

May 2017

SCH No. 2014091020

**TESORO  
LOS ANGELES REFINERY  
INTEGRATION AND COMPLIANCE PROJECT  
FINAL  
ENVIRONMENTAL IMPACT REPORT**

VOLUME V: Appendix G (Comment Letter No. G1-75 – Response G1-78.166)

**Executive Officer**

Wayne Nastri

**Deputy Executive Officer**

**Planning, Rule Development, and Area Sources**

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**Assistant Deputy Executive Officer**

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Susan Nakamura

Submitted to:

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

Prepared by:

**ENVIRONMENTAL AUDIT, INC.**

**Reviewed by:** Jillian Wong, Ph.D. – Planning and Rules Manager  
Danny Luong – Senior Enforcement Manager  
Tran Vo – Air Quality Analysis and Compliance Supervisor  
Sam Wang – Air Quality Specialist  
Barbara Baird – Chief Deputy Counsel  
Veera Tyagi – Principal Deputy District Counsel  
Cal Enviro Metrics, LLC

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**Comment Letter No. G1-75**

**From:** Jim Stewart [<mailto:drjimstewart@gmail.com>]  
**Sent:** Friday, June 10, 2016 3:46 PM  
**To:** Jillian Wong <[jwong1@aqmd.gov](mailto:jwong1@aqmd.gov)>; Danny Luong <[dluong@aqmd.gov](mailto:dluong@aqmd.gov)>; [organizer@southbay350.org](mailto:organizer@southbay350.org)  
**Subject:** Oppose Proposed Tesoro Merger, Facility ID#s 174655 and 800436

Dear Dr. Wong:

I write in opposition to the Proposed Title V Significant Permit Revisions and the Draft Environmental Impact Report (DEIR) for Tesoro Refining & Marketing Co., LLC's Carson and Wilmington Sites, Facility ID#s 174655 and 800436.

G1-75.1

As a resident of the ports area, suffering from some of the worst air quality in the country, I am scared to death of refinery expansion in this area.

G1-75.2

Please reject this DEIR and save us in the ports area from more deadly emissions.

Thanks,

James Stewart  
1720 Chestnut Ave #17  
Long Beach CA 90813  
Cell: 213-820-4345

**Response to Comment Letter No. G1-75**

**James Stewart**

**Comment G1-75.1**

I write in opposition to the Proposed Title V Significant Permit Revisions and the Draft Environmental Impact Report (DEIR) for Tesoro Refining & Marketing Co., LLC's Carson and Wilmington Sites, Facility ID#s 174655 and 800436.

]

G1-75.1

**Response G1-75.1**

The comment regarding opposition to the proposed project does not raise issues related to the proposed project or the DEIR. The comment is noted and no response is necessary under CEQA.

**Comment G1-75.2**

As a resident of the ports area, suffering from some of the worst air quality in the country, I am scared to death of refinery expansion in this area.  
Please reject this DEIR and save us in the ports area from more deadly emissions.

]

G1-75.2

**Response G1-75.2**

As explained in Section 4.2.2.2 of the DEIR, upon completion, the proposed project will result in regional and local reductions in CO emissions and local reductions of operational NOx, SOx, PM10, and PM2.5 emissions. The increase in operational VOC emissions associated with the proposed project was found to be less than significant. The proposed project emissions are described in detail in Section 4.2 of the DEIR and are summarized in Table 4.2-4 (see pages 4-16 through 4-18). The proposed project will result in local overall reductions in GHG emissions, as described in Section 5.2 of the FEIR and summarized in Table 5.2-8 (see page 5-26).

Master Response 6 explains that the volume of available crude oil storage capacity has no bearing on Refinery crude oil processing capacity. The proposed project would not create a new or larger refinery or result in a substantial increase of crude oil throughput capacity. It would further integrate the Refinery's Carson and Wilmington Operations.

Sections 2.7.1.3 and 4.1.2.1 of the FEIR describe the potential 6,000 bbl/day crude oil capacity increase that could be accommodated with the proposed permit revision of the DCU H-100 heater. The potential impacts of this crude oil capacity increase are fully analyzed in Chapter 4 of the DEIR. Master Response 7 further explains that the proposed project is not an expansion of the Refinery.

Although the proposed project includes adding new storage tanks, this component of the proposed project would not increase the crude oil throughput capacity at the Refinery. Instead, the new crude oil storage tanks would allow the Refinery to reduce transportation emissions associated with marine vessels that deliver crude oil. As explained in the DEIR (see pages 4-26

## APPENDIX G1: RESPONSE TO COMMENTS

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through 4-29) and Master Response 6, the proposed project will increase the crude oil storage capacity at the Refinery, which will reduce the amount of time that marine vessels spend at the Port and the associated emissions.

As explained in Master Response 3, the DEIR fully analyzed and disclosed the proposed project's potential health impacts from all pollutants. The proposed project's potential cancer and non-cancer human health impacts, including asthma and other respiratory illnesses, were analyzed in the DEIR, and determined to be less than significant. The estimated cancer risk due to the operation of the proposed project was found to be less than the SCAQMD's cancer risk significance threshold of ten in one million (see FEIR Section 4.2.2.5). The non-cancer chronic and acute hazard indices were found to be below the SCAQMD's non-cancer chronic and acute hazard index threshold of 1.0. Therefore, the proposed project is not expected to cause a significant adverse health impact.

The comment regarding rejection of the proposed project does not raise issues related to the proposed project or the DEIR. The comment is noted and no response is necessary under CEQA.

Comment Letter No. G1-76



Century Villages at Cabrillo  
2001 River Avenue, Long Beach, California 90810  
phone: (562) 388-8107 fax: (562) 388-8199  
centuryvillages.org

June 5, 2016

**Via Email**

Ms. Jillian Wong  
Office of Planning, Rule Development and Area Sources/CEQA  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765-4182

***RE: Draft Environmental Impact Report and Title V Permit for the Tesoro Los Angeles Refinery Integration and Compliance Project***

Dear Ms. Wong:

This letter documents Century Villages at Cabrillo's ("CVC") comments on the Draft Environmental Impact Report ("DEIR") and Title V Permit request for the Tesoro Los Angeles Refinery Integration and Compliance Project ("LARIC").

**Background**

CVC is the 501(c)3 mission driven nonprofit organization that is the owner, manager, and steward of the Villages at Cabrillo ("Villages"), a 27-acre former Navy housing facility that has become a vibrant supportive housing community to more than 1,300 residents on any given night. The Villages was conveyed to CVC in 1997 under the federal McKinney Act for the benefit of the homeless. Over the past 20 years CVC has redeveloped the property to become a supportive neighborhood for highly vulnerable populations, including homeless veterans (more than 550 on any given night), families, children, and others. A collaboration of more than 20 different nonprofit and government organizations have been convened to support the health and recovery of CVC's population. These organizations include the Department of Veterans Affairs, US VETS, Catholic Charities of Los Angeles, PATH Ventures, Project Return Peer Support Network, Comprehensive Child Development, School on Wheels, The Children's Clinic, Harbor Interfaith Services, American Indian Changing Spirits, Oasis Community Center, Long Beach Unified School District's Bethune Transition Center, Los Angeles Habilitation House, among others. Throughout the 2015 fiscal year, CVC housed and served a total of 2,049 residents, 667 of whom were children. Nearly half of the persons housed and served in 2015 were veterans. The Villages is situated just 2,000 feet to the east of the Tesoro Wilmington Operations.

Consistent with its mission, CVC is strongly committed to providing a healthy, supportive environment for residents of the Villages at Cabrillo. Accordingly, we are concerned about the environmental impacts that LARIC project may have upon the Villages at Cabrillo and its residents. Recently we have made many improvements to the campus to mitigate the impact of the environmental hazards that reside just to the west of our campus and create new opportunities for our population. We have planted a comprehensive landscape buffer, developed an 81 unit, award winning permanent supportive housing, brought a new federally qualified health clinic to the Villages, developed partnerships with local universities to bring occupational therapy

G1-76.1

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programming to our community, and installed a new solar facility, among other developments. In addition, we recently broke ground on a 120 unit permanent supportive housing development that will come online in the fall of 2017 and house homeless veterans, homeless families, and other low income populations. And, more supportive housing is being planned at the Villages.

G1-76.1  
cont'd.

We offer the following comments on the Draft EIR, and request that they be addressed in preparation of the Final Environmental Impact Report.

Surrounding Land Uses and Setting

In numerous sections throughout the DEIR, land use in the “vicinity of Refinery” lists “oil production facilities, refineries, hydrogen plants, coke handling facilities, automobile wrecking/dismantling facilities, and other industrial operations,” but minimizes the proximity to sensitive receptors such as the Villages at Cabrillo. In fact, a map in the Localized Significance Threshold Analysis used a USGS Topographic map from 1981 to illustrate the site location for the proposed facility. As noted above, the following sensitive receptors are located on the Century Villages at Cabrillo campus and are not captured on this map: Long Beach Unified School District’s Bethune Transition Center, Comprehensive Child Development, Los Angeles Habilitation House; Oasis Community Center; PATH Ventures, Catholic Charities of Los Angeles, Project Return Peer Support Network’s Hacienda of Hope and Hopewell, School on Wheels, The Children’s Clinic, Harbor Interfaith Services, VA’s Primary Care Outpatient Clinic, the VA’s Veteran’s Village Recovery Center, US VETS, and others. These programs provide a range of critical on-site services to our residential community and represent thousands of unduplicated visits per year. Unfortunately all are mislabeled as a “Naval Reservation Area,” a designation that hasn’t been in effect for decades. In short, the map severely mislabels and underrepresents these sensitive receptors. Without an accurate assessment of neighboring uses and populations, the DEIR’s impacts have not been fully analyzed and are fundamentally flawed.

G1-76.2

Hazard Impact

The DEIR and the Title V Permit fail to recognize Tesoro’s published plans to bring dangerous North Dakota Bakken crude oil by rail to the Tesoro Savage Vancouver Washington ship terminal, then by ship to the Los Angeles refinery. This crude oil is particularly explosive as evidenced by recent accidents. North Dakota Bakken crude contains high levels of volatile, toxic air contaminants which the DEIR needs to evaluate. In addition, the LARIC project could also bring extreme Canadian tar sands crude oil to the refinery through the same Tesoro Savage ship terminal. These two crude oils cause increased greenhouse gases and harms to air, land, and water during extraction, and add explosion risks in storage and in refineries. The DEIR fails to contemplate these crude sources and related impacts and hazards. Further, the DEIR and Title V permit fail to consider air emissions from flaring during startup, shutdown, and maintenance, other air emissions sources, and fail to set permit conditions that would prevent these emissions.

G1-76.3

Accordingly, the hazards of the LARIC operation must be more completely analyzed. And subsequent to that more thorough analysis, the mitigation measures should be re-evaluated.

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**Sensitive Receptors**

As noted above, the DEIR severely underrepresents the number of sensitive receptors in the immediate vicinity of the LARIC project. The DEIR states:

*“Noise-sensitive receptors or receivers... 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 report goes on to list the “closest noise sensitive receptor” but does an inadequate job of listing all the noise sensitive receptors that will be impacted, including, again, the Villages at Cabrillo, a mere 2,000 feet from the proposed facility.

This deficiency is most blatant in the Health Risk Assessment (Appendix B-4) which not fully identify the sensitive receptors located at the Villages at Cabrillo. Further, the Health Risk Assessment performed under the Air Quality Analysis is devoid of a full list of sensitive receptors. This is a requirement for any sensitive receptor within six kilometers of the proposed facility. The Health Risk Assessment states that:

*Sensitive receptor locations (schools, day care facilities, hospitals, and convalescent homes) were obtained via an internet search and the Google Maps database. The sensitive receptors used in the project analysis are listed in Table 6.*

Given the adjacencies between CVC and Tesoro’s Wilmington operation and the long working relationship between the two organizations it is perplexing that the Health Risk Assessment could so blatantly overlook the sensitive receptors residing at, or being served at, the Villages at Cabrillo. Without a full accounting of the impacts on sensitive receptors, the Health Risk Assessments and larger air quality analysis are fundamentally flawed and deficient.

G1-76.4

**Construction of the Proposed Project**

CVC has concerns about the prolonged four (4) year construction period of the LARIC project and its impacts on our community.

*“... 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. (allowing 30 minutes for lunch) five days per week. During Refinery turnaround periods (when some of the Refinery Units are shutdown), 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. seven days per week” (pg. 2-51).*

G1-76.5



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*"The proposed project's construction emissions exceed the applicable significance thresholds for VOC, and NOx (see Table 4.2-2)*

This extended construction activity represents a significant burden for the veterans, families and children residing at the Villages at Cabrillo. Further, the project's construction-related emissions are cumulatively significant when considered in combination with related projects. It is unclear if the mitigation measures proposed will address the considerable impact upon local air quality, traffic, and noise. CVC believes more impact analysis is required.

G1-76.5  
cont'd.

**Geology and Soils**

The DEIR failed to incorporate a seismic or geologic study. This deficiency is a cause for alarm given the sheer volume, length and explosive materials being carrier by proposed pipelines within the context of the site's soil conditions:

*"The pipelines are expected to transport gasoline and gasoline blending components, crude oil, gas oil, butylene, propylene, and liquid petroleum gases. In this EIR, the term "pipelines" refers to all of the proposed pipelines shown in Figure 2-17, primarily pipelines on Tesoro property, but also portions of the pipeline that will be routed in a bundle under the Alameda Corridor and Sepulveda Boulevard. The interconnecting pipelines between the Carson and Wilmington Operations, including the pipeline bundle in the bore, includes approximately 15,000 feet of new 12-inch piping, 30,000 feet of new 10-inch piping and 40,000 feet of new 6-inch and 4-inch piping" (pg. 2-48).*

The proposed expansion for LARIC is an area commonly known as the Long Beach Quadrangle. There is a history of "numerous effects attributed to liquefaction...noted following the 1933 Long Beach earthquake including numerous leaks in gas lines, water mains broken, roads cracked, and displaced pavement" (Barrows, 1974). Part of the Port of Los Angeles is situated in the south-westernmost corner of the Long Beach Quadrangle. During the 1994 Northridge earthquake significant damage occurred to facilities near Berths 121 to 126 and at Pier 300 (Stewart and others, 1994, p. 135). Features that developed at these localities, such as lateral spreading, settlement, and sand boils, manifested liquefaction." These same soil conditions exist at the Villages at Cabrillo and require extensive ground improvement to remediate the effects of liquefaction. For example, pursuant to a geotechnical report, we recently installed 1,331 stone columns 25 deep across a 3 acre site in an effort to stabilize the subgrade for our Anchor Place development, a new 120 unit permanent supportive housing development.

G1-76.6

We request that a thorough seismic and geologic study be conducted as a part of the EIR in addition to a thorough vetting of compliance to local building codes. Given the preponderance of above ground pipelines carrying corrosive and explosive materials for long distances this is an enormous cause for concern.

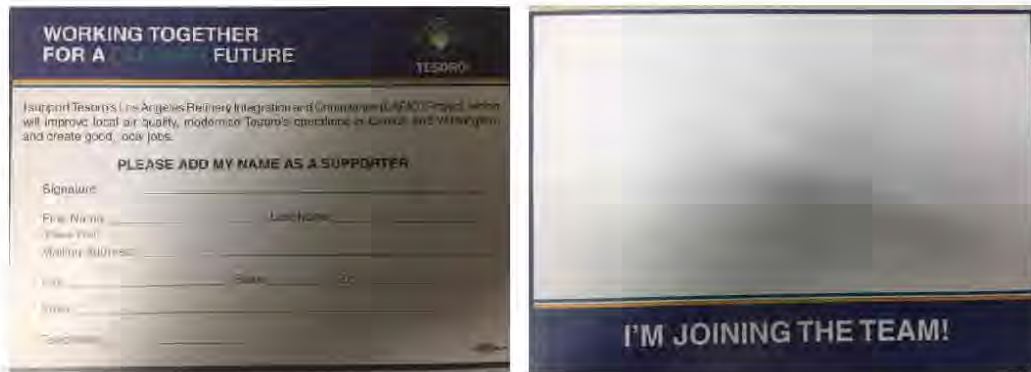
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**Tesoro Community Meeting held at CVC**

On Thursday April 14, 2016 CVC assisted Tesoro by hosting a community meeting in an effort to educate the broader community about the LARIC project, including mitigation and disaster recovery planning efforts. CVC assisted with outreach and used its considerable influence in the community to attract neighbors and stakeholders throughout the region. The event was structured like a community fair with informational tables staffed by Tesoro representatives. This structure made it difficult for community members of various education and capacity levels to understand the information and ask questions. Certain attendees observed the practice of being passed off from one Tesoro representative to another with limited and confusing information being presented and many questions left unanswered.

Beyond that, in a tactic that can only be described as grossly deceptive, attendees were asked to complete a Tesoro “comment” card in order receive a voucher. In turn, vouchers could be redeemed for tacos which Tesoro provided. One might be able to justify this practice as slightly less than manipulative were the card were an actual comment card. However, as noted in the photo below the card was an actual “Support card” for Tesoro’s LARIC project. The card even failed to have room for comment. Given CVC’s vulnerable population, this was a disingenuous tactic that served to raise suspicion about the motives behind the event and the overall objectives of Tesoro. Further, it creates the false impression that the 60 “support” cards received are an accurate reflection of community support for the project.

G1-76.7





**APPENDIX G1: RESPONSE TO COMMENTS**

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In closing, CVC has serious concerns about certain significant, unavoidable impacts, including that the proposed LARIC project will impose on its community and other neighboring disadvantaged communities. As noted above, the DEIR is deficient in many respects, in particular in its underrepresentation of sensitive receptors at the Villages at Cabrillo and beyond.

Given these expansive impacts and the DEIR's failure to fully acknowledge surrounding land use and sensitive receptors, the report is deficient and its proposed mitigation is inadequate. The DEIR is fundamentally flawed and should be revised to more completely evaluate alternatives, impacts, and mitigations.

Thank for the opportunity to provide comments on the DEIR for the LARIC Project. We look forward to reviewing the responses to this and other comments.

Yours sincerely,



Brian D'Andrea  
President, Century Villages at Cabrillo

cc: Steve Colman, Executive Director  
Ronald M. Griffith

G1-76.8

**Response to Comment Letter No. G1-76**

**Century Villages at Cabrillo**

**Comment G1-76.1**

*Background*

CVC is the 501(c)3 mission driven nonprofit organization that is the owner, manager, and steward of the Villages at Cabrillo (“Villages”), a 27-acre former Navy housing facility that has become a vibrant supportive housing community to more than 1,300 residents on any given night. The Villages was conveyed to CVC in 1997 under the federal McKinney Act for the benefit of the homeless. Over the past 20 years CVC has redeveloped the property to become a supportive neighborhood for highly vulnerable populations, including homeless veterans (more than 550 on any given night), families, children, and others. A collaboration of more than 20 different nonprofit and government organizations have been convened to support the health and recovery of CVC’s population. These organizations include the Department of Veterans Affairs, US VETS, Catholic Charities of Los Angeles, PATH Ventures, Project Return Peer Support Network, Comprehensive Child Development, School on Wheels, The Children’s Clinic, Harbor Interfaith Services, American Indian Changing Spirits, Oasis Community Center, Long Beach Unified School District’s Bethune Transition Center, Los Angeles Habilitation House, among others. Throughout the 2015 fiscal year, CVC housed and served a total of 2,049 residents, 667 of whom were children. Nearly half of the persons housed and served in 2015 were veterans. The Villages is situated just 2,000 feet to the east of the Tesoro Wilmington Operations.

Consistent with its mission, CVC is strongly committed to providing a healthy, supportive environment for residents of the Villages at Cabrillo. Accordingly, we are concerned about the environmental impacts that LARIC project may have upon the Villages at Cabrillo and its residents. Recently we have made many improvements to the campus to mitigate the impact of the environmental hazards that reside just to the west of our campus and create new opportunities for our population. We have planted a comprehensive landscape buffer, developed an 81 unit, award winning permanent supportive housing, brought a new federally qualified health clinic to the Villages, developed partnerships with local universities to bring occupational therapy programming to our community, and installed a new solar facility, among other developments. In addition, we recently broke ground on a 120 unit permanent supportive housing development that will come online in the fall of 2017 and house homeless veterans, homeless families, and other low income populations. And, more supportive housing is being planned at the Villages.

We offer the following comments on the Draft EIR, and request that they be addressed in preparation of the Final Environmental Impact Report.

G1-76.1

G1-76.1  
cont’d.

**Response G1-76.1**

The comment does not raise issues related to the proposed project or DEIR. The SCAQMD acknowledges the proximity of the Century Villages at Cabrillo to the Refinery. The comment has been noted and no response is necessary under CEQA.

**Comment G1-76.2**

Surrounding Land Uses and Setting

In numerous sections throughout the DEIR, land use in the “vicinity of Refinery” lists “oil production facilities, refineries, hydrogen plants, coke handling facilities, automobile wrecking/dismantling facilities, and other industrial operations,” but minimizes the proximity to sensitive receptors such as the Villages at Cabrillo. In fact, a map in the Localized Significance Threshold Analysis used a USGS Topographic map from 1981 to illustrate the site location for the proposed facility. As noted above, the following sensitive receptors are located on the Century Villages at Cabrillo campus and are not captured on this map: Long Beach Unified School District’s Bethune Transition Center, Comprehensive Child Development, Los Angeles Habilitation House; Oasis Community Center; PATH Ventures, Catholic Charities of Los Angeles, Project Return Peer Support Network’s Hacienda of Hope and Hopewell, School on Wheels, The Children’s Clinic, Harbor Interfaith Services, VA’s Primary Care Outpatient Clinic, the VA’s Veteran’s Village Recovery Center, US VETS, and others. These programs provide a range of critical on-site services to our residential community and represent thousands of unduplicated visits per year. Unfortunately all are mislabeled as a “Naval Reservation Area,” a designation that hasn’t been in effect for decades. In short, the map severely mislabels and underrepresents these sensitive receptors. Without an accurate assessment of neighboring uses and populations, the DEIR’s impacts have not been fully analyzed and are fundamentally flawed.

G1-76.2

**Response G1-76.2**

Sensitive receptors were appropriately evaluated in the HRA and the LST analyses.

While Figure 1 of Appendix B-2 of the DEIR (page B-2-13), used the most recent 1981 USGS topographic map as the base map, the area labeled “U.S. Naval Reservation” was treated as a residential area in both the LST and HRA modeling. Residential and sensitive receptors, such as schools, are evaluated using the same criteria. The 76 individual sensitive receptors included in Table 6 in Appendix B-4 of the DEIR (pages B-4-25 and B-4-26) were compiled using a search of publicly available databases. While not all sensitive receptors listed in the comment are included in Table 6, the area where the sensitive receptors are located was evaluated as a residential area. The maximum carcinogenic risk for a residential location is west of the Refinery and the sensitive receptors listed in the comment are east of the Refinery.

As shown in Figure 76.2-1, the receptor grid used for both the HRA (DEIR page B-4-27) and the LST analysis (DEIR page B-3-279) encompass all valid receptors within 3,500 meters of the Refinery, and is a visual representation of all the receptors that were analyzed for LST and HRA. Valid receptors include all receptors not located in the Refinery or on roads and other transportation thoroughways. While all the sensitive receptors may not be directly named in the DEIR, all sensitive receptors within 3,500 meters of the Refinery were evaluated for LST analysis and HRA. As shown in Figure 76.2-1, sensitive receptors were included in the vicinity of the receptors mentioned in the comment.



APPENDIX G1: RESPONSE TO COMMENTS

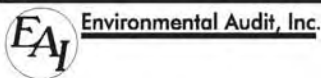
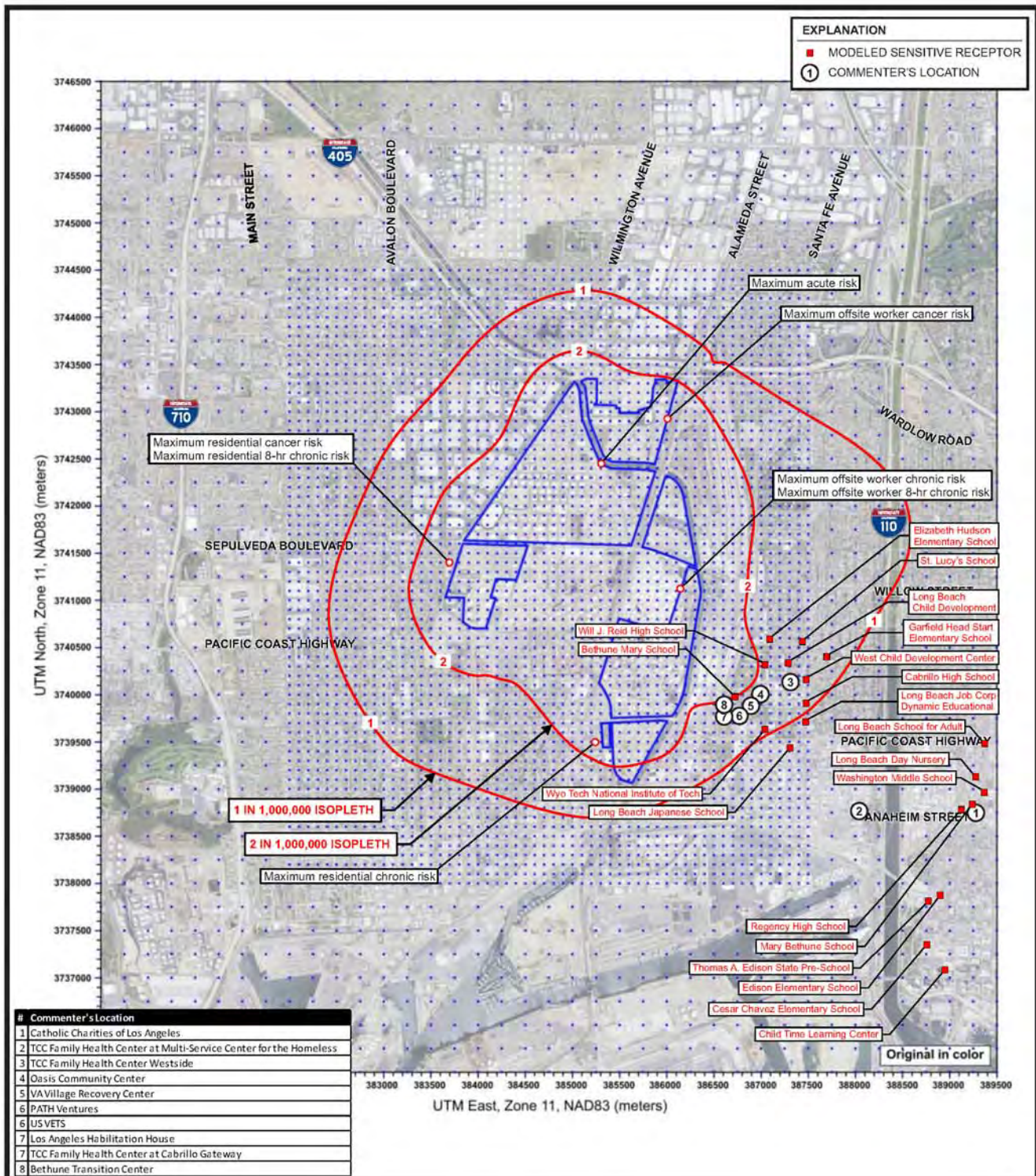


FIGURE 76.2-1  
TESORO LOS ANGELES REFINERY  
MODELING GRID, SENSITIVE RECEPTORS, AND RISK ISOPLETH CONTOURS



**Comment G1-76.3**

Hazard Impact

The DEIR and the Title V Permit fail to recognize Tesoro's published plans to bring dangerous North Dakota Bakken crude oil by rail to the Tesoro Savage Vancouver Washington ship terminal, then by ship to the Los Angeles refinery. This crude oil is particularly explosive as evidenced by recent accidents. North Dakota Bakken crude contains high levels of volatile, toxic air contaminants which the DEIR needs to evaluate. In addition, the LARIC project could also bring extreme Canadian tar sands crude oil to the refinery through the same Tesoro Savage ship terminal. These two crude oils cause increased greenhouse gases and harms to air, land, and water during extraction, and add explosion risks in storage and in refineries. The DEIR fails to contemplate these crude sources and related impacts and hazards. Further, the DEIR and Title V permit fail to consider air emissions from flaring during startup, shutdown, and maintenance, other air emissions sources, and fail to set permit conditions that would prevent these emissions.

Accordingly, the hazards of the LARIC operation must be more completely analyzed. And subsequent to that more thorough analysis, the mitigation measures should be re-evaluated.

G1-76.3

**Response G1-76.3**

As described in Section 4.1.2.5 of the DEIR and Master Response 8, the Vancouver Energy Project is wholly independent from the proposed project and is undergoing separate environmental review by the Washington State EFSEC. That Review includes evaluation of transportation hazards. Additionally, as described in Master Response 8, the Final EIS has not yet been issued for the Vancouver Energy Project, and the project has not been approved.

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery is currently processing a blend of various crude oils and will continue to do so with or without the proposed project. The proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery, except to the extent that the permit revisions to the DCU H-100 heater will allow a slightly heavier crude oil blend to be processed.

The DEIR has analyzed the potential increase in crude oil processing of up to 6,000 bbl/day associated with the modification of the DCU H-100 heater permit description. The increase in crude oil processing rate is not related to any specific crude oil source. Master Response 4 explains that the Refinery's sources of crude oils have and will continue to vary with or without the proposed project. By using worst-case crude oil properties (see Response G1-78.157), the DEIR fully analyzed the potential impacts associated with storing various crude oils in the new and replacement storage tanks and with transferring various crude oils via the associated piping. There would be no additional impacts, beyond those analyzed in the DEIR, for the new and replacement storage tanks if different light or heavy crude oil is processed at the Refinery (see Section 4.2.2.2 of the FEIR). The proposed project does not facilitate or encourage sourcing crude oil from any particular location. In other words, the improved offloading efficiency provides a benefit regardless of the type of crude oil transported by marine vessel.

Statements made by Tesoro regarding sourcing "advantaged crude oils" as used by Tesoro, including Bakken crude oil, are typically made with regard to its West Coast system, which

includes the Kenai Refinery in Alaska, the Anacortes Refinery in Washington, and the two California refineries in Martinez and Los Angeles<sup>112</sup>, not specifically the Los Angeles Refinery.

The Refinery already purchases, stores, and processes Bakken and other light crude oils with similar RVPs. Light and heavy crude oil is currently delivered, stored, and processed at the Refinery and will continue to be delivered, stored, and processed with or without the proposed project. The impact analysis in the DEIR accounts for the variety of crude oils that have been and will be handled by the Refinery. For example, the TAC concentrations of crude oils in storage tanks associated with the proposed project were based on a worst-case hybrid analysis of the toxic content of the crude oils currently and potentially processed at the Refinery, including Bakken and heavy Canadian crude oil. The hybrid TAC speciation was prepared by selecting the highest concentration of each toxic compound from the entire speciated data set of all the crude oils analyzed.

Additionally, Master Response 4 explains that the proposed project does not enable the Refinery to process a significantly different or additional crude oil blend, such as a blend containing predominantly Bakken crude oil or Canadian Tar Sands crude oil.

There have been previous volatility issues associated with the transport of Bakken crude oil. However, regulations have since been adopted that require a reduction in volatility of Bakken crude oil that is transported. For example, on December 9, 2014, the Industrial Commission of North Dakota issued Order 25417 regarding conditioning of Bakken crude oil and limiting the RVP of crude oil provided for transport to 13.7 RVP. Thus, Bakken crude oil transported to the West Coast will be pipeline quality (i.e., qualified for safe transport) and will not have as high a vapor pressure as the Bakken crude oil produced at the wellhead. As with other U. S. crude oil production operations, the order adopted by the State of North Dakota will require that crude oil production facilities remove a significant portion of the light ends (ethane, propane, butane and pentane) prior to offering the crude oil for shipment to refineries for processing.

Because of Bakken crude oil's purported volatility, concerns were raised in the media as to whether Bakken crude oil was properly classified as a Class 3 hazardous material under U.S. DOT regulations. A Class 3 hazardous material is generally a flammable or combustible liquid that does not meet the regulatory classification requirements for other hazardous characteristics, such as toxicity, corrosivity, radioactivity or explosiveness. However, those concerns have since been resolved by repeated analysis and testing that demonstrates Bakken crude oil to be a Class 3 hazardous material, similar to other light sweet crude oils. After considering the information, the PHMSA Deputy Administrator testified to Congress that Bakken crude oil is accurately

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<sup>112</sup> The reference to the "West Coast system" that appears in Tesoro's corporate presentations and statements is a term that is used with varying meanings based on the context of the presentation or statement. Analyst day and earning statements presentations are given to an audience that routinely participates in the presentations and is familiar with Tesoro's corporate structure and financial performance, as such, some of the references are not as explicit as would be to an uninformed audience. At times, it refers to Tesoro's four west coast refineries, but it can also refer to those four refineries as well as Tesoro Logistics or distribution system to third-party clients on the west coast. Thus, awareness of the context surrounding the use of this phrase is always necessary to understand the speaker's intended meaning, but the phrase is not used to refer only to the Los Angeles Refinery in isolation.

classified as a Hazard Class 3 Flammable Liquid.<sup>113</sup> This is consistent with the sampling and testing Tesoro has completed on Bakken crude oil.

