0%
Carson Tank 35	TK35	0.0E+00	0.0%
Carson Tank 502	TK502	0.0E+00	0.0%
Carson Tank 959	TK959	0.0E+00	0.0%

Source Description	Source ID	Total risk	Fraction
Wilmington Tank 80035	80035	-2.3E-12	0.0%
Wilmington Tank 80036	80036	-4.7E-12	0.0%
Wilmington Tank 80215	80215	-7.0E-11	0.0%
Wilmington Tank 80038	80038	-1.2E-10	0.0%
Wilmington HCU H-300 and H-301 Heaters Stack	H300_301	-1.5E-07	-5.0%
Total		2.9E-06	100.0%

Table 12. Cancer Risk by Pollutant at MEIW (FEIR Addendum Sources)

Pollutant	CAS Number	Total risk	Fraction
Diesel exhaust particulate matter	9901	6.9E-06	98.7%
1,3-Butadiene	106-99-0	4.1E-08	0.6%
Naphthalene	91-20-3	2.7E-08	0.4%
Benzene	71-43-2	2.2E-08	0.3%
Dioxin and dioxin-like compounds	N150	4.8E-09	0.1%
Chromium, hexavalent (& compounds)	18540-29-9	2.8E-09	0.0%
Arsenic	7440-38-2	2.2E-09	0.0%
Benzo[a]pyrene	50-32-8	1.5E-09	0.0%
Ethyl benzene	100-41-4	1.2E-09	0.0%
Benzo[b]fluoranthene	205-99-2	8.1E-10	0.0%
Benz[a]anthracene	56-55-3	3.7E-10	0.0%
Formaldehyde	50-00-0	2.8E-10	0.0%
Nickel	7440-02-0	1.9E-10	0.0%
Dibenz[a,h]anthracene	53-70-3	1.4E-10	0.0%
Acetaldehyde	75-07-0	9.5E-11	0.0%
Chrysene	218-01-9	7.5E-11	0.0%
Beryllium	7440-41-7	7.0E-11	0.0%
Lead	7439-92-1	2.1E-11	0.0%
Indeno[1,2,3-cd]pyrene	193-39-5	4.5E-12	0.0%
Benzo[k]fluoranthene	207-08-9	9.8E-13	0.0%
3-Methylcholanthrene	56-49-5	-2.1E-10	0.0%
Cadmium	7440-43-9	-1.5E-08	-0.2%
Total		7.0E-06	100.0%

Table 13. Cancer Risk by Source at MEIW (FEIR Addendum Sources)

Source Description	Source ID	Total risk	Fraction
Locomotives	RRB_0001 to RRB_0098, RRG_0001 to RRG_0303	6.8E-06	97.8%
Onsite Trucks	CAR_0001 to CAR_0417, WLM_0001 to WLM_0154, COK_0001 to COK_0165	6.2E-08	0.9%
Carson LPG Rail Car Loading/Unloading	LPG_C	3.4E-08	0.5%
Carson HCU	HCU_C	1.3E-08	0.2%
Carson Wet Jet Treater (New)	WETJET_C	8.4E-09	0.1%
Carson Side Pig Station - Piping Interconnect	PIGST_C	7.1E-09	0.1%
Wilmington Hydrocracker Unit	HCU_W1 to HCU_W3	5.6E-09	0.1%
Carson FCCU Regenerator	FCCUR_C	4.6E-09	0.1%
Carson Tank 62	TK62	3.9E-09	0.1%
Wilmington Side Pig Station - Piping Interconnect	PIGST_W1 to PIGST_W2	3.8E-09	0.1%
Carson Tank 63	TK63	3.4E-09	0.0%
Crude Tank Farm - Pipeline Component Fugitives	CCT_FUG	3.3E-09	0.0%
Carson New 500 MBBL Crude Tanks	CRDTK1_C to CRDTK6_C	2.0E-09	0.0%
Wilmington Interconnect Piping - PSTU	IC_W3	1.7E-09	0.0%
Carson 51 Vacuum Unit Heater Stack (D63)	51VAC	1.1E-09	0.0%
Wilmington Tank 300036 (replaces 80036)	300036	9.3E-10	0.0%
Wilmington HTU3 Unit H-21/H-22 Heaters Stack	H21_22	8.7E-10	0.0%
Wilmington Tank 300035 (replaces 80035)	300035	8.6E-10	0.0%
Carson Mid Barrel Distillate Treater	MID_C1 to MID_C2	8.4E-10	0.0%
Wilmington Tank 80060	80060	8.0E-10	0.0%
Carson Hydrocracker R2 Heater Stack (D627)	HCU_R2	5.9E-10	0.0%
Wilmington Boilers 7 & 8 Stack	BLR78_W	5.7E-10	0.0%
Wilmington - Sulfuric Acid Regen Plant Stk 2 - Decomp Furnace	SA2_W	5.6E-10	0.0%
Carson Hydrocracker R1 Heater Stack (D625)	HCU_R1	5.4E-10	0.0%
Wilmington Interconnect Piping - OSBL	IC_W1 to IC_W2	5.2E-10	0.0%
Wilmington Tank 80067	80067	5.2E-10	0.0%
Carson Naphtha HDS Heater Stack (D1433)	NHDS	5.1E-10	0.0%
Wilmington - Sulfuric Acid Regen Plant Stk 1 - Process Air & Converter Htr	SA1_W	4.4E-10	0.0%
Carson Naphtha HDS	NAPHDS_C	4.3E-10	0.0%
Wilmington Hydrotreater Unit No. 2	HTU2_W	4.0E-10	0.0%
Wilmington H100 Heater Stack	H100	3.9E-10	0.0%
Wilmington Tank 80079	80079	3.6E-10	0.0%
Wilmington HTU3 Unit H-30 Heater Stack	H30	3.2E-10	0.0%

Source Description	Source ID	Total risk	Fraction
Wilmington - New Piping for Tanks 300035-300036	NWPIPE_W	3.0E-10	0.0%
Wilmington Boilers 9 & 10 Stack	BLR910_W	2.9E-10	0.0%
Carson Interconnect Piping - OSBL	IC_C1 to IC_C2	2.7E-10	0.0%
Carson Light Hydro Unit	LHU_C1 to LHU_C2	2.1E-10	0.0%
Wilmington Hydrotreater Unit No. 1	HTU1_W	2.0E-10	0.0%
Carson No. 51 Vacuum Unit	51VAC_C	1.7E-10	0.0%
Wilmington Coker Heater H101	H101	1.5E-10	0.0%
Wilmington Tank 80044	80044	1.1E-10	0.0%
Carson Alkylation Unit	ALKY_C	1.0E-10	0.0%
Carson FCCU	FCCU_C	8.8E-11	0.0%
Wilmington Tank 80217	80217	7.9E-11	0.0%
Carson Cogeneration Unit 4 Turbine and Duct Burner Stack (D1239/D1240)	COGEN4	7.8E-11	0.0%
Carson Cogeneration Unit 3 Turbine and Duct Burner Stack (D1236/D1237)	COGEN3	7.5E-11	0.0%
Carson Cogeneration Unit 2 Turbine and Duct Burner Stack (D1233/D1234)	COGEN2	7.4E-11	0.0%
Carson Cogeneration Unit 1 Turbine and Duct Burner Stack (D1226/D1227)	COGEN1	7.2E-11	0.0%
Wilmington Coke Handling Emissions	COKE_W	6.5E-11	0.0%
Carson Tank 31	TK31	4.5E-11	0.0%
Wilmington CRU2 Unit H-510 Heater Stack	H510	4.5E-11	0.0%
Wilmington Sulfur Plant Combined H-1601/1602 Stack	H1601_2	3.5E-11	0.0%
Wilmington Hydrotreater Unit No. 4	HTU4_W	3.1E-11	0.0%
Wilmington CRU	CRU_W1 to CRU_W2	2.2E-11	0.0%
Wilmington CRU2 Unit H-501A/B 502 503 504 Heaters Stack	H501A_ET	1.9E-11	0.0%
Wilmington Tank 80211	80211	8.5E-12	0.0%
Carson Light Hydrotreating Unit Heater (D425)	LHU_HTR	8.4E-12	0.0%
Wilmington Tank 80074	80074	5.1E-12	0.0%
Carson FCCU Pre-Heater	FCCUPH_C	5.0E-12	0.0%
Wilmington Sulfur Plant Incinerator Stack 2	F754	2.1E-12	0.0%
Wilmington Sulfur Plant Incinerator Stack 1	F704	1.8E-12	0.0%
Wilmington Propane Sales Treating Unit	PSTU_W	4.8E-13	0.0%
Carson Tank 64	TK64	3.8E-13	0.0%
C3 Splitter Fugitives	C3SPLT_C	8.1E-14	0.0%
Carson Tank 14	TK14	0.0E+00	0.0%
Carson Tank 35	TK35	0.0E+00	0.0%
Carson Tank 502	TK502	0.0E+00	0.0%
Carson Tank 959	TK959	0.0E+00	0.0%