As explained in subsequent responses, which are listed in Table 78-94.1, Bakken and heavy Canadian crude oils are similar to other light and heavy crude oils currently processed by the Refinery. As described in Master Response 4 and Response G1-78.150, in the future, as now, any Bakken or heavy Canadian crude oils processed would have to be combined with other crude oils to create a crude oil blend that matches the Refinery's processing capabilities and permit limitations. This is what has occurred with Bakken, heavy Canadian, and many other heavy and light crude oils that were utilized in the baseline period, and is what will continue after implementation of the proposed project. It is correct to say that Tesoro makes ongoing efforts to provide "advantaged crude oil", as that term is used by Tesoro (i.e., any economically advantaged crude oil capable of being processed at each of Tesoro's refineries). Providing advantaged crude oil to Tesoro refineries, including the Los Angeles Refinery, is occurring independent of the proposed project. Any increased use of Bakken or heavy Canadian crude oils, or any other specific crude oils, would not be caused by the proposed project. The proposed project's impacts were analyzed in detail using worst-case assumptions (e.g., the maximum vapor pressure of crude oil allowable by SCAQMD rules), which accounts for any impacts from increased use of Bakken or heavy Canadian crude oil. Response G1-78.111 specifically addresses crude oil corrosivity.

Responses G1-81.65 and G1-81.67 explain that the DEIR does not need to analyze the environmental impacts from crude oil production because the proposed project will not cause any changes to that industry.

The FEIR fully analyzed the potential impacts of the proposed project with respect to GHG emissions in Section 5.2.2.3 and hazards in Section 4.3.2.

The proposed project will not increase flaring emissions. Part of the piping associated with unit modifications includes installation of new pressure relief valves that will tie into the various existing Refinery flare gas recovery systems and flares. Master Response 15 explains the operation of the flare gas recovery system and flares. Under normal operating conditions, pressure relief valves vent to the flare gas recovery systems. The pressure relief valves allow gases to vent to the flares, which are safety equipment, during emergency conditions when the flare gas recovery system capacity is exceeded. There will be no routine venting to the flare system or the flare gas recovery systems from any of the modifications. As explained in Master Response 15 and Response G1-78.207, the number of pressure relief valves tied in to the flare systems is not indicative of flaring emissions. The proposed project will not increase flaring with the installation of new or modified process units because flaring from normal operations is prohibited by SCAQMD Rule 1118.

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<sup>113</sup> Written statement of Timothy P. Butters Before the Subcommittees on Energy and Oversight Committee on Science, Space and Technology, U.S. House of Representatives at page 12 (Sept. 9, 2014).



## APPENDIX G1: RESPONSE TO COMMENTS

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As explained in Master Response 15 and Response G1-78.207, the amount (hours) of flaring and emissions from flaring have decreased since the additional requirements in SCAQMD Rule 1118 were implemented.

As described in Master Response 15, the Refinery strives for startups and shutdowns without flaring. In any event, there are no new process units associated with the proposed project that would be expected to flare during startup or shutdown. No additional permit conditions are needed to control startup and shutdown emissions.

Emission changes as a result of the proposed project have been fully analyzed and are described in Section 4.2 of the DEIR. An emissions summary can be found on pages 4-16 through 4-18 in Table 4.2-4. Further, the Title V permit limits will be equal to or more restrictive than emissions analyzed in the DEIR.

The comment also refers to “other air emission increases” that were not accounted for in the DEIR and the Title V permit. The comment lacks specificity. Without further detail regarding these other air emissions, a specific response cannot be provided.

### Comment G1-76.4

#### Sensitive Receptors

As noted above, the DEIR severely underrepresents the number of sensitive receptors in the immediate vicinity of the LARIC project. The DEIR states:

*“Noise sensitive receptors or receivers... 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 report goes on to list the “closest noise sensitive receptor” but does an inadequate job of listing all the noise sensitive receptors that will be impacted, including, again, the Villages at Cabrillo, a mere 2,000 feet from the proposed facility.

This deficiency is most blatant in the Health Risk Assessment (Appendix B-4) which not fully identify the sensitive receptors located at the Villages at Cabrillo. Further, the Health Risk Assessment performed under the Air Quality Analysis is devoid of a full list of sensitive receptors. This is a requirement for any sensitive receptor within six kilometers of the proposed facility. The Health Risk Assessment states that:

*Sensitive receptor locations (schools, day care facilities, hospitals, and convalescent homes) were obtained via an internet search and the Google Maps database. The sensitive receptors used in the project analysis are listed in Table 6.*

Given the adjacencies between CVC and Tesoro’s Wilmington operation and the long working relationship between the two organizations it is perplexing that the Health Risk Assessment could so blatantly overlook the sensitive receptors residing at, or being served at, the Villages at Cabrillo. Without a full accounting of the impacts on sensitive receptors, the Health Risk Assessments and larger air quality analysis are fundamentally flawed and deficient.

G1-76.4

### Response G1-76.4

Section 4.5 of the DEIR summarizes the Noise Impact Assessment (see Appendix D). The Noise Impact Assessment included a noise survey that was conducted in the residential areas surrounding the Refinery. It is not necessary to monitor every location to fully assess noise



impacts. Because noise diminishes rapidly with distance, data was gathered at representative sensitive receptors outside the Refinery in the vicinity of noise generating sources. It should be noted that one of the noise monitoring stations (see page D-12) was located adjacent to the Villages at Cabrillo (at Merimac Avenue and West Willard Street). Sufficient data was gathered to run the noise modeling software (SoundPLAN). The overall change in noise levels were found to be 0.9 dBA, which is less than the significance threshold of 3.0 dBA. Therefore, the potential noise impacts from the proposed project are considered less than significant.

As explained in Response G1-76.2, and in Figure 76.2-1 the sensitive receptors may not all be specifically named; however, all sensitive receptors within 3,500 meters of the Refinery were evaluated in the HRA. The HRA evaluated health risks from carcinogens and projected the incremental risk on a grid over the residential area in the vicinity of the Refinery. The HRA identifies the maximum worker and residential receptors, including all sensitive receptors within the receptor grid. The comment references an uncited receptor grid requirement of 6 kilometers (6,000 meters). However, the 3,500 meters used in the DEIR HRA adequately determines the maximum impact locations because the one in one million isopleth has been delineated, as required by OEHHA and SCAQMD HRA guidance. Therefore, modeling at greater distance is not necessary.

**Comment G1-76.5**

CVC has concerns about the prolonged four (4) year construction period of the LARIC project and its impacts on our community.

*"... 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. (allowing 30 minutes for lunch) five days per week. During Refinery turnaround periods (when some of the Refinery Units are shutdown), 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. seven days per week" (pg. 2-51).*

*"The proposed project's construction emissions exceed the applicable significance thresholds for VOC, and NOx (see Table 4.2-2)*

This extended construction activity represents a significant burden for the veterans, families and children residing at the Villages at Cabrillo. Further, the project's construction-related emissions are cumulatively significant when considered in combination with related projects. It is unclear if the mitigation measures proposed will address the considerable impact upon local air quality, traffic, and noise. CVC believes more impact analysis is required.

G1-76.5

G1-76.5  
cont'd.

**Response G1-76.5**

Construction impacts from the proposed project were evaluated based on the peak activity levels over the entire construction period, which is a conservative analysis. The actual construction activity levels will vary throughout the construction period, and the peak levels will only occur for a short time. Construction mitigation measures were imposed to the extent feasible to address air quality and traffic impacts based on the peak levels.

Additionally, the temporary and short-term construction impacts will enable long-term operational emission benefits from the shutdown of the Wilmington Operations FCCU. As

explained in Section 4.2.2.2 of the DEIR, operation of the proposed project will result in regional and local reductions in CO emissions and local reductions of operational NOx, SOx, PM10, and PM2.5 emissions, and, as explained in Section 5.2.2.3 of the FEIR, local GHG emission reductions. The increase in operational VOC emissions associated with the proposed project was found to be less than significant. The proposed project emissions are described in detail in Section 4-2 of the DEIR and are summarized in Table 4.2-4 (see pages 4-16 through 4-18). The proposed project will result in local overall reductions in GHG emissions, as described in Section 5.2 of the FEIR and summarized in Table 5.2-8 (see page 5-26).

Section 4.5.2.1 of the DEIR analyzes construction noise impacts and determines that they will be less than significant.

As described in Response G1-78.258, Tesoro has completed a health risk assessment regarding the diesel particulate emissions from the construction of the proposed project. The health risk assessment for construction emissions determined the construction health risk to be less than significant; 2.9 in one million at the maximum residential receptor location and 2.5 in one million at the maximum worker receptor location. These locations differ from the maximum impact locations of the operational health risk assessment presented in the FEIR in Section 4.2.2.5. Table 78.258-1 and Figure 78.258-1 from Response G1-78.258 summarize the construction, operational and combined health risk results. The combined construction and operational cancer risk and chronic hazard indices for the proposed project are also less than significant.

### Comment G1-76.6

#### Geology and Soils

The DEIR failed to incorporate a seismic or geologic study. This deficiency is a cause for alarm given the sheer volume, length and explosive materials being carrier by proposed pipelines within the context of the site's soil conditions:

*"The pipelines are expected to transport gasoline and gasoline blending components, crude oil, gas oil, butylene, propylene, and liquid petroleum gases. In this EIR, the term "pipelines" refers to all of the proposed pipelines shown in Figure 2-17, primarily pipelines on Tesoro property, but also portions of the pipeline that will be routed in a bundle under the Alameda Corridor and Sepulveda Boulevard. The interconnecting pipelines between the Carson and Wilmington Operations, including the pipeline bundle in the bore, includes approximately 15,000 feet of new 12-inch piping, 30,000 feet of new 10-inch piping and 40,000 feet of new 6-inch and 4-inch piping" (pg. 2-48).*

The proposed expansion for LARIC is an area commonly known as the Long Beach Quadrangle. There is a history of "numerous effects attributed to liquefaction...noted following the 1933 Long Beach earthquake including numerous leaks in gas lines, water mains broken, roads cracked, and displaced pavement" (Barrows, 1974). Part of the Port of Los Angeles is situated in the south-westernmost corner of the Long Beach Quadrangle. During the 1994 Northridge earthquake significant damage occurred to facilities near Berths 121 to 126 and at Pier 300 (Stewart and others, 1994, p. 135). Features that developed at these localities, such as lateral spreading, settlement, and sand boils, manifested liquefaction." These same soil conditions exist at the Villages at Cabrillo and require extensive ground improvement to remediate the effects of liquefaction. For example, pursuant to a geotechnical report, we recently installed 1,331 stone columns 25 deep across a 3 acre site in an effort to stabilize the subgrade for our Anchor Place development, a new 120 unit permanent supportive housing development.

We request that a thorough seismic and geologic study be conducted as a part of the EIR in addition to a thorough vetting of compliance to local building codes. Given the preponderance of above ground pipelines carrying corrosive and explosive materials for long distances this is an enormous cause for concern.

G1-76.6

### Response G1-76.6

It is important to note that the design standards used for the proposed project pipelines meet and exceed current pipeline standards (see DEIR Section 2.7.3.1). The proposed project pipelines are designed in accordance with: American Lifeline Alliance design criteria for earthquake interaction<sup>114</sup>, American Society for Mechanical Engineers Standard B 31.4, and 49 CFR Section 193. A geotechnical review of the site was performed and verified that the pipeline will not cross or approach any State identified earthquake faults that could damage the pipelines. As explained in Section 4.10.6 of the DEIR, 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 (see Appendix A, pages A-66 and A-67 of the DEIR). The general area is underlain with alluvial type soils with a high ground water table that could liquefy during a seismic event. As long as liquefied soils do not flow, they are not a hazard to the pipelines. Because the proposed pipelines do not cross or run near a change in elevation, the soils could not become unstable and flow in a direction that would involve the pipelines. Therefore, no significant adverse impacts to the proposed project facilities are expected from seismically-induced ground rupture, and no additional seismic or geological study is necessary.

Further, the new and modified equipment must be designed to comply with the California Building Code requirements since the proposed project is located in a seismically active area. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings and structures from failure during earthquakes.

The new and modified equipment at the Refinery will require building permits, as applicable, for all new structures associated with the proposed project from the City of Los Angeles and the City of Carson. The 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 proposed project will be required to comply with the California Building Codes, including those addressing seismic effects.

It should be noted that existing potential earthquake hazard conditions at the Port of Los Angeles or the Villages at Cabrillo are unrelated to the proposed project because the proposed project does not include modifications to those facilities.

The proposed project has been fully analyzed for hazard impacts, including those associated with pipelines, storage tanks, and process units regardless of the cause of release (e.g., human error, equipment failure, sabotage, terrorism, natural disaster, or civil uprising). Section 4.3 of the FEIR found that hazards associated with the Naphtha Isomerization Unit, new crude tanks, and interconnecting pipelines are potentially significant due to hazards associated with worst-case

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<sup>114</sup> American Lifeline Alliance design criteria for earthquake interaction, [http://www.americanlifelinesalliance.com/Products\\_new3.html](http://www.americanlifelinesalliance.com/Products_new3.html), and <http://www.americanlifelinesalliance.com/pdf/Update061305.pdf>.

## APPENDIX G1: RESPONSE TO COMMENTS

release scenarios. A Worst-Case Consequence Analysis is presented in Appendix C and explained in Section 4.3 of the FEIR. See Master Response 9 for additional information regarding the hazards analyses of pipelines and storage tanks.

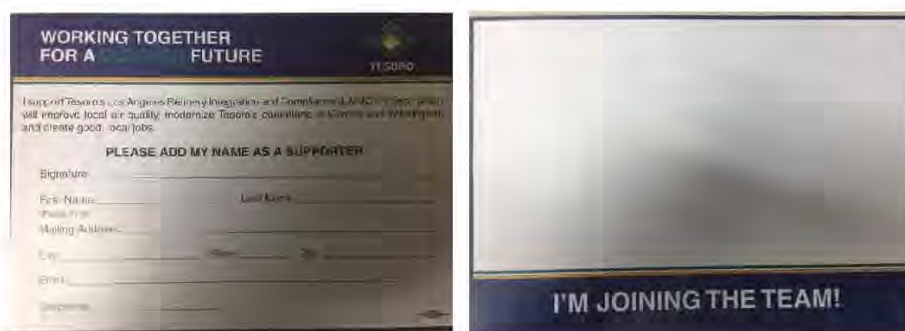
### Comment G1-76.7

#### Tesoro Community Meeting held at CVC

On Thursday April 14, 2016 CVC assisted Tesoro by hosting a community meeting in an effort to educate the broader community about the LARIC project, including mitigation and disaster recovery planning efforts. CVC assisted with outreach and used its considerable influence in the community to attract neighbors and stakeholders throughout the region. The event was structured like a community fair with informational tables staffed by Tesoro representatives. This structure made it difficult for community members of various education and capacity levels to understand the information and ask questions. Certain attendees observed the practice of being passed off from one Tesoro representative to another with limited and confusing information being presented and many questions left unanswered.

Beyond that, in a tactic that can only be described as grossly deceptive, attendees were asked to complete a Tesoro “comment” card in order to receive a voucher. In turn, vouchers could be redeemed for tacos which Tesoro provided. One might be able to justify this practice as slightly less than manipulative were the card were an actual comment card. However, as noted in the photo below the card was an actual “Support card” for Tesoro’s LARIC project. The card even failed to have room for comment. Given CVC’s vulnerable population, this was a disingenuous tactic that served to raise suspicion about the motives behind the event and the overall objectives of Tesoro. Further, it creates the false impression that the 60 “support” cards received are an accurate reflection of community support for the project.

G1-76.7



### Response G1-76.7

Independent of the SCAQMD, Tesoro offered and provided community outreach to over 100 entities including public agencies, community organizations, neighborhood organizations, business associations, and other interested parties to describe the scope of the proposed project and environmental effects of the proposed project. The community meetings were held on April 4, 11, and 14, 2016 in Carson, Wilmington, and Long Beach, respectively. Tesoro has informed the SCAQMD that printed information was distributed at each event in multiple languages and independent Spanish-speaking translators were on-hand to assist residents as needed. To thank attendees for their time, Tesoro offered a small meal at no cost. Tesoro reports that at each event, roughly 200 meals were served, while approximately 30 support statements were collected. In any event, the SCAQMD was not involved in the Tesoro-sponsored outreach

activities. The DEIR reflects the independent judgement of the SCAQMD, as required by CEQA Guidelines § 15084.

**Comment G1-76.8**

In closing, CVC has serious concerns about certain significant, unavoidable impacts, including that the proposed LARIC project will impose on its community and other neighboring disadvantaged communities. As noted above, the DEIR is deficient in many respects, in particular in its underrepresentation of sensitive receptors at the Villages at Cabrillo and beyond.

Given these expansive impacts and the DEIR's failure to fully acknowledge surrounding land use and sensitive receptors, the report is deficient and its proposed mitigation is inadequate. The DEIR is fundamentally flawed and should be revised to more completely evaluate alternatives, impacts, and mitigations.

Thank for the opportunity to provide comments on the DEIR for the LARIC Project. We look forward to reviewing the responses to this and other comments.

G1-76.8

**Response G1-76.8**

Neither the CEQA Statutes nor Guidelines require an analysis of environmental justice impacts. The SCAQMD, however, has a strong record of addressing environmental justice issues since the SCAQMD's Environmental Justice program began in 1997. Since that time, the SCAQMD has instituted a number of community initiatives to help improve air quality for low income residents and residents of color in the Basin. The programs and initiatives have been continually reviewed and updated. As a result, the SCAQMD's Environmental Justice program goes beyond a single project, and encompasses a unified regional approach to reducing impacts to the Basin's most impacted communities. Master Response 14 addresses environmental justice regarding the proposed project.

Chapter 6 of the DEIR discusses alternatives to the proposed project in detail, a summary of which can be found on page 6-54. The DEIR found that while several of the alternatives discussed meet many of the project objectives, none of the project alternatives would eliminate the potentially significant adverse construction air quality and hazard impacts except Alternative 1, the No Project Alternative. As a result, when balancing environmental impacts with achieving project objectives, the proposed project was the preferred choice as it would most effectively meet all project objectives.

The DEIR fully analyzed the proposed project's potential impacts and the comment does not provide any new information of environmental impacts that was not analyzed or that changes the significance conclusions made in the DEIR. Therefore, no revision of the DEIR is necessary under CEQA.

Comment Letter No. G1-77

To Ms. Jillian Wong  
c/o Office of Planning Rule Development  
and Area Sources/CEQA  
(Via facsimile to (909) 396-3324  
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and to  
Mr. Danny Luong  
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South Coast Air Quality Management District



Comments on the Draft Environmental Impact Report (DEIR) and the Title V Permit for the Tesoro Los Angeles Refinery Integration and Compliance Project (LARIC)

June 10, 2016

Dear Ms. Wong and Mr. Luong,

The Draft Environmental Impact Report (DEIR) and the Title V Permit for the Tesoro LARIC Project contain inaccurate and incomplete information, and do not consider reasonable alternatives.

G1-77.1

Section 4.3.2.5.2 of the DEIR states that the project would require the import of up to 10 railcars per day of Liquefied Petroleum Gas (LPG) to the newly combined refinery, from any of several sources hundreds of miles away. The DEIR should have evaluated an alternative to avoid the hazardous transport of this flammable volatile mixture of LPG. However, avoiding the long-distance transportation of LPG should by no means be used to justify storage, purchase, or transportation of LPG to or from the Rancho LPG facility in San Pedro. Response 6-6, responding to the Sierra Club letter on the Tesoro NOP/IS (Appendix A of this DEIR) states "Please note that Tesoro does not own Rancho LPG nor does Tesoro own any of the LPG stored at the Rancho LPG facility. As previously noted, the proposed project does not include storage of any hydrocarbon products at the Rancho LPG facility." If Tesoro has any involvement with the Rancho LPG facility, then we reiterate our comments to the NOP, referenced in Appendix A of this DEIR.

G1-77.2

Section 4.4.2.1.2 of the DEIR states that there will be an increased water usage of about 190,000 gallons of water per day. This is on top of present water consumption of about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water. The DEIR should have evaluated an alternative to minimize consumption of fresh/potable water by increasing use of reclaimed water to the maximum extent possible. There are wastewater treatment plants nearby which could be a source of reclaimed water. The Sanitation Districts of Los Angeles County in particular have treated wastewater that is not being consumed. In this time of drought, consumption of fresh/potable water should be minimized.

G1-77.3



The DEIR and the Title V Permit (which sets permit limits) are inaccurate. They ignore Tesoro's own published plans to bring dangerous N. Dakota Bakken crude oil by rail to the Tesoro Savage Vancouver Washington ship terminal, then by ship to the Los Angeles refinery. This crude oil is particularly explosive. A Bakken crude oil rail accident blew up an entire town in 2013, killing many people. Just last Saturday another crude oil train carrying this material exploded, requiring evacuation of an elementary school, and spilling oil into the Columbia River. Bakken crude also contains high levels of volatile and toxic air contaminants and the DEIR should evaluate this threat. Tesoro's Project could also bring extreme Canadian tar sands crude oil to the LA refinery through the same Tesoro Savage ship terminal. These two crude oils cause increased greenhouse gases and harm to air, land, and water during extraction, and add explosion risks in storage and in refineries, all of which need to be evaluated and compared to alternatives.

G1-77.4

Section 4.1.2.1 of the DEIR states that there will be up to an increase of up to 6,000 BBL/day of crude oil throughput. The DEIR does not disclose the increase in greenhouse gases produced the refining process, nor by combustion by end users as a result of this increase. In addition, it does not disclose the greenhouse gases produced the refining process, nor by combustion by end users for the present output of the refinery. The DEIR does not disclose the cumulative impact of increased global warming as a result of the refining process and combustion of refined petroleum products by end users, over the projected lifetime of the proposed project.

G1-77.5

/s

Suvan Geer  
Co-Chair  
Angeles Chapter Climate Change Committee  
Sierra Club

**Response to Comment Letter No. G1-77**

**Sierra Club**

**Comment G1-77.1**

The Draft Environmental Impact Report (DEIR) and the Title V Permit for the Tesoro LARIC Project contain inaccurate and incomplete information, and do not consider reasonable alternatives.

G1-77.1

**Response G1-77.1**

This comment summarizes the comment's assertion that the DEIR and Title V Permit contain inaccurate and incomplete information and fails to consider reasonable alternatives. The comment gives no specific evidence as to deficiencies in the proposed project, the DEIR or the Title V permit. Therefore, no response is necessary under CEQA.

**Comment G1-77.2**

Section 4.3.2.5.2 of the DEIR states that the project would require the import of up to 10 railcars per day of Liquefied Petroleum Gas (LPG) to the newly combined refinery, from any of several sources hundreds of miles away. The DEIR should have evaluated an alternative to avoid the hazardous transport of this flammable volatile mixture of LPG. However, avoiding the long-distance transportation of LPG should by no means be used to justify storage, purchase, or transportation of LPG to or from the Rancho LPG facility in San Pedro. Response 6-6, responding to the Sierra Club letter on the Tesoro NOP/IS (Appendix A of this DEIR) states "Please note that Tesoro does not own Rancho LPG nor does Tesoro own any of the LPG stored at the Rancho LPG facility. As previously noted, the proposed project does not include storage of any hydrocarbon products at the Rancho LPG facility." If Tesoro has any involvement with the Rancho LPG facility, then we reiterate our comments to the NOP, referenced in Appendix A of this DEIR.

G1-77.2

**Response G1-77.2**

The potential hazard impacts of the proposed project have been fully analyzed, including hazards related to explosive materials (see FEIR Section 4.3 pages 4-45 through 4-69 and Master Response 9). The Refinery currently receives LPG railcar deliveries. The proposed project will not increase the number of deliveries. The additional ten railcars associated with the proposed project will be added to existing trains. The potential risks associated with rail transport were analyzed in FEIR Section 4.3.2.5.2. The Worst-Case Consequence Analysis for the proposed project carefully evaluated the proposed modifications to existing equipment and proposed new units (see FEIR Appendix C).

As explained in Master Response 10, the Rancho LPG facility is an existing facility that is not owned or operated by Tesoro. Additionally, Tesoro does not lease tankage at Rancho LPG. Tesoro regularly sells LPG on the open market and Rancho LPG is a customer. However, none of the LPG stored at the Rancho LPG facility in San Pedro is owned by Tesoro. It should be noted that the proposed project will reduce the excess LPG available for third-party sales (see Master Response 10).



**APPENDIX G1: RESPONSE TO COMMENTS**

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Further, the Rancho LPG facility operates independently of, and is not part of, the proposed project. Thus, comments regarding risks related to the Rancho Facility do not raise issues relating to the proposed project or the DEIR and no response is necessary under CEQA.

Chapter 6 of the DEIR discusses alternatives to the proposed project in detail, a summary of which can be found on page 6-54. The DEIR found that while several of the alternatives discussed meet many of the project objectives, none of the project alternatives would eliminate the potentially significant adverse construction air quality and hazard impacts except Alternative 1, the No Project Alternative. As a result, when balancing environmental impacts with achieving project objectives, the proposed project was the preferred choice as it would most effectively meet all project objectives.

The comment suggests that an alternative be considered to avoid transporting LPG to the Refinery, but does not specify an alternative for consideration. It should be noted that there are no significant impacts of increased hazards associated with increased transportation of LPG. Therefore, no mitigation or analysis of alternatives is required under CEQA. There are no known alternatives for supplying LPG (Alkylation Unit feedstock) that is required to meet the proposed project objective of maintaining the Refinery's overall transportation fuels production rates.

**Comment G1-77.3**

Section 4.4.2.1.2 of the DEIR states that there will be an increased water usage of about 190,000 gallons of water per day. This is on top of present water consumption of about 13.8 million gpd of fresh/potable water and about 4.5 million gpd of reclaimed water. The DEIR should have evaluated an alternative to minimize consumption of fresh/potable water by increasing use of reclaimed water to the maximum extent possible. There are wastewater treatment plants nearby which could be a source of reclaimed water. The Sanitation Districts of Los Angeles County in particular have treated wastewater that is not being consumed. In this time of drought, consumption of fresh/potable water should be minimized.

G1-77.3

**Response G1-77.3**

The total water demand from the proposed project is less than the SCAQMD's CEQA significance threshold (see DEIR Section 4.4.2.1.2), and therefore, no mitigation is required under CEQA. The comment accurately states the proposed project water demand found in Section 4.4.2.1.2 of the DEIR. As explained in DEIR Section 4.4.2.1.2 in DEIR, the incremental increase in water demand for the proposed project is expected to be produced by Tesoro's privately-owned wells.

**Comment G1-77.4**

The DEIR and the Title V Permit (which sets permit limits) are inaccurate. They ignore Tesoro's own published plans to bring dangerous N. Dakota Bakken crude oil by rail to the Tesoro Savage Vancouver Washington ship terminal, then by ship to the Los Angeles refinery. This crude oil is particularly explosive. A Bakken crude oil rail accident blew up an entire town in 2013, killing many people. Just last Saturday another crude oil train carrying this material exploded, requiring evacuation of an elementary school, and spilling oil into the Columbia River. Bakken crude also contains high levels of volatile and toxic air contaminants and the DEIR should evaluate this threat. Tesoro's Project could also bring extreme Canadian tar sands crude oil to the L.A refinery through the same Tesoro Savage ship terminal. These two crude oils cause increased greenhouse gases and harm to air, land, and water during extraction, and add explosion risks in storage and in refineries, all of which need to be evaluated and compared to alternatives.

G1-77.4

**Response G1-77.4**

As explained in Section 4.1.2.5 of the DEIR and Master Response 8, the Vancouver Energy Project is wholly independent from the proposed project and is undergoing separate environmental review by the Washington State EFSEC. That review includes evaluation of transportation hazards. Additionally, as described in Master Response 8, the Final EIS has not yet been issued for the Vancouver Energy Project, and the project has not been approved.

The proposed project is not designed to, and will not in fact, facilitate a switch to Bakken, heavy Canadian Crude, or any other specific crude oil. In addition, as explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery is currently processing a blend of various crude oils and will continue to do so with or without the proposed project. The proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery, except to the extent that the permit revisions to the DCU H-100 heater will allow a slightly heavier crude oil blend to be processed.

The DEIR analyzed the potential increase in crude oil processing of up to 6,000 bbl/day associated with the modification of the DCU H-100 heater permit description. The increase in crude oil processing rate is not related to any specific crude oil source. Master Response 4 explains that the Refinery's sources of crude oils have and will continue to vary with or without the proposed project. By using worst-case crude oil properties (see Response G1-78.157), the DEIR fully analyzed the potential impacts associated with storing various crude oils in the new and replacement storage tanks and with transferring various crude oils via the associated piping. There would be no additional impacts, beyond those analyzed in the DEIR, for the new and replacement storage tanks if different light or heavy crude oil is processed at the Refinery (see Section 4.2.2.2 of the FEIR).

Light and heavy crude oil is currently delivered, stored, and processed at the Refinery and will continue to be delivered, stored, and processed with or without the proposed project. The impact analysis in the DEIR accounts for the variety of crude oils that have been and will be handled by the Refinery. For example, the TAC concentrations of crude oils in storage tanks associated with the proposed project were based on a worst-case hybrid analysis of the toxic content of the crude oils currently and potentially processed at the Refinery, including Bakken and heavy Canadian crude oil. The hybrid TAC speciation was prepared by selecting the highest concentration of each toxic compound from the entire speciated data set of all the crude oils analyzed.

There have been previous volatility issues associated with the transport of Bakken crude oil. However, regulations have since been adopted that require a reduction in volatility of Bakken crude oil that is transported. For example, in December 2014, the Industrial Commission of North Dakota issued an order regarding conditioning of Bakken crude oil and limiting the RVP of crude oil provided for transport to 13.7 RVP. Thus, Bakken crude oil transported to the West Coast will be pipeline quality (i.e., qualified for safe transport) and will not have as high a vapor pressure as the Bakken crude oil produced at the wellhead. As with other U. S. crude oil production operations, the order adopted by the State of North Dakota will require that crude oil production facilities remove a significant portion of the light ends (ethane, propane, butane and pentane) prior to offering the crude oil for shipment to refineries for processing.

Because of Bakken crude oil's purported volatility, concerns were raised in the media as to whether Bakken crude oil was properly classified as a Class 3 hazardous material under U.S. DOT regulations. A Class 3 hazardous material is generally a flammable or combustible liquid that does not meet the regulatory classification requirements for other hazardous characteristics, such as toxicity, corrosivity, radioactivity or explosiveness. However, those concerns have since been resolved by repeated analysis and testing that demonstrates Bakken crude oil to be a Class 3 hazardous material, similar to other light sweet crude oils. After considering the information, the PHMSA Deputy Administrator testified to Congress that Bakken crude oil is accurately classified as a Hazard Class 3 Flammable Liquid.<sup>115</sup> This is consistent with the sampling and testing Tesoro has completed on Bakken crude oil. Therefore, Bakken crude oil has properties similar to other light crude oils, and is not classified as explosive.

The proposed project is not designed to, and will not in fact, facilitate a switch to a different blend of crude oil. In addition, as explained in subsequent responses, which are listed in Table 78-94.1, Bakken and heavy Canadian crude oils are similar to other light and heavy crude oils currently processed by the Refinery. As described in Master Response 4 and Response G1-78.150, in the future, as now, any Bakken or heavy Canadian crude oils processed would have to be combined with other crude oils to create a crude oil blend that matches the Refinery's processing capabilities and permit limitations. This is what has occurred with Bakken, heavy Canadian, and many other heavy and light crude oils that were utilized in the baseline period, and is what will continue after implementation of the proposed project. Any increased use of Bakken or heavy Canadian crude oils at the Refinery would not be caused by the proposed project. The proposed project's impacts were analyzed in detail using worst-case assumptions (e.g., the maximum vapor pressure of crude oil allowable by SCAQMD rules), which accounts for any impacts from increased use of Bakken or heavy Canadian crude oil. Response G1-78.111 specifically addresses crude oil corrosivity. Responses G1-81.65 and G1-81.67 address greenhouse gases and crude oil production.

The comment also refers to derailment of a train carrying Bakken crude oil in Mosier, Oregon. As explained in Response G1-81.57, there are no proposed project modifications to bring crude oil by rail to the Refinery. Therefore, the Mosier derailment is not relevant to the DEIR analysis or the proposed project.

Responses G1-81.65 and G1-81.67 explain that the DEIR does not need to analyze the environmental impacts from crude oil production because the proposed project will not cause any changes to that industry.

The FEIR fully analyzed the potential impacts of the proposed project with respect to greenhouse gas emissions in Section 5.2.2.3 and hazards in Section 4.3.2.

Chapter 6 of the DEIR discusses alternatives to the proposed project in detail, a summary of which can be found on page 6-54. The DEIR found that while several of the alternatives discussed meet many of the project objectives, none of the project alternatives would eliminate

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<sup>115</sup> Written statement of Timothy P. Butters Before the Subcommittees on Energy and Oversight Committee on Science, Space and Technology, U.S. House of Representatives at page 12 (Sept. 9, 2014).

the potentially significant adverse construction air quality and hazard impacts except Alternative 1, the No Project Alternative. As a result, when balancing environmental impacts with achieving project objectives, the proposed project was the preferred choice as it would most effectively meet all project objectives.

The comment proposes that the DEIR consider a hybrid alternative which only meets some of the proposed project objectives. As further explained in Response G1-81.121, CEQA only requires consideration of alternatives “which would feasibly attain most of the basic objectives of the project.”<sup>116</sup> An “EIR [i]s not required to analyze the effects of a project that [the proponent] did not propose, or to analyze the effects of an alternative that would not feasibly attain most of the basic objectives of the project.”<sup>117</sup> The Supreme Court has upheld alternatives analysis that did not include any alternatives which would not meet all project objectives because the agency reasoned that all objectives were necessary to achieve the project’s fundamental purpose.<sup>118</sup> It is well-settled that “[a]n EIR need not consider every conceivable alternative to a project or alternatives that are infeasible.”<sup>119</sup>

### Comment G1-77.5

Section 4.1.2.1 of the DEIR states that there will be up to an increase of up to 6,000 BBL/day of crude oil throughput. The DEIR does not disclose the increase in greenhouse gases produced the refining process, nor by combustion by end users as a result of this increase. In addition, it does not disclose the greenhouse gases produced the refining process, nor by combustion by end users for the present output of the refinery. The DEIR does not disclose the cumulative impact of increased global warming as a result of the refining process and combustion of refined petroleum products by end users, over the projected lifetime of the proposed project.

G1-77.5

### Response G1-77.5

The potential 6,000 bbl/day crude oil capacity increase associated with the proposed project is explained in Master Response 6. Section 2.2 of the DEIR lists the objectives of the proposed project. One of the objectives is to make Refinery process modifications that improve efficiency through integration and enable the shutdown of the Wilmington Operations FCCU. The planned process modifications are designed to maintain the overall production capability of transportation fuels while achieving substantial emission reductions onsite and reducing carbon intensity.

The proposed project will result in local reductions of GHG emissions as summarized in Table 5.2-8 on page 5-26. The cumulative impact of GHG emissions is explained in Section 5.2.2.

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<sup>116</sup> CEQA Guidelines, § 15126.6(a).

<sup>117</sup> *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490, 1509 (holding that the EIR did not need to consider a suggested alternative that did not meet the “specific objective of putting vineyards on the site and irrigating them with wastewater resulting from its operations”).

<sup>118</sup> *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1165-1166. (The agency “determined that the four primary project objectives had to be addressed concurrently in an integrated manner if the project was to be successful and therefore feasible . . . Although a lead agency may not give a project’s purpose an artificially narrow definition, a lead agency may structure its EIR alternatives analysis around a reasonable definition of underlying purpose and need not study alternatives that cannot achieve that basic goal.”)

<sup>119</sup> *Bay-Delta*, 43 Cal.4th at 1163.

## APPENDIX G1: RESPONSE TO COMMENTS

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GHG emissions produced by combusting the fuels produced by the Refinery are included in, and regulated by, the AB32 GHG Cap and Trade Program. It should be noted that the proposed project is not expected to increase production of transportation fuels, as described above.

Responses G1-81.65 and G1-81.67 explain that the DEIR does not need to analyze the environmental impacts from crude oil production because the proposed project will not cause any changes to that industry.

Comment Letter No. G1-78

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June 10, 2016

**VIA EMAIL AND OVERNIGHT MAIL**

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**Re: Comments on the Draft Environmental Impact Report  
for the Tesoro Los Angeles Refinery Integration and  
Compliance Project**

Dear Ms. Wong:

We are writing on behalf of Safe Fuel and Energy Resources California (“SAFER California”), Peter Estrada, Leonardo Parra and Nicolas Garcia to provide comments on the Draft Environmental Impact Report (“DEIR”) prepared by the South Coast Air Quality Management District (“Air District”) pursuant to the California Environmental Quality Act (“CEQA”), for the Tesoro Los Angeles Refinery Integration and Compliance Project (“Project”). Tesoro Refining & Marketing Company LLC (“Applicant”) proposes to modify and integrate its Wilmington Operations located at 2101 East Pacific Coast Highway in the City of Los Angeles, and its Carson Operations, located at 2350 East 223<sup>rd</sup> Street in the City of Carson.

G1-78.1

Based on our review of the DEIR, the documents referenced in the DEIR, public records within the Air District’s possession and publicly available information, we conclude that the DEIR is deficient and must be revised and recirculated for public review and comment. Although the DEIR includes various analytical errors, the major defect in the DEIR is that it entirely fails to disclose the implications of the crude slate switch facilitated by the Project. Substantial evidence shows that the Project is designed to achieve maximum flexibility in crude slate to reduce operating costs and maximize profits by refining the cheapest

G1-78.2

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available crude, including Bakken and other similar light crudes, and tar sands and other heavy crudes. The Air District completely fails to acknowledge this in the DEIR and fails to evaluate the impacts from the Project's reasonably foreseeable crude slate changes. The Air District also fails to disclose that the Project's proposed crude storage tank and piping modifications facilitate an increase in delivery of these cost-advantaged crudes to the Los Angeles Refinery. The resulting, reasonably foreseeable throughput increases would cause significant environmental impacts that are not disclosed in the DEIR.

G1-78.2  
cont'd.

Other deficiencies in the DEIR include the Air District's failure to establish the existing environmental setting for the purpose of analyzing impacts on air quality, public health, soils and groundwater. As a result of these defects, and other errors and omissions in the DEIR, the Air District fails to identify and address the Project's significant air quality impacts, impacts from greenhouse gas emissions, cancer risks and other public health impacts, hazards impacts, land use impacts, and impacts to soils and groundwater. These numerous defects, set forth in greater detail in the following paragraphs, are fatal errors. The Air District must prepare a revised DEIR which fully complies with CEQA.

G1-78.3

We prepared these comments with the assistance of technical experts Phyllis Fox, Ph.D., QEP, PE, DEE and Matt Hagemann, P.G., C.Hg. Dr. Fox's and Mr. Hagemann's technical comments and curriculum vitae are attached and hereby submitted to the Air District in addition to the comments in this letter. Therefore, the Air District must respond to the comments of Dr. Fox and Mr. Hagemann separately.

G1-78.4

**I. STATEMENT OF INTEREST**

SAFER California advocates for safe processes at California refineries to protect the health, safety, the standard of life and the economic interests of its members. For this reason, SAFER California has a strong interest in enforcing environmental laws, such as CEQA, which require the disclosure of potential environmental impacts of, and ensure safe operations and processes for, California oil refineries. Failure to adequately address the environmental impacts of crude oil and fuel products transport, refining, storage and distribution processes poses a substantial threat to the environment, worker health, surrounding communities, and the local economy.

G1-78.5

Refineries and fuel storage and distribution facilities are uniquely dangerous and capable of generating significant fires and the emission of hazardous and toxic

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substances that adversely impact air quality, water quality, biological resources and public health and safety. These risks were recognized by the Legislature and Governor when enacting SB 54 (Hancock). Absent adequate disclosure and mitigation of hazardous materials and processes, refinery workers and surrounding communities may be subject to chronic health problems and the risk of bodily injury and death.

Poorly planned refinery and fuel products storage and distribution projects also adversely impact the economic wellbeing of people who perform construction and maintenance work in these facilities and the surrounding communities. Plant shutdowns in the event of accidental release and infrastructure breakdown have caused prolonged work stoppages. Such nuisance conditions and catastrophic events impact local communities and can jeopardize future jobs by making it more difficult and more expensive for businesses to locate and people to live in the area. The participants in SAFER California are also concerned about projects that carry serious environmental risks and public service infrastructure demands without providing countervailing employment and economic benefits to local workers and communities.

G1-78.5  
cont'd.

The members represented by the participants in SAFER California live, work, recreate and raise their families in Los Angeles County, including in or near the City of Carson and the community of Wilmington. Accordingly, these people would be directly affected by the Project's adverse environmental impacts. The members of SAFER California's participating unions may also work on the Project itself. They will, therefore, be first in line to be exposed to any hazardous materials, air contaminants, and other health and safety hazards, that exist onsite.

These comments are also submitted on behalf of individuals who reside and/or work in the Project area, including Peter Estrada, Leonardo Parra and Nicolas Garcia.

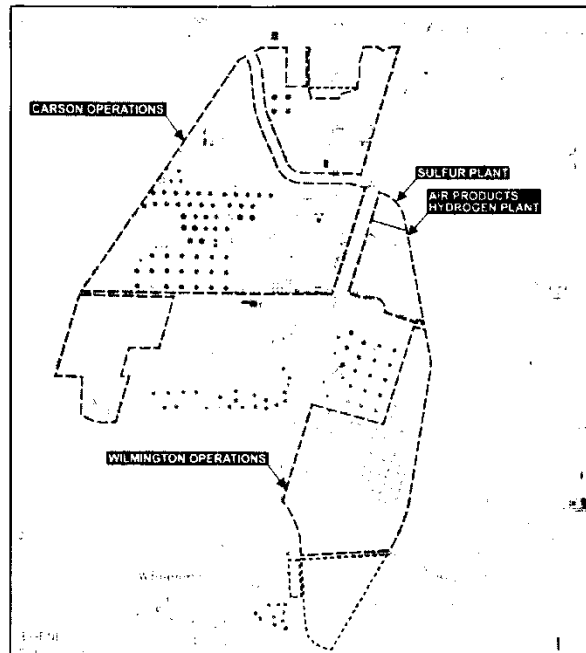
## II. PROJECT BACKGROUND

The Applicant's Los Angeles Refinery, depicted in the figure below, includes two adjacent facilities, the Wilmington Operations and the Carson Operations. The Applicant acquired the Wilmington Operations and the Carson Operations in 2007 and 2013, respectively. The Wilmington Operations are located primarily within the Wilmington community and are within the jurisdiction of the City of Los Angeles. The Carson Operations are located entirely within the City of Carson.

G1-78.6



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G1-78.6  
cont'd.

The Los Angeles Refinery is located approximately three miles northwest of the Port of Long Beach. The Los Angeles Refinery receives crude oil from ships which unload at three Port of Long Beach marine terminals operated by Tesoro Logistics Operations, LLC: Marine Terminal 2 (Berths 76-78), the Long Beach Terminal (berths 84-87) and Marine Terminal 1 (Berth 121).<sup>1</sup> Crude oil is unloaded at the marine terminals and transferred to the Los Angeles Refinery by underground pipelines.

In 2014, the Air District considered the Applicant's proposed Storage Tank Replacement and Modification Project, which included the following modifications to the Wilmington Operations:

- (1) Removing two existing 80,000 barrel ("bbl") fixed-roof petroleum product storage tanks (tanks 80035 and 80036);

G1-78.7

<sup>1</sup> DEIR, p. 2-27.

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- (2) Installing two new 300,000 bbl internal floating roof storage tanks (tanks 300035 and 300036) in the same location as the tanks that are being removed;
- (3) Modifying one existing 80,000 bbl storage tank (tank 80038) to change the type of commodity to be stored in the tank to also include light gas oil and to connect the tank to the existing vapor recovery system in the tank farm;
- (4) Increasing the throughput of an additional 80,000 bbl storage tank (tank 80079) from 350,000 bbl per month (bbl/month) to 500,000 bbl/month;
- (5) Removing 12-inch diameter piping that connects four tanks with Tesoro's marine terminal; and
- (6) Replacing the 12-inch diameter piping with 42-inch diameter piping to connect tanks throughout the tank farm with Tesoro's existing marine terminal pipeline.

The Air District prepared an Initial Study and Negative Declaration ("IS/ND") for the Tesoro Storage Tank Replacement and Modification Project.

G1-78.7  
cont'd.

SAFER California reviewed the IS/ND and submitted comments on it to the Air District.<sup>2</sup> SAFER California's comments showed that the IS/ND failed to satisfy CEQA's requirements. The IS/ND failed to disclose the operational implications of the 1200% increase in crude throughput in the affected tanks from the tank farm piping modifications. SAFER California explained that the increase would allow the tank farm and one of Applicant's marine terminals to increase its throughput, and would facilitate a substantial increase in the delivery of cost-advantaged crudes to the Los Angeles Refinery. SAFER California showed that the resulting, reasonably foreseeable throughput increases at the tank farm and marine terminal would cause significant environmental impacts that were not disclosed in the IS/ND. The IS/ND failed to identify and address significant air quality impacts, cancer risks and hazards impacts. SAFER California also showed that the Air District improperly piecemealed environmental review by failing to analyze the Tesoro Storage Tank Replacement and Modification Project together with

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<sup>2</sup> **Attachment A:** SAFER California Comments on the Draft Negative Declaration and Initial Study for the Tesoro Storage Tank Replacement & Modification Project, June 10, 2014.

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reasonably foreseeable modifications to the Los Angeles Refinery's refining processes. As a result of these numerous defects, SAFER California recommended that the Air District withdraw the IS/ND and prepare an EIR which fully complies with CEQA. In August of 2014, the Air District withdrew the IS/ND for the Tesoro Storage Tank Replacement and Modification Project. The District stated that it would prepare a new CEQA document that includes the Tesoro Storage Tank Replacement and Modification Project and the "Tesoro-BP Refinery Integration Project." In September of 2014, the Air District released a Notice of Preparation of a Draft EIR for the Project.

G1-78.7  
cont'd.

Now, the Applicant proposes to further integrate the Carson and Wilmington Operations by installing interconnecting pipelines "to allow efficient transfer of hydrocarbons between the facilities to allow gasoline blending optimization, process unit feedstock optimization, and increased diesel production."<sup>3</sup> The Project also includes adding a sulfuric acid regeneration plant, a wet jet treater and a propane recovery and treatment facility, and upgrading existing liquefied petroleum gas ("LPG") rail facilities to enable an increase of 4,000 barrel per day of LPG (or 10 railcars per day).<sup>4</sup> In addition, the Project includes constructing six new 500,000 barrel tanks at the Carson Crude Terminal, replacing two 80,000 barrel tanks at the Wilmington Operations with two 300,000 barrel tanks, and installing piping to connect the six new Carson Crude Terminal 500,000 barrel tanks to the Carson Operations and Marine Terminal 1.<sup>5</sup> The two 300,000 barrel tanks at the Wilmington Operations will<sup>6</sup> connect to the Long Beach Terminal.

G1-78.8

**III. THE AIR DISTRICT FAILED TO DISCLOSE TO THE PUBLIC ALL INFORMATION NECESSARY TO FULLY AND MEANINGFULLY EVALUATE THE PROJECT'S ENVIRONMENTAL AND PUBLIC HEALTH AND SAFETY IMPACTS**

As a preliminary matter, the Air District failed to disclose to the public all information necessary to fully and meaningfully evaluate the Project's environmental and public health and safety impacts. Since the Air District's release of the DEIR, we have submitted several requests for records necessary for the public to conduct a complete and accurate review of the Project's public health and safety and environmental impacts.<sup>7</sup> While the Air District provided some

G1-78.9

<sup>3</sup> *Id.*, p. 1-6.

<sup>4</sup> *Id.*, pp. 1-6, 1-18.

<sup>5</sup> *Id.*, p. 1-7.

<sup>6</sup> *Id.*

<sup>7</sup> Request from Cody Elliott for All Documents Referenced in DEIR, March 8, 2016 (SCAQMD form):

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records in response to our requests, the Air District has failed to disclose to the public the following:

- Firing rates and throughputs used to calculate emissions in the DEIR;
- Live Excel spreadsheets used to support the emissions estimates in Appendices A through H of applications 575838, 575876, 578248, 578249, 567644, 567439, 567643, 567645, 567646, 567647, 567648, 567649, 575837, 575839, 575940, 575841, 575874, 575875, 567619, 575873 and 567642;
- Attachments E and F to applications 567645, 567646, 567647, 567648, 567649, 575937, 575939, 575939, 575940, 575940, 575974, 575975, 575876, 578249, 567439 and 567619;
- Baseline amount of crude oil throughput for the Carson Operations;
- Baseline amount of crude oil throughput for the Wilmington Operations;
- Contents of Carson Operations tanks for the period 2010 to 2015;
- Contents of Carson Crude Terminal tanks for the period 2010 to 2015;
- Contents of Wilmington Operations tanks for the period 2010 to 2015;
- Contents of Marine Terminal 1 (Berth 121) tanks for the period 2010 to 2015;
- Contents of Marine Terminal 2 (Berths 76-78) tanks for the period 2010 to 2015;
- Contents of Long Beach Terminal (Berths 84-87) tanks for the period 2010 to 2015;
- Vapor pressures of Carson Operations tanks storing crude oil for the period 2010 to 2015;

G1-78.9  
cont'd.

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Letter from Cody Elliott to Danny Luong re: Request for Documentation Per Rule 212, March 18, 2016; Letter from Rachael Koss to Public Records Coordinator re: Public Records Act Request - Tesoro Refining Los Angeles Refinery Integration and Compliance Project, April 12, 2016; Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Tesoro Refining Los Angeles Refinery Integration and Compliance Project, April 27, 2016; Email from Cody Elliott to Danny Luong re: Tank Numbers/Device I.D. - Tesoro Refinery Integration Project, April 28, 2016; Request from Cody Elliott for Title V permits, April 28, 2016 (SCAQMD form); Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Emission Inventories, May 2, 2016; Email from Cody Elliott to Danny Luong re: Tank Numbers/Device I.D. - Tesoro Refinery Integration Project, May 3, 2016; Email from Rachael Koss to Danny Luong re: Tank Numbers/Device I.D. - Tesoro Refinery Integration Project, May 3, 2016; Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Tesoro Los Angeles Refinery Integration Project, May 3, 2016; Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Tesoro Los Angeles Refinery Integration and Compliance Project, May 25, 2016.

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- Vapor pressure of Carson Crude Terminal tanks storing crude oil for the period 2010 to 2015;
- Vapor pressure of Wilmington Operations tanks storing crude oil for the period 2010 to 2015;
- Vapor pressures of Marine Terminal 1 (Berth 121) tanks storing crude oil for the period 2010 to 2015;
- Vapor pressures of Marine Terminal 2 (Berths 76-78) tanks storing crude oil for the period 2010 to 2015; and
- Vapor pressures of Long Beach Terminal (Berths 84-87) tanks storing crude oil for the period 2010 to 2015.

G1-78.9  
cont'd.

The Air District's failure to disclose this information violates CEQA, the Public Records Act and the Federal Clean Air Act. First, CEQA requires the Air District to disclose all documents referenced or relied upon in the DEIR for the entire comment period.<sup>8</sup> Further, an EIR must be "a compilation of all relevant data into a single formal report...which would facilitate both public input and the decisionmaking process."<sup>9</sup> Second, the California Public Records Act requires the Air District to disclose all air pollution emissions data.<sup>10</sup> Finally, the federal Clean Air Act requires the Air District to disclose to the public emission data,<sup>11</sup> including "[i]nformation necessary to determine the identity, amount, frequency, concentration, or other characteristics" of emissions or pollutants.<sup>12</sup>

G1-78.10

Until the Air District discloses the above-listed records, it is impossible for the public to conduct a complete and accurate review of the Project's public health and safety and environmental impacts. Therefore, we hereby reserve our right to file supplemental comments on the DEIR at a later date.

#### IV. THE DEIR FAILS TO SATISFY CEQA'S PURPOSE AND GOALS

CEQA has two basic purposes, neither of which the DEIR satisfies. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.<sup>13</sup> CEQA requires that an agency analyze potentially significant environmental impacts in an EIR.<sup>14</sup> The EIR must

G1-78.11

<sup>8</sup> Cal. Pub. Resources Code § 21092(b)(1); 14 Cal. Code Regs. § 15087(c) ("CEQA Guidelines").

<sup>9</sup> *Russian Hill Improvement Association v. Board of Permit Appeals* (1975) 44 Cal. App. 3d 158, 168.

<sup>10</sup> Cal. Govt. Code § 6254.7(e).

<sup>11</sup> 42 U.S.C. § 7414(c).

<sup>12</sup> 40 C.F.R. § 2.301(2)(i).

<sup>13</sup> CEQA Guidelines § 15002(a)(1).

<sup>14</sup> Pub. Resources Code § 21000; CEQA Guidelines § 15002.

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not rely on scientifically outdated information to assess the significance of impacts, and must instead result from “extensive research and information gathering” including consultation with state and federal agencies, local officials, and the interested public.<sup>15</sup> To be adequate, the EIR must evidence the lead agency’s good faith effort at full disclosure.<sup>16</sup> The EIR has been described as “an environmental alarm bell” whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.<sup>17</sup> Thus, the EIR protects not only the environment but also informed self-government.<sup>18</sup> The EIR’s purpose is to inform responsible officials of the environmental consequences of their decisions *before* those decisions are made.

G1-78.11  
cont’d.

The second purpose of CEQA is to require public agencies to avoid, reduce or prevent environmental damage when possible by requiring appropriate mitigation measures and through the consideration of environmentally superior alternatives.<sup>19</sup> The EIR serves to provide public agencies, and the public in general, with information about the effect that a proposed project is likely to have on the environment and to “identify ways that environmental damage can be avoided or significantly reduced.”<sup>20</sup> If a project has a significant effect on the environment, the agency may approve the project only upon a finding that it has “eliminated or substantially lessened all significant effects on the environment where feasible,” and that any unavoidable significant effects on the environment are “acceptable due to overriding concerns” specified in CEQA section 21081.<sup>21</sup> As described in our comments below, the DEIR fails to satisfy these two basic purposes of CEQA.

G1-78.12

**V. THE PROJECT DESCRIPTION IS INADEQUATE**

The courts have repeatedly held that “[a]n accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR.”<sup>22</sup> CEQA requires that a project be described with enough particularity that its impacts can be assessed.<sup>23</sup> “A curtailed or distorted project description may stultify

G1-78.13

<sup>15</sup> *Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm.* (2001) 91 Cal. App. 4th 1344, 1367; see also *Schaeffer Land Trust v. San Jose City Council* (1989) 215 Cal. App. 3d 612, 620.

<sup>16</sup> CEQA Guidelines § 15151; see also *Laurel Heights I* (1998) 47 Cal. 3d 376, 406.

<sup>17</sup> *County of Inyo v. Yorty* (1973) 32 Cal. App. 3d 795, 810 (internal quotations omitted).

<sup>18</sup> *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal. 3d 553, 564 (citations omitted).

<sup>19</sup> CEQA Guidelines § 15002(a)(2)-(3); *Berkeley Keep Jets Over the Bay Comm.*, 91 Cal. App. 4th at 1354.

<sup>20</sup> CEQA Guidelines § 15002(a)(2).

<sup>21</sup> *Id.*, § 15092(b)(2)(A)-(B).

<sup>22</sup> *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.

<sup>23</sup> *Id.* at 192.

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the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental costs . . . ."<sup>24</sup> As stated by the court in *County of Inyo v. City of Los Angeles*, "a curtailed, enigmatic or unstable project description draws a red herring across the path of public input."<sup>25</sup>

G1-78.13  
cont'd.

CEQA Guidelines section 15378 defines "project" to mean "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment."<sup>26</sup> "The term "project" refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. The term project does not mean each separate governmental approval."<sup>27</sup> Courts have explained that a complete description of a project must "address not only the immediate environmental consequences of going forward with the project, but also all "reasonably foreseeable consequence[s] of the initial project."<sup>28</sup> "If a[n]...EIR...does not adequately apprise all interested parties of the true scope of the project for intelligent weighing of the environmental consequences of the project, informed decisionmaking cannot occur under CEQA and the final EIR is inadequate as a matter of law."<sup>29</sup>

G1-78.14

The DEIR fails to meet CEQA's requirements for an adequate project description by omitting from the analysis the reasonably foreseeable consequences of the Project. In particular, the DEIR fails to identify and analyze reasonably foreseeable changes in crude oil throughput and crude slate. First, the DEIR fails to disclose that the Project would facilitate an increase in crude oil throughput. Second, the DEIR fails to identify with a sufficient degree of particularity the type and amount of crudes that will be imported, stored and refined after the Project is operational. The DEIR fails to disclose that the Project would facilitate the Los Angeles Refinery to receive a broader range of crudes and facilitate the Refinery's transition to cost-advantaged crudes, including crudes from the Bakken field in North Dakota and Canadian tar sands. In short, the Project description in the

G1-78.15

<sup>24</sup> *Id.* at 192-193.

<sup>25</sup> *Id.* at 197-198.

<sup>26</sup> CEQA Guidelines § 15378.

<sup>27</sup> *Id.*, § 15378(c).

<sup>28</sup> *Laurel Heights Improvement Association v. Regents of University of California* (1988) 47 Cal. 3d 376, 398 (emphasis added); see also *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 449-50.

<sup>29</sup> *Riverwatch v. Olivenhain Municipal Water Dist.* (2009) 170 Cal. App. 4th 1186, 1201.

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DEIR is invalid because it misleads the reader about the Applicant's purpose and goals and the Project's effect on Los Angeles Refinery operations.

G1-78.15  
cont'd.

**A. The DEIR Fails to Adequately Disclose the Reasonably Foreseeable Consequences of the Project's Tank and Pipeline Modifications**

The DEIR states that the purpose of adding and enlarging crude storage tanks and pipelines is to increase ship unloading efficiency, thereby reducing ship emissions.<sup>30</sup> This truncated description of the Project's purpose is simply not credible given the significant proposed tank and piping modifications (six new 500,000 barrel tanks at the Carson Crude Terminal, replacing two 80,000 barrel tanks at the Wilmington Operations with two 300,000 barrel tanks, and installing associated piping to connect the tanks to the marine terminals). The Air District obscures the magnitude of the Project's environmental impacts by omitting any mention of the implications of the proposed equipment modifications in terms of the Refinery's operations. Substantial evidence shows that the Project would facilitate a substantial increase in crude oil throughput at the tank farms and the marine terminals, and the increased storage of cost-advantaged crudes.

G1-78.16

The DEIR includes a series of statements regarding the Project's effects on the Los Angeles Refinery's operation which are inaccurate or otherwise misleading. The DEIR claims that the Project: (1) is not designed to enable the Refinery to change its feedstock or crude oil blend; (2) would not impact the refining process; (3) would not change or increase the ship deliveries of crude oil; and (4) would allow no more than a 6,000 bbl/day throughput increase. *These assertions should be struck from the Air District's analysis because they are contradicted by the DEIR itself, documents in the Air District's possession, and the Applicant's public statements and regulatory filings.* As fully documented by Dr. Fox<sup>31</sup> and summarized below, these contentions are inaccurate, or otherwise misleading.

G1-78.17

First, as explained more fully below, the Project will change the range of crude oils that will be imported to include a broader range of crudes, such as Bakken and Canadian tar sands crudes. The import, storage and refining of these crude oils will result in distinct, potentially significant impacts that the Air District

G1-78.18

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<sup>30</sup> DEIR, p. 2-4.

<sup>31</sup> **Attachment B:** Phyllis Fox Comments on the Draft Environmental Impact Report for the Tesoro Los Angeles Refinery Integration and Compliance Project, June 10, 2016 ("Fox Comments"), pp. 4-74, 78-79.



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failed to identify and mitigate in the DEIR. Second, the Project would impact downstream refining processes by supplying the Los Angeles Refinery with a different crude slate. Third, the Project facilitates the unloading of a greater proportion of bigger ships, as compared to baseline operations, or even unloading ships on more days. Simply put, if ships can be unloaded faster, more or larger ships can be unloaded, increasing imports and exports. Finally, the Project would allow the amount of crude imports to the Los Angeles Refinery to increase, as compared to baseline conditions, by removing tank and pipeline throughput constraints.

G1-78.18  
cont'd.

The DEIR fails as an informational document. Rather than disclosing the Project accurately and completely, the DEIR deceives the public about the Project's scope and the Project's significant impacts on the environment.

**B. The DEIR Fails to Adequately Identify the Crudes Proposed to Be Imported, Stored and Refined**

CEQA requires the Air District to identify the crudes that may be imported, stored and refined at the Los Angeles Refinery from Project implementation with sufficient particularity to enable environmental review. The DEIR completely fails to satisfy this CEQA requirement.

G1-78.19

In *Communities for a Better Environment v. City of Richmond*, the First District Court of Appeal held that an EIR for a refinery project must disclose whether the proposed project would allow the refinery to process heavier crude where a change in feedstock is a reasonably foreseeable consequence of the proposed project.<sup>32</sup> The California Attorney General and the Governor's Office of Planning Research concur in the determination that CEQA requires the disclosure of changes in fuel, by source and chemical composition. Each agency has stated that an environmental document for a fuel project is deficient under CEQA unless it discloses the change in the products that the project proponent intends to process at the facility.<sup>33</sup> The failure to identify and address a crude switch narrows the scope of environmental review and "stultif[ies] the objectives of the reporting process."<sup>34</sup>

G1-78.20

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<sup>32</sup> *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal. App. 4th 70, 89.

<sup>33</sup> **Attachment C:** Letter from the Office of the Attorney General to the City of Pittsburg Planning Department regarding Recirculated Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project (SCH # 2011072053), Jan. 15, 2013; **Attachment D:** Letter from the Governor's Office of Planning and Research to The City of Pittsburg Planning Department, regarding WesPac Pittsburg Energy Infrastructure Project, Tar Sands, Dec. 3, 2013.

<sup>34</sup> *County of Inyo v. City of Los Angeles*, 71 Cal. App. at 192-193.

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In *Communities for a Better Environment v. City of Richmond*, the petitioners argued that the EIR was inadequate because the project description failed to clearly and consistently state whether the project would facilitate the future processing of heavier crudes at the refinery, and to analyze the consequences of such a change.<sup>35</sup> In that case, the EIR acknowledged that the proposed project would allow the refinery to process a wider range of crude oils, including crude that contains a higher amount of sulfur and associated contaminants.<sup>36</sup> However, the lead agency denied claims that the refinery would also be able to process heavier crudes than before.<sup>37</sup> Petitioners pointed to conflicting statements in the EIR and the project proponent's SEC filings, as well as the project proponent's rejection of a permit limitation precluding the alteration of the baseline crude slate mix, all of which suggested that the project would (contrary to the lead agency's claim) enable the refinery to process heavier crudes.<sup>38</sup> The court agreed with petitioner that a crude switch was reasonably foreseeable and invalidated the EIR "because the EIR's project description ... [was] inconsistent and obscure as to whether the Project enables the Refinery to process heavier crudes."<sup>39</sup>

G1-78.21

Here, the DEIR suffers from a similar error. The DEIR states that the Los Angeles Refinery's crude slate would not change as a result of the Project.<sup>40</sup> However, as described below, the Project would facilitate the import of cost-advantaged crudes, such as Bakken crudes and tar sands crudes. Moreover, the DEIR places no limits on the amount of cost-advantaged crudes the Applicant can import. Dr. Fox explains in her comments that "[t]he source of, and chemical and physical composition of, the individual crude oils that have been and will be refined are essential to determine numerous impacts, including air quality, public health, odor or consequences of accidents."<sup>41</sup> Indeed, for example, the DEIR acknowledges that the "hazards [from accidents] that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions."<sup>42</sup> Yet, the DEIR completely fails to disclose the physical and chemical properties of the crudes that will be imported, stored and refined at the Los Angeles Refinery after the Project is operational. This is a blatant violation of CEQA.

G1-78.22

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<sup>35</sup> *Communities for a Better Environment v. City of Richmond*, 184 Cal. App. 4th 83.

<sup>36</sup> *Id.* at 76-77.

<sup>37</sup> *Id.*

<sup>38</sup> *Id.* at 83-85.

<sup>39</sup> *Id.* at 89.

<sup>40</sup> DEIR, p. 2-2.

<sup>41</sup> Fox Comments, p. 3.

<sup>42</sup> DEIR, p. 1-27.

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**1. The DEIR Fails to Disclose that the Project Facilitates the Import of Bakken Crudes**

The Applicant asserts, without any support, that the Project will not change the crude slate or crude quality. Substantial evidence shows otherwise. The following substantial evidence shows that the Project is designed to facilitate a crude switch to Bakken: (1) the vapor pressure of the proposed Project tanks is designed to contain Bakken; (2) Material Safety Data Sheets submitted with the initial tank applications identify Bakken; and (3) the Project proposes to remove storage and unloading constraints, which facilitates importing Bakken by marine vessel.