Source Description	Source ID	Total risk	Fraction
Wilmington Tank 80035	80035	-9.7E-14	0.0%
Wilmington Tank 80036	80036	-2.1E-13	0.0%
Wilmington Tank 80038	80038	-4.8E-12	0.0%
Wilmington Tank 80215	80215	-6.0E-12	0.0%
Wilmington HCU H-300 and H-301 Heaters Stack	H300_301	-1.6E-08	-0.2%
Total		7.0E-06	100.0%

Table 14. Chronic Risk by Pollutant at Maximum Exposed Individual (FEIR Addendum Sources)[9]

Pollutant	CAS Number	Total risk	Fraction
Benzene	71-43-2	8.3E-02	97.5%
Nickel	7440-02-0	1.4E-03	1.7%
Dioxin and dioxin-like compounds	N150	6.4E-04	0.8%
Diesel exhaust particulate matter	9901	2.0E-05	0.0%
Chromium, hexavalent (& compounds)	18540-29-9	2.6E-06	0.0%
Total		8.5E-02	100.0%

[9] To calculate maximum chronic risk, HARP2 determines risk from all chemicals for all pathways, and the pathway with the highest total is considered the maximum. If a chemical contributes risk to one or more pathways but does affect the pathway with the highest risk, that chemical is not shown in this table. For this project, the pathway with the highest chronic risk at the MEI was the hematologic system (blood).

Table 15. Chronic Risk by Source at Maximum Exposed Individual (FEIR Addendum Sources)

Source Description	Source ID	Total risk	Fraction
Wilmington Side Pig Station - Piping Interconnect	PIGST_W1 to PIGST_W2	7.8E-02	91.5%
Carson Tank 62	TK62	1.2E-03	1.4%
Carson Tank 63	TK63	1.2E-03	1.4%
Wilmington Coke Handling Emissions	COKE_W	9.7E-04	1.1%
Carson FCCU Regenerator	FCCUR_C	5.8E-04	0.7%
Carson Side Pig Station - Piping Interconnect	PIGST_C	5.8E-04	0.7%
Wilmington Hydrocracker Unit	HCU_W1 to HCU_W3	4.6E-04	0.5%
Carson New 500 MBBL Crude Tanks	CRDTK1_C to CRDTK6_C	3.3E-04	0.4%
Wilmington Tank 80060	80060	2.1E-04	0.2%
Crude Tank Farm - Pipeline Component Fugitives	CCT_FUG	1.7E-04	0.2%
Wilmington HTU3 Unit H-21/H-22 Heaters Stack	H21_22	1.6E-04	0.2%
Wilmington Tank 80067	80067	1.3E-04	0.2%
Wilmington Interconnect Piping - PSTU	IC_W3	1.3E-04	0.1%
Wilmington Hydrotreater Unit No. 2	HTU2_W	1.2E-04	0.1%
Wilmington Tank 300036 (replaces 80036)	300036	7.7E-05	0.1%
Wilmington Tank 300035 (replaces 80035)	300035	7.0E-05	0.1%
Wilmington Boilers 7 & 8 Stack	BLR78_W	7.0E-05	0.1%
Wilmington Tank 80079	80079	6.0E-05	0.1%
Wilmington Tank 80217	80217	5.7E-05	0.1%
Wilmington HTU3 Unit H-30 Heater Stack	H30	5.5E-05	0.1%
Wilmington Interconnect Piping - OSBL	IC_W1 to IC_W2	5.4E-05	0.1%
Carson Naphtha HDS	NAPHDS_C	5.2E-05	0.1%
Wilmington Coker Heater H101	H101	4.7E-05	0.1%
Wilmington Tank 80044	80044	4.2E-05	0.0%
Wilmington - New Piping for Tanks 300035-300036	NWPIPE_W	4.0E-05	0.0%
Locomotives	RRB_0001 to RRB_0098, RRG_0001 to RRG_0303	3.9E-05	0.0%
Wilmington Boilers 9 & 10 Stack	BLR910_W	3.8E-05	0.0%
Wilmington H100 Heater Stack	H100	3.5E-05	0.0%
Carson Interconnect Piping - OSBL	IC_C1 to IC_C2	3.0E-05	0.0%
Carson Naphtha HDS Heater Stack (D1433)	NHDS	2.8E-05	0.0%
Carson Mid Barrel Distillate Treater	MID_C1 to MID_C2	2.3E-05	0.0%
Carson Tank 31	TK31	2.2E-05	0.0%
Carson Cogeneration Unit 1 Turbine and Duct Burner Stack (D1226/D1227)	COGEN1	1.6E-05	0.0%
Carson Cogeneration Unit 2 Turbine and Duct Burner Stack (D1233/D1234)	COGEN2	1.6E-05	0.0%
Carson Cogeneration Unit 3 Turbine and Duct	COGEN3	1.5E-05	0.0%

Source Description	Source ID	Total risk	Fraction
Burner Stack (D1236/D1237)			
Carson Cogeneration Unit 4 Turbine and Duct Burner Stack (D1239/D1240)	COGEN4	1.5E-05	0.0%
Carson 51 Vacuum Unit Heater Stack (D63)	51VAC	1.4E-05	0.0%
Wilmington HCU H-300 and H-301 Heaters Stack	H300_301	1.3E-05	0.0%
Wilmington - Sulfuric Acid Regen Plant Stk 2 - Decomp Furnace	SA2_W	8.9E-06	0.0%
Wilmington CRU2 Unit H-510 Heater Stack	H510	8.1E-06	0.0%
Wilmington - Sulfuric Acid Regen Plant Stk 1 - Process Air & Converter Htr	SA1_W	7.3E-06	0.0%
Onsite Trucks	CAR_0001 to CAR_0417, WLM_0001 to WLM_0154, COK_0001 to COK_0165	6.5E-06	0.0%
Carson Hydrocracker R1 Heater Stack (D625)	HCU_R1	6.3E-06	0.0%
Carson Hydrocracker R2 Heater Stack (D627)	HCU_R2	6.0E-06	0.0%
Carson Light Hydro Unit	LHU_C1 to LHU_C2	6.0E-06	0.0%
Wilmington CRU2 Unit H-501A/B 502 503 504 Heaters Stack	H501A_ET	2.1E-06	0.0%
Carson LPG Rail Car Loading/Unloading	LPG_C	1.1E-06	0.0%
Wilmington Sulfur Plant Combined H-1601/1602 Stack	H1601_2	5.4E-07	0.0%
Wilmington Tank 80211	80211	4.9E-07	0.0%
Carson No. 51 Vacuum Unit	51VAC_C	3.3E-07	0.0%
Carson Alkylation Unit	ALKY_C	1.0E-07	0.0%
Wilmington Hydrotreater Unit No. 4	HTU4_W	7.7E-08	0.0%
Carson Light Hydrotreating Unit Heater (D425)	LHU_HTR	4.4E-08	0.0%
Carson FCCU	FCCU_C	2.3E-08	0.0%
Carson FCCU Pre-Heater	FCCUPH_C	1.6E-08	0.0%
Wilmington Sulfur Plant Incinerator Stack 2	F754	4.2E-09	0.0%
Wilmington Sulfur Plant Incinerator Stack 1	F704	3.5E-09	0.0%
Wilmington Tank 80035	80035	0.0E+00	0.0%
Wilmington Tank 80036	80036	0.0E+00	0.0%
Wilmington Tank 80038	80038	0.0E+00	0.0%
Wilmington Tank 80074	80074	0.0E+00	0.0%
C3 Splitter Fugitives	C3SPLT_C	0.0E+00	0.0%
Wilmington CRU	CRU_W1 to CRU_W2	0.0E+00	0.0%
Carson HCU	HCU_C	0.0E+00	0.0%
Wilmington Hydrotreater Unit No. 1	HTU1_W	0.0E+00	0.0%
Wilmington Propane Sales Treating Unit	PSTU_W	0.0E+00	0.0%
Carson Tank 14	TK14	0.0E+00	0.0%
Carson Tank 35	TK35	0.0E+00	0.0%