G1-78.23

First, the DEIR indicates that all of the new floating roof storage tanks will be permitted with a Reid Vapor Pressure limit of 10.5 psi (which corresponds to a True Vapor Pressure of approximately 11.5 psi).<sup>13</sup> Dr. Fox explains that there are very few existing tanks at either the Wilmington or Carson Operations that are permitted to store crude oil with a vapor pressure of 11 psi.<sup>14</sup> Dr. Fox shows that the new tanks would increase 11 psi crude storage by a factor of eight at Wilmington and by a factor of seven at Carson, facilitating the import of Bakken and other similar light crude oils.<sup>15</sup> Indeed, the Project goal of increasing the production of gasoline or distillate by 30,000 to 40,000 bbl/day requires a lighter crude slate.<sup>16</sup> In addition, several Project components, such as the shutdown of the Wilmington FCCU, require an increase in lighter crude.<sup>17</sup>

G1-78.24

Second, the Applicant submitted Material Safety Data Sheets (“MSDS”) for Bakken crude oil with its initial permit applications for the new Wilmington tanks. Further, Tesoro submitted the same MSDSs for its proposed Vancouver Export Terminal, which proposes to ship Bakken crude oil to the Los Angeles Refinery.<sup>18</sup> In its December 2015 Analyst and Investor Day earnings call, the Applicant stated:

G1-78.25

When you think about formalizing competitive advantage and fully integrating our value chain, that is really what the Los Angeles Integration and Compliance Project is about. And when we think about creating value, we are not just thinking about advantaged crude oils in front of our

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<sup>13</sup> Fox Comments, p. 22.

<sup>14</sup> *Id.*, p. 19.

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*, p. 20.

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*, p. 25.

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refineries, but we're thinking about how that supply to the west coast of advantaged crude oils can change the shape of the crude oil supply/demand dynamics for the west coast. And that's what we are trying to accomplish through Vancouver Energy.<sup>49</sup>

G1-78.25  
cont'd.

Finally, the Project's increased capacity of crude storage tanks that serve the associated marine terminals would eliminate storage and unloading constraints and, in turn, facilitate Bakken crude imports by marine vessel. Specifically, Project implementation would allow the Applicant to import Bakken via marine vessel from its proposed Vancouver Energy Terminal. These imports would replace crude currently delivered by pipeline from California sources and by marine vessel from the Alaska North Slope and various foreign sources.<sup>50</sup> The Applicant anticipates exporting 80% Bakken crude and 20% other crudes from its Vancouver Energy Terminal.<sup>51</sup> The Applicant also reports that "...we're very confident that the movement of Bakken crude oil to the West Coast will continue to make sense over time. Or we don't see any changes there, and our commitment to Vancouver Energy hasn't wavered from the very first day."<sup>52</sup> Dr. Fox explains in her comments that, by removing storage and unloading constraints, the Project would allow an increase of 59,000 barrels per day of throughput capacity at the marine terminals.<sup>53</sup>

G1-78.26

Substantial evidence shows that it is reasonably foreseeable that the Project will involve a change in amount and quality of crude imported to the Los Angeles Refinery. The failure of the DEIR to analyze, let alone mitigate, any of the potentially significant environmental impacts associated with Bakken crude renders the DEIR inadequate. The Air District must either expand its analysis to encompass the reasonably foreseeable possibility that Bakken crude will be imported or condition the approval of the Project to prohibit the import of Bakken and other similar light crudes.

G1-78.27

<sup>49</sup> Tesoro 2015 Analyst and Investor Day, December 9, 2015, Edited Transcript, p. 10, available at <http://phx.corporateir.net/External.File?item=UGFyZW50SUQ9NjA1MTY0fENoaWxkSUQ9MzE2NDI2fFR5cGU9MQ==&t=1>

<sup>50</sup> Fox Comments, p. 26.

<sup>51</sup> Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%20201301%20Volume%201/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%201.pdf>; 2/27/13 Tesoro Presentation, p. 17 and Kristen Hays and Erwin Seba, Update 1 – Tesoro Delivering First Bakken Crude Unit Train to California, Reuters, September 11, 2013, Available at: <http://www.reuters.com/article/2013/09/11/tesoro-rail-crude-idUSL2N0H70U420130911>.

<sup>52</sup> Fox Comments, p. 32, quoting Tesoro Q2 2015 Earnings Call, p. 22.

<sup>53</sup> *Id.*, p. 34.

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**2. The DEIR Fails to Disclose that the Project Facilitates the Import of Tar Sands Crudes**

While publicly available information and the proposed vapor pressure limit on the new tanks suggest that Bakken crudes are the most likely Project feedstock, the Project description is general enough to allow imports of other cost-advantaged crudes, such as tar sands. Dr. Fox explains that the Project, along with the Applicant's recently completed projects at the Los Angeles Refinery, would facilitate refining increased amounts of heavy sour crudes, such as tar sands.<sup>54</sup> For example, the hydrogen plant at the Wilmington Operations was recommissioned to remove constraints for the hydrocracker and hydrotreaters at both facilities, allowing them to refine increased amounts of heavy crudes, such as tar sands.<sup>55</sup> The Wilmington Operations sulfur recovery unit was "debottlenecked," increasing its capacity by 10 ton/day. According to Dr. Fox, this increased capacity would be required to run significant amounts of high sulfur tar sands crudes.<sup>56</sup> A blending system was also installed at the Carson Operations to mix light and heavy crudes to eliminate metallurgy (e.g., corrosion due to high total acid number ("TAN") tar sands crudes) or yield constraints (e.g., reductions in yield due to system design).<sup>57</sup> Dr. Fox explains that, "[a]ll of these projects at the Los Angeles Refinery, and especially the Wilmington Operations, allow the Refinery to process increased amounts of tar sands crudes."<sup>58</sup>

G1-78.28

In sum, the DEIR fails to identify the Project crude slate by source and chemical composition, and fails to disclose that the Project would facilitate the import, storage and refining of cost-advantaged crudes, such as Bakken crudes and tar sand crudes. As a result, the Air District cannot accurately identify the Project's environmental impacts. The Air District must prepare a revised DEIR that identifies the Project crude slate with sufficient particularity that its impacts may be assessed.

**III. THE DEIR FAILS TO ESTABLISH THE ENVIRONMENTAL SETTING**

CEQA requires the lead agency to include a description of the physical environmental conditions in the vicinity of a project as they exist at the time

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<sup>54</sup> *Id.*, pp. 36-41.

<sup>55</sup> *Id.*, p. 38.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*, p. 38.

<sup>58</sup> *Id.*

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environmental review commences.<sup>59</sup> The description of the environmental setting constitutes the baseline physical conditions by which a lead agency may assess the significance of a project's impacts. The EIR must also describe the existing environmental setting in sufficient detail to enable a proper analysis of project impacts.<sup>60</sup>

Describing the environmental setting accurately and completely for each environmental condition in the vicinity of the project is critical to an accurate and meaningful evaluation of environmental impacts. The courts are clear that, "[b]efore the impacts of a Project can be assessed and mitigation measures considered, an [environmental review document] must describe the existing environment."<sup>61</sup> It is:

a central concept of CEQA, widely accepted by the courts, that the significance of a Project's impacts cannot be measured unless the DEIR [or IS/ND] first establishes the actual physical conditions on the property. In other words, baseline determination is the first rather than the last step in the environmental review process.<sup>62</sup>

Additionally, it is axiomatic that the baseline information on which a lead agency relies must be supported by substantial evidence.<sup>63</sup> The CEQA Guidelines define "substantial evidence" as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion."<sup>64</sup> "Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts . . . [U]nsubstantiated opinion or narrative [and] evidence which is clearly inaccurate or erroneous . . . is not substantial evidence."<sup>65</sup>

G1-78.29  
cont'd.

G1-78.30

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<sup>59</sup> CEQA Guidelines § 15125(a); see also *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 321.

<sup>60</sup> *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109, 1121-22.

<sup>61</sup> *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 952.

<sup>62</sup> *Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 125.

<sup>63</sup> See CEQA Guidelines §15063(a)(3) ("An initial study may rely upon expert opinion supported by facts, technical studies or other substantial evidence to document its findings.")

<sup>64</sup> CEQA Guidelines §15384.

<sup>65</sup> Pub. Resources Code § 21082.2(c).

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**A. The DEIR Fails to Establish the Environmental Setting Against Which to Measure the Project's Air Quality, Public Health, Odor and Hazards Impacts**

The DEIR is deficient because it fails to identify the existing crudes that are imported, stored and refined at the Los Angeles Refinery. The quality and chemical composition of the existing crudes are necessary to evaluate the Project's air quality, public health, odor and hazards impacts. Rather than disclose the existing crude information, the DEIR claims that the Project would not modify the crude slate imported, stored and refined at the Los Angeles Refinery. The DEIR's claim is an assumption that cannot be verified by any data and is entirely unsupported. Rather, as summarized above, and documented at length by Dr. Fox in her comments, the Project clearly facilitates a crude switch by allowing the import and storage of a broader range of crudes than previously received at the Los Angeles Refinery.

G1-78.31

The Air District must prepare a revised analysis that describes the existing crudes by source and chemical composition. This information is necessary for the Air District to evaluate the Project's air quality, public health, odor and hazards impacts.

**B. The DEIR Fails to Establish the Environmental Setting Against Which to Analyze the Project's Health and Safety Impacts from Onsite Soil and Groundwater Contamination**

The Los Angeles Refinery has a long history of releases of contaminants to soil and groundwater. A 2015 soil characterization report prepared for the Project documents both soil and groundwater contamination with a light non-aqueous phase liquid ("LNAPL") at the Carson and Wilmington Operations. The DEIR states that, according to the 2015 report, "[o]f the 44 soil samples analyzed, samples indicate that 95 percent of the soil to be potentially excavated will be classified as non-hazardous waste."<sup>66</sup> However, hazardous materials expert Matt Hagemann reviewed the 2015 report and found that the DEIR fails to disclose that: (1) exceedances of construction worker health and safety environmental screening levels ("ESL") were found in soils close to areas where Project construction will take place; (2) with few exceptions, samples were not collected where Project construction would disturb soil; and (3) sampling density was "woefully inadequate"

G1-78.32

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<sup>66</sup> DEIR, p. 3-25.

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to characterize soil contamination.<sup>67</sup> In other words, the DEIR fails to establish the environmental setting against which to measure the Project's public health and safety impacts from the Project's mobilization of onsite soil and groundwater contamination. The Air District must prepare a revised DEIR that includes the results of adequate sampling that targets areas of Project improvements.

G1-78.32  
cont'd.

**VI. THE DEIR FAILS TO DISCLOSE AND ANALYZE ALL OF THE PROJECT'S POTENTIALLY SIGNIFICANT AND SIGNIFICANT ENVIRONMENTAL AND PUBLIC HEALTH IMPACTS**

An EIR must disclose all potentially significant adverse environmental impacts of a project.<sup>68</sup> As explained in an appellate court CEQA decision:<sup>69</sup>

The EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated and discussed and it must permit the significant effects of the project to be considered in the full environmental context.<sup>70</sup> We interpret this Guideline broadly in order to "afford the fullest possible protection to the environment."<sup>71</sup> In so doing, we ensure that the EIR's analysis of significant effects, which is generated from this description of the environmental context, is as accurate as possible.<sup>72</sup>

G1-78.33

The DEIR for this Project fails to provide the legally required disclosure. The DEIR fails to adequately disclose and analyze the Project's potentially significant impacts to air quality, public health, soils and groundwater, land use impacts, and impacts from greenhouse gas emissions and hazards.

The DEIR must be revised to address these impacts and recirculated for public review. CEQA requires recirculation of an EIR when significant new information is added to the EIR following public review but before certification.<sup>73</sup> New information is significant if "the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse

<sup>67</sup> **Attachment E:** Letter from Matt Hagemann to Rachael Koss re: Comments on the Tesoro Los Angeles Refinery Integration and Compliance Project, June 6, 2016, p. 2.

<sup>68</sup> Pub. Resources Code § 21100(b)(1).

<sup>69</sup> *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, 874 (2003)

<sup>70</sup> CEQA Guidelines § 15125(c).

<sup>71</sup> *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal. App. 3d 692, 720.

<sup>72</sup> See also Remy et al., Guide to the Cal. Environmental Quality Act (10th ed. 1999), pp. 374-376.

<sup>73</sup> Pub. Resources Code § 21092.1.



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environmental effect of the project” including, for example, “a disclosure showing that . . . [a] new significant environmental impact would result from the project.”<sup>74</sup> The following new, significant environmental impacts would result from the Project and must be addressed in a revised DEIR that is recirculated for public review.

G1-78.33  
cont’d.

**A. The DEIR Fails to Evaluate the Potentially Significant Impacts to Air Quality and Public Health from the Full Range of Crude Oil Types that Could Be Imported as a Result of the Project**

The DEIR asserts that the Project would not result in significant impacts from alternate crudes that could be imported to the Los Angeles Refinery because the crudes would be blended to the same API gravity and sulfur content as the current operating range.<sup>75</sup> Dr. Fox explains that the DEIR is wrong for several reasons, and shows that the reasonably foreseeable crude slate switch would result in significant environmental impacts not identified in the DEIR, including: significant increases in VOC emissions, contributing to existing violations of ozone ambient air quality standards; significant increases in TAC emissions, resulting in significant health impacts; significant increases in malodorous sulfur compounds, resulting in significant odor impacts; significant increases in combustion emissions, contributing to existing violations of ambient air quality standards; significant increases in corrosive sulfur compounds, leading to increased risk of accident; and significant increases in flammability and thus the potential for more dangerous accidents involving the 52% increase in terminal storage tank capacity and unloading operations.

G1-78.34

First, Dr. Fox explains that many of the impacts of concern occur from emissions from tanks and fugitive components *before* the crude is blended and sent to processing units.<sup>76</sup>

G1-78.35

Second, Dr. Fox describes several physical and chemical properties of crude, unrelated to API gravity and sulfur content, which vary and would result in significant environmental impacts without affecting refining characteristics. These include, for example, increased VOCs, increased TACs (like benzene), highly malodorous and toxic compounds (like mercaptans), higher volatility and higher flammability. These characteristics may be present in newly imported crudes even if new crudes have identical sulfur content and API gravity to the current crude

G1-78.36

<sup>74</sup> CEQA Guidelines § 15088.5.

<sup>75</sup> DEIR, p. 2-16; DEIR, Appendix A, pp. 4-6.

<sup>76</sup> Fox Comments, p. 45.

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slate.<sup>77</sup> For example, because vapor pressure determines the amount of VOC and TAC emissions when crude is transported, stored and refined.<sup>78</sup> Thus, a crude slate may have identical sulfur content and API gravity, but would result in dramatically different VOC and TAC emissions.<sup>79</sup> Notably, Bakken crudes have uniquely elevated vapor pressures compared to the light sweet crudes they would replace.<sup>80</sup> Bakken and other light crudes also contain large amounts of natural gas liquids called “light ends,” such as methane, propane, butane, ethane and pentane.<sup>81</sup> The light ends are the components of crude that volatilize, burn or explode in an accident. The high concentration of light ends makes these types of crude highly flammable and more likely to cause accidents.<sup>82</sup> Thus, “[t]he unique chemical and physical characteristics of each crude, as it relates to potential environmental impacts, [must] be separately evaluated.”<sup>83</sup>

G1-78.36  
cont’d.

Finally, Dr. Fox explains that Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in increased emissions from refinery operating issues.<sup>84</sup> This is because these blended crudes result in waxy coatings on storage tanks, greater development of sludges and solids, elevated hydrogen sulfide, fouling of the cold preheat train, desalter upsets, fouling of hot preheater exchangers and furnaces, and corrosion.<sup>85</sup>

G1-78.37

The Air District’s conclusion that the Project would not result in significant impacts from a crude slate change is not supported by substantial evidence. Rather, substantial evidence shows that the Project’s reasonably foreseeable crude slate switch would result in significant air quality, public health, hazards and odor impacts. The Air District must disclose, analyze and mitigate these impacts in a revised DEIR that is circulated for public review and comment.

G1-78.38

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<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> *Id.*, p. 48.

<sup>81</sup> *Id.*, p. 51.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*, p. 45.

<sup>84</sup> *Id.*, p. 51.

<sup>85</sup> *Id.*

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**B. The DEIR Fails to Disclose the Project's Significant Cancer Risks from TAC Emissions**

The MSDSs included in the Applicant's original application for the new storage tanks, reported benzene (a TAC) concentrations of five to seven percent for light sweet crude oil, such as Bakken crude oil. However, the DEIR's analysis of health impacts assumes a very low benzene concentration (0.2 percent) in crude oil, and the health risk assessment ("HRA") prepared for the Project assumes a crude oil with low concentrations of TACs. According to Appendix B-3 to the DEIR, more than 98 percent of the Project's benzene emissions are from the tanks and fugitive sources that handle crude oil. Thus, the DEIR underestimates the Project's health impacts from TAC emissions.<sup>86</sup>

G1-78.39

The DEIR reports the Project's cancer risk ranges from 2.1 cases in a million at the nearest sensitive receptor to 9.2 million at the nearest off-site worker.<sup>87</sup> The cancer significance threshold is 10 in one million. Dr. Fox adjusted the HRA calculations to reflect the upper bound benzene concentration in Bakken crude (7 percent) and found that the Project's cancer risk increases from 3.64 to 45 in a million for the maximum exposed individual resident ("MEIR"), 9.19 to 10.2 in a million for the maximum exposes individual worker ("MEIW) and 2.09 to 32 in a million for the sensitive receptor.<sup>88</sup> Thus, if the HRA used the upper bound benzene concentration for Bakken crude oil (or the light crude oil listed in the MSDS submitted with the Applicant's tank application), the cancer risk at all three receptors would exceed the significance threshold of 10 in a million. The DEIR fails to disclose, analyze or mitigate this significant public health impact.

G1-78.40

**C. The DEIR's Analysis of Air Quality Impacts from Marine Vessel Emissions is Fatally Flawed; the Project Would Result in Significant Air Quality Impacts from Marine Vessel Emissions**

The Los Angeles Refinery receives crude oil by ship at three marine terminals at the Port of Long Beach: (1) Long Beach Terminal (Berths 84 and 86), which serves the Wilmington Operations; (2) Marine Terminal 1 (Berth 121), which serves the Carson Operations; and (3) Marine Terminal 2 (Berths 76-78), which serves the

G1-78.41

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<sup>86</sup> *Id.*, p. 46.

<sup>87</sup> DEIR, Appx. B-4, Table 10.

<sup>88</sup> Fox Comments, p. 48.

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Carson Operations. Together, the marine terminals have a storage capacity of 6.6 million barrels.<sup>89</sup>

G1-78.41  
cont'd.

The Project includes modifications to tanks and pipelines that serve the marine terminals. Specifically, the Project would replace two 80,000 barrel tanks with two 300,000 barrel tanks at the Wilmington Operations, and will add six 500,000 barrel tanks at the Carson Crude Terminal, adjacent to the Carson Operations. In total, the Project would increase the Los Angeles Refinery's storage capacity by 3,440,000 barrels.<sup>90</sup> The Project's new storage tanks and pipelines facilitate significant increases in the unloading rate and capacity for the marine terminals.<sup>91</sup>

G1-78.42

The DEIR states that the new tanks and pipelines would increase the unloading rate at the marine terminals, reducing the time that ships remain at the terminals and, therefore, *reducing* marine vessel emissions. The DEIR's conclusion is wrong for several reasons.

First, the marine deliveries for the Carson and Wilmington Operations could include crude oils with much higher vapor pressures, increasing tank VOC emissions. All of the new storage tanks would be permitted with a Reid vapor pressure of 10.5 psi (or a true vapor pressure of 11+ psi), which is much higher than the permitted vapor pressure of any existing crude storage tanks.<sup>92</sup>

G1-78.43

Second, the DEIR incorrectly assumes that the Long Beach Terminal would continue to receive crude oil in the same size vessels as those currently delivering crude. The crude oil unloading rate is proposed to *increase* from 5,000 bbl/hr to 15,000 bbl/hr and the storage capacity serving the Long Beach Terminal will *increase* by 440,000 barrels.<sup>93</sup> This will allow a greater proportion of bigger ships to unload and/or allow ships to unload on more days. If ships can unload faster, more and/or larger ships can be unloaded, increasing emissions.<sup>94</sup> Dr. Fox explains that emissions would increase if the number of ship calls increased or if the mix of ships changed to favor larger ships.<sup>95</sup> The DEIR completely fails to consider these scenarios. In Dr. Fox's opinion, "it is entirely possible, especially in the absence of

G1-78.44

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<sup>89</sup> *Id.*, 61.

<sup>90</sup> DEIR, p. 2-7; Fox Comments, pp. 34-35.

<sup>91</sup> Fox Comments, pp. 61.

<sup>92</sup> *Id.*, p. 64.

<sup>93</sup> DEIR, p. 4-26.

<sup>94</sup> Fox Comments, p. 62.

<sup>95</sup> *Id.*, p. 64.

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any enforceable conditions of approval on marine deliveries, that the Project would increase marine deliveries, increasing emissions of VOC, NOx, CO, PM10 and PM2.5.”<sup>96</sup>

G1-78.44  
cont'd

Third, the DEIR incorrectly assumes that the Project would increase the Refinery’s throughput by only 6,000 bb/day. The Project facilitates an increase in marine deliveries far more than the 6,000 bbl/day increase in design throughput since storage capacity would increase by 3,440,000 barrels and unloading rates would increase.<sup>97</sup> Further, marine deliveries would likely replace existing pipeline deliveries.<sup>98</sup> Dr. Fox explains that the Los Angeles Refinery historically received crude oil by pipeline from the San Joaquin Valley and Los Angeles Basin, and by ship from the Alaska North Slope and foreign sources.<sup>99</sup> Pipeline deliveries are not only more expensive, but are, in fact, declining.<sup>100</sup> Thus, it is reasonably foreseeable that marine deliveries would replace pipeline deliveries. Indeed, this is consistent with the Applicant’s express plans to expand marine terminal throughputs:<sup>101</sup>

G1-78.45

We have two of our terminals are being expanded (sic) to handle additional capacity, and those expansion will come online this summer. And that will allow us to bump up volumes either very later in the second quarter or early in the third quarter.

Our marine facility down there [referring to its terminals in Long Beach], 121, which is the large neighbor de-berth in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, P-2 in Long Beach. And between P-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity.<sup>102</sup>

Dr. Fox estimated the increase in criteria pollutants from increased marine deliveries to the Long Beach Terminal for the Wilmington Operations. Since the design throughput of the Los Angeles Refinery is 380,000 bbl/day and

G1-78.46

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<sup>96</sup> *Id.*, p. 65.

<sup>97</sup> *Id.*, pp. 61, 67.

<sup>98</sup> *Id.*, pp. 62-63.

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> Thompson Reuters Streetevents Edited Transcript, TLLP – Q12014 Tesoro Logistics LP Earnings Conference Call, pp. 6-7, available at <http://seekingalpha.com/article/2183263-tesoro-management-discusses-q1-2014-results-earnings-call-transcript?part=single>.

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approximately 17 percent of the crude arrives by pipeline from California sources (which are in decline), Dr. Fox estimated that up to 65,000 bbl/day of pipeline imports could be replaced by marine deliveries.<sup>103</sup> Using the DEIR's emission factors and baseline marine deliveries (30,000 bbl/day), Dr. Fox found that if Panamax vessel marine imports increased by 50,000 bbl/day, the average daily increase in both VOC (84 lb/day) and NOx (2,367 lb/day) emissions exceed the Air District's CEQA significance thresholds. For Aframax vessels, the average daily increase in NOx emissions (1,292 lb/day) would exceed the Air District's CEQA significance threshold.<sup>104</sup> Further, if future marine deliveries replaced 100 percent of pipeline imports (an increase of 65,000 bbl/day by marine vessels), the increase in emissions from Panamax vessels of VOC (84 lb/day) and NOx (2,367 lb/day) would exceed the Air District's CEQA significance thresholds. For Aframax vessels, VOC (155 lb/day) and NOx (4,027 lb/day) emissions would exceed significance thresholds.<sup>105</sup>

G1-78.46  
cont'd.

For the Carson Operations, up to six new 500,000 barrel domed external floating roof crude oil storage tanks and five electrically-driven transfer pumps will be constructed adjacent to the Carson Crude Terminal to increase the crude unloading rate at the Carson Crude Terminal. Piping and instrumentation will be installed within the Carson Crude Terminal to connect these new tanks to existing pipelines to the Carson Operations and Marine Terminal 1.<sup>106</sup> According to the DEIR, these 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.<sup>107</sup>

G1-78.47

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<sup>103</sup> Fox Comments, p. 70.

<sup>104</sup> *Id.*, p. 71.

<sup>105</sup> *Id.*

<sup>106</sup> DEIR, pp. 1-6, 7, 1-16, 17, 2-46, 2-48, Figure 2-16; Appx. B-3, Table 1.

<sup>107</sup> DEIR, p. 1-17. See also similar assertions at DEIR pp. 2-4, 2-46, 6-1.

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However, the DEIR fails to disclose the anticipated increase in unloading rate and the existing crude oil deliveries by marine vessels to Marine Terminal 1. The DEIR also provides no emission calculations for marine vessels at Marine Terminal 1. As a result, it was impossible for Dr. Fox to estimate these emissions.<sup>108</sup>

In short, the DEIR underestimates marine vessel emissions. Substantial evidence shows that the Project's increase in marine vessel emissions related to the Wilmington Operations are significant and unmitigated. The Air District must revise the DEIR to disclose and mitigate this significant impact. The DEIR also fails to include the necessary information to determine the Project's increase in marine vessel emissions related to the Carson Operations, and thus fails as an informational document. The Air District must revise the DEIR accordingly.

G1-78.47  
cont'd.

**D. The DEIR Fails to Adequately Analyze the Project's Significant Impacts from Greenhouse Gas Emissions**

The DEIR states that the Project will decrease greenhouse gas ("GHG") emissions by 66,139 metric tons per year. The DEIR's calculations are flawed because they fail to include the increase in GHG emissions from: increased marine vessel calls, LPG train trips, combustion of increased amounts of LPG and from producing and delivering Bakken and/or tar sands crudes from their point of origin to the Los Angeles Refinery's associated marine terminals.<sup>109</sup> The Air District must prepare a revised DEIR that includes these additional sources of GHG emissions.

G1-78.48

**E. The DEIR Fails to Disclose the Project's Significant Air Quality Impacts from Operational Emissions from Fired Sources**

The Project includes modifications to heaters, furnaces and boilers.<sup>110</sup> These modifications include increased firing rates, increased utilization or new equipment. The DEIR concludes that the Project would not result in any significant changes in emissions from fired sources. However, Dr. Fox shows that the DEIR underestimates operational emissions from these modifications.

G1-78.49

First, the DEIR estimates the increase in emissions from increased firing rates or increased throughputs at certain modified units by multiplying the increase in either the firing rate or throughput above the maximum firing rate or throughput

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<sup>108</sup> Fox Comments, p. 72.

<sup>109</sup> *Id.*, p. 74.

<sup>110</sup> DEIR, Table 4.2-4 and Appendix B-23, Table A-1 to A-4.

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under an existing permit by an emissions factor.<sup>111</sup> By doing so, Dr. Fox explains that the Air District “effectively assumes the permit limit for the baseline.”<sup>112</sup> The California Supreme Court made it clear that the Air District’s approach violates CEQA.<sup>113</sup> Rather, the Air District must calculate the Project’s emission increases relative to actual emissions.

G1-78.49  
cont’d.

Second, the DEIR uses the wrong existing conditions against which to evaluate the Project’s potentially significant impacts from heater emissions. The DEIR calculates the existing emissions for each heater based on days where combined actual emissions from heaters were at the 98<sup>th</sup> percentile.<sup>114</sup> The correct baseline to calculate the Project’s change in emissions is average daily emissions in the baseline years (2012 and 2013).<sup>115</sup> Dr. Fox explains that, “[t]his, in effect, significantly underestimates the increase in emissions from the proposed increase in firing rates of heaters by resulting in a very high baseline value, higher than the average emission rate after the firing rate is increased.”<sup>116</sup> Dr. Fox illustrates the DEIR’s error with an example. Dr. Fox explains that the Project proposes to increase the firing rate of Delayed Coker Unit Fresh Feed Heater H-100 from 252 MMBtu/hr to 302.4 MMBtu/hr (a 20 percent increase). Further, “[e]missions are directly proportional to firing rate unless modifications are made to the heater and/or its controls to reduce emissions,” but [n]o modifications are made to the heater and/or its controls to reduce emissions.”<sup>117</sup> Therefore, according to Dr. Fox,

G1-78.50

this change in firing rate should increase emissions by a factor of 1.2 (302.4/252 = 1.20). Instead, the emissions summary table shows that this change in firing rate would **reduce** VOC emissions by -0.43 lb/day, CO emissions by -5.14 lb/day, NOx emissions by -171.03 lb/day, PM10 emissions by -0.98 lb/day and PM2.5 emissions by -0.98 lb/day. The error in NOx emissions for this one heater is sufficient by itself to tip Project NOx emissions over the CEQA significance threshold if NOx emissions are calculated using the correct method.<sup>118</sup>

<sup>111</sup> DEIR, Appendix B-3, Attachment A, pp. B-3-51, 52.

<sup>112</sup> Fox Comments, p. 79.

<sup>113</sup> *Communities for a Better Environment v. South Coast Air Quality Management District*, 48 Cal.4th at 321.

<sup>114</sup> DEIR, pp. 4-21, B-3-10, B-3-49, B-3-56, B-3-59, B-3-64.

<sup>115</sup> Fox Comments, p. 79.

<sup>116</sup> *Id.*, p. 76.

<sup>117</sup> *Id.*

<sup>118</sup> *Id.*, pp. 76-77.



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Notably, this fatal flaw in also means that the Air District cannot rely on the DEIR to issue the draft Title V permit modifications for the Project. This is because the proposed permit modifications do not ensure the emission reductions assumed in the DEIR are actually achieved or are enforceable. By artificially inflating the baseline, the Air District ascribed much lower emissions changes than would actually occur from the Project.<sup>119</sup> The Air District must modify the proposed Title V permits to ensure that the assumed emission reductions in the DEIR are achieved in practice and are enforceable, or the Air District must revise the DEIR to use the correct baseline.

G1-78.50  
cont'd.

Third, the DEIR excludes emissions from periods of startup and shutdown of fired sources, which would occur approximately 720 hours per year for each fired source.<sup>120</sup> Dr. Fox explains that, during startup and shutdown, emission control devices such as selective catalytic reduction and low NOx burners, are partially working or not working at all.<sup>121</sup> Also, during these periods, incomplete combustion occurs, which increases emissions of NOx, VOC and carbon monoxide.<sup>122</sup> The DEIR fails to include these emissions in the analysis of operational emissions.

G1-78.51

Fourth, the DEIR bases its analysis of operational emissions on the *average* daily increase in emissions. This is incorrect. According to the Air District's CEQA Air Quality Handbook, the analysis should be based on the *maximum* daily increase in emissions.<sup>123</sup> The maximum daily increase in emissions occurs during periods of startup, shutdown and commissioning.<sup>124</sup> Notably, the proposed Title V permits for the Project explicitly exempt periods of startup and shutdown from complying with NOx limits.<sup>125</sup> Dr. Fox shows that, when startup, shutdown and commissioning emissions are included in the analysis of potentially significant impacts, NOx emissions are significant. For example, for the Wilmington Operations H-100 heater, the DEIR reports that the maximum daily non-routine startup, shutdown and commissioning emissions are 881.27 lbs per day.<sup>126</sup> Using this estimate of the post-Project potential emissions, Dr. Fox determined that the net increase in NOx

G1-78.52

<sup>119</sup> See **Attachment F**: Safe Fuel and Energy Resources California Comments on the Proposed Title V Significant Permit Revisions for Tesoro Refining & Marketing Co. LLC's Carson and Wilmington Sites, June 10, 2016.

<sup>120</sup> DEIR, Appendix B-3, Table A-2.

<sup>121</sup> Fox Comments, p. 75.

<sup>122</sup> *Id.*

<sup>123</sup> SCAQMD, CEQA Air Quality Handbook, April 1993, p. 6-3.

<sup>124</sup> Fox Comments, p. 75.

<sup>125</sup> Draft Wilmington Title V Permit, Condition A99.X, pdf 19; Draft Carson Title V Permit, Condition A99.X1, pdf 46.

<sup>126</sup> DEIR, Appendix B-3, p. B-3-49.

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emissions from heater H-100 would be 528.80 lbs per day (not -171.03 lbs per day reported in the DEIR).<sup>127</sup> Correcting emissions from this one heater, the net increase in NOx emissions for the entire Project would increase from -38.18 lbs per day to 662 lbs per day.<sup>128</sup> This greatly exceeds the CEQA significance threshold of 55 lb per day. Making similar corrections to the Project's other fired sources would result in greater exceedances of the NOx significance threshold. Dr. Fox anticipates similar results for CO and VOC, which increase significantly during startup and shutdown. However, Dr. Fox could not calculate the increases because the DEIR does not report startup, shutdown and commissioning emissions for CO or VOCs.