Source Description	Source ID	Total risk	Fraction
Carson Tank 502	TK502	0.0E+00	0.0%
Carson Tank 64	TK64	0.0E+00	0.0%
Carson Tank 959	TK959	0.0E+00	0.0%
Carson Wet Jet Treater (New)	WETJET_C	0.0E+00	0.0%
Wilmington Tank 80215	80215	-5.0E-06	0.0%
Total		8.5E-02	100.0%

Table 16. Acute Risk by Pollutant at Maximum Exposed Individual (FEIR Addendum Sources)[10]

Pollutant	CAS Number	Total risk	Fraction
Benzene	71-43-2	7.5E-02	98.1%
Nickel	7440-02-0	1.5E-03	1.9%
Total		7.6E-02	100.0%

[10] To calculate maximum acute risk, HARP2 determines risk from all chemicals for all pathways, and the pathway with the highest total is considered the maximum. If a chemical contributes risk to one or more pathways but does affect the pathway with the highest risk, that chemical is not shown in this table. For this project, the pathway with the highest acute risk at the MEI was the immune system.

Table 17. Acute Risk by Source at Maximum Exposed Individual (FEIR Addendum Sources)

Source Description	Source ID	Total risk	Fraction
Wilmington Side Pig Station - Piping Interconnect	PIGST_W1 to PIGST_W2	6.3E-02	83.0%
Carson Tank 62	TK62	1.7E-03	2.2%
Carson Tank 63	TK63	1.5E-03	2.0%
Carson New 500 MBBL Crude Tanks	CRDTK1_C to CRDTK6_C	1.2E-03	1.6%
Wilmington Tank 80044	80044	1.2E-03	1.6%
Wilmington Tank 300036 (replaces 80036)	300036	7.7E-04	1.0%
Wilmington Coke Handling Emissions	COKE_W	6.8E-04	0.9%
Wilmington Tank 300035 (replaces 80035)	300035	6.7E-04	0.9%
Wilmington Tank 80060	80060	6.5E-04	0.9%
Wilmington Hydrocracker Unit	HCU_W1 to HCU_W3	6.4E-04	0.8%
Carson Side Pig Station - Piping Interconnect	PIGST_C	5.7E-04	0.7%
Wilmington Tank 80067	80067	4.4E-04	0.6%
Wilmington Tank 80079	80079	3.6E-04	0.5%
Crude Tank Farm - Pipeline Component Fugitives	CCT_FUG	3.4E-04	0.5%
Wilmington HTU3 Unit H-21/H-22 Heaters Stack	H21_22	3.2E-04	0.4%
Wilmington Tank 80215	80215	2.9E-04	0.4%
Wilmington Interconnect Piping - PSTU	IC_W3	2.6E-04	0.3%
Wilmington H100 Heater Stack	H100	1.6E-04	0.2%
Wilmington Hydrotreater Unit No. 2	HTU2_W	1.5E-04	0.2%
Wilmington Tank 80217	80217	1.4E-04	0.2%
Wilmington Boilers 7 & 8 Stack	BLR78_W	1.2E-04	0.2%
Wilmington Interconnect Piping - OSBL	IC_W1 to IC_W2	9.8E-05	0.1%
Carson Tank 31	TK31	8.6E-05	0.1%
Wilmington - New Piping for Tanks 300035-300036	NWPIPE_W	8.1E-05	0.1%
Carson 51 Vacuum Unit Heater Stack (D63)	51VAC	7.8E-05	0.1%
Wilmington HTU3 Unit H-30 Heater Stack	H30	7.3E-05	0.1%
Wilmington Boilers 9 & 10 Stack	BLR910_W	5.7E-05	0.1%
Carson Naphtha HDS	NAPHDS_C	4.5E-05	0.1%
Wilmington Tank 80211	80211	3.9E-05	0.1%
Carson Interconnect Piping - OSBL	IC_C1 to IC_C2	3.4E-05	0.0%
Wilmington Coker Heater H101	H101	3.4E-05	0.0%
Carson Mid Barrel Distillate Treater	MID_C1 to MID_C2	2.8E-05	0.0%
Wilmington HCU H-300 and H-301 Heaters Stack	H300_301	2.5E-05	0.0%
Wilmington - Sulfuric Acid Regen Plant Stk 2 - Decomp Furnace	SA2_W	2.1E-05	0.0%
Carson Naphtha HDS Heater Stack (D1433)	NHDS	1.9E-05	0.0%

Source Description	Source ID	Total risk	Fraction
Wilmington - Sulfuric Acid Regen Plant Stk 1 - Process Air & Converter Htr	SA1_W	1.5E-05	0.0%
Wilmington CRU2 Unit H-510 Heater Stack	H510	1.3E-05	0.0%
Carson Hydrocracker R1 Heater Stack (D625)	HCU_R1	8.1E-06	0.0%
Carson Light Hydro Unit	LHU_C1 to LHU_C2	7.4E-06	0.0%
Carson Hydrocracker R2 Heater Stack (D627)	HCU_R2	7.2E-06	0.0%
Wilmington CRU2 Unit H-501A/B 502 503 504 Heaters Stack	H501A_ET	2.2E-06	0.0%
Carson FCCU Regenerator	FCCUR_C	2.0E-06	0.0%
Carson LPG Rail Car Loading/Unloading	LPG_C	1.9E-06	0.0%
Wilmington Sulfur Plant Combined H-1601/1602 Stack	H1601_2	1.4E-06	0.0%
Carson No. 51 Vacuum Unit	51VAC_C	2.4E-07	0.0%
Wilmington Hydrotreater Unit No. 4	HTU4_W	1.2E-07	0.0%
Carson Alkylation Unit	ALKY_C	9.1E-08	0.0%
Carson Light Hydrotreating Unit Heater (D425)	LHU_HTR	5.5E-08	0.0%
Carson FCCU Pre-Heater	FCCUPH_C	3.2E-08	0.0%
Carson FCCU	FCCU_C	3.0E-08	0.0%
Wilmington Sulfur Plant Incinerator Stack 2	F754	1.1E-08	0.0%
Wilmington Sulfur Plant Incinerator Stack 1	F704	9.0E-09	0.0%
Wilmington Tank 80035	80035	0.0E+00	0.0%
Wilmington Tank 80036	80036	0.0E+00	0.0%
Wilmington Tank 80038	80038	0.0E+00	0.0%
Wilmington Tank 80074	80074	0.0E+00	0.0%
C3 Splitter Fugitives	C3SPLT_C	0.0E+00	0.0%
Carson Cogeneration Unit 1 Turbine and Duct Burner Stack (D1226/D1227)	COGEN1	0.0E+00	0.0%
Carson Cogeneration Unit 2 Turbine and Duct Burner Stack (D1233/D1234)	COGEN2	0.0E+00	0.0%
Carson Cogeneration Unit 3 Turbine and Duct Burner Stack (D1236/D1237)	COGEN3	0.0E+00	0.0%
Carson Cogeneration Unit 4 Turbine and Duct Burner Stack (D1239/D1240)	COGEN4	0.0E+00	0.0%
Wilmington CRU	CRU_W1 to CRU_W2	0.0E+00	0.0%
Carson HCU	HCU_C	0.0E+00	0.0%
Wilmington Hydrotreater Unit No. 1	HTU1_W	0.0E+00	0.0%
Wilmington Propane Sales Treating Unit	PSTU_W	0.0E+00	0.0%
Carson Tank 14	TK14	0.0E+00	0.0%
Carson Tank 35	TK35	0.0E+00	0.0%
Carson Tank 502	TK502	0.0E+00	0.0%
Carson Tank 64	TK64	0.0E+00	0.0%
Carson Tank 959	TK959	0.0E+00	0.0%

Source Description	Source ID	Total risk	Fraction
Carson Wet Jet Treater (New)	WETJET_C	0.0E+00	0.0%
Locomotives	RRB_0001 to RRB_0098, RRG_0001 to RRG_0303	0.0E+00	0.0%
Onsite Trucks	CAR_0001 to CAR_0417, WLM_0001 to WLM_0154, COK_0001 to COK_0165	0.0E+00	0.0%
Total		7.6E-02	100.0%

6.0 IMPACT OF CONSTRUCTION EMISSIONS

A Supplemental HRA was included in the May 2017 FEIR as Appendix H. The Supplemental HRA addressed DPM emissions resulting from the construction of the project (portable engines, mobile equipment, etc.). The construction schedule and associated DPM emissions have been updated following the release of the May 2017 FEIR; updated emissions are shown in **Table 18** below. A detailed description of the construction emissions methodology is provided in Appendix B of this Addendum.