G1-78.52  
cont'd.

Fifth, the DEIR omits flaring emissions. The Project includes the installation of new pressure relief valves that will vent to the flares. The DEIR states that the Project would not increase flaring.<sup>129</sup> Dr. Fox explains that, while the Project would not increase routine flaring emissions, it would increase emergency flaring emissions.<sup>130</sup> In Dr. Fox's opinion, increased flaring from increased connections to flares would significantly increase NOx, CO, VOC, PM10 and PM2.5 emissions during flaring events.<sup>131</sup>

G1-78.53

Finally, the DEIR excludes emissions from an increase in crude throughput. According to the DEIR, the throughput rate for Wilmington Operations is "primarily constrained by Crude Unit and Coker Feed heater duty conditions" and the rate for the Carson Operations is "constrained by physical limitations of the equipment, including heater duty and pump/piping capacity limitations."<sup>132</sup> The DEIR states that the Los Angeles Refinery's crude oil rate capacity is 363,000 bbl/day<sup>133</sup> and the Project would increase the throughput by 6,000 bbl/day "by eliminating feed heater duty at the Wilmington Crude Unit and Coker."<sup>134</sup> However, in its most recent Form 10-K, the Applicant reported to the U.S. Securities and Exchange Commission, that the throughput capacity of the Los Angeles Refinery is 380,000 bbl/day and its 2015 throughput was 369,000 bbl/day. Thus, either modifications to debottleneck the refinery were already completed, or the DEIR understates the impact of the Project on throughput. Either way, since

G1-78.54

<sup>127</sup> Fox Comments p. 75.

<sup>128</sup> *Id.*

<sup>129</sup> DEIR, p. 4-53.

<sup>130</sup> Fox Comments, p. 77.

<sup>131</sup> *Id.*

<sup>132</sup> DEIR, pp. 2-17, A-151.

<sup>133</sup> *Id.*, p. 2-17.

<sup>134</sup> *Id.*, p. 1-9.

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increased throughput translates to increased emissions, the emissions reported in the DEIR would be substantially higher.

The DEIR fails to include increased emissions from fired sources in the analysis of operational emissions. Substantial evidence shows that these sources would result in significant increases in emissions. The Air District must prepare a revised DEIR that discloses, analyzes and mitigates significant air quality impacts from fired sources.

G1-78.54  
cont'd.

**F. The DEIR Underestimates VOC Emissions from Storage Tanks**

The DEIR uses the EPA TANKS 4.0.9d model to estimate tank VOC emissions. Dr. Fox points out that the EPA no longer recommends using this model to calculate tank emissions and cautions “use at your own risk.”<sup>135</sup> The TANKS model is known to underestimate VOC emissions in the following circumstances: (1) heated tanks (like Wilmington Operations tank 80067); (2) unheated, fixed-roof tanks (like Carson Operations tanks 062, 063, 502 and 959, and Wilmington Operations tanks 80038 and 80074); (3) tanks that receive warmer-than-ambient stock but are not heated (like Carson Operations tanks 14, 31, 62, 63, 64, 502 and 959, and Wilmington Operations tanks 80211, 80215, 80217 and 80038); and (4) tanks that store complex mixtures, like crude oil.<sup>136</sup> In these circumstances, the TANKS model underestimates VOC emissions by factors of 2 to 15.<sup>137</sup>

G1-78.55

Further, the TANKS model runs for the Project assume a vapor pressure of 10 psi and vapor molecular weight of 50 lb/lb-mol. However, the EPA default for heavier crudes with a vapor pressure of 5 psi is 50 lb/lb-mol. A lighter crude, like Bakken, would have a higher vapor molecular weight. According to Dr. Fox, the vapor molecular weight of a Bakken is 60 lb/lb-mol and the vapor molecular weight of a 10 psi gasoline is 66 lb/lb-mol.<sup>138</sup> Permits to operate do not limit vapor molecular weight. Thus, this TANKS input, which determines VOC emissions, is not enforceable.

G1-78.56

Similarly, Bakken crudes have vapor pressures up to 16 psi.<sup>139</sup> Dr. Fox points out that, while the tanks may be permitted at 10.5 psi, “tank vapor pressure limits are rarely enforced as no monitoring is required to confirm the limits. None

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<sup>135</sup> Fox Comments, p. 81.

<sup>136</sup> *Id.*, p. 81.

<sup>137</sup> *Id.*, p. 82.

<sup>138</sup> *Id.*, pp. 83-84.

<sup>139</sup> *Id.*

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of the tank vapor pressure limits in the refineries' existing Title V permits, for example, require routine monitoring."<sup>140</sup> Therefore, even if vapor pressure limits are established in the permit to operate, the limits would not guarantee that crudes with vapor pressures greater than 10.5 psi would not be stored in the tanks. As a result, higher VOC emissions could reasonably occur, but were not considered by the Air District.

G1-78.57  
cont'd.

The TANKS model also underestimates the Project's VOC emissions from tanks because it does not include roof landings, degassing and cleaning emissions. The TANKS model only estimates evaporative emissions from normal operations. For example, the TANKS model assumes that a floating roof tank is always floating. Dr. Fox explains that when a tank is emptied to the point where the roof no longer floats on the liquid, evaporative losses occur.<sup>141</sup> "These losses are uncontrolled tank emissions and can be larger than routine controlled emissions."<sup>142</sup> The DEIR completely fails to include these "roof landing losses" emissions. The DEIR also fails to include degassing and cleaning losses, which occur when tanks are drained and degassed for inspection and/or cleaning. These are uncontrolled tank emissions that can be larger than normal operating emissions.<sup>143</sup>

G1-78.58

Similarly, the TANKS model underestimates the Project's VOC emissions by omitting tank flashing emissions. Tank flashing emissions occur when crude oils with high concentrations of volatile materials, like Bakken, are exposed to temperature increases or pressure drops. When this occurs, some of the compounds transform from liquids to gases and are released or "flashed."<sup>144</sup> The DEIR fails to include these tank flashing emissions in its analysis.

G1-78.59

The TANKS model also underestimates the Project's VOC emissions by omitting water draw tank emissions. Crude oil typically contains small amounts of water, which accumulates in the bottom of storage tanks. This accumulated water is called "water draw," and is typically transferred from storage tanks to smaller water draw surge tanks for processing prior to disposal.<sup>145</sup> Over time, a thick layer of crude oil forms in the water draw surge tank, and, as a result, the water draw

G1-78.60

<sup>140</sup> *Id.*

<sup>141</sup> *Id.*, p. 84.

<sup>142</sup> *Id.*, p. 85.

<sup>143</sup> *Id.*

<sup>144</sup> *Id.*, p. 86.

<sup>145</sup> *Id.*, pp. 86-87.

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surge tank and processing waters from it emit VOC and TACs.<sup>146</sup> The DEIR fails to include these water draw tank emissions in its analysis.

G1-78.60  
cont'd.

In short, the DEIR omits many sources of tank VOC emissions. Dr. Fox explains that the DEIR does not contain sufficient information to correct the omissions. However, according to Dr. Fox, “an increase of only 6 lb/day or 2% more than estimated in the DEIR, would be required to exceed the CEQA significance threshold.”<sup>147</sup> In Dr. Fox’s opinion, “the many errors and omissions in the tank calculations are sufficient to exceed the VOC significance threshold for the Project. Thus, mitigation for tank emissions must be required.”<sup>148</sup> Dr. Fox recommends that, to reduce the Project’s emissions from tank breathing losses, degassing, cleaning and roof landing losses, the Air District should require the Applicant to install geodesic domes on all tanks that do not have them and require degassing control equipment for all tank degassing and cleaning vents.<sup>149</sup>

G1-78.61

**G. The DEIR Fails to Disclose the Project’s Health Impacts from Construction Emissions**

Project construction requires the use of diesel-fueled, off-road equipment such as backhoes, bulldozers, paving equipment and cranes. The equipment emits large amounts of diesel particulate matter. Dr. Fox explains that construction is known to cause significant health impacts in surrounding communities.<sup>150</sup> The South Coast Air Basin, where the Project is located, ranks first in California for the greatest construction health impacts, including more than 700 premature deaths, more than 650 hospitalizations for respiratory and cardiovascular illness, more than 1,700 cases of acute bronchitis, nearly 21,000 incidents of asthma attacks and other lower respiratory symptoms, and over 300,000 days of lost work and school absences.<sup>151</sup> Despite this evidence, the DEIR completely fails to disclose the Project’s health impacts from construction emissions.

G1-78.62

<sup>146</sup> *Id.*, p. 87.

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

<sup>149</sup> *Id.*, pp. 87-88.

<sup>150</sup> *Id.*, pp. 110-111.

<sup>151</sup> Don Anair, Union of Concerned Scientists, Digging Up Trouble. The Health Risks of Construction in California, 2006, Figure 1, available at: [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean\\_vehicles/digging-up-trouble.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/digging-up-trouble.pdf).

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**H. The DEIR Underestimates the Project's Hazards Impacts from Accidents**

The DEIR characterizes its analysis of accident consequences at several units for the Wilmington and Carson Operations as a worst case analysis. The DEIR asserts that the Project would “not introduce the use of new flammable substances or hazardous materials that are not currently used at the Refinery” and “no new sources of accidental releases of new hazardous materials would be present at the Refinery.”<sup>152</sup> The DEIR concludes that the Project poses no greater hazards risks than currently exist at the Los Angeles Refinery. These assertions and conclusions are unsupported and incorrect.

G1-78.63

**1. The Project May Result in More Severe Accident Scenarios than Disclosed or Analyzed in the DEIR**

The DEIR did not analyze a “worst case” accident, let alone all reasonably foreseeable accident scenarios as a result of the Project. Dr. Fox lists the types of accidents that could occur when a flammable material is released and an ignition source is encountered, including, for example, vapor cloud detonation, vapor cloud explosion and flash fire.<sup>153</sup> The DEIR fails to consider most of these reasonably foreseeable scenarios. Rather, the DEIR evaluates either a flash fire or a pool fire at all tanks, processing units and pipelines, except at the mid-barrel distillate treater, where the DEIR evaluated a torch fire. Dr. Fox explains that a pool fire occurs when a flammable liquid forms a puddle on the ground and catches on fire.<sup>154</sup> The accident is contained to the area where the spill occurs. If a flammable spill forms a vapor cloud that encounters an ignition source, the vapor cloud can catch fire and burn rapidly. This is a flash fire. A torch fire is similar to a pool fire, but burns in the form of a torch. These are not reasonably foreseeable worst case accidents because they are contained and do not spread to surrounding equipment or cause explosions.<sup>155</sup>

G1-78.64

On the other hand, a “vapor cloud explosion is one of the most dangerous and destructive explosions that could result.”<sup>156</sup> A vapor cloud explosion result from the sudden release of a large quantity of flammable vapor, such as loss of tank containment. The resulting vapor is dispersed throughout the general area while

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<sup>152</sup> DEIR, p. 4-52.

<sup>153</sup> Fox Comments, p. 90.

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*

<sup>156</sup> *Id.*, p. 91.

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mixing with air. If the mixture encounters an ignition source, a vapor cloud explosion occurs.<sup>157</sup> Dr. Fox explains that there are many ignition sources present in a refinery, from idling vehicles to sparks generated during repairs.<sup>158</sup> A Boiling Liquid Vapor Explosion (“BLEVE”) is also one of the more dangerous and destructive accident scenarios. A BLEVE occurs when a vessel containing a superheated liquid catastrophically fails.<sup>159</sup> Unlike a pool fire or vapor cloud explosion, the liquid within a tank does not have to be flammable to cause a BLEVE. Dr. Fox explains that the Project’s new tanks within or adjacent to existing tank farms present opportunities for a BLEVE.<sup>160</sup> Indeed, the DEIR acknowledges that “[t]he greatest threat to off-site receptors could occur from a vapor cloud explosion (release, dispersion and explosion of a flammable vapor cloud) or a confined explosion (ignition and explosion of flammable vapors within a confined area).<sup>161</sup> Yet, the DEIR only evaluates these types of accidents for LPG railcar loading.

G1-78.65  
cont’d.

The DEIR’s failure to evaluate these reasonably foreseeable accident scenarios is particularly alarming because vapor cloud explosions and BLEVEs are more likely to occur when Bakken crude is being handled.<sup>162</sup> Further, vapor cloud explosions and BLEVEs are likely to occur on the Project site because of the proximity of many ignition sources and the high density of tanks and process units that could be engulfed by vapors.<sup>163</sup> In Dr. Fox’s opinion:

G1-78.66

The release of a flammable material, such as Bakken crude, may result in a vapor cloud explosion, fireball or BLEVE, which could result in much more significant consequences than the accident scenarios that were evaluated in the DEIR. In a vapor cloud explosion, the vapors from a crude oil spill could engulf adjacent tanks or process units and ignite, presenting greater impacts than considered in the DEIR.<sup>164</sup>

Dr. Fox provides examples of these reasonably foreseeable scenarios. According to Dr. Fox, if the contents of one of the new storage tanks within the existing tank farm at the Wilmington Operations, or one the new tanks at the Carson Operations,

G1-78.67

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<sup>157</sup> *Id.*

<sup>158</sup> *Id.*, p. 92.

<sup>159</sup> *Id.*

<sup>160</sup> *Id.*

<sup>161</sup> DEIR, p. 3-19.

<sup>162</sup> Fox Comments, p. 93.

<sup>163</sup> *Id.*

<sup>164</sup> *Id.*



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adjacent to the main Carson tank farm, were lost (e.g. during a seismic event), a vapor cloud could engulf adjacent tanks and could ignite (e.g., from welding at an adjacent tank), causing a vapor cloud explosion.<sup>165</sup> “The risks of these types of events at the new tanks are significantly greater than at existing crude oil tanks as they will store Bakken crude oil, which is much more volatile and flammable than crude oils stored in the baseline.”<sup>166</sup> Also, for example, the Project includes a pipeway between the Wilmington and Carson Operations. The pipeway includes up to 15 pipelines that would transport gasoline and gasoline blending components, gas oil, crude oil, butylenes, propylene and LPG. Since the Project would increase the number of pipelines in the pipeway, it would increase the potential hazards of an accident.<sup>167</sup> A pipeline break, for example, triggered by an earthquake, could release gasoline and create a vapor cloud that could ignite, involving not only other pipelines in the corridor, but also other nearby facilities, such as tanks and process units.<sup>168</sup> The DEIR fails to disclose these reasonably foreseeable accident scenarios.

G1-78.67  
cont'd.

The Applicant is no stranger to these types of severe accident scenarios. For example, a 2010 fatal explosion and fire at the Applicant’s refinery in Anacortes, Washington, led state regulators to cite the company for 30 “willful” and five “serious” violations of health and safety regulations. The Washington Department of Labor and Industries called this accident the “worst industrial disaster in the 37 years that L&I has been enforcing the states’ workplace safety law.”<sup>169</sup> The U.S. Chemical Safety Board concluded that the company’s “safety culture” was a key factor in the accident.<sup>170</sup> The accident was attributed to the Applicant’s “complacent” attitude towards flammable leaks and fires and failure to correct a history of recurring leaks, failure to maintain equipment and general “deficient refinery safety culture, weak industry standards for safeguarding equipment, and a regulatory system that too often emphasizes activities rather than outcomes.”<sup>171</sup>

G1-78.68

<sup>165</sup> *Id.*

<sup>166</sup> *Id.*

<sup>167</sup> *Id.*, p. 94.

<sup>168</sup> *Id.*

<sup>169</sup> Eric de Place, Tesoro: A Track Record of Pollution, Hostility to Workers, and Meddling in Politics, Sightline Institute, March 21, 2014; Available at: <http://www.sightline.org/2014/03/21/tesoro-a-track-record-of-pollution-hostility-to-workers-and-meddling-in-politics/>.

<sup>170</sup> U.S. Chemical Safety and Hazard Investigation Board, Investigation Report, Catastrophic Rupture of Heat Exchanger (Seven Fatalities), Tesoro Anacortes Refinery, Anacortes, Washington, April 2, 2010, Report 2010-08-I-WA, May 2014; Available at: [file:///C:/Users/Phyllis/Downloads/Tesoro\\_Anacortes\\_2014-May-01.pdf](file:///C:/Users/Phyllis/Downloads/Tesoro_Anacortes_2014-May-01.pdf).

<sup>171</sup> CSB Investigation Finds 2010 Tesoro Refinery Fatal Explosion Resulted from High Temperature Hydrogen Attack Damage to Heater Exchanger, Available at: <http://www.csb.gov/csb-investigation->

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The DEIR fails to disclose or analyze all of the Project’s reasonably foreseeable accident scenarios. The Air District must revise the DEIR accordingly.

G1-78.69

**2. The DEIR Fails to Consider the Location of New Tanks as a Factor in Assessing Hazards Impacts**

Dr. Fox explains that “[t]he location of a process, such as the new tanks and pipelines in relation to other facilities is a key consideration in evaluating risks.”<sup>172</sup> Dr. Fox points out that the Project’s new tanks, for example, are within or adjacent to existing tank farms.<sup>173</sup> Thus, an accident at one of the new tanks could generate a vapor cloud that would engulf one or more tanks in the existing tank farms or a vapor cloud from an accident in the tank farm could engulf the new tanks. The location of the Project tanks “significantly increas[es] the impacts of an accident” and “result[s] in significant impacts. If the vapor clouds from these types of events encountered an ignition source, a vapor cloud explosion or BLEVE could result.”<sup>174</sup> The Air District must revise the DEIR to consider the location of the Project’s proposed tanks.

G1-78.70

**3. The DEIR Fails to Disclose Ignition Sources**

Vapor clouds from spilled flammable liquids, such as imported crude oil, can ignite anywhere within their flammable limits if there is an ignition source.<sup>175</sup> There are many ignition sources at the Project site, including:

- locomotives for LPG and coke trains on the local rail lines;
- traffic on the access road and heavily traveled adjacent public roads;
- workers who smoke;
- hot surfaces;
- open flames from welding;
- electric sparks from motors driving pumps and other equipment;
- suction of crude vapors into diesel engines and subsequent combustion;
- friction sparks, as from trains on the tracks and railcars jamming into each other during stops and starts;

G1-78.71

[finds-2010-tesoro-refinery-fatal-explosion-resulted-from-high-temperature-hydrogen-attack-damage-to-heat-exchanger/?SID=97](#).

<sup>172</sup> Fox Comments, p. 95.

<sup>173</sup> *Id.*

<sup>174</sup> *Id.*, pp. 95-96

<sup>175</sup> *Id.*, p. 96.

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- heaters and boilers; and
- increased flaring from new pressure relief valves that will tie into existing flares.

The Air District did not disclose or consider these emissions sources in its analysis of the Project's hazards impacts. The Air District must revise the DEIR accordingly.

G1-78.71  
cont'd.

#### 4. The DEIR Fails to Include a Health Risk Assessment for Impacts from Refinery Accidents

The DEIR evaluates the health impacts from the Project's routine operational emissions, but fails to include a health risk assessment for emissions that occur during refinery accidents. The DEIR's analysis of health impacts from routine operational emissions cannot be applied to impacts from refinery accidents for four reasons.

First, the DEIR uses toxic endpoints for five scenarios based on the Emergency Response Planning Guideline 2 ("ERPG-2") for hydrogen sulfide ("H<sub>2</sub>S") and sulfur dioxide ("SO<sub>2</sub>"). However, Dr. Fox points out that "these toxic endpoints are not a reasonable basis to evaluate the significance of accidents that release [toxic air pollutants] and do not constitute or substitute for a health risk assessment."<sup>176</sup> This is because the ERPG-2 values do not protect public health.<sup>177</sup> "An ERPG-2 is the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action."<sup>178</sup> However, "[s]ensitive members of the public, such as old, sick or very young people are not covered by these guidelines and they may experience adverse effects at concentrations below the ERPG levels."<sup>179</sup> Rather, a health risk assessment covers these sensitive members of the public.

G1-78.72

Second, ERPGs are not an appropriate endpoint hazard criteria for accidents because they are focused on exposure of one hour. Dr. Fox explains that exposures from accidents are typically much longer.<sup>180</sup> The American Industrial Hygiene

G1-78.73

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<sup>176</sup> Fox Comments, p. 99.

<sup>177</sup> *Id.*

<sup>178</sup> *Id.*, p. 100

<sup>179</sup> *Id.*

<sup>180</sup> *Id.*

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Association (“AIHA”) developed the ERPGs and “strongly advises against trying to extrapolate ERPG values to longer periods of time.”<sup>181</sup>

G1-78.73  
cont’d.

Third, ERPGs should only be used when Acute Exposure Guidelines Levels (“AEGLs”) are unavailable.<sup>182</sup> AEGLs are available for H<sub>2</sub>S. AEGLs estimate concentrations at which most people, including sensitive receptors, will experience health effects.<sup>183</sup> Dr. Fox shows that the AEGL H<sub>2</sub>S concentrations at which most people would experience health effects are lower than the ERPG H<sub>2</sub>S concentrations.<sup>184</sup>

G1-78.74

Finally, even AEGLs are no substitute for a health risk assessment which evaluates chronic, acute and carcinogenic risks. Moreover, health risk assessments cover many toxic air pollutants (such as mercaptans, dimethyl sulfide, benzene, toluene, hydrogen cyanide, carbon monoxide, fine particulate matter and smoke, among others), not just a single pollutant, such as H<sub>2</sub>S or SO<sub>2</sub>.<sup>185</sup> In addition, Dr. Fox shows that the reference exposure levels used in health risk assessments are much lower than that AEGLs and EPRGs.<sup>186</sup> For H<sub>2</sub>S, for example, the reference exposure level is 0.03 ppm, the AEGL-1 is 0.51 ppm, the AEGL-2 is 27 ppm and the ERPG-2 is 30 ppm.<sup>187</sup>

G1-78.75

In short, the DEIR’s conclusion that the Project poses no greater hazards risks than currently exist at the Los Angeles Refinery is unsupported by evidence and incorrect. Furthermore, substantial evidence shows that the Project would result in significant impacts from accidents. The Air District must revise the DEIR accordingly.

G1-78.76

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<sup>181</sup> Office of Response and Restoration, Emergency Response Planning Guidelines (ERPGs); Available at: <http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html>.

<sup>182</sup> Fox Comments, p. 101.

<sup>183</sup> *Id.*

<sup>184</sup> *Id.*

<sup>185</sup> *Id.*, p. 102.

<sup>186</sup> *Id.*

<sup>187</sup> *Id.*

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**I. The DEIR Fails to Adequately Disclose and Analyze the Project’s Health and Safety Impacts from Onsite Soil and Groundwater Contamination**

The Los Angeles Refinery has a long history of releases of contaminants to soil and groundwater. The DEIR refers to a 2015 soil characterization report prepared for the Project documents soil and groundwater contaminated with LNAPL at the Carson and Wilmington Operations. The DEIR states that, according to the 2015 report, “[o]f the 44 soil samples analyzed, samples indicate that 95 percent of the soil to be potentially excavated will be classified as non-hazardous waste.”<sup>188</sup> However, Mr. Hagemann reviewed the 2015 report and found that the DEIR fails to disclose that: (1) exceedances of construction worker health and safety ESLs were found in soils close to areas where Project construction will take place; (2) with few exceptions, samples were not collected where Project construction would disturb soil; and (3) sampling density was “woefully inadequate” to characterize soil contamination.<sup>189</sup> Thus, the DEIR’s conclusion is unsupported.

G1-78.77

Mr. Hagemann evaluated the Project’s potential public health and safety impacts from on-site contamination. Based on the 2015 report, Mr. Hagemann prepared maps for the Wilmington and Carson Operations showing the locations near Project construction where soil ESLs for construction workers will be exceeded.<sup>190</sup> In Mr. Hagemann’s opinion, if samples targeted the areas proposed to be disturbed by the Project, it is possible that those soil samples would also exceed construction worker ESLs.<sup>191</sup>

G1-78.78

In his comments, Mr. Hagemann describes the health effects of the compounds detected above ESLs at the Wilmington and Carson Operations. For TPH compounds, health effects include central nervous system disruptions (such as headaches, dizziness and peripheral neuropathy) and effects on the blood, immune system, lungs, skin and eyes. For mercury exposure at high levels, health effects include damage to the brain, kidneys and developing fetus. For short-term mercury vapor exposure, health effects include lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes and eye irritation.<sup>192</sup> Despite these health effects, the DEIR completely fails to disclose or mitigate the Project’s

G1-78.79

<sup>188</sup> DEIR, p. 3-25.

<sup>189</sup> Hagemann Comments, p. 2.

<sup>190</sup> *Id.*, pp. 3, 4.

<sup>191</sup> *Id.*, p. 2.

<sup>192</sup> *Id.*, p. 4.

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potentially significant health impacts on construction workers from the excavation of contaminated soils.

G1-78.79  
cont'd.

Further, based on the sampling conducted for the Project, the Air District could not determine the extent of the Project's health impacts from soil and groundwater contamination. As explained above, sampling was not targeted to the Project. While the 2015 report purported sampling in "locations where soil will be generated during the Integration Project," the maps prepared by Mr. Hagemann show that very few samples were collected in areas where Project construction would occur.<sup>193</sup>

G1-78.80

Mr. Hagemann also prepared a map showing the location of the Project's proposed pipeline bundle (under the Alameda Corridor and Sepulveda Boulevard) in relation to the disclosed LNAPL. The pipeline bundle requires drilling 80 feet underground. The map shows that the bundle would cross through or near a pool of 0.74-foot thick LNAPL at a depth of 14 feet.<sup>194</sup> The DEIR completely fails to analyze the potentially significant impacts that may result from penetrating the LNAPL. According to Mr. Hagemann, the Project may result in soil and groundwater contamination from "smear[ing] the LNAPL to deeper depths" because "[a]s drilling advances, the 54-inch bore may intersect the LNAPL and drag down relatively shallow contaminants to deeper levels."<sup>195</sup> The DEIR also fails to disclose the "[p]otential need to dewater and the need to handle the LNAPL and the contaminated groundwater associated with the LNAPL."<sup>196</sup> Finally, the DEIR fails to include measures to protect construction workers from direct contact with the LNAPL and from exposure to vapors.<sup>197</sup> In short, the DEIR fails to disclose, analyze and mitigate the Project's potentially significant impacts to construction health and safety, and to soil and groundwater quality, from penetrating the LNAPL. The Air District must revise the DEIR accordingly.

G1-78.81

**VII. THE DEIR'S PROPOSED MITIGATION MEASURES ARE INADEQUATE**

CEQA prohibits agencies from approving projects with significant environmental impacts when feasible mitigation measures can substantially lessen

G1-78.82

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<sup>193</sup> *Id.*, pp. 3-4.

<sup>194</sup> *Id.*, pp. 5-6.

<sup>195</sup> *Id.*, p. 6.

<sup>196</sup> *Id.*

<sup>197</sup> *Id.*

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or avoid such impacts.<sup>198</sup> An agency may not approve a project unless it has “[c]eliminated or substantially lessened all significant effects on the environment where feasible.”<sup>199</sup> The mitigation measures that are adopted by the agency must be enforceable through conditions of approval, contracts, or other means that are *legally* binding.<sup>200</sup> Incorporating mitigation measures into conditions of approval ensures that the measures will be implemented, not merely adopted and ignored.<sup>201</sup> Therefore, a project proponent’s agreement to a mitigation measure, by itself, is insufficient under CEQA. The mitigation measure must be adopted in a way that makes it an enforceable agreement that actually mitigates the significant environmental impact.<sup>202</sup> The DEIR’s proposed measures to mitigate the Project’s significant air quality impacts from Project construction, and the Project’s significant hazards impacts, are inadequate under CEQA.

G1-78.82  
cont’d.

**A. The DEIR’s Proposed Mitigation Measures for Significant Air Quality Impacts from Construction Emissions are Inadequate**

The DEIR concludes that emissions of VOC and NOx from Project construction are significant.<sup>203</sup> The DEIR proposes eight mitigation measures (with four exceptions), and eight best management practices for construction.<sup>204</sup> However, the DEIR concludes that “[c]onstruction emissions for the proposed project for VOC and NOx are expected to remain significant following mitigation.”<sup>205</sup> The DEIR’s proposed mitigation is inadequate.

G1-78.83

First, mitigation measures A-5 and A-6 require the Applicant to survey, identify and document all construction areas served by electricity and to use only electric welders and power generators in these areas. In Dr. Fox’s opinion, the documented survey is an effective measure. However, Dr. Fox points out that other construction equipment is available in electrical models, including pumps, jack hammers, excavators, augers and trucks.<sup>206</sup> The Air District should require the Applicant to use all available electric construction equipment.

<sup>198</sup> Pub. Resources Code § 21002.

<sup>199</sup> CEQA Guidelines § 15092(b)(2).

<sup>200</sup> Pub. Resources Code § 21081.6(b).

<sup>201</sup> *Federation of Hillside & Canyon Ass’ns v. City of Los Angeles* (2000) 83 CA 4th 1252, 1261.

<sup>202</sup> *Woodward Park Homeowners Ass’n v. City of Fresno* (2007) 150 CA 4th 683, 730.

<sup>203</sup> DEIR, Table 4.2-2 and p. 4-36.

<sup>204</sup> DEIR, pp. 4-36 – 4-40.

<sup>205</sup> *Id.* p. 4-42.

<sup>206</sup> Fox Comments, p. 104.

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Second, the DEIR's best management practices require maintaining a 1,000-foot buffer zone between truck traffic and sensitive receptors, where feasible. This is not adequate mitigation for three reasons: (1) the measure is limited to truck traffic, but should be expanded to include all diesel and gasoline powered on-site and off-site construction equipment; (2) there is no basis for selecting 1,000 feet as the buffer, which should be determined by health risk assessments (which were not conducted for the Project's construction emissions); and (3) the DEIR fails to require that the buffer be enforced or verified as adequate.

G1-78.84

Finally, the DEIR includes exceptions to complying with mitigation measures A-2 through A-8 for on-road and off-road construction equipment and generator requirements. These exceptions allow the Applicant to step down to dirtier equipment or vehicles if: (1) cleaner equipment is not available for lease or short-term rental within 200 miles of the Project site; (2) agency funding was not provided to cover the equipment retrofit or purchase cost; (3) equipment purchased at least 60 days prior to use has not arrived; or (4) the equipment would be used for less than 10 days.<sup>207</sup> Simply put, these exceptions allow the Applicant to plan poorly and avoid mitigation, rendering the measures meaningless. For effective mitigation, the Air District should require the following feasible alternative measures: (1) if a compliant engine is not available, equip available engines with retrofit controls; (2) extend the search radius to 1,000 miles from the Project site; and (3) modify on-site stationary source equipment to reduce NOx and VOC emissions during Project construction.<sup>208</sup>

G1-78.85

In addition, Dr. Fox recommends the following feasible mitigation measures to reduce the Project's significant impact from construction emissions:<sup>209</sup>

- Implement EPA's National Clean Diesel Program;
- Diesel- or gasoline-powered equipment shall be replaced by lowest emitting feasible equipment for each piece of equipment from among these options: electric equipment whenever feasible, gasoline-powered equipment if electric infeasible;
- If cranes are required for construction, they shall be rated at 200 hp or greater equipped with Tier 4 or equivalent engines;

G1-78.86

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<sup>207</sup> DEIR, p. 4-38.

<sup>208</sup> Fox Comments, p. 106.

<sup>209</sup> *Id.*, pp. 106 - 110.



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- Use electric fleet or alternative fueled vehicles where feasible including methanol, propane, and compressed natural gas;
- Use alternative diesel fuels, such as Clean Fuels Technology (water emulsified diesel fuel), or O2 diesel ethanol-diesel fuel (O2 Diesel) in existing engines;
- Convert part of the construction truck fleet to natural gas;
- Include “clean construction equipment fleet”, defined as a fleet mix cleaner than the state average, in all construction contracts;
- Fuel all off-road and portable diesel powered equipment with ARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road);
- Use electric fleet or alternative fueled vehicles, where feasible, including methanol, propane, and compressed natural gas;
- Use on-road, heavy-duty trucks that meet the ARB’s 2007 or cleaner certification standard for on-road diesel engines, and comply with the State on-road regulation;
- Use idle reduction technology, defined as a device that is installed on the vehicle that automatically reduces main engine idling and/or is designed to provide services, e.g., heat, air conditioning, and/or electricity to the vehicle or equipment that would otherwise require the operation of the main drive engine while the vehicle or equipment is temporarily parked or is stationary;
- Minimize idling time either by shutting off equipment when not in use or limit idling time to 3 minutes (5 minutes is required by 13 CCR 2449[d][3], 2485, so is not “mitigation”). Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the 3 minute idling limit. The on-site construction manager shall enforce this limit;

G1-78.86  
cont’d.