Table 18. Summary of Construction Emissions

Construction Project	Duration (months)	Total DPM Emissions (lbs)
Wilmington	24	659
Wilmington Crude Tanks	12	169
SARP	14	201
Carson North	21	450
Carson South	29	569
Carson Crude Tanks	51	370
Pipeline	14	1,013
Electric	23	457

6.1 EXPOSURE ASSESSMENT

Exposure assessment for construction emissions was performed in the same manner as described in Appendix H to the May 2017 FEIR with the following exceptions:

- Modeling was performed with the latest versions of AERMOD and HARP
- Modeling was performed with the 2012-2016 Long Beach meteorological data
- Modeling was performed with the updated emission rates (shown in **Table 18** above)

6.2 HEALTH RISK RESULTS

Acute and 8-hr chronic reference exposure levels do not exist for DPM, therefore, the health risk associated with construction emissions was only evaluated for cancer and chronic risk.

6.2.1 Cancer Risk

The predicted increase in health risks at maximally exposed offsite receptors are summarized by category in **Table 19**, **Table 20**, and **Table 21**. **Table 19** shows the predicted increase in cancer and chronic health risks from emissions of operational sources. **Table 20** shows the predicted increase in cancer and chronic health risks from construction DPM emissions. **Table 21** shows the predicted increase in cancer and chronic health risks from emissions of operational and construction sources combined. As shown, the highest calculated cancer risks in the combined scenario at residential, sensitive, and worker receptors are below 10 in one million. It should be noted that because the maximum risk associated with operational emissions does not necessarily occur at the same receptor location as the maximum risk associated with construction emissions, the combined risk may not be equal to the sum of each maximum value.

For the combined scenario, the highest cancer risk at a residential receptor is a cancer risk value of 4.7 in one million. The receptor is located north of the refinery just north of the 405 freeway – see **Figure 9**. Contours showing the aerial distribution of calculated cancer risks for worst-case residential exposure are shown on **Figure 10**. The highest calculated cancer risk at a listed sensitive receptor was 4.1 in one million, at Bethune Mary School located about 500 meters east of the eastern boundary of the Wilmington Operations area. **Table 22** provides a list of the highest cancer risk for sensitive receptors.

The receptor with the highest calculated worker exposure cancer risk was located near the railroad tracks at the northeastern boundary of the refinery – see Figure 5. The receptor is in the immediate vicinity of the location where a locomotive engine enters and exits the facility boundary when moving LPG railcars. The worst-case worker cancer risk at this receptor is 7.0 in one million. This receptor is located along the fenceline where long-term (multi-decade) 40 hour/week exposure is highly unlikely to occur. Contours showing the areal distribution of calculated cancer risks for worst-case worker exposure are shown on **Figure 11**.

6.2.2 Chronic Risk

The maximum chronic hazard index (worker or residential) of 0.096 was predicted at a receptor on the western fenceline of the southern portion of the facility. The highest calculated chronic risk at a listed sensitive receptor was 0.019, at Cesar Chavez Elementary School located about 4 kilometers southeast of the Wilmington Operations area. The maximum chronic HI receptors are shown in **Figure 9**. The maximum residential and worker chronic HI receptors were in close proximity to or along facility boundaries.

Table 19: Summary of Maximum Project Offsite Cancer and Non-cancer Risks (Operation Sources Only)

Location[a]	Cancer Risk			Chronic Risk		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)
Residential receptor[b]	2.9	383700.0	3741400.0	0.024	385251.4	3739502.8
Offsite workplace receptor	7.0	386019.1	3742969.4	0.085	386152.5	3741127.8
Sensitive Receptor[b]	2.4	386720.8	3739987.2	0.019	388750.0	3737361.0

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Maximum sensitive receptors:
Cancer Risk: Bethune Mary School
Chronic Risk: Cesar Chavez Elementary School

Table 20: Summary of Maximum Project Offsite Cancer and Non-cancer Risks (Construction Sources Only)

Location[a]	Cancer Risk			Chronic Risk		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)
Residential receptor[b]	2.3	385000.0	3743600.0	0.002	385000.0	3743600.0
Offsite workplace receptor	1.1	385701.4	3741819.3	0.018	385701.4	3741819.3
Sensitive Receptor[b]	1.7	386720.8	3739987.2	0.001	386720.8	3739987.2

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Maximum sensitive receptors:
Cancer Risk: Bethune Mary School
Chronic Risk: Bethune Mary School

Table 21: Summary of Maximum Project Offsite Cancer and Non-cancer Risks (Operation Plus Construction Sources)

Location[a]	Cancer Risk			Chronic Risk		
	Increase Cases in-one-million	UTM Coordinates (NAD83)		Hazard Index	UTM Coordinates (NAD83)	
		Easting (m)	Northing (m)		Easting (m)	Northing (m)
Residential receptor [b]	4.7	385000.0	3743600.0	0.025	385251.4	3739502.8
Offsite workplace receptor	7.0	386019.1	3742969.4	0.096	386152.5	3741127.8
Sensitive Receptor [b]	4.1	386720.8	3739987.2	0.019	388750.0	3737361.0

[a] Excluding onsite grid receptors
[b] Worst-case residential exposure
[c] Maximum sensitive receptors:
Cancer Risk: Bethune Mary School
Chronic Risk: Cesar Chavez Elementary School

Figure 9. Location of Maximum Calculated Health Risks, FEIR Addendum Sources Plus Construction Sources with 2012-2016 Meteorological Data

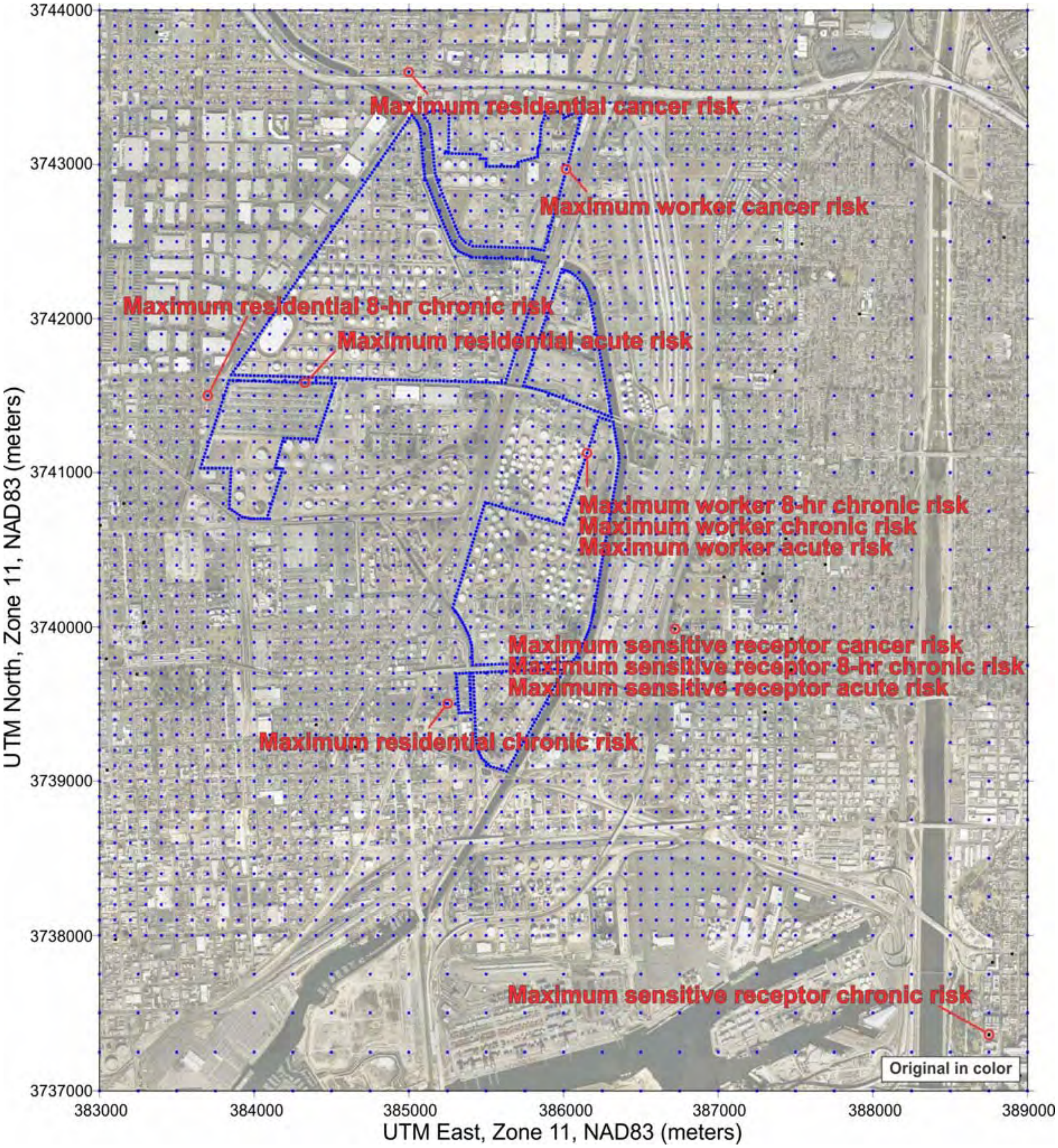


Figure 10. Contours of Residential Cancer Risk, per million exposed, FEIR Addendum Sources Plus Construction Sources with 2012-2016 Meteorological Data

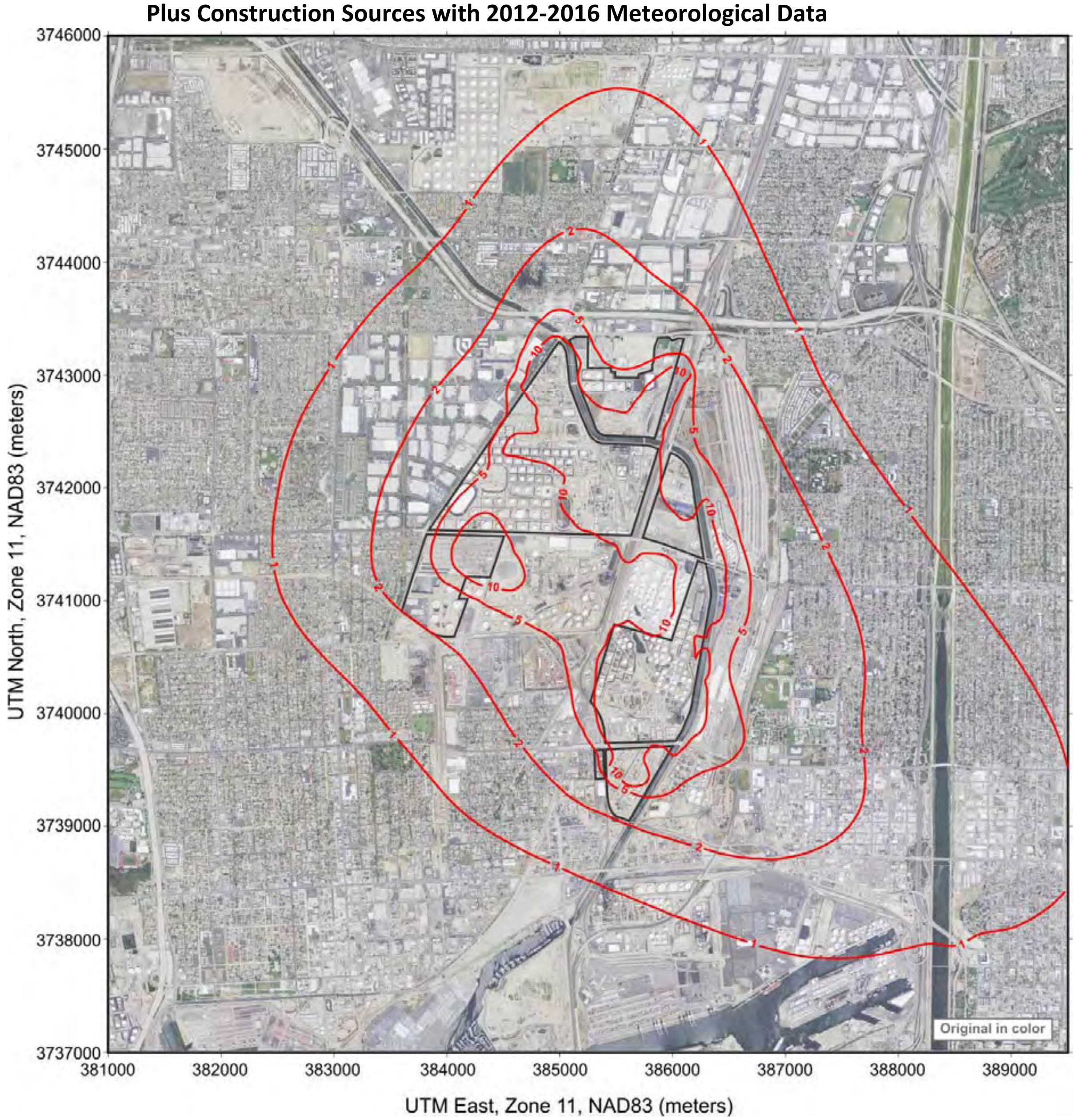


Figure 11. Contours of Worker Cancer Risk, per million exposed, FEIR Addendum Sources Plus Construction Sources with 2012-2016 Meteorological Data