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- Prohibit diesel idling within a buffer zone established by health risk assessment to protect sensitive receptors and use an on-site monitor to enforce this distance;
- Staging and queuing areas shall not be located within a buffer zone established by health risk assessment to protect sensitive receptors and use an on-site monitor to enforce this distance;
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time;
- The engine size of construction equipment shall be the minimum practical size;
- Catalytic converters shall be installed on gasoline-powered equipment;
- Signs shall be posted in designated queuing areas and job sites to remind drivers and operators of the idling limit;
- Engine size of construction equipment shall be the minimum practical size;
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time;
- Construction worker trips shall be minimized by providing options for carpooling and by providing for lunch onsite;
- Use new or rebuilt equipment;
- Maintain all construction equipment in proper working order, according to manufacturer's specifications. The equipment must be checked by an ASE-certified mechanic and determined to be running in proper condition before it is operated;

G1-78.86  
cont'd.

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- Use low rolling resistance tires on long haul class 8 tractor-trailers;
- Use diesel-electric and hybrid construction equipment;
- Maintain all construction equipment in proper working order, according to manufacturer's specifications. The equipment must be checked by an ASE-certified mechanic and determined to be running in proper condition before it is operated; and
- All off-road diesel-powered equipment must be tested to confirm tailpipe emissions do not exceed 20% opacity for more than three minutes in any hour. Any equipment found to exceed 20% opacity must be repaired immediately. The Air District should require a weekly visual inspection of all in-operation equipment by the contractor and witnessed monthly or more frequently by the Air District. A periodic summary of the visual survey results must be submitted by the contractor throughout the duration of the project to the Air District. The summary should include the quantity and type of vehicles inspected and dates.

G1-78.86  
cont'd.

The Air District must revise the DEIR to include all feasible measures necessary to mitigate the Project's significant impact from construction emissions.

**B. The DEIR's Proposed Mitigation Measures for Significant Hazards Impacts from Accidents are Inadequate**

The DEIR concludes that the Project's hazards impacts from the Naptha Isomerization Unit, new crude tanks, SARP and interconnecting piping would remain significant after the incorporation of mitigation.<sup>210</sup> The DEIR's proposed mitigation measure is inadequate.

G1-78.87

Substantial evidence shows that these programs were in place when two catastrophic events occurred – the 2010 accident at the Applicant's Anacortes refinery and the 2012 accident at the Chevron refinery.<sup>211</sup> Clearly, the programs were not enough to prevent these catastrophic accidents. Indeed, the U.S. Chemical Safety and Hazard Investigation Board concluded that these programs were not

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<sup>210</sup> DEIR, p. 1-29.

<sup>211</sup> Fox Comments, p. 103.

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effective at preventing refinery accidents in its analysis of the Tesoro Anacortes accident.<sup>212</sup>

The Chevron Refinery Modernization Project EIR incorporated many additional mitigation measures to reduce that project's significant hazards impacts from accidents. Dr. Fox includes the list of feasible measures in Exhibit 30 to her comments and recommends that these measures be included in a revised DEIR.

G1-78.87  
cont'd.

**VIII. THE DEIR FAILS TO DISCLOSE THE PROJECT'S INCONSISTENCIES WITH THE CITY OF CARSON'S GENERAL PLAN**

Under California law, a general plan serves as a "charter for future development"<sup>213</sup> and embodies "fundamental land use decisions that guide the future growth and development of cities and counties."<sup>214</sup> The general plan has been aptly described as "the constitution for all future developments" within a city or county.<sup>215</sup> Further, the "propriety of virtually any local decision affecting land use and development depends upon consistency with the applicable general plan and its elements."<sup>216</sup> The consistency doctrine has been described as the "linchpin of California's land use and development laws; it is the principle which infuses the concept of planned growth with the force of law."<sup>217</sup>

G1-78.88

The DEIR fails to acknowledge the Project's conflicts with a number of the City of Carson's General Plan goals and policies. These goals and policies were adopted for the purpose of avoiding or mitigating environmental impacts.<sup>218</sup> Therefore, these inconsistencies are significant environmental impacts. The Air District must revisit the DEIR's General Plan consistency analysis and must disclose and mitigate any inconsistencies in a revised DEIR that is circulated for public review and comment. The following are examples of these inconsistencies:

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<sup>212</sup> U.S. Chemical Safety and Hazard Investigation Board. Tesoro Anacortes Refinery. May 2014. Section 7.8.

<sup>213</sup> *Leshar Communications, Inc. v. City of Walnut Creek* (1990) 52 Cal.3d 531, 54.

<sup>214</sup> *City of Santa Ana v. City of Garden Grove* (1979) 100 Cal.App.3d 521, 532.

<sup>215</sup> *Families Unafraid to Uphold Rural El Dorado County v. Board of Supervisors of El Dorado County* (1998) 62 Cal.App.4th 1334, 1335.

<sup>216</sup> *Citizens of Goleta Valley v. Board of Supervisors of County of Santa Barbara* (1990) 52 Cal.3d 553, 570.

<sup>217</sup> *Corona-Norco Unified School District v. City of Corona* (1993) 17 Cal.App.4th 985, 994.

<sup>218</sup> CEQA Guidelines §X(b).

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**A. The Project is Inconsistent with Public Safety Goals 4 and 5**

The City of Carson General Plan considers “[p]ublic safety relating to the handling and exposure of the community to hazardous materials.”<sup>219</sup> The purpose of Goal SAF-4 is to “[m]inimize the threat to the public health and safety and to the environment posed by a release of hazardous materials.”<sup>220</sup> The General Plan also recognizes the risk of urban fires “to both residents and workers within Carson,” which “can result in the release of hazardous toxic substances...”<sup>221</sup> The purpose of Goal SAF-5 is to “[m]inimize the public hazard from fire emergencies.”<sup>222</sup>

G1-78.89

The Project is inconsistent with Goals SAF-4 and SAF-5 because, as described above and in the attached comments of Dr. Fox, the Project would result in significant, unmitigated hazards impacts associated with accident risks (explosion, fire, spills) from the increased import and storage of Bakken (or similar light) crude oil. Thus, the Project *increases* the public health and safety threats from hazardous materials and fires.

**B. The Project is Inconsistent with Air Quality Goals and Policies**

The General Plan recognizes that “dust not only creates a nuisance, but those temporary and permanent uses which generate substantial amounts of dust can impact the health of residents.”<sup>223</sup> Thus, the purpose of Goal AQ-1 is to reduce “particulate emissions from paved and unpaved surfaces and during building construction.”<sup>224</sup> Policy AQ-1.1 is to “mandate the use of dust control measures to minimize this nuisance.”<sup>225</sup> Also, Goal AQ-2 is to improve regional air quality to meet State and federal standards.<sup>226</sup> In addition, Goal AQ-5 is “[r]educe emissions related to industry to enhance air quality.”<sup>227</sup> Policy AQ-5.1 is to use the “City’s Planning processes” to “reduce air pollutant emissions by mitigating air quality impacts associated with facilities/industries in Carson, to the greatest extent possible.”<sup>228</sup>

G1-78.90

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<sup>219</sup> City of Carson General Plan, p. SAF-32.

<sup>220</sup> *Id.*

<sup>221</sup> *Id.*, p. SAF-33.

<sup>222</sup> *Id.*, p. SAF-34.

<sup>223</sup> *Id.*, p. AQ-10.

<sup>224</sup> *Id.*

<sup>225</sup> *Id.*

<sup>226</sup> *Id.*, p. AQ-11.

<sup>227</sup> *Id.*, p. AQ-15.

<sup>228</sup> *Id.*

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The Project is inconsistent with these air quality goals and policies because, as described above and in Dr. Fox's attached comments, Project construction and operation would result in significant, unmitigated air quality impacts. The Project would increase particulate emissions, fails to utilize all feasible measures to reduce particulate emissions, would deteriorate regional air quality, and would increase industry-related emissions. Therefore, the Project would worsen air quality, not improve it.

G1-78.90  
cont'd.

**IX. CONCLUSION**

The DEIR is inadequate and must be withdrawn. We urge the Air District to prepare and circulate a revised DEIR which includes a complete Project description and an accurate description of the environmental setting upon which to measure the whole Project's reasonably foreseeable impacts. The revised DEIR must also identify *all* of the Project's potentially significant impacts, and require all feasible mitigation measures to reduce the Project's significant environmental and public health and safety impacts.

G1-78.91

We thank you for the opportunity to provide these comments on the DEIR.

Sincerely,



Rachael Koss

REK:ric

# ATTACHMENT A

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**By: Email and Overnight Mail**

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(c/o Planning/CEQA)  
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**Re: Comments on the Draft Negative Declaration and Initial Study  
for the Tesoro Storage Tank Replacement & Modification  
Project**

Dear Ms. Radlein:

We are writing on behalf of Safe Fuel and Energy Resources California ("SAFER California") to provide comments on the Draft Negative Declaration and Initial Study ("IS/ND") prepared by the South Coast Air Quality Management District ("SCAQMD" or "District") pursuant to the California Environmental Quality Act ("CEQA"),<sup>1</sup> for the Tesoro Storage Tank Replacement and Modification Project. Tesoro Refining & Marketing Company LLC ("Applicant") proposes the following modifications within the Wilmington Operations of its Los Angeles Refinery:

- (1) Removing two existing 80,000 barrel ("bbl") fixed-roof petroleum product storage tanks (tanks 80035 and 80036);
- (2) installing two new 300,000 bbl internal floating roof storage tanks (tanks 300035 and 300036) in the same location as the tanks that are being removed;

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<sup>1</sup> Pub. Resources Code, §§ 21000 et seq.  
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- (3) modifying one existing 80,000 bbl storage tank (tank 80038) to change the type of commodity to be stored in the tank to also include light gas oil and to connect the tank to the existing vapor recovery system in the tank farm;
- (4) increasing the throughput of an additional 80,000 bbl storage tank (tank 80079) from 350,000 bbl per month (bbl/month) to 500,000 bbl/month;
- (5) removing 12-inch diameter piping that connects all four Project tanks with Tesoro's marine terminal; and
- (6) replacing the 12-inch diameter piping with 42-inch diameter piping to connect all four Project tanks and other, unidentified, tanks throughout the tank farm ("Tank Farm Piping Modifications") with Tesoro's existing marine terminal pipeline.

Tanks 300035 and 300036 are proposed to primarily store crude oil. The above-listed modifications are referred to, collectively, in these comments as "the Project."

Based upon our review of the IS/ND, the documents referenced in the IS/ND, public records within the District's possession and publicly available information, we conclude that the IS/ND is deficient and must be withdrawn. Although the IS/ND includes various analytical errors, the major defect in the IS/ND is that it entirely fails to disclose the operational implications of the **1200%** increase in crude throughput in the Project-affected tanks from the Tank Farm Piping Modifications. This Project component would allow, not just the Tank Farm, but also Tesoro's Marine Terminal to increase its throughput, and facilitates a substantial increase in the delivery of cost-advantaged crudes to the Los Angeles Refinery. The resulting, reasonably foreseeable throughput increases at the Tank Farm and Marine Terminal would cause significant environmental impacts that are not disclosed in the IS/ND.

Other deficiencies in the IS/ND include an incomplete and inaccurate Project description, the District's failure to establish the environmental setting for the purpose of analyzing air quality, public health and hazards impacts and the District's failure to use an appropriate baseline to evaluate the Project's air quality impacts. As a result of these defects, and other technical errors in the IS/ND, the

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District has failed to identify and address the Project's significant air quality impacts, cancer risks and hazards impacts. Lastly, here, the District has improperly piecemealed environmental review by failing to analyze the Project together with reasonably foreseeable modifications to the Los Angeles Refinery's refining processes.

These numerous defects, set forth in greater detail in the following paragraphs, are fatal errors. The District must withdraw the IS/ND and prepare a Draft EIR which fully complies with CEQA.

We prepared these comments with the assistance of technical expert Phyllis Fox, Ph.D., QEP, PE, DEE. Dr. Fox's technical comments and curriculum vitae are attached and submitted in addition to the comments in this letter. We request that the District respond to the comments of Dr. Fox separately.

#### **I. STATEMENT OF INTEREST**

SAFER California advocates for safe processes at California refineries to protect the health, safety, the standard of life and the economic interests of its members. For this reason, SAFER California has a strong interest in enforcing environmental laws, such as CEQA, which require the disclosure of potential environmental impacts of, and ensure safe operations and processes for, California oil refineries. Failure to adequately address the environmental impacts of crude oil and fuel products transport, refining, storage and distribution processes poses a substantial threat to the environment, worker health, surrounding communities, and the local economy.

Refineries and fuel storage and distribution facilities are uniquely dangerous and capable of generating significant fires and the emission of hazardous and toxic substances that adversely impact air quality, water quality, biological resources and public health and safety. These risks were recognized by the Legislature and Governor when enacting SB 54 (Hancock). Absent adequate disclosure and mitigation of hazardous materials and processes, refinery workers and surrounding communities may be subject to chronic health problems and the risk of bodily injury and death.

Poorly planned refinery and fuel products storage and distribution projects also adversely impact the economic wellbeing of people who perform construction

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and maintenance work in these facilities and the surrounding communities. Plant shutdowns in the event of accidental release and infrastructure breakdown have caused prolonged work stoppages. Such nuisance conditions and catastrophic events impact local communities and can jeopardize future jobs by making it more difficult and more expensive for businesses to locate and people to live in the area. The participants in SAFER California are also concerned about projects that carry serious environmental risks and public service infrastructure demands without providing countervailing employment and economic benefits to local workers and communities.

The members represented by the participants in SAFER California live, work, recreate and raise their families in Los Angeles County, including in or near the City of Carson and the community of Wilmington. Accordingly, these people would be directly affected by the Project's adverse environmental impacts. The members of SAFER California's participating unions may also work on the Project itself. They will, therefore, be first in line to be exposed to any hazardous materials, air contaminants, and other health and safety hazards, that exist onsite.

## II. PROJECT BACKGROUND

The Applicant's Los Angeles Refinery, depicted in Figure 1 below, includes two adjacent facilities, the Wilmington Refinery ("Wilmington Operations") and the recently acquired Carson Refinery ("Carson Operations"). The Applicant acquired the Wilmington Operations and the Carson Operations in 2007 and 2013, respectively.<sup>2</sup> As described in the IS/ND, the Wilmington Operations are located primarily within the Wilmington community and are within the jurisdiction of the City of Los Angeles.<sup>3</sup> The Carson Operations are located entirely within the City of Carson.

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<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid.*

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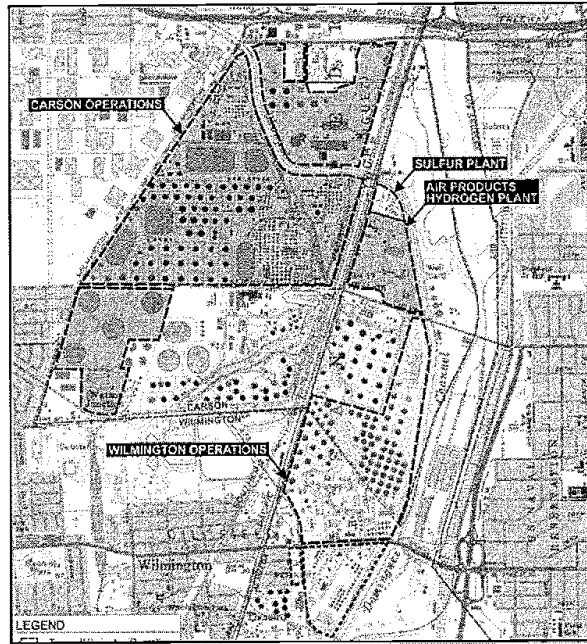


Figure 1: Tesoro Los Angeles Refinery<sup>4</sup>

The Los Angeles Refinery is located approximately three miles northwest of the Port of Long Beach. According to the IS/ND, Tesoro operates a marine terminal at the Port of Long Beach at Berths 84-87 (“Marine Terminal”).<sup>5</sup> As illustrated in the IS/ND, and Figure 2 below, crude oil is unloaded from the Marine Terminal at the Port of Long Beach and transferred to the Wilmington Operations by an underground pipeline.

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<sup>4</sup> Source: IS/ND, Fig. 1-2.

<sup>5</sup> IS/ND, at p. 1-7 & Fig. 1-5.  
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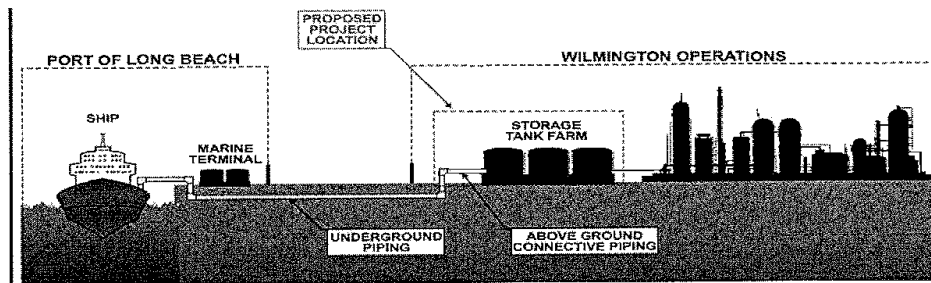


Figure 2: Project crude oil import pathway<sup>6</sup>

Tesoro also owns and operates additional terminals at the Port of Long Beach. These are located at Berths 167-169 and 78-78 and 121 and were originally acquired by the Applicant as part of the 2013 Carson Refinery purchase. The IS/ND does not identify these additional terminals.

According to the IS/ND, the Wilmington Operations use 20 tanks, located within the Wilmington Operations boundary, for storage of crude oil and other heavy petroleum liquids (“Tank Farm”). The location of the Tank Farm within the boundaries of the Wilmington Operations is nowhere depicted in the IS/ND. The Project tank and piping replacements and modifications, however, are proposed to take place within the Tank Farm, as illustrated in Figure 2 above.

### III. THE PROJECT DESCRIPTION IN THE IS/ND IS INADEQUATE

The courts have repeatedly held that “[a]n accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR.”<sup>7</sup> CEQA requires that a project be described with enough particularity that its impacts can be assessed.<sup>8</sup> “A curtailed or distorted project description may stultify the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal’s benefit against its environmental costs . . . .”<sup>9</sup> As stated by the court in *County of Inyo v. City of Los*

<sup>6</sup> Source: IS/ND, p. 1-10.

<sup>7</sup> *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.

<sup>8</sup> *Id.* at 192.

<sup>9</sup> *Id.* at 192-193.

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*Angeles*, “a curtailed, enigmatic or unstable project description draws a red herring across the path of public input.”<sup>10</sup>

The IS/ND fails to meet CEQA’s standard for an adequate project description in various respects. First, the IS/ND fails to identify with a sufficient degree of particularity the products that will be stored in the new and modified tanks. Second, the IS/ND fails to disclose that the Project would allow the Wilmington Operations to receive a broader range of crudes and facilitate the Los Angeles Refinery’s transition to cost-advantaged crudes, including crudes from the Bakken field in North Dakota and Canadian tar sands. Third, the IS/ND fails to identify various Project components with sufficient particularity to allow for environmental review. These components include the proposed piping and tank modifications. Finally, the Project description in the IS/ND is invalid because it appears to be crafted primarily to mislead the reader about the Applicant’s purpose and goals and the Project’s effect on Los Angeles Refinery operations. The IS/ND is riddled with factual errors and unsupported assertions. We address the key omissions and misstatements in the IS/ND in these comments.

**A. The IS/ND Fails to Adequately Identify the Products Proposed to Be Imported Into and Stored at the Tank Farm**

CEQA requires the District to identify the products that may be imported into and stored at the Los Angeles Refinery during Project implementation with sufficient particularity to enable environmental review. The IS/ND fails in this regard. The IS/ND states that the Project “would not change *the types* of crude oils delivered to the Wilmington Operations.”<sup>11</sup> The IS/ND’s description of the products proposed to be stored in the Tank Farm is inadequate because it is vague and misleading. As explained by Dr. Fox, the word “type” is so vague that it precludes an accurate evaluation of the Project’s impacts on the environment.<sup>12</sup>

Type is a relative term that encompasses a fairly broad range of crudes. The chemical and physical characteristics that determine environmental impacts can vary greatly within crude “types” and thus result in a wide range of environmental impacts. Changes in crude quality can include properties such as vapor pressure

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<sup>10</sup> *Id.* at 197-198.

<sup>11</sup> IS/ND at p. 1-1, emphasis added.

<sup>12</sup> Comments of Dr. Phyllis Fox, at pp. 5-7 (hereafter “Fox Comments”), attached as **Attachment 1**. 3094-002cv

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(which determines how much criteria pollutants and toxic air contaminants (“TACs”) will be emitted); flammability and flash point (which determine the potential for fires and explosions and their consequences); chemical speciation (which determines public health and odor impacts); Total Acid Number (“TAN”) (which determines the potential for corrosion and related accidents); and API gravity, sulfur and nitrogen content (which determine emissions during refining), among others.<sup>13</sup>

For example, “light crudes” may be broadly classified as a “type” of crude, but this “type” of crude includes various light crudes, such as Bakken and Basrah crudes. As explained by Dr. Fox, these two “light” crudes have very different chemical and physical characteristics that result in different environmental impacts when they are transported, stored, and refined.<sup>14</sup> Bakken crude is also much more volatile than Basrah, and thus presents greater risks of fire and explosion.<sup>15</sup>

In sum, without identifying the Project crude slate by source and chemical composition, the District cannot accurately identify the Project’s environmental impacts. The District must withdraw the IS/ND, and prepare a revised environmental analysis that identifies the Project crude slate with sufficient particularity that its impacts may be assessed.

**B. The IS/ND Fails to Identify and Address the Applicant’s Proposed Crude Switch**

In *Communities for a Better Environment v. City of Richmond*, the First District Court of Appeal held that an EIR for a refinery project must disclose whether the proposed equipment and facility changes would allow the refinery to process different products if a fuel change is reasonably foreseeable from the project.<sup>16</sup> The California Attorney General and the Governor’s Office of Planning Research concur in the determination that CEQA requires the disclosure of changes in fuel, by source and chemical composition. In recent months, each agency has stated that an environmental document for a fuel project is deficient under CEQA unless it discloses the change in the products that the project proponent intends to

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<sup>13</sup> See *ibid.*

<sup>14</sup> See *ibid.*

<sup>15</sup> See, generally, Fox Comments.

<sup>16</sup> See *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 89. 3094-002cv

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process at the facility.<sup>17</sup> The failure to identify and address a crude switch narrows the scope of environmental review and “stultif[ies] the objectives of the reporting process.”<sup>18</sup>

Tesoro’s filings with the U.S. Securities and Exchange Commission indicate that the Los Angeles Refinery does not currently process significant amounts of North American cost-advantaged crudes, such as Bakken and tar sands crudes, and the Wilmington Refinery Tank Farm has not historically been permitted to store Bakken crudes.<sup>19</sup> However, Tesoro also indicates in various public statements and representations made by its executive officers that Tesoro intends to transition its crude slate away from California and Alaska North Slope crudes – both types of crudes are currently refined at the Los Angeles Refinery – and replace these sources with cost-advantaged North American crudes.<sup>20</sup>

Dr. Fox demonstrated in her comments that Tesoro’s crude slate strategy is being implemented through the Project and that a switch to cost-advantaged crudes is reasonably foreseeable and should have been analyzed by the District. In particular, Dr. Fox documented in her comments that the permitting and engineering specifications of replacement Tanks 300035 and 300036 permit the storage of a broader range of crudes than was previously stored in the Tank Farm, and specifically allow the Applicant to store Bakken and Canadian tar sands crudes.<sup>21</sup> Dr. Fox also demonstrated that the Material Safety Data Sheets included in the Project application for the Project match those included in Tesoro’s application for its Vancouver Terminal Project. The Vancouver Terminal Project will supply the Los Angeles Refinery and is proposed as a major hub for Tesoro’s cost-advantaged crude shipments.<sup>22</sup>

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<sup>17</sup> See Letter from the Office of the Attorney General to the City of Pittsburg Planning Department regarding Recirculated Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project (SCH # 2011072053), Jan. 15, 2013, attached as **Attachment 2**; Letter from the Governor’s Office of Planning and Research to The City of Pittsburg Planning Department, regarding WesPac Pittsburg Energy Infrastructure Project, Tar Sands, Dec. 3, 2013, attached as **Attachment 3**.

<sup>18</sup> *County of Inyo v. City of Los Angeles* 71 Cal. App. at 192-193.

<sup>19</sup> See Fox Comments at pp. 14-15.

<sup>20</sup> See *id.* at pp. 7,9,14-16.

<sup>21</sup> *Id.* at p. pp. 7,8,12,13.

<sup>22</sup> See *id.* at pp. 10-12.



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Thus, documentation in the District's possession makes clear that the Project includes a crude switch to Bakken. However, Tesoro's public representations eliminate any remaining doubt as to the foreseeability of a crude switch at the Tank Farm. Just a few months ago, Tesoro CEO Greg Goff stated that Bakken is the "right supply source" for the Los Angeles Refinery.<sup>23</sup> Tesoro has also claimed that the cost-advantaged feedstock opportunity at the Los Angeles Refinery is currently up to 15% California heavy, *with the potential to increase this up to 50% California heavy and Bakken*.<sup>24</sup>

Dr. Fox also documented that a crude switch significantly expands the scope of the Project's environmental impacts. In particular, Dr. Fox demonstrated that a crude switch to Bakken and tar sands crudes results in significant environmental impacts not considered by the IS/ND because these crudes are chemically and physically different from the current crude slate. As explained by Dr. Fox, light crude oils are not unique and have been common since the advent of petroleum production.<sup>25</sup> However, Bakken is unique from other light crude oils as the large amounts of natural gas liquids, known as light ends, are not removed from most Bakken crudes before they are transported and refined, due to a lack of infrastructure in the Bakken oil fields.<sup>26</sup> These light ends have the effect of increasing a crude's vapor pressure, lowering its flash point and lowering its initial boiling point, all of which result in increased environmental risks.<sup>27</sup> The high concentration of light ends makes them highly flammable, more likely to form fire balls and boiling liquid expanding vapor explosions ("BLEVES") in accidents.<sup>28</sup>

Dr. Fox demonstrated that the impacts of refining a larger fraction of tar sands crudes is also reasonably foreseeable and would likewise result in significant environmental impacts not addressed in the IS/ND. These include adverse odor impacts from higher levels of mercaptans and other odiferous sulfur compounds, increased potential for accidental releases from corrosion due to high Total Acid Numbers, higher greenhouse gas emissions, and other environmental impacts.<sup>29</sup> The District is required to prepare a revised environmental document that discloses

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<sup>23</sup> See *Id.* at p. 9.

<sup>24</sup> See *ibid.*

<sup>25</sup> *Id.* at pp. 17-19.

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*

<sup>28</sup> *Ibid.*

<sup>29</sup> *Ibid.*

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the reasonably foreseeable crude switch for the Tank Farm and Tank Farm Piping Modifications and analyzes the environmental consequence of this Project component.

**C. The IS/ND Fails to Identify the Tanks That Will Be Impacted by the Tank Farm Piping Modifications**

An Initial Study must include a description of the project, including the Project's location.<sup>30</sup> The IS/ND fails to satisfy this basic requirement. The IS/ND states "the proposed project will remove the existing older piping (12-inch diameter) within the Wilmington Operations that connects existing tanks (which include Tanks 80035 and 80036) to the pipeline from the Marine Terminal. New larger piping (42-inch diameter) will be installed to connect to the two new tanks (Tanks 300035 and 300036) and *reconnect other tanks throughout the tank farm.*"<sup>31</sup> The IS/ND, however, fails to identify these "other tanks" by tank number, or show the location of the "other tanks" that are proposed to be connected to the new 42-inch diameter piping. Further, the IS/ND fails to show the boundary of the Tank Farm.

As shown, in Figure 1 above, there are dozens of tanks within the boundary of the Wilmington Operations. Thus, it is unclear from the IS/ND whether the Applicant proposes to replace piping connecting ALL of the tanks located within the boundaries of the Wilmington Operations, or just some of the tanks. The District is required to prepare a revised analysis which identifies all of the tanks that will be impacted by the Tank Farm Piping Modifications (i.e., not just tanks 80035, 80079, 80038 and 80036 and new Tanks 300035 and 300036). The District's failure to identify all Project-affected tanks violates CEQA's basic format and content requirements and is a prejudicial error.

As documented by Dr. Fox in her comments, the flow rate through a pipeline is directly proportional to the diameter of the pipe, squared.<sup>32</sup> Thus, increasing the diameter of the pipeline from 12 inches to 42 inches would allow an increase in pipeline throughput by a factor of 12.25.<sup>33</sup> Dr. Fox showed that interconnecting

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<sup>30</sup> Cal. Code Regs., tit. 14, § 15063 subd. (d) (hereafter "CEQA Guidelines").

<sup>31</sup> IS/ND, at p. 1-4.

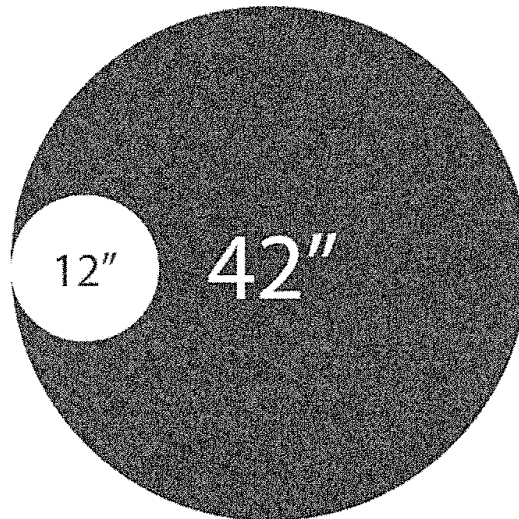
<sup>32</sup> Fox Comments, at p. 23.

<sup>33</sup> *Ibid.*

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tanks 80038, 80079, 300035 and 300036 to the new 42-inch pipeline, alone, increases baseline pipeline crude throughput of approximately 460,000 bbl/mo to approximately 3.9 million bbl/mo.<sup>34</sup> Interconnecting other tanks to the new pipeline would further increase Tank Farm throughput on a barrel per month basis, and would also significantly increase the Project's rate of air pollutant emissions, among other impacts.



**Figure 3: To-scale Drawing of Tank Farm Piping Modification Diameter Increase**

The District's failure to identify all of the tanks that would be affected by the proposed piping improvements precludes an analysis of these impacts. The District is required to prepare a revised analysis which identifies all of the tanks that will be impacted by the proposed piping improvements, including the tank number and the location of the tank within the Refinery boundary.

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<sup>34</sup> See *id.* at pp. 22-23.  
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**D. The IS/ND Fails to Describe the Location of the Proposed Piping Improvements**

An Initial Study must include a description of the project, including the Project's location.<sup>35</sup> The Tank Farm Piping Modifications are part of the Project and their location must be described in the IS/ND. The IS/ND, however, does not depict the piping extensions connecting to the unidentified tanks described above.<sup>36</sup> The IS/ND also fails to disclose what the new pipeline connects with on each end. The northeast end, for example, extends beyond any of the tanks involved in the Project, begging the question of why and what it is connecting with at this end.<sup>37</sup> The District is required to prepare a revised environmental analysis that discloses the location of all Project components, including the proposed piping improvements, and the pipe end points.

**E. The IS/ND Fails to Describe the Location of Tank 80079**

An Initial Study must include a description of the project, including the Project's location.<sup>38</sup> The proposed modifications to Tank 80079 are part of the Project and its location must be described in the IS/ND. The IS/ND, however, omits Tank 80079 from all of the graphics included in the IS/ND.<sup>39</sup> The District is required to prepare a revised environmental analysis that discloses the location of all Project components, including the location of Tank 80079.

**F. The IS/ND Fails to Identify Additional Proposed Piping Modifications Described in the Project Application**

The IS/ND fails to address all of the piping modifications described in the Project application materials. In particular, the Applicant's updated application, dated March 7, 2013, states: "The existing 24" crude receiving pipeline will remain [presumably in the Marine Terminal]. [But that the] *[t]he existing 8" pipeline extending across the length of the refinery to the new tanks will be replaced*

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<sup>35</sup> CEQA Guidelines, § 15063 subd. (d).

<sup>36</sup> See IS/ND, at Fig. 13.