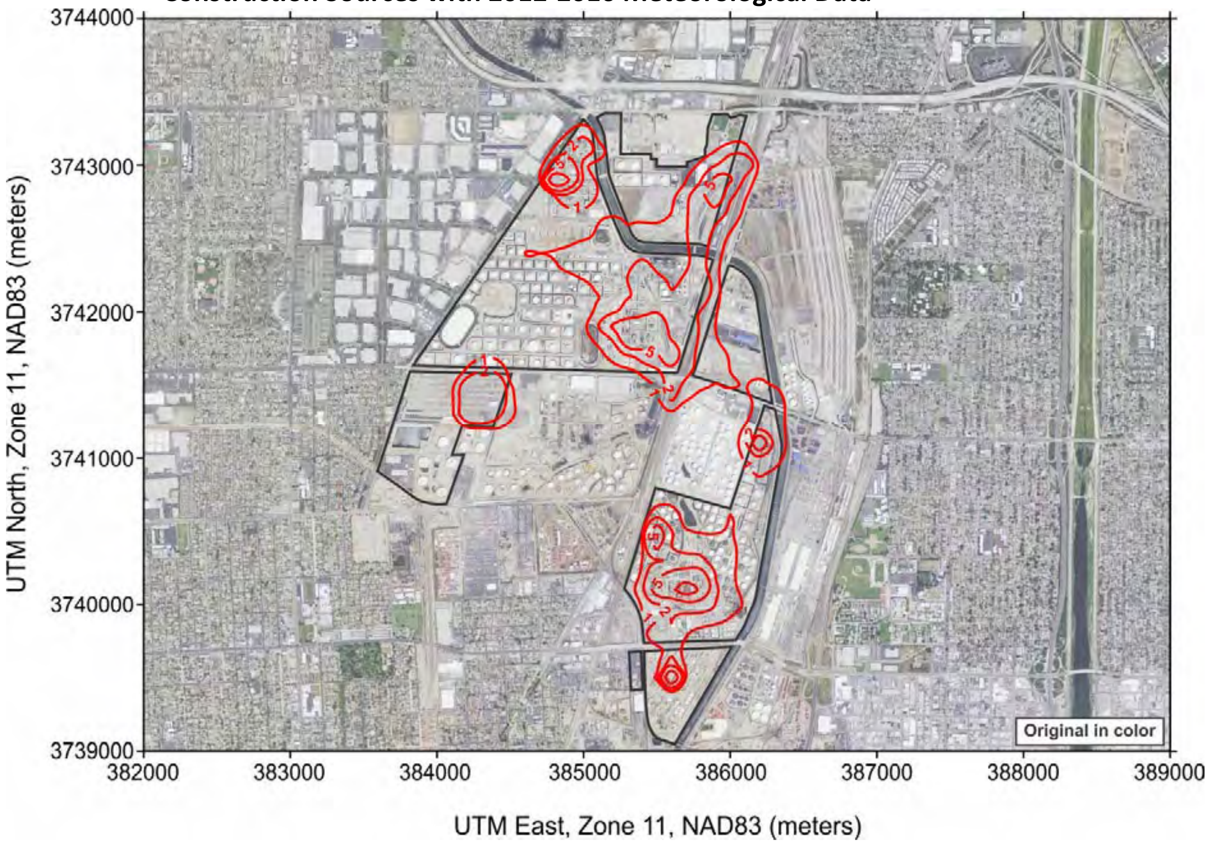


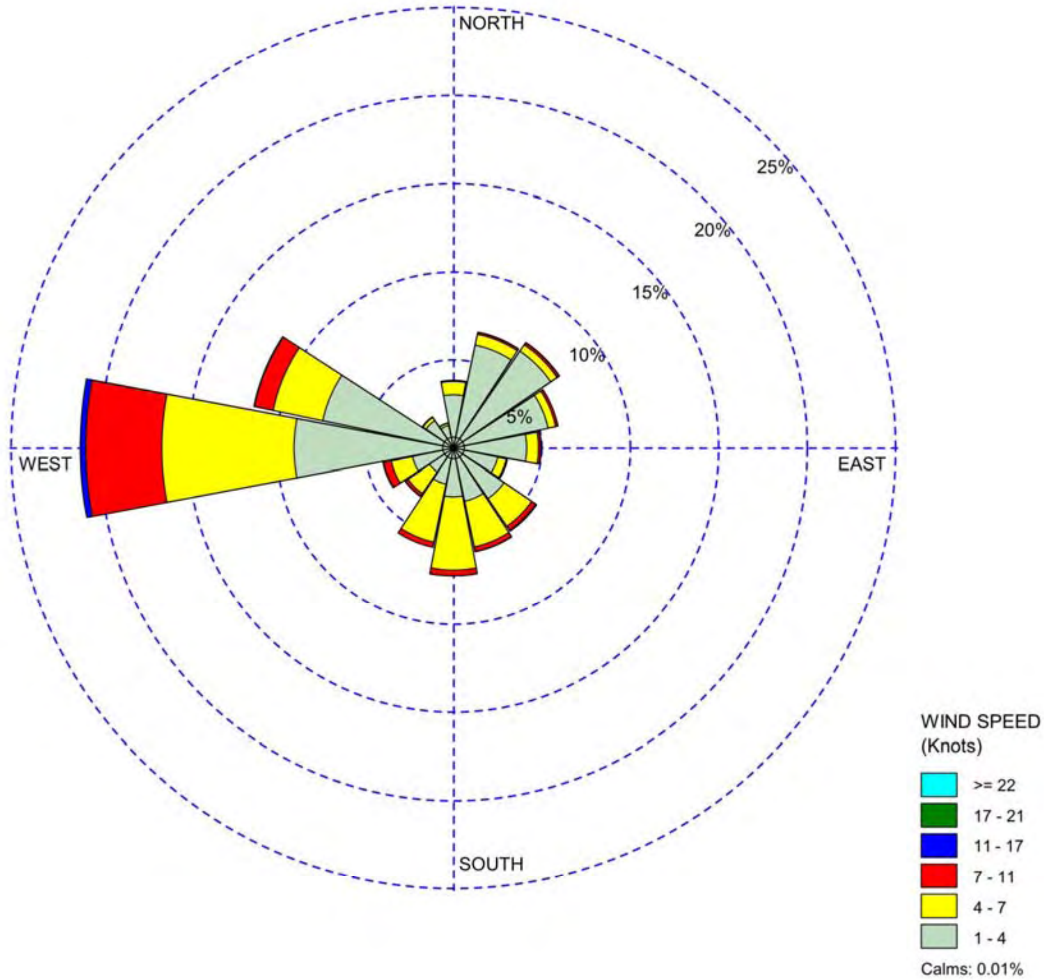
Table 22. Summary of Project Cancer Risks at the Most Exposed Sensitive Receptors

Sensitive Receptor Name	UTM Coordinates (NAD83)		Increased Cancer Cases (in-one-million), FEIR Addendum Sources + Construction Sources, 12-16 Met Data
	Easting (m)	Northing (m)	
Bethune Mary School	386721	3739987	4.09
Wyo Tech National Institute of Tech	387041	3739640	3.15
Elizabeth Hudson Elementary School	387091	3740595	2.91
Will J. Reid High School	387037	3740324	2.86
Long Beach Japanese School	387304	3739447	2.56
Long Beach Child Development	387287	3740345	2.48
St. Lucy's School	387437	3740571	2.30
Long Beach Job Corp Dynamic Educational	387472	3739724	2.22
West Child Development Center	387474	3740168	2.20
Cabrillo High School	387473	3739922	2.18
Garfield Head Start Elementary School	387692	3740405	1.99
William Logan Stephens Junior High	387367	3741657	1.81
Del Amo Elementary School	385247	3744738	1.45
Wilmington Park Children's Center	384655	3739221	1.38
Wilmington Park Elementary School	384618	3739222	1.35
Holy Family Grammar School	384401	3739366	1.31
Broad Avenue Elementary School	383158	3740800	1.31
Webster Elementary School	387380	3742512	1.15
Regency High School	389116	3738789	1.12
Wilmington Christian School	383005	3740658	1.11
Mary Bethune School	389232	3738849	1.10
Long Beach Day Nursery	389275	3739143	1.07
Washington Middle School	389361	3738974	1.06
Long Beach School for Adult	389368	3739487	1.04
Santa Fe Convalescent Hospital	387542	3742485	1.03

ATTACHMENT A **WINDROSES**

WIND ROSE PLOT:
Long Beach, CA

DISPLAY:
Wind Speed
Direction (blowing from)

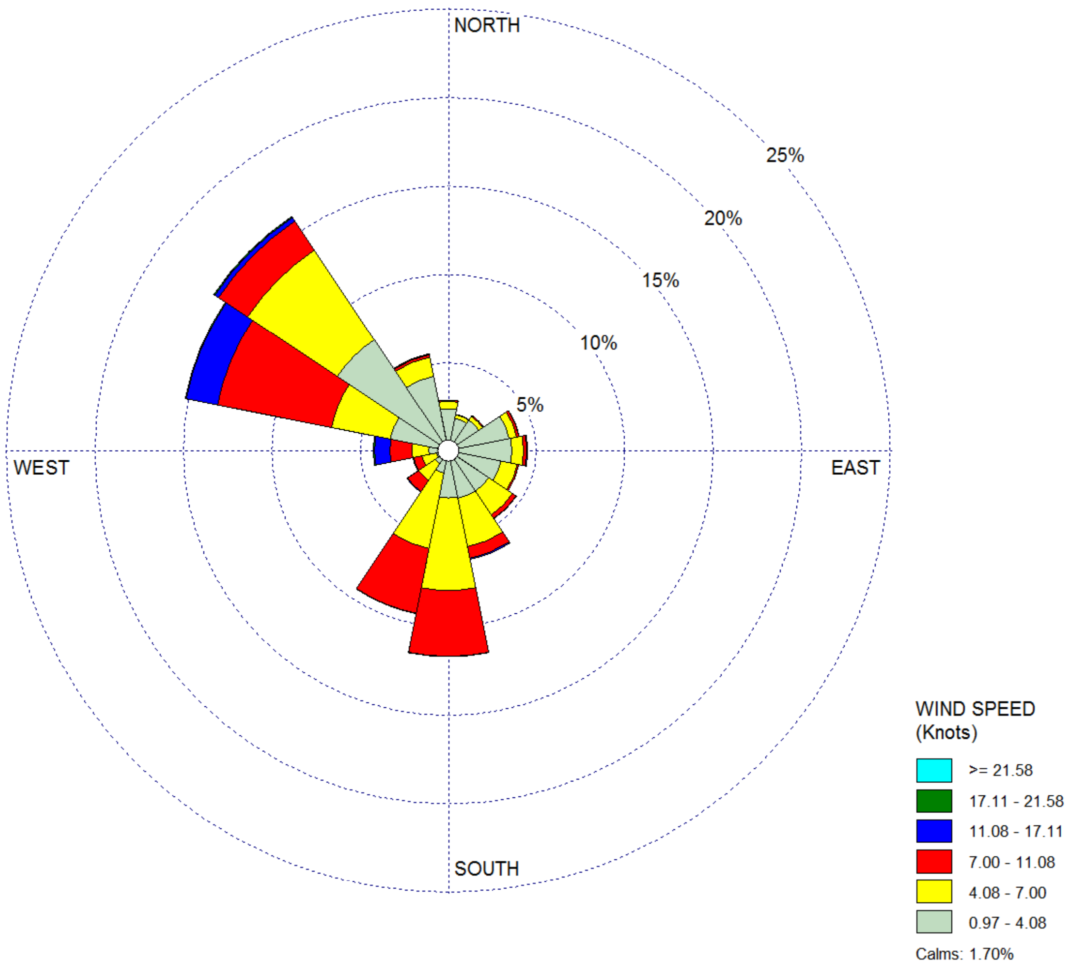


COMMENTS: Met years: 2006, 2007, 2008, 2009, 2011	DATA PERIOD: **Start Date: 1/1/2006 - 00:00** **End Date: 12/31/2011 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.01%**	TOTAL COUNT: **43378 hrs.**	
	AVG. WIND SPEED: **3.66 Knots**	DATE: **5/19/2014**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Long Beach, CA

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
Met years: 2012, 2013, 2014, 2015, 2016	**Start Date: 1/1/2012 - 00:00** **End Date: 12/31/2016 - 23:59**	MODELER:	
	CALM WINDS: **1.70%**	TOTAL COUNT: **43706 hrs.**	
	AVG. WIND SPEED: **5.02 Knots**	DATE: **12/12/2017**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

The AERMOD and HARP2 input and output files are available to SCAQMD upon request.

APPENDIX F

QUEST MEMO ON HAZARD ASSESSMENT

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MEMORANDUM

TO: Marcia Baverman
Environmental Audit, Inc.

DATE: February 22, 2021

FROM: John B. Cornwell
Quest Consultants Inc.

SUBJECT: Additional Information

This memorandum is designed to supplement Quest's previous Worst-Case Consequence Analysis dated February 10, 2017 contained in Appendix C of the May 2017 Final Environmental Impact Report (EIR) for the Tesoro Los Angeles Refinery Integration and Compliance (LARIC) Project and two additional information memoranda contained in Attachment H of Appendix G to the May 2017 Final EIR, as well as Section 6.2.2 of the October 2019 Addendum (Addendum).

This memorandum provides additional information on how it was determined that the update to the TAC speciation discussed in the Addendum did not change the Worst-Case Consequence Analysis associated with the six crude oil storage tanks at the Carson Crude Terminal (CCT). In addition, this memorandum explains why the update to the hydrogen sulfide (H_2S) speciation does not require an additional evaluation of impacts on upstream and downstream operations.

In the May 2017 Final EIR, the worst-case consequence analysis for the crude oil storage tanks was determined to be thermal radiation from a pool fire (i.e., ignition of vapor above accumulated liquid). The May 2017 Final EIR described the concentration of H_2S in crude oil as typically less than 5 parts per million (ppm). To clarify, when describing liquid concentrations, 5 ppm is parts per million by weight (ppmw).

One distinction key to understanding the hazard impacts of a change in speciation for the crude oil is that liquid concentrations are measured in terms of parts per million by weight (ppmw), while gas or vapor concentrations are measured in terms of ppm by volume (ppmv). Thus, for a liquid, 5 ppmw H_2S means 5 pounds (or kilograms) of H_2S is contained in 1,000,000 pounds (or kilograms) of crude oil. Similarly, for a gas or vapor, 5 ppmv H_2S means 5 molecules of H_2S combine with 999,995 molecules of air.

The first issue is whether the update in H_2S concentration in liquid crude oil from less than 5 ppmw to 45 ppmw changes the pool fire hazard zone around a storage tank. A pool fire hazard zone refers to the size of the flame from a fire and its heat generating properties. As described below, updating the H_2S speciation does not change the pool fire hazard zone.

When calculating the impact of a pool fire, a calculation is made from the surface of the flame rising off the liquid pool to a specific radiant endpoint. In the calculation performed, the radiant endpoint is 1,600 British thermal units per hour per square foot ($Btu/(hr \cdot ft^2)$) (or approximately 5 kilowatts per square meter (kW/m^2)).

The size of the flame is defined by its width and height.

The width of the flame is defined by the width of the liquid pool. Whether the liquid contains 0 ppmw H_2S in crude oil (e.g., 100% crude oil without H_2S), 5 ppmw H_2S in crude oil, or 45 ppmw H_2S in crude oil, the width of the liquid pool does not change.

The height of the flame is a function of the heat of combustion of the fuel (ΔHc), which is measured in megajoules/kilogram (MJ/kg). The ΔHc for H_2S and average crude oil is presented below.

ΔHc (H_2S) = 18.1 MJ/kg

ΔHc (crude oil used in analysis) = 42.8 MJ/kg (crude oil ranges from 42 to 46 KJ/kg)

Since ΔHc is based on mass (lbs. or kg), it is straight forward to calculate ΔHc for the two crude oils containing H_2S.

ΔHc (0 ppmw H_2S in crude oil used in analysis) = 42.8 MJ/kg

ΔHc (5 ppmw H_2S in crude oil used in analysis) = (5/(1,000,000))*18.1 + (999,995/(1,000,000)*42.8 = 0.00000905 + 42.799786 ≈ 42.8 MJ/kg

ΔHc (45 ppmw H_2S in crude oil used in analysis) = (45/(1,000,000))*18.1 + (999,955/(1,000,000)*42.8 = 0.0008145 + 42.798074 ≈ 42.8 MJ/kg

Thus, the ΔHc for 0 ppmw H_2S in crude oil (100% crude oil), 5 ppmw H_2S in crude oil, and 45 ppmw H_2S in crude oil is the same.

Since the ΔHc for the three H_2S concentrations in the crude oil are the same, the height of the flame is the same. If the height and width of the flame are the same, the size of the flame surface is, by definition, the same. Similar to the ΔHc calculation shown above, the surface flux, Φ (kW/m^2) from the surface of the flame is the same whether it is 100 % crude oil, 5 ppmw H_2S in crude oil, or 45 ppmw H_2S in crude oil.

In summary, the low concentration of H_2S (e.g., 5 to 45 ppmw) in crude oil does not affect the size or radiative properties of the flame generated if ignited.

The second issue is whether the 5 ppmw to 45 ppmw H_2S speciation update would cause a toxic vapor cloud to be a greater hazard than thermal radiation from a pool fire. Because a concentrated cloud of H_2S could not travel much beyond the liquid pool of crude oil, a toxic vapor cloud would not present a significant hazard compared to a pool fire.

The ability of the crude oil to form a vapor cloud above the liquid pool is dependent on the vapor pressure of the crude oil. Since the crude oil is stored in an atmospheric storage tank, the pressure in the vapor space must be one atmosphere or less. Crude oil typically has a vapor pressure that is less than atmospheric pressure, which is 14.7 pounds per square inch (psi). Thus, the vapor composition above the liquid is a mix of crude oil vapors and air. In the crude oil vapor, there can be some H_2S since H_2S is a liquid in the crude oil (in this case up to 45 ppmw). However, the H_2S is in liquid form and is bound in the crude oil (it is not a free gas) and will not easily change phase from a liquid to a vapor.