<sup>37</sup> See *ibid.*

<sup>38</sup> *Ibid.*

<sup>39</sup> See, e.g., IS/ND, Appendix C, at pp. C-2, C-6, C-7 and C-8.  
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*with 24" pipeline.*<sup>40</sup> Thus, in addition to replacing piping within the Tank Farm, the Applicant is also apparently proposing to replace piping "along the length of the refinery."<sup>41</sup> These modifications are also reflected in other Project materials within the District's possession.<sup>42</sup>

Failure to include additional proposed pipeline modifications in the Project description section of the IS/ND is prejudicial error. The District's omission of this Project component precludes an accurate analysis of the Project's impacts, including but not limited to air pollutant emissions and hazards impacts. The District is required to prepare a revised environmental analysis that identifies all Project components, including piping improvements that extend outside of the Tank Farm and connect other Refinery operations. The revised analysis should also explain whether the new piping between the Refinery and Tank Farm are intended to integrate the Carson and Wilmington Operations, consistent with Tesoro's previously stated objectives to "physically link the two refineries together, as well as those refineries to our Marine and product terminals."<sup>43</sup>

**G. The Project Description in the IS/ND Is Inaccurate and Misleading**

The IS/ND states that the sum total of the Applicant's goals are to increase ship unloading efficiency, thereby reducing ship emissions, and to increase the storage capacity at the Tank Farm.<sup>44</sup> This truncated description of the Project's purpose and goals is simply not credible given the proposed tank and piping modifications. The District obscures the magnitude of the Project's environmental impacts by omitting any mention of the implications of the proposed equipment modifications in terms of the Refinery's operations. These include a substantial increase in crude oil throughput at the Tank Farm, as well as the Marine Terminal, and the increased storage of cost-advantaged crudes within the boundaries of the

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<sup>40</sup> Tesoro, Revisions for Application for Permit to Construct, AQMD Application Nos. 545646 & 545745, Tank No. 300035 and Tank No. 300036, PRN 545646, March 7, 2013 (3/7/13 Revised Application), pdf 41, emphasis added.

<sup>41</sup> See *ibid.*

<sup>42</sup> Handwritten notes on the December 18, 2012 "Agenda" for a "kick-off meeting" in the SCAQMD's file #545745.

<sup>43</sup> See Fox Comments at p. 21.

<sup>44</sup> See IS/ND, at p. 1-1, emphasis added.

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Wilmington Operations. All of these operational modifications are fully documented in the technical comments of Dr. Fox.

The IS/ND also includes a series of statements regarding the Project's effects on the Los Angeles Refinery's operation which are inaccurate or otherwise misleading. The IS/ND claims that the Project will not: (1) change "types" of crude oils delivered to the Wilmington Operations; (2) change or increase the frequency of ship deliveries on a daily basis; (3) increase the total amount of crude oil delivered to the Wilmington Operations on an annual basis; (4) alter the methods of crude oil delivery (e.g., continue to be delivered via ships and pipelines); (5) change the crude throughput of the Wilmington Operations or any downstream refining process.<sup>45</sup> These comments should be struck from the District's analysis because they are contradicted by the IS/ND, documents in the District's possession, and the Applicant's public statements and regulatory filings. As fully documented by Dr. Fox and summarized below, these contentions are inaccurate, or otherwise misleading.

First, as explained above, while the Project may not change the "type" of crude oil that is delivered, it will change the range of crude oils that will be imported and stored in the Tank Farm to include a broader range of crudes, such as Bakken and Canadian tar sands crudes. The import and storage of these crude oils will result in distinct, potentially significant impacts that the District failed to identify and address in the IS/ND.

Second, while the Project may not change the frequency of ship deliveries on a daily basis, it most certainly facilitates the unloading of a greater proportion of bigger ships, as compared to baseline operations, or even unloading ships on more days. Simply put, if ships can be unloaded faster, more or larger ships can be unloaded, increasing imports and exports.

Third, the Project would allow the amount of crude imports to the Wilmington Operations to increase, as compared to baseline conditions, by removing a pipeline throughput constraint in the Tank Farm. As demonstrated by Dr. Fox, increasing Tank Farm pipeline diameter from 12 to 42 inches increase throughput by 1200%, or a factor 12.25.<sup>46</sup> These modifications, together with Tanks

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<sup>45</sup> IS/ND at pp. 1-1 to 1-4 & B-3.

<sup>46</sup> See Fox Comments, at pp. 22-23.

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300035 and 300036, would also allow the Marine Terminal to increase its throughput of crude to its maximum permitted throughput. Specifically, because the Marine Terminal and most of the tanks in the Tank Farm do not have throughput limits, the Project would allow the Marine Terminal to realize 100% of its current design capacity of 32,000 bbl/hr.<sup>47</sup> Dr. Fox showed that due to the Project, the Marine Terminal's throughput could roughly double.<sup>48</sup> In sum, the Project is a keystone modification that debottlenecks the entire Wilmington Operations crude unloading and storage system.

Fourth, while the Project may not change the method by which crude is delivered to the Wilmington Operations, it would permit for the unloading of larger ships. Fifth and finally, the Project would impact downstream refining processes by supplying the Los Angeles Refinery with a different crude slate.

The District should withdraw the IS/ND because it fails as an informational document. Rather than disclosing the Project accurately and completely, the IS/ND appears to be crafted primarily to deceive the public about the Project's scope and the Project's significant impacts on the environment.

#### **IV. THE IS/ND FAILS TO ESTABLISH THE ENVIRONMENTAL SETTING FOR AIR QUALITY, PUBLIC HEALTH AND HAZARDS IMPACTS**

CEQA requires the lead agency to include a description of the physical environmental conditions in the vicinity of a project as they exist at the time environmental review commences.<sup>49</sup> The description of the environmental setting constitutes the baseline physical conditions by which a lead agency may assess the significance of a project's impacts. The EIR must also describe the existing environmental setting in sufficient detail to enable a proper analysis of project impacts.<sup>50</sup>

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<sup>47</sup> See *id* at p.24.

<sup>48</sup> See *id* at p. 16.

<sup>49</sup> CEQA Guidelines, § 15125 subd. (a); see also *Communities For a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 321.

<sup>50</sup> *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109, 1121-22.  
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Describing the environmental setting accurately and completely for each environmental condition in the vicinity of the project is critical to an accurate and meaningful evaluation of environmental impacts. The courts are clear that, “[b]efore the impacts of a Project can be assessed and mitigation measures considered, an [environmental review document] must describe the existing environment.”<sup>51</sup> It is:

a central concept of CEQA, widely accepted by the courts, that the significance of a Project’s impacts cannot be measured unless the DEIR [or IS/ND] first establishes the actual physical conditions on the property. In other words, baseline determination is the first rather than the last step in the environmental review process.<sup>52</sup>

Additionally, it is axiomatic that the baseline information on which a lead agency relies must constitute substantial evidence.<sup>53</sup> The CEQA Guidelines define “substantial evidence” as “enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion.”<sup>54</sup> “Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts . . . [U]nsubstantiated opinion or narrative [and] evidence which is clearly inaccurate or erroneous . . . is not substantial evidence.”<sup>55</sup>

The IS/ND is deficient because it fails to identify the baseline crude at the Los Angeles Refinery. The quality and chemical composition of the baseline crudes is necessary to evaluate the Project’s air quality, public health and hazards impacts. The IS/ND also fails to establish that the environmental baseline used to evaluate Project air quality impacts is representative of actual conditions and is, therefore, an appropriate starting point for the District’s air quality impact analysis.

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<sup>51</sup> *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 952.

<sup>52</sup> *Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 125.

<sup>53</sup> See CEQA Guidelines, §15063 subd. (a)(3) (“An initial study may rely upon expert opinion supported by facts, technical studies or other substantial evidence to document its findings.”)

<sup>54</sup> CEQA Guidelines, §15384.

<sup>55</sup> Pub. Resources Code, § 21082.2 subd. (c).

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**A. The IS/ND Fails to Identify the Environmental Setting for Baseline Crudes Storage at the Wilmington Operations**

The IS/ND concludes that “the proposed project does not modify the sources of crude oil received at the Wilmington Operations.”<sup>56</sup> As a result, the IS/ND does not identify the environmental setting for the baseline crudes. However, the IS/ND’s claim that the Project would not modify the sources of crude oil lacks basis. The contention is contradicted by the IS/ND and documentation included in the Applicant’s most recent permit application.<sup>57</sup> As summarized above, and documented by Dr. Fox in her comments, the Project facilitates a crude switch by allowing for the import and storage of a broader range of crudes than previously received at the Los Angeles Refinery, these crudes would most likely include Bakken and tar sands crudes.<sup>58</sup>

The District should prepare a revised analysis that describes the baseline crudes by source and chemical composition. This information is necessary to evaluate the Project’s air quality, public health and hazards impacts.

**B. The District Relied on an Inappropriate Baseline to Evaluate Air Quality Impacts**

In *Communities for a Better Environment v. South Coast Air Quality Management District* (“*CBE v. SCAQMD*”), the California Supreme Court held that CEQA requires that the impacts of a proposed project ordinarily be compared to the *actual environmental conditions* existing at the time of CEQA analysis.<sup>59</sup> That is, the lead agency is required to consider “*real conditions on the ground* . . . rather than the level of development or activity that *could* or *should* have been present according to a plan or regulation.”<sup>60</sup> In *CBE v. SCAQMD*, the Court struck down the SCAQMD’s Initial Study and Negative Declaration because the District relied on a hypothetical baseline, rather than real conditions on the ground, to evaluate the impacts of a project proposed at the ConocoPhillips Wilmington Refinery. The Court explained:

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<sup>56</sup> IS/ND, at p. 1-15.

<sup>57</sup> See, *supra*, Comments, Section III. B.

<sup>58</sup> See *ibid.*

<sup>59</sup> *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 321.

<sup>60</sup> *Id.* at p. 321, emphasis added and in original.  
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[T]he District's baseline operational level was the collective maximum capacity of the boilers; under the Negative Declaration's analysis, all four boilers could be run at maximum capacity simultaneously without creating any potential environmental impact. Yet the District acknowledged that in ordinary operation any given boiler ran at the maximum allowed capacity only when one or more of the other boilers was shut down for maintenance; operation of the boilers simultaneously at their collective maximum was not the norm.<sup>61</sup>

Accordingly, the Court concluded that the District relied on an inadequate, hypothetical baseline to evaluate project impacts, and invalidated the District's analysis. The District repeated this same error here.

The IS/ND assumes that baseline emissions for Tank 80079 are the maximum allowable emissions under District permits.<sup>62</sup> However, analysis included in the Project application show that tanks have not always operated at maximum capacity. CEQA prohibits this approach. The District is required to determine the environmental baseline in reference to actual on-the-ground operations, rather than to a hypothetical baseline established in a permit. The District is required to prepare a revised analysis that discloses the actual emissions rate from Tank 80079 and documents an environmental baseline that is representative of actual "on-the-ground" conditions.

**V. A NEGATIVE DECLARATION IS INAPPROPRIATE AND THE DISTRICT MUST PREPARE AN EIR**

CEQA has two basic purposes. First, CEQA is designed to inform decision-makers and the public about the potential, significant environmental effects of a project. CEQA requires that lead agencies analyze any Project with potentially significant environmental impacts in an EIR. The purpose of the EIR is to "inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR protects not only the environment, but also informed self-government."<sup>63</sup> The EIR has been described as "an

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<sup>61</sup> *Id.* at p. 322, emphasis added.

<sup>62</sup> IS/ND, Appendix A, at p. A-12.

<sup>63</sup> *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564.  
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environmental ‘alarm bell’ whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.”<sup>64</sup>

Second, CEQA directs public agencies to avoid or reduce environmental damage when possible by requiring alternatives or mitigation measures. The EIR serves to provide public agencies and the public in general, with information about the effect that a proposed project is likely to have on the environment, and to “identify ways that environmental damage can be avoided or significantly reduced.” If a project has a significant effect on the environment, the agency may approve the project only upon a finding that it has “eliminated or substantially lessened all significant effects on the environment where feasible,” and that any unavoidable significant effects on the environment are “acceptable due to overriding concerns” specified in CEQA section 21081.<sup>65</sup>

CEQA’s purpose and goals must be met by preparing an EIR, except in certain limited circumstances.<sup>66</sup> CEQA contains a strong presumption in favor of requiring a lead agency to prepare an EIR. This presumption is reflected in the “fair argument” standard. Under that standard, a lead agency must prepare an EIR whenever substantial evidence in the whole record before the agency supports a fair argument that a project may have a significant effect on the environment.<sup>67</sup> The fair argument standard creates a “low threshold” favoring environmental review through an EIR.<sup>68</sup> An agency’s decision *not* to require an EIR can be upheld only when there is no credible evidence to the contrary.<sup>69</sup>

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<sup>64</sup> *Cherry Valley Pass Acres and Neighbors v. City of Belmont* (2010) 190 Cal. App. 4th 316.

<sup>65</sup> CEQA Guidelines § 15002 subd. (a)(2)-(3).

<sup>66</sup> See Pub. Resources Code, § 21100.

<sup>67</sup> Pub. Resources Code § 21082.2; CEQA Guidelines § 15064(f), (h); *Laurel Heights Improvement Ass’n v. Regents of the University of California* (1993) (“Laurel Heights II”) 6 Cal. 4th 1112, 1123; *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal. 3d 68, 75, 82; *Stanislaus Audubon Society, Inc. v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-151; *Quail Botanical Gardens Foundation, Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1601-1602.

<sup>68</sup> *Citizens Action to Serve All Students v. Thornley* (1990) 222 Cal.App.3d 748, 754.

<sup>69</sup> *Sierra Club v. County of Sonoma*, (1992) 6 Cal.App.4th, 1307, 1318; see also *Friends of “B” Street v. City of Hayward* (1980) 106 Cal.App.3d 988, 1002 [“If there was substantial evidence that the proposed project might have a significant environmental impact, evidence to the contrary is not sufficient to support a decision to dispense with preparation of an [environmental impact report] and adopt a negative declaration, because it could be ‘fairly argued’ that the project might have a significant environmental impact”].

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CEQA defines “substantial evidence” as “fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact.”<sup>70</sup> The California Natural Resources Agency regulations further define “substantial evidence” as:

Enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached.<sup>71</sup>

“If the local agency has failed to study an area of possible environmental impact, a fair argument may be based on the limited facts in the record. Deficiencies in the record may actually enlarge the scope of fair argument by lending a logical plausibility to a wider range of inferences.”<sup>72</sup>

Here there is more than a fair argument that the Project will result in potentially significant impacts to public health and ambient air quality and hazards impacts. As shown by Dr. Fox, the District failed to study key elements of the Project: the elimination of a piping throughput constraint on the Tank Farm, the related throughput increases at the Tank Farm and Marine Terminal, and the installation of a 42-inch diameter above-ground crude oil-carrying pipe within the Tank Farm. The Applicant’s proposed piping modifications, in combination with the remaining Project components, will result in potentially significant impacts not identified in the IS/ND. The IS/ND should be withdrawn and the District is required to study and address the Project’s significant impacts in a Draft EIR.

**A. Project Cancer Impacts Are Significant**

The IS/ND concludes that Project cancer risks are below the significance threshold of ten in one million and, therefore, Project cancer risks are less than significant.<sup>73</sup> Dr. Fox has shown that the conclusion in the IS/ND is invalid because the analyses in the IS/ND fail to account for Tank Farm throughput increases caused by the Project, rely on the wrong TAC emissions speciation profile, fail to address early-in-life exposure to TACs and underestimate TAC emissions from the

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<sup>70</sup> Pub. Resources Code, § 21080 subd. (e)(1).

<sup>71</sup> CEQA Guidelines, § 15384, subd. (a).

<sup>72</sup> *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 311.

<sup>73</sup> See IS/ND at p. 2-25.

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proposed tank replacements and modifications.<sup>74</sup> Dr. Fox also showed that when the above errors are corrected, the Project cancer risk is estimated at 16.8 in one million and significantly exceeds the SCAQMD's CEQA significance threshold for cancer risk.<sup>75</sup> Dr. Fox also concluded that the Project's cancer risks may be even higher than estimated in her analyses because the IS/ND fails to account for all TAC emission sources, including, but not limited to, emissions from the vapor recovery system and from tank roof landing, degassing cleaning, and flashing emissions.<sup>76</sup>

There is a fair argument based on substantial evidence that the Project will result in significant, unmitigated cancer risks to neighboring communities. The District is required to prepare a Draft EIR that evaluates all Project components and their implications for Los Angeles Refinery operations, discloses the Project's significant cancer risks and proposes all feasible mitigation measures that can reduce cancer risks to a less than significant level.

**B. The District Failed to Identify Significant VOC Emissions**

A "negative declaration" is "a written statement by the lead agency briefly describing the reasons that a proposed project . . . will not have a significant effect on the environment and therefore does not require the preparation of an EIR."<sup>77</sup> However, a negative declaration is inappropriate and an EIR must be prepared where there is a fair argument supported by substantial evidence that a project may result in potentially significant impacts.<sup>78</sup> Even if other substantial evidence supports the opposite conclusion, the agency must prepare an EIR.<sup>79</sup> Here, the IS/ND itself provides substantial evidence of a significant air quality impact from Project VOC emissions and the District is required to prepare an EIR.

In particular, the IS/ND provides that the Project is estimated to emit VOCs at a rate of 84.1 pounds per day ("lbs/day") during Project operations.<sup>80</sup> The District's CEQA significance threshold for VOCs is 55 lbs/day. Accordingly, Project

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<sup>74</sup> Fox Comments, at pp. 28-34.

<sup>75</sup> See *ibid.*

<sup>76</sup> See *ibid.*

<sup>77</sup> CEQA Guidelines, § 15371.

<sup>78</sup> CEQA Guidelines § 15064 subd. (f), (h).

<sup>79</sup> See *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75.

<sup>80</sup> See IS/ND, at Table 2-5.

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VOC emissions are *significant*. The District failed to identify this impact. This omission is fatal to the IS/ND.

A lead agency's failure to admit a potentially significant impact in plain language in a CEQA document "is not merely harmless procedural failing . . . this short-cutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decision-making and informed public participation."<sup>81</sup> The First District Court of Appeal recently held in *Lotus v. Department of Transportation*, that a lead agency's failure to separately identify and analyze the significance of an impact is prejudicial error which subverts CEQA's purpose and goals.<sup>82</sup> As explained by the *Lotus* Court, a significance finding triggers the need to consider a range of specifically targeted mitigation measures, including analysis of whether the project itself could be modified to lessen the impact and the need to adopt an enforceable monitoring program.<sup>83</sup> The District is required to study the Project's significant VOC emissions in a Draft EIR.

Dr. Fox has also demonstrated that Project VOC emissions are substantially higher than reported in the IS/ND. In particular, Dr. Fox documented that the IS/ND fails to account for roof landing, flashing, degassing and cleaning losses, fails to utilize correct vapor pressure specifications for the Project tanks, fails to account for tank throughput increases for the tanks that would be impacted by the Tank Farm Piping Modifications, fails to include water draw emissions, and fails to include increased emissions from the vapor recovery system in the Tank Farm.<sup>84</sup> All of these Project activities would result in VOC emissions and the District improperly excluded these emissions from the emissions estimate in the IS/ND.<sup>85</sup> Additionally, Dr. Fox showed that the VOC emissions estimate in the IS/ND fails to account for VOC emissions from increased unloading of vessels at the Marine Terminal.<sup>86</sup> Emissions from these activities alone amount to 1,296 lbs/day and are significant.<sup>87</sup>

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<sup>81</sup> *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 658.

<sup>82</sup> *See ibid.*

<sup>83</sup> *See id.* at pp. 656-57.

<sup>84</sup> Fox Comments, at pp. 37-44.

<sup>85</sup> *See ibid.*

<sup>86</sup> *See, infra*, Comments at Section III.

<sup>87</sup> *See* Fox Comments, at p. 48.

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There is a fair argument based on substantial evidence that the Project will result in potentially significant VOC emissions. Here, CEQA prohibits the District from proceeding through a negative declaration. The District is required to prepare a revised environmental review document which identifies the Project's significant VOC emissions and proposes mitigation measures that can reduce emissions to a less than significant level. The Project's significant VOC emissions must be evaluated in a Draft EIR.

**C. The Applicant's VOC Emission Reduction Credits Are Incapable of Reducing Project Air Quality Impacts**

The IS/ND concludes that the Project is not expected to result in an increase in VOC emissions, and operational emissions are considered less than significant, because the Project will be required to purchase VOC offsets as a condition of a District Authority-to-Construct permit.<sup>88</sup> The conclusion in the IS/ND that VOC offsets would reduce Project emissions is invalid because it is unsupported. First, as documented by Dr. Fox, the IS/ND and supporting analyses do not evaluate the localized impacts of the Project's emissions.<sup>89</sup> The IS/ND also fails to demonstrate how implementing the emission reductions identified by the Applicant will reduce Project emissions. Accordingly, the District lacks substantial evidence to support the conclusion that VOC offsets would reduce Project impacts.

Second, Dr. Fox demonstrated that the Applicant's VOC emission reduction credits are not capable of reducing Project emissions because they occurred long in the past and at a considerable distance from the Project. The emissions reductions that the Applicant proposes to rely on to "reduce" Project emissions occurred in the 1990s in Santa Monica and South Gate. Dr. Fox explains that these reductions will do nothing to address the Project's impacts because none of the Applicant's emission reduction credits occur contemporaneously with the Project or near the neighborhoods affected by the Project. To the contrary, Dr. Fox concludes that absent any alternative mitigation measures, the Project will expose persons in the vicinity of the Project, and regionally in the air basin, to unhealthy pollutant levels.

Lastly, even if the Applicant's emission reduction credits were capable of reducing the Project's emissions, which they are not, the emission reduction credits

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<sup>88</sup> See IS/ND, at p. 2-21.

<sup>89</sup> Fox Comments, at p. 35.

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referenced in the IS/ND are insufficient to reduce Project VOC emissions. This is because the IS/ND significantly underestimates the Project's VOC emissions. Dr. Fox demonstrated that the Project's VOC emissions are more than ten times the emissions rate reported in the IS/ND and would not be offset by the Applicant's emission reduction credits.<sup>90</sup>

The District is required to identify and address the Project's significant VOC emissions in a Draft EIR. Dr. Fox recommends that the District require the Applicant to implement zero-leak fugitive components, external floating roof tanks with geodesic domes commonly used on tanks that store RVP 11 crude oils, cable-suspended, full-contact floating roofs, or geodesic domes on existing fixed roof tanks as conditions of Project approval.<sup>91</sup> These mitigation measures are feasible and have been recently required for other refinery projects in California.

**D. Project Carbon Monoxide (CO), Nitrogen Oxides (NO<sub>x</sub>), Sulfur Oxides (SO<sub>x</sub>), and Fine Particulate Matter Emissions are Significant**

There is a fair argument based on substantial evidence that the Project will result in significant CO, NO<sub>x</sub>, SO<sub>x</sub>, and fine particulate matter (less than 2.5 micrometers in diameter or "PM<sub>2.5</sub>") emissions. The IS/ND fails to identify and to address the impact of the Tank Farm Piping Modifications on the operations of the Marine Terminal and the related air quality impacts. Dr. Fox explained in her comments that the Marine Terminal is currently limited to a discharge capacity of 5,000 bbl/hr by a vapor recovery system constraint, but has a design capacity of 32,000 bbl/hr.<sup>92</sup> Dr. Fox also documented that once the Project is operational, the Marine Terminal could be operated at its maximum design capacity.<sup>93</sup> This means that shipping and unloading activities could increase and so would the related emissions of criteria air pollutants.

Dr. Fox calculated criteria pollutant emissions from vessel unloading activities using the emission factors relied upon in the IS/ND and the maximum Marine Terminal unloading rate of 32,000 bbl/hr.<sup>94</sup> The resulting calculations show

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<sup>90</sup> See *id.* at p. 37.

<sup>91</sup> See *ibid.*

<sup>92</sup> *Id.* at pp. 25.

<sup>93</sup> *Ibid.*

<sup>94</sup> *Ibid.*

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that the Project would cause an incremental increase of criteria pollutants emissions, and that the increased emissions of CO, NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>2.5</sub> exceed the District's CEQA significance thresholds for these pollutants.<sup>95</sup> These are significant impacts that the IS/ND failed to identify. The District is required to study these significant Project impacts in a Draft EIR.

#### **E. The Project Will Result in Significant Hazards Impacts**

There is a fair argument based on substantial evidence that the Project will result in potentially significant hazards impacts. Dr. Fox demonstrated that the hazards analysis included in the IS/ND fails to address the Project's potentially significant hazards impacts because it does not analyze all plausible accident scenarios and fails to address the Project under review.<sup>96</sup> In particular, Dr. Fox has shown that, contrary to the conclusions in the IS/ND, fire hazards from the new crude oil tanks (Tank 300035 and 300036) and from the Tank Farm Piping Modifications are significant. We discuss each of these Project components below.

With respect to new Tanks 300035 and 300036, Dr. Fox showed that the amount of crude oil involved in an accident would substantially increase, as compared to replacement tanks 80035 and 80036, due to the dimensions of the new tanks. In the event of an upset, far more than the content of one tank could be released if the accident occurred while the tank was being filled.<sup>97</sup> The IS/ND fails to recognize this accident scenario.

The IS/ND also fails to address the possibility that more than one tank could catch fire during a pool fire. Dr. Fox demonstrated that this scenario is plausible and should have been assessed.<sup>98</sup> Indeed, multiple-tank fires have been known to occur, and Dr. Fox catalogues some of these incidents in her comments.<sup>99</sup>

When accounting for the above scenarios, Dr. Fox concludes that hazards impacts would be significant if Tanks 300035 and 300036 were to catch fire. Dr. Fox's conclusion relies on the thermal radiation significance criterion used in the IS/ND. Using this criterion, Dr. Fox demonstrated that thermal radiation impacts

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<sup>95</sup> *Id.* at p. 48-55.

<sup>96</sup> *See ibid.*

<sup>97</sup> *See ibid.*

<sup>98</sup> *See ibid.*

<sup>99</sup> *See ibid.*

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would extend beyond the boundaries of the Wilmington Operations and encompass portions of Alameda Street, which is a public highway.<sup>100</sup> Dr. Fox concludes that these impacts are significant. These impacts would be even more severe if additional tanks were to catch fire.

Additionally, Dr. Fox demonstrated that a pool fire at the wind speeds assumed in the IS/ND is not the reasonably foreseeable worst case accident that could occur at Tanks 300035 and 300036 for two reasons. First, as these new tanks would be permitted to store material with a true vapor pressure of up to 11 psi, the highly volatile crude oil to be stored in these tanks could spill, flash and ignite quickly and cause a fireball.<sup>101</sup> Dr. Fox concludes that the occurrence of a fireball is plausible, given the design parameters of the new tanks, and would result in more significant impacts than a pool fire.<sup>102</sup> Second, the wind speeds assumed in the IS/ND are not representative of reasonably foreseeable worst case conditions for the Project area. Dr. Fox concludes that higher wind speeds could carry a vapor cloud over long distances and into residential areas.<sup>103</sup> Dr. Fox concludes that these impacts would be significant.<sup>104</sup>

Dr. Fox also demonstrated in her comments that the consequences involving the release of crude oil and other petroleum products in a spill from the proposed 42-inch diameter Tank Farm piping are significant.<sup>105</sup> The hazards analysis in the IS/ND fails entirely to address the new 42-inch diameter piping. The amount of crude oil that could spill from the new piping, at wind speeds appropriate for a coastal location where the Project is located, meets and exceeds the hazards significance threshold used by other jurisdictions for similar projects.<sup>106</sup> These include the Phillips 66 Rail Spur Extension Project that is pending before San Luis Obispo County. Dr. Fox further documents that such a spill would result in significant impacts, including second degree burns and even death.

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<sup>100</sup> See *ibid.*

<sup>101</sup> *Ibid.*

<sup>102</sup> See *ibid.*

<sup>103</sup> See *ibid.*

<sup>104</sup> See *ibid.*

<sup>105</sup> *Ibid.*

<sup>106</sup> See *ibid.*

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In particular, Dr. Fox showed that an accident at the Tank Farm under calm wind conditions would cause impacts at a distance of 1,647 feet.<sup>107</sup> At a wind speed of 45 miles per hour, all persons up to 2,641 feet away would be seriously impacted and within a radius of 1,273 would all be killed.<sup>108</sup> Off-site receptors fall within these distances. In fact, the closest resident is located only 2,000 feet away from the Wilmington Operations. The District is required to study the significant hazards related to Project tank and pipeline spills in a Draft EIR.

**F. The IS/ND's Assumption That Hazards Impacts Within the Wilmington Operation's Boundaries Are Less Than Significant Is Unsupported**

The IS/ND states that "fire radiation hazards from the existing and proposed storage tanks can extend up to 190 feet and 280 feet respectively . . . and the property boundary is at least 350 feet from the storage tank [*sic*]."<sup>109</sup> The IS/ND further states "the fire hazards associated with the existing and new storage tanks would remain within the boundaries of the Wilmington operations and no exposure to off-site receptors from the thermal radiation would be expected to occur."<sup>110</sup> The IS/ND then concludes that Project hazards impacts are less than significant.<sup>111</sup> The IS/ND, however, fails to provide any justification to explain why injury and fatality for persons located within the boundaries of the Wilmington Operations are not a significant impact.

There is a fair argument based on substantial evidence that the Project would result in significant impacts to persons within the Wilmington Operations in the event of an accident. Dr. Fox concludes that any person, including workers, located between the accident site and up to the reported impact distance would experience significant impacts under the scenarios summarized in the IS/ND.<sup>112</sup> To make this conclusion, Dr. Fox relied on the findings of the hazards analysis included in the IS/ND. Her conclusion is that 100 percent of persons located between the tanks and the maximum fire impact distance would be injured, incurring second-degree burns in 14 seconds, 10 percent fatality at 60 seconds, and

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<sup>107</sup> *Ibid.*

<sup>108</sup> *Ibid.*

<sup>109</sup> IS/ND, at p. 2-56.

<sup>110</sup> *Ibid.*

<sup>111</sup> *See ibid.*

<sup>112</sup> *See Fox Comments*, at p. 46.

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significant fatalities near the tanks.<sup>113</sup> The District is required to address these significant impacts in a Draft EIR.

## VI. THE DISTRICT IMPROPERLY PIECEMEAELED ENVIRONMENTAL REVIEW

CEQA defines “project” broadly to encompass the “whole of the action.”<sup>114</sup> The CEQA Guidelines state “the term ‘project’ has been interpreted to mean far more than the ordinary dictionary definition of the term.”<sup>115</sup> Any activity “which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment” constitutes a “project” or the “whole of the action.”<sup>116</sup> This includes, but is not limited to, “later phases of the project, and any secondary, support, or off-site features necessary for its implementation.”<sup>117</sup> If later phases or future activities are reasonably foreseeable consequences of a proposed project, an agency must include a description of the actions in the environmental review document and analyze their impacts.<sup>118</sup>

If an agency fails to analyze the “whole of an action,” it may be “piecemealing” the environmental review process and thwarting informed decision-making and intelligent public review. In *Laurel Heights Improvement Association v. Regents of the University of California*, the California Supreme Court held that “an EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects.”<sup>119</sup> Here, the City improperly piecemealed environmental review by failing to analyze the Project together with reasonably foreseeable modifications to refining processes within the Los Angeles Refinery.

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<sup>113</sup> See *ibid.*

<sup>114</sup> Pub. Resources Code, §§ 21065, 21080(a); CEQA Guidelines, §§ 15002(b), 15003(h), 15165, 15378, Appendix G.

<sup>115</sup> CEQA Guidelines, § 15002(b).

<sup>116</sup> Pub. Resources Code, § 21065.

<sup>117</sup> CEQA Guidelines, Appendix G.

<sup>118</sup> *Citizens Assn. for Sensible Development v. County of Inyo* (1985) 172 Cal.App.3d 151, 16.

<sup>119</sup> (1988) 47 Cal.3d 376, 396.

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The Wilmington and Carson Operations are full-conversion coking refineries, designed to maximize the yield of more valuable light products from the heaviest fraction of the crude blend, present in large amounts in its current crude slate.<sup>120</sup> However, coking refineries such as Wilmington and Carson are not configured to process large amounts of lighter crude due to crude distillation column limitations, overhead cooling issues, light ends recovery capacity, naphtha handling capability, and other constraints that must be addressed to efficiently process these crudes.<sup>121</sup>

Dr. Fox documented in her comments that the Applicant is modifying its Los Angeles Refinery in anticipation of refining cost-advantaged crudes, such as Bakken and tar sands.<sup>122</sup> Some of these modifications include physically linking the Wilmington and Carson Operations, pipeline installations between the two refineries to allow for transfer of intermediaries, and replacing a vacuum distillation unit at the Wilmington Operations to allow it to upgrade heavy ends to clean products.<sup>123</sup> Dr. Fox identifies these and other proposed and past modifications that would allow the Los Angeles Refinery to receive and refine a wider range of crudes.<sup>124</sup> These modifications are reasonably foreseeable from the Project because the Project is designed to facilitate the storage of a wider range of crudes, including Bakken and tar sands crudes, and will also expand the Project's environmental impacts. The District is required to analyze these modifications, together with the Project, in one Draft EIR.

That some of these modifications may have already occurred does not negate CEQA's requirement that the District study the "whole of the action"<sup>125</sup> in one EIR. The requirement to evaluate the whole of a project applies even where one of the phases has already undergone prior environmental review. It was precisely such piecemealing that was rejected by the Second District in the *Natural Resources Defense Council v. City of Los Angeles* case.<sup>126</sup> In that case, the Port of Los Angeles analyzed Phase 2 of a three-phase project in a negative declaration. The Court held that an EIR was required to analyze the entire three-phase project as a whole, even

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<sup>120</sup> See Fox Comments at pp.19-20.