The rate at which a liquid turns into a. vapor is a function of mass transfer. Mass transfer is a weak function of the wind speed and can be represented as:

Mass transfer ∝ constant * wind speed, where ∝ means proportional.

The constant is much less than one. Thus, as the wind speed over the crude oil pool increases, the rate at which H_2S liquid vaporizes slowly increases. To conservatively assess a domed external floating roof tank, the dome is assumed to be absent.

The dispersion of the H_2S from the liquid pool vapor boundary is also a function of the wind speed and can be represented as:

Dispersion (specific concentration at a downwind distance) ∝ 1 / wind speed

As can be seen by the two relationships above, the ability of the H_2S to disperse downwind is often enhanced at low wind speeds (lower wind speed in the denominator of the dispersion). However, the evolution of the H_2S from the crude oil is lowered as the wind speed decreases (lower wind speed in the numerator of the vaporization). These two counter-balancing effects result in limited travel of a concentrated cloud of H_2S beyond the liquid pool boundary.

Quest has performed these types of calculations for local public agencies and private companies and has found this behavior to be consistent. Thus, when comparing the potential impacts of a crude oil pool fire to potential impacts of a vapor cloud evolving off a pool of crude oil with concentrations of 5 ppmw to 45 ppmw of H_2S, the fire impacts will always extend to a larger area than an H_2S cloud.

Emergency releases are best evaluated against Emergency Response Planning Guidelines (ERPGs) because the events are short in duration and releases are not continuous. The ERPGs are designed to establish the lowest levels at which health effects will begin to be experienced at their respective toxic endpoints (i.e., lungs) for up to a one-hour exposure. Therefore, they are suitable for determining hazard impacts from short duration accidental releases. The hazard endpoint for H_2S vapor used for the worst-case consequence analysis is the ERPG-2 level of 30 ppmv for H_2S.

In order to perform a dispersion calculation, an evaporation rate of the species from the pool must be calculated first using properties of the pool, properties of the species of interest, and the mass transfer coefficient [Stiver, 1983]:

$$Q_i = \frac{k_m P_{i,s} MW_i A}{RT_s}$$

where:

- Q_i is the evaporation rate (mass/time)
- k_m is the mass transfer coefficient (length/time)
- $P_{i,s}$ is the vapor pressure of the species i at the surface
- A is the surface area of the pool
- MW_i is the molecular weight of species i
- R is the gas constant
- T_s is the surface temperature (absolute)

The mass transfer coefficient is calculated using the Khajehnajafi and Pourdarvish [2011] method. This method requires multiple inputs, including properties of air, wind velocity, pool size, and the Schmidt number (a dimensionless number relating diffusion). The evaporation rate and other variables (for example, wind velocity and pool area) are input into an area source Gaussian plume model, and the concentration of the species is calculated at distances from the center of the pool [Smith, 1995] and [Briggs, 1973].

The pool fire radiant impact to 1,600 Btu/(hr·ft^2) and the H_2S toxic impact to the ERPG-2 of 30 ppmv are presented in the Table 1 below.

TABLE 1. Comparison of Pool Fire and Toxic Cloud Impact Zone Distances

Hazard Consequence Scenario	Impact Zone Distance (feet)
Distance from edge of liquid pool to 1,600 Btu/(hr*ft^2)$^{(1)}$ (Distance from center of the liquid pool as reported in May 2017 Final EIR)	220 (340)
Distance from edge of liquid pool to 30 ppmv H_2S (5 ppmw H_2S in crude oil)	0
Distance from edge of liquid pool to 30 ppmv H_2S (45 ppmw H_2S in crude oil)	3

(1) To exemplify the effects of varying H_2S concentration, the distances are reported from the edge of the liquid pool. The May 2017 Final EIR reported the distance from the center of the liquid pool.

Thus, whether the crude oil stored in a tank has a concentration of 5 ppmw or 45 ppmw H_2S, the radiant impacts from a pool fire will be larger. Therefore, the worst-case consequence from a storage tank fire does not change from the analysis presented in the May 2017 Final EIR.This is also explained in Section 6.2.2 of the October 2019 Addendum.

The third issue is whether the update to H_2S speciation in the crude oil would necessitate an upstream and downstream operational hazard assessment. Because this updated speciation does not represent a change in existing crude slates, no such hazard assessment is necessary for the tank project, any downstream units or LARIC Project components.

The six new crude oil storage tanks at the CCT will be located at an existing crude oil storage terminal. As stated in Section 5.3 of the Addendum, “the updated speciation reflects quantification improvements of the TAC speciation, but there are no changes in the types of crude oils stored from those previously analyzed in the May 2017 Final EIR. This update is informational only, as there are no physical or operational changes to the CCT tanks from what was previously analyzed in the May 2017 Final EIR.”

The May 2017 Final EIR project description explained that the LARIC Project was not designed to facilitate a change in crude oil slate. Additional detail was provided in Section G0-2.4 of the May 2017 Final EIR Master Response 4. The existing operations upstream (i.e., Marine Terminal 1 and the connecting pipeline) and immediately downstream (i.e., Carson Operations tankage and Crude Units) of the CCT are not being modified as part of the LARIC Project. In addition, the 45 ppmw H_2S concentration used in the hybrid speciation for the new storage tanks was identified as the highest concentration from the many crude oils that have already been received in the existing crude oil storage tanks at CCT and processed as part of the crude oil blend in the Crude Units at the Carson Operations. As explained in this memorandum, the update to the H_2S speciation from 5 ppmw to 45 ppmw did not change the characteristics of the crude oil; and no changes to the crude units were proposed in the May 2017 Final EIR, nor are changes to the crude units proposed in the Addendum. Likewise, no change to the Worst-Case Consequence analysis performed on the other LARIC Project components that are downstream of the CCT is needed because, for process units downstream of the crude unit, the analysis is not based on the crude oil properties but is based on the operating characteristics of the individual process units. Any hazard impacts from crude oil composition upstream and downstream of CCT would therefore remain the same after the project as they were before the project. The LARIC Project modifications are not affected by the update in the crude oil speciation, so the Worst-Case Consequence analysis as presented in the May 2017 Final EIR remains valid.

As explained in Section G0-2.9 of the May 2017 Final EIR Master Response 9, the Worst-Case Consequence Analysis provided in the May 2017 Final EIR is not based on any single accident scenario. Hazards at a facility can occur due to releases resulting from natural events, such as earthquakes, and non-natural events, such as mechanical failure or human error. Therefore, the analysis evaluated the potential hazard regardless of what type of event caused the accident, including earthquakes and accidents.

As discussed in Appendix F of the May 2017 Final EIR, the crude oil properties (e.g., gravity, sulfur content, and Total Acid Number (TAN)) are provided by the crude oil supplier to provide information to the Refinery regarding the compatibility of the crude oil with the other crude oils and the design of the Refinery. The TAN is the indicator of the corrosivity of the crude oil. The TAN is determined by a neutralization test that is not based on H_2S content but on the entire composition of the crude oil. Since the crude oils are selected based on the properties of the crude oil, but not the concentration of H_2S in the crude oil, no change in the selection of crude oils would occur due to the speciation change.

The worst-case consequence analysis assesses potential hazard impact changes from modifications to existing units and potential new hazard impacts from new equipment. No modifications to existing upstream and downstream operations are occurring by installing six new crude oil storage tanks.

Odor concerns are not considered in a worst-case consequence analysis. H_2S has a distinctive "rotten egg" odor and can be detected by humans at low concentrations (0.0005 to 0.3 parts per million (ppm[v]), Agency for Toxic Substances Disease Registry (ASTDR) ToxFAQs, December 2016, available at https://www.atsdr.cdc.gov/toxfaqs/tfacts114.pdf). However, odor detection does not necessarily correlate to adverse health impacts.

Summary

As explained above, the hazard assessment presented in the May 2017 Final EIR and Section 6.2.2 of the October 2019 Addendum present the worst-case consequence associated with the new crude oil storage tanks at CCT. Therefore, no revision to the hazard assessment previously presented is necessary, and, in any event, the updated speciation does not represent a change in actual H_2S content, but instead a refinement in the characterization of existing crude oils.

References

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