<sup>121</sup> See *id.* at p. 20.

<sup>122</sup> See *ibid.*

<sup>123</sup> See *id.* at pp. 19-20.

<sup>124</sup> See *ibid.*

<sup>125</sup> Pub. Resources Code, §§ 21065, 21080(a); CEQA Guidelines, §§ 15002(b), 15003(h), 15165, 15378, Appendix G.

<sup>126</sup> *Natural Resources Defense Council v. City of Los Angeles* (2002) 103 Cal.App.4th 268, 284. 3094-002cv

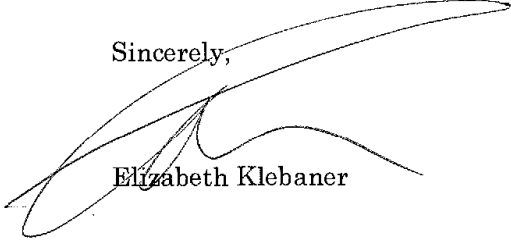
June 10, 2014  
Page 31

though earlier CEQA review had been completed on Phase I of the project.<sup>127</sup> Similarly here, the District must prepare a Draft EIR analyzing the impacts of the Project and the reasonably foreseeable changes to Los Angeles refining processes as a whole, rather than analyzing each individual development phase as a distinct project proposal.

## VII. CONCLUSION

The District must withdraw the IS/ND and prepare a Draft EIR, consistent with these comments and the technical comments of Dr. Phyllis Fox.

Sincerely,



Elizabeth Klebaner

EK:clv  
Attach.

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<sup>127</sup> *Id.*  
3094-002cv

## **Attachment 1**

Phyllis Fox, Ph.D., QEP, PE, DEE  
745 White Pine Ave.  
Rockledge, FL 32955  
321-626-6885

June 10, 2014

By: Email

Elizabeth Klebaner  
Adams Broadwell Joseph & Cardozo  
601 Gateway Blvd., Suite 1000  
South San Francisco, CA 94080  
eklebaner@adamsbroadwell.com

Re: *Comments on the Initial Study and Draft Negative Declaration for the Tesoro Storage Tank Replacement and Modification Project*

Dear Ms. Klebaner,

Per your request, I have reviewed the Initial Study and Draft Negative Declaration (Neg.Dec.) prepared by the South Coast Air Quality Management District (SCAQMD) for the Tesoro Storage Tank Replacement and Modification Project,<sup>1</sup> as well as the records referenced in the Neg. Dec. that have been provided by the District to your firm. I have also conducted an independent investigation of the activities described in the Neg.Dec. The Tesoro Storage Tank Replacement and Modification Project is proposed by Tesoro Refining & Marketing Company LLC (Applicant). The replacement and modifications addressed in the Neg.Dec. include replacing two 80,000 barrel (bbl) fixed roof storage tanks with two 300,000 bbl floating roof storage tanks, changing the service and throughput of two existing storage tanks, and replacing pipelines in the tank farm (Project) within the Applicant's Los Angeles Refinery.<sup>2</sup>

As described by the Neg.Dec., the Applicant's Los Angeles Refinery consists of two adjacent facilities, the Wilmington Refinery (Wilmington Operations) and the recently acquired Carson Refinery (Carson Operations). The Applicant is integrating the Wilmington Operations and the Carson Operations to operate as one Refinery. In particular, Tesoro plans to reconfigure the Wilmington and Carson Refineries to achieve operational synergies through an integrated crude oil supply, the optimization of

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<sup>1</sup> South Coast Air Quality Management District (SCAQMD), Notice of Intent to Adopt a Draft Negative Declaration, Tesoro Storage Tank Replacement and Modification Project, April 23, 2014.

<sup>2</sup> ND, pp. 1-1 to 1-4.



intermediate feedstocks and product distribution costs, improvements in light product yield, and reductions in refining costs.<sup>3</sup>

According to the Neg. Dec., Tesoro also operates a Marine Terminal at the Port of Long Beach (POLB) at Berths 84-87 and an underground pipeline that connects the Terminal to the Wilmington Refinery.<sup>4</sup> This underground pipeline supplies the crude oil that will be involved in Project operations.<sup>5</sup> Publicly available information indicates that the Applicant transferred ownership of the Marine Terminal to Tesoro Logistics LP<sup>6</sup> in September 2012.<sup>7</sup> The Applicant also transferred ownership of other nearby marine terminals to Tesoro Logistics LP, including POLB Berths 167-169 and those acquired in the purchase of the Carson Operations from BP to Tesoro Logistics LP (POLB Berths 76-78 and 121<sup>8</sup>).<sup>9</sup> The partnership agreement between the Applicant and Tesoro Logistics LP for the Marine Terminal includes minimum throughput commitments (Marine Terminal Agreement).<sup>10</sup>

<sup>3</sup> Tesoro Gets FTC OK for BP Refinery Acquisition, Bakken Oil Business Journal, May 17, 2013 (5/17/13 BOBJ), Available at: <https://www.facebook.com/BakkenOilBusinessJournal/posts/382670525179174> and attached as Exhibit B.

<sup>4</sup> ND, p. 1-7 & Fig. 1-5.

<sup>5</sup> Ibid.

<sup>6</sup> Tesoro Logistics is a limited partnership formed by Tesoro in April 2011 to own, operate, develop and acquire crude oil and refined products logistics assets for Tesoro Refining and Marketing. Tesoro owns 52% of the outstanding partnership units. Tesoro Logistics provides pipeline transportation, crude oil trucking, terminaling services, and crude and refined products storage operation and storage services within Tesoro's refining and market supply chain. See: <http://www.getfilings.com/sec-filings/120904/TESORO-LOGISTICS-LP-8-K/d406099dex992.htm>.

<sup>7</sup> Tesoro Logistics, New Release, September 12, 2012 (transferred assets described as a two-vessel berth dock, six storage tanks with a combined capacity of 235,000 bbl and six related pipelines with 70,000 bbl/day throughput connecting the Marine Terminal, Tesoro's refinery, and other third-party facilities), Available at: <http://www.tesorologistics.com/phoenix.zhtml?c=242247&p=irol-newsArticle&ID=1735351&highlight=>. See also: Long Beach Berth Access, Use and Throughput Agreement, Available at: <http://www.sec.gov/Archives/edgar/data/50104/000119312512392844/d412270dex104.htm>.

<sup>8</sup> Pacific L.A. Marine Terminal LLC Crude Oil Terminal Draft Supplemental Environmental Impact Statement/Draft Subsequent Environmental Impact Report (Pacific L.A. Marine Terminal SEIR/DSEIR), Chapter 2, p. 2-66 and Appendix D1; Available at: [http://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/seir\\_pacificLA\\_marine.asp](http://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/seir_pacificLA_marine.asp).

<sup>9</sup> U.S. Securities & Exchange Commission, Tesoro Logistics LP Form 10-K, Fiscal Year Ended December 31, 2013, See p. 4, "Los Angeles Assets Acquisitions". Available at: [http://www.tesorologistics.com/phoenix.zhtml?c=242247&p=irol-sec&seccat01enhanced.1\\_rs=11&seccat01enhanced.1\\_rc=10&genphase2=true](http://www.tesorologistics.com/phoenix.zhtml?c=242247&p=irol-sec&seccat01enhanced.1_rs=11&seccat01enhanced.1_rc=10&genphase2=true).

<sup>10</sup> Tesoro Sells Marine Terminal and Pipelines to Tesoro Logistics, Tank Storage Magazine, December 2012, p. 21. Available at: <http://www.scribd.com/doc/213481496/Tank-Storage-Magazine>. See also: Long Beach Berth Access, Use and Throughput Agreement (Marine Terminal Agreement), available at: <http://www.sec.gov/Archives/edgar/data/50104/000119312512392844/d412270dex104.htm>. This agreement was modified on December 6, 2013 (<http://www.sec.gov/Archives/edgar/data/50104/000119312513465459/d638208dex109.htm>), eliminating the specification limits in Sec. 7.0 and Annex D. However, this eliminated material is relevant to the environmental baseline for evaluating Project impacts.

The Wilmington Operations include 20 tanks that store crude oil and other heavy petroleum liquids (Tank Farm).<sup>11</sup> This Tank Farm is the site of the proposed Project. Crude oil is unloaded at the Marine Terminal and sent via underground pipeline to the Tank Farm. The crude oil is delivered to the tanks in the Tank Farm at a baseline throughput rate of 5,000 bbl/hr per tank<sup>12</sup> using local pipelines,<sup>13</sup> shown on Neg.Dec. Figure 1-3.

Based on my investigation, I conclude that the analysis presented in the Neg.Dec. inadequately addresses the Project's environmental impacts because it fails to identify a reasonably foreseeable crude switch and reasonably foreseeable throughput increases at the Marine Terminal and the Applicant's Los Angeles Refinery. The Neg.Dec. also fails to include a complete and accurate description of the Project, fails to identify potentially significant impacts from the modifications that are analyzed in the Neg.Dec. and is otherwise inadequate.

First, the Neg.Dec. fails to disclose the throughput and composition of the baseline crudes at the Los Angeles Refinery. This information is required to determine the impact of the Project on air quality, hazards, and public health impacts.

Second, the Neg.Dec. fails to disclose that the Project would debottleneck the throughput of both the Tank Farm and the Marine Terminal by replacing the existing 12-inch diameter pipeline within the Tank Farm with a new, 42-inch diameter pipeline. This modification alone allows for a throughput increase of a factor of 12.25 at the Tank Farm.

Third, the Neg.Dec. fails to disclose and address the environmental impacts of foreseeable modifications at the Refinery to allow it to more efficiently process cost-advantaged crude oils, including Bakken and tar sands crudes.

Finally, the Neg.Dec. fails to identify the Project's significant and unmitigated air quality, worker and public health, and hazards impacts, described fully below.

My resume is included in Exhibit A to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting;

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<sup>11</sup> ND, p. 1-1.

<sup>12</sup> ND, p. 1-8.

<sup>13</sup> ND, p. 1-1.

nuisance investigations (odor, noise); environmental impact reports, including CEQA/NEPA documentation; risk assessments; and litigation support.

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers; and a Qualified Environmental Professional, certified by the Institute of Professional Environmental Practice.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 CEQA documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries as well as various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310.

#### I. THE PROJECT DESCRIPTION IS MISLEADING AND INACCURATE

The Neg.Dec. claims that the purpose of the Project is to increase the rate of crude oil unloading from ships and the amount of crude oil that can be stored. ND, pp. 1-1, B-3. It would certainly achieve these goals. However, in addition, the Neg.Dec. makes a number of assertions about what the Project would not do, which appear to be misleading and/or incorrect. The Neg.Dec. asserts the Project would not:

- change "types" of crude oils delivered to the Wilmington Operations;
- change or increase the frequency of ship deliveries on a daily basis;
- increase the total amount of crude oil delivered to the Wilmington Operations on an annual basis;
- alter the methods of crude oil delivery (e.g., continue to be delivered via ships and pipelines);
- change the crude throughput of the Wilmington Operations or any downstream refining process.<sup>14</sup>

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<sup>14</sup> ND, pp. 1-1 to 1-4 & B-3.

My review of the Neg.Dec. and supporting documents indicates that the proposed modifications are designed to facilitate a crude switch, a throughput increase at the Marine Terminal, a throughput increase at the Tank Farm, and potentially, also facilitate a throughput increase and/or a modification of the configuration of the Applicant's Los Angeles Refinery. Each of these points is discussed below.

**A. The Neg.Dec. Fails to Identify a Crude Switch**

The Neg.Dec. asserts that the Project "would not change the types of crude oils delivered to the Wilmington Operations."<sup>15</sup> Elsewhere, it asserts that the Wilmington Operations are designed to and have processed crude oils "with characteristics of light-to heavy-gravity and low to high sulfur content (referred to as light sweet to heavy sour crude oils)."<sup>16</sup>

However, the Neg.Dec. does not identify the "types of crude" that are currently, or were historically delivered to the Wilmington Operations. The Project includes installing two new crude oil tanks that have very high vapor pressure limits, higher than any other crude tanks at the Refinery, suggesting the Project is designed to accommodate a crude switch that the Applicant has disclosed in other fora. Further, information reviewed below suggests that most of the crude that would be imported and stored in the Tank Farm would be refined at the Carson Operations, not Wilmington, calling into question the Neg.Dec.'s Project description.

The word "type" is so vague that it precludes an accurate evaluation of the Project's impacts on the environment. Type is a relative term that encompass a fairly broad range of crudes. The chemical and physical characteristics that determine environmental impacts can vary greatly within crude "types" and thus result in a wide range of environmental impacts.

Impacts due to changes in crude quality were not considered in the Neg.Dec, but dismissed with a vague and unsupported assertion that the crude "type" would not change. Changes in crude quality can include properties such as vapor pressure (which determines how much VOCs and TACs will be emitted); flammability and flash point (which determine the potential for fires and explosions and their consequences); chemical speciation (which determines public health and odor impacts); Total Acid Number (TAN), which determine the potential for corrosion and related accidents; and API gravity, sulfur and nitrogen content (which determine emissions during refining), among others.

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<sup>15</sup> ND, p. 1-1.

<sup>16</sup> ND, p. 2-24.

The inadequacy of "type" to classify crudes is demonstrated by the list of crudes received at the Marine Terminal in the baseline.<sup>17</sup> This list includes chemical composition data that can be used to demonstrate that type is not an adequate description of crude quality.

The list includes several "heavy" crudes (API gravity <24) that can be imported, including two Canadian tar sands crudes (Cold Lake, Wabasca) and heavy crudes from Peru, Mexico, and Ecuador. Sulfur, for example, in these crudes ranges from 1.14% (Peru) to 3.9% (tar sands) and mercaptan from 19 ppm (Ecuador) to 248 ppm (tar sands). Thus, the tar sands crudes, a possible replacement for a large part of the crude slate at the Los Angeles Refinery, would increase odiferous sulfur emissions from tanks and fugitive components. Refining the tar sands crudes would also require an increase in sulfur removal capacity and much more energy, increasing greenhouse gas and other combustion emissions, compared to other "heavy" baseline crudes.

Likewise, "light crudes" (API gravity >32) included in this list include Alaska North Slope (ANS), Arab Light, Plutonio, and Sokol. The sulfur content of these crudes ranges from 0.54% (ESPO) to 1.87% (Arab Light) and mercaptans from 1 ppm (Plutonio) to 111 ppm (ESPO). These "light" crudes have very different chemical and physical characteristics that result in different environmental impacts when they are transported, stored, and refined.

Thus, without identifying the baseline and future crude slate with more specificity, providing composition and throughput data for the baseline and post-Project crude slate, the Neg.Dec. simply cannot accurately identify the Project's environmental impacts and is deficient. The broad generic classifications used in the Neg.Dec. are not useful for determining environmental impacts, i.e., the broad classification of "heavy" or "light" or "light-to heavy-gravity and low to high sulfur content" reveal nothing about chemical and physical characteristics of crudes and thus the impacts from transporting, storing, and refining them. The specific crude(s), on the other hand, allows properties to be determined and thus, impacts of transporting, storing, and refining them to be determined.

Tesoro's California refineries currently refine 19% foreign heavy crudes, 30% foreign light crudes, 19% Alaska North Slope (ANS), 17% California heavy crudes, and 15% North American crudes.<sup>18</sup> My review of the Neg.Dec., supporting files, and other

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<sup>17</sup> Marine Terminal Agreement, Annex D.

<sup>18</sup> Tesoro, Transformation through Distinctive Performance, Simmons Energy Conference, February 27, 2014, at p. 18 (2/27/13 Tesoro Presentation). Available at: <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-presentations>, attached as Exhibit C. Elsewhere, it is reported that the Wilmington Refinery primarily runs heavy crude produced in California and imported from abroad, while the Carson Refinery runs oil from Alaska's North Slope, the Middle East, and West Africa. See: Tesoro to Shut Los Angeles Refinery Hydrocracker in January for Repairs, Hydrocarbon Processing,

publicly available information indicate that one purpose of the Project is to allow the Los Angeles Refinery to replace declining ANS and California crudes and more expensive foreign crude oil imports<sup>19</sup> with cost-advantaged North American crude oils.

1. *Bakken Crudes Are The Most Likely Post-Project Imports*

The Project is designed to facilitate a crude switch. The Project description states that the two new 300,000 bbl floating roof crude oil storage tanks would be permitted with a true vapor pressure (TVP) limit of <11 psi.<sup>20</sup> This corresponds to a Reid Vapor Pressure (RVP) of about 12 psi at a stock temperature of 66 F, based on AP-42,<sup>21</sup> Fig. 7.1-13a.

Bakken crude oils are the only crude oils that I am aware in the market today that have a TVP of 11 psi. The Wall Street Journal, for example, analyzed data collected by Calpine Pipeline, which tested crudes from 86 locations world-wide for vapor pressure. The Journal reported:<sup>22</sup>

"[L]ight, sweet oil from the Bakken Shale had a far higher vapor pressure – making it much more likely to throw off combustible gases – than crude from dozens of other locations...According to the data, oil from North Dakota and the Eagle Ford Shale in Texas had vapor-pressure readings of over 8 pounds per square inch, although Bakken readings reached as high as 9.7 PSI. U.S. refinery Tesoro Corp. TSO +1.01%, a major transporter of Bakken crude to the West Coast, said it regularly has received oil from North Dakota with even more volatile pressure readings – up to 12 PSI. By comparison, Louisiana Light Sweet from the Gulf of Mexico, had vapor pressure of 3.33 PSI, according to the Calpine data."

This data, as summarized by the Wall Street Journal, is shown in Figure 1. This figure shows that all crude oils that are designated as "light" do not have the same vapor pressure and thus, the same environmental impacts when stored and transported. The more volatile the crude, the higher the VOCs, TACs, and greenhouse gas (GHG) emissions, the higher the flammability, and the greater the consequences in

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Available at: <http://www.hydrocarbonprocessing.com/Article/3283087/Tesoro-to-shut-Los-Angeles-refinery-hydrocracker-in-January-for-repairs.html>.

<sup>19</sup> California Energy Almanac, Crude Oil Supply Sources to California Refineries, Available at: [http://energyalmanac.ca.gov/petroleum/statistics/crude\\_oil\\_receipts.html](http://energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts.html).

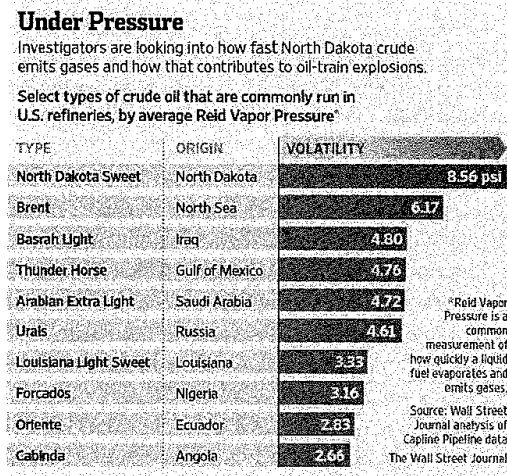
<sup>20</sup> ND, Table 1-1.

<sup>21</sup> U.S. EPA, Compilation of Air Pollutant Emission Factors, Available at: [www.epa.gov/ttnchie1/ap42/42/](http://www.epa.gov/ttnchie1/ap42/42/).

<sup>22</sup> Russell Gold, Analysis of Crude From North Dakota Raises Further Questions About Rail Transportation, Wall Street Journal, February 23, 2014.

the event of an accident. The only "light"<sup>23</sup> crude oil that Tesoro has admitted to refining at its California refineries in its filings with the U.S. Security and Exchange Commission is Basrah, an imported Iraqi light crude oil with a vapor pressure that is half that of Bakken. Thus, any claim in the Neg Dec. that the crude "type" will not change is clearly invalid in terms of disclosing the Project's environmental impacts, if the claim is based on replacing "light" crudes (Basrah) with different "light" crudes (Bakken).

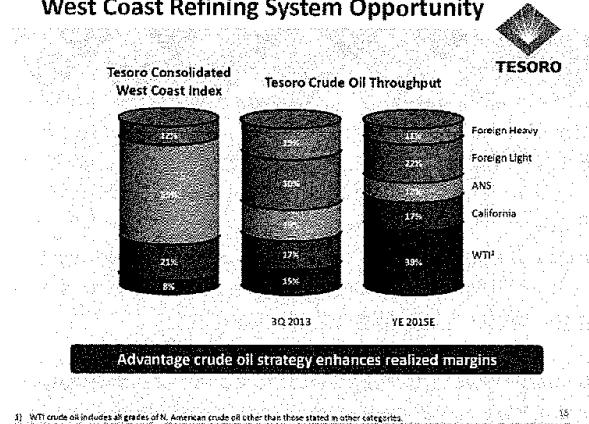
Figure 1.  
Volatility (psi) of Some Commonly Refined Crude Oils  
(Wall Street Journal, February 23, 2014)



The Applicant's proposed vapor pressure (TVP) limit of <11 psi for the new storage tanks is a design parameter that is consistent with Tesoro's widely reported plans to reduce operating costs by replacing a portion of its crude slate with certain cost-advantaged North American crudes, labeled "WTI" in Figure 2.

<sup>23</sup> Bashrah has an API gravity of 29.7 and thus, while very light, falls just below the "light" threshold of 32 used in the industry to classify crudes. Therefore, it is a very light "medium" crude under the usual classification scheme. However, Tesoro itself classifies it as "light" in its SEC filings (SEC 10-Q, Quarter Ending March 31, 2014).

Figure 2.  
 Tesoro Cost-Advantaged Crude Strategy  
 2/27/14 Tesoro Presentation, p. 18  
 West Coast Refining System Opportunity



Bakken crudes, which are a cost-advantaged North American crude, would most likely replace foreign heavy and light crudes and Alaska North Slope (ANS) that are currently refined at the Los Angeles Refinery, as illustrated in Figure 2.<sup>24</sup> The CEO of Tesoro, Greg Goff, stated in the first quarter 2014 earnings call that Bakken is the “right supply source” for the Los Angeles Refinery.<sup>25</sup> However, the tanks required to store these light crudes during unloading currently do not exist at the Refinery, which imported much heavier crudes in the baseline crude slate.<sup>26</sup>

Tesoro has reported that its cost-advantaged feedstock opportunity at its Los Angeles refinery is currently up to 15% California heavy, with the potential to increase this up to 50% California heavy and Bakken.<sup>27</sup> California oil production is not increasing.<sup>28</sup> Thus, up to 35% of the crude oil supplied to the Los Angeles Refinery could be Bakken crude (50% - 15% = 35%). As the refining capacity of the Los Angeles Refinery is 363,000 bbl/day, Tesoro’s projections indicate that up to 127,000 bbl/day of Bakken could be refined.

<sup>24</sup> See, e.g., Greg Goff, Barclays CEO Energy-Power Conference, September 2012, p. 9, Available at: <http://www.sec.gov/Archives/edgar/data/50104/000005010412000072/exhibit991presentation95.htm>.

<sup>25</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Bank of America questions at 44:02 – 44:32 min. (Bakken differentials), Available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en> and included as Exhibit D.

<sup>26</sup> Marine Terminal Agreement, Annex D, RVP column.

<sup>27</sup> 2/27/14 Tesoro Presentation, pp. 13, 14 and 1/9/14 Tesoro Presentation, p. 17.

<sup>28</sup> 1/9/14 Tesoro Presentation, p. 20 and attached as Exhibit E.



The amount of Bakken that could potentially be refined at the Los Angeles Refinery is roughly equal to excess capacity in the Applicant's Port of Long Beach (POLB) marine terminals, including the Project Marine Terminal, and could be greater than the baseline throughput of the Los Angeles Refinery. See further discussion of elsewhere in these Comments.

This is consistent with statements made by Tesoro in its December 10, 2013 Analyst and Investor Presentation, where it stated: "Los Angeles, which is the largest of our West Coast facilities, will potentially see an increase of 125,000 to 130,000 barrels a day of advantaged crude."<sup>29</sup> Bakken would replace foreign imports and ANS,<sup>30</sup> as shown in Figure 2. Bakken is attractive as an alternative to ANS as it yields 14% to 16% more gasoline and distillate than ANS.<sup>31</sup> Thus, Bakken crudes are the likely cost-advantaged crudes to be imported and stored at the Tank Farm, and specifically the two new proposed storage tanks, in significant amounts.

The Bakken crude would be supplied via a new 360,000 bbl/day rail-to-marine terminal facility at the Port of Vancouver in Washington (Vancouver Terminal) that Tesoro is currently building with Savage Companies. This Terminal will import North American "cost-advantaged" crudes by rail and export them by ship to California and Alaska. This terminal is key to Tesoro's plans to import Bakken and other cost advantaged crudes to its Los Angeles Refinery.<sup>32</sup>

The relationship between the Applicant's Los Angeles Refinery and Vancouver Terminal operations is graphically illustrated in Figure 2, which shows crude moving from the Bakken region by rail to the Vancouver Terminal and then by ship to the Los Angeles Refinery. The Project is an initial phase of the Applicant's larger plan to import significant amounts of Bakken crude to the Los Angeles Refinery via Tesoro's Vancouver Terminal and Marine Terminal and other Tesoro LP terminals in the POLB. However, a switch to other cost-advantaged crudes cannot be ruled out, as discussed elsewhere in these Comments.

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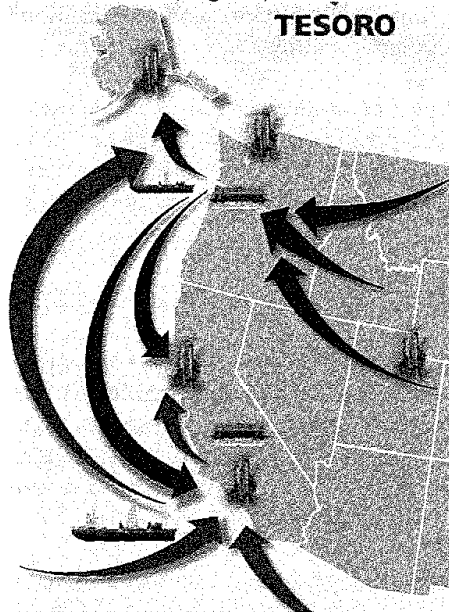
<sup>29</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Tesoro Analyst and Investor Presentation, December 10, 2013, p. 11.

<sup>30</sup> Tesoro, Transformation through Distinctive Performance, 2014 Analyst and Investor Day, December 10, 2013, p. 39 (Feedstock advantage: "Replace ANS and foreign crude oil with higher value alternatives."). Available at: <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-presentations>.

<sup>31</sup> 1/9/14 Tesoro Presentation, p. 16.

<sup>32</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff response to Barclay questions at 28:54 - 30:19 min, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

Figure 2.  
 Cost-Advantaged Crude Transportation Options  
 1/9/14 Tesoro Presentation, p. 19<sup>33</sup>  
 (Legend)<sup>34</sup>



The Vancouver Terminal will export 80% Bakken crude and 20% other crudes<sup>35</sup> and is expected to be operational in mid-2015.<sup>36</sup> The CEO of Tesoro, Greg Goff, has indicated that the Los Angeles Refinery can take the entire shipment. There are “no restrictions on how much we can take...”<sup>37</sup> The Applicant’s SCAQMD applications for Tanks 80079, 300035, and 300036 all contain the same two crude oil Material Safety Data

<sup>33</sup> Tesoro, Deutsche Bank Energy Conference, January 9, 2014, p. 19 (1/9/14 Tesoro Presentation). Available at: <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-presentations>.

<sup>34</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Tesoro Analyst and Investor Presentation, December 10, 2012, p. 13: “The blue arrows represent Tesoro’s ability to move advantaged North American crude from the production fields to the Port of Vancouver...and then through the entire West Coast system. The red arrows represent our waterborne domestic and foreign capabilities.” Available at: <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-transcriptsarchive>.

<sup>35</sup> Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%201/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%201.pdf>.

<sup>36</sup> 2/27/13 Tesoro Presentation, p. 17 and Kristen Hays and Erwin Seba, Update 1 - Tesoro Delivering First Bakken Crude Unit Train to California, Reuters, September 11, 2013, Available at: <http://www.reuters.com/article/2013/09/11/tesoro-rail-crude-idUSL2N0H70U420130911..>

<sup>37</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Paul Cheng, Barkley questions at 31 min. et seq, Available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

Sheets<sup>38</sup> as found in the Vancouver Application, which would supply the Marine Terminal. These are generic MSDSs for “light sweet crude oil,” that are consistent with Bakken crude and “sweet heavy crude oil,” consistent with some Canadian tar sands, discussed elsewhere in these Comments. As the Vancouver Terminal will export other crudes, including tar sands crudes, these cannot be eliminated as part of the imported supply to the Wilmington Operations.

Thus, the < 11 psi vapor pressure limit for new tanks 300035/300036, coupled with identical crude composition data reported in MSDSs for SCAQMD permit tank applications and the Vancouver Terminal Application establish that the Project is designed to facilitate the crude switch that is widely reported by Tesoro and Tesoro Logistics.

2. *Tar Sands Crudes Are Also A Viable Option for Project Implementation*

While publicly available information and the proposed vapor pressure limit on the new tanks (<11 psi) suggests that Bakken crudes are currently the most likely Project feedstock, the Project description is general enough to allow other cost-advantaged crudes such as tar sands, given the Los Angeles Refinery’s configuration and Project design. Tar sands crude exports to the West coast are currently challenged by logistics, but this may change in the future.

The Marine Terminal Agreement lists crudes that could be accepted at the Marine Terminal in the baseline. These include two Canadian tar sands crudes, Cold Lake and Wabasca.<sup>39</sup> In 2012, the Wilmington Refinery reportedly ran 1,000 bbl of tar sands crude, less than 2% of its throughput.<sup>40</sup> The U.S. Energy Information and Administration (US EIA) provide data on foreign crude imports. The data for the Wilmington Operations indicates it has continued to import tar sands crudes.<sup>41</sup> The Project description includes modifications that would facilitate an increase in tar sands imports. These include an increase in the throughput of Tank 80079, which is permitted to store heavy crude oil and whose throughput is being increased.<sup>42</sup> Further, the two new 300,000-bbl floating roof tanks (300035/36) will be equipped with heating coils

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<sup>38</sup> Applications 545745 (Tanks 300035 & 300036), 545646 (Tanks 300035 & 300036), and 556835 (Tank 80079) all contain the same MSDSs for “light sweet crude oil” and “sweet heavy crude oil” as contained in the Vancouver Application, Appx. G.

<sup>39</sup> Marine Terminal Agreement, Annex D.

<sup>40</sup> OilChange International, Refinery Report, Available at: <http://refineryreport.org/refineries-list.php>.

<sup>41</sup> U.S., EIA Data, Tesoro Corp. Crude Oil Imports, Port City: Los Angeles, CA, Port Code 2704. Available at: <http://www.eia.gov/petroleum/imports/companylevel/>.

<sup>42</sup> ND, p. 1-14.

(3/7/13 Revised Application<sup>43</sup>, pdf 42), which would allow handling heavy tar sands crudes.

Lastly, some of the Applicant's recently completed and planned projects to integrate the Carson and Wilmington Operations are required to facilitate the refining of increased amounts of heavy sour crudes, such as tar sands, at the Wilmington Operations. The hydrogen plant at Wilmington, for example, was recommissioned to produce 15 MMSCF/day of hydrogen. This removed constraints for the hydrocracker and hydrotreaters at both facilities, allowing them to refine increased amounts of heavy crudes, such as tar sands. The Wilmington sulfur recovery unit was "debottlenecked", increasing its capacity by 10 ton/day. This increased capacity would be required to run significant amounts of high sulfur tar sands crudes. A blending system was also installed at Carson to mix light and heavy crudes to eliminate metallurgy (e.g., corrosion due to high TAN tar sands crudes) or yield constraints (e.g., reductions in yield due to system design).<sup>44</sup> All of these projects at the Los Angeles Refinery, and especially the Wilmington Operations, allow the Refinery to process increased amounts of tar sands crudes. Thus, the Project in conjunction with Carson integration projects, that have been completed or are proposed, would allow a significant increase in the amount of tar sands that could be refined.

Tar sands crudes would face stronger opposition in California than Bakken due to the well-known environmental impacts from producing and refining them.<sup>45</sup> Thus, they are frequently disguised in project proposals by referring only to broad general classes of crudes, e.g., light and heavy.

As tar sands crudes cannot be eliminated, the Neg. Dec. should have identified them and disclosed the environmental impacts that would be associated with refining them.<sup>46</sup> While a small amount of these crudes were run in the baseline, the Project would allow a substantial increase in these crudes due to increased storage capacity at the Tank Farm to be received at the Marine Terminal from the Vancouver Terminal.

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<sup>43</sup> Tesoro, Revisions for Application for Permit to Construct AQMD Application Nos. 545646 & 545745 Tank No. 300035 and Tank No. 300036, March 7, 2013 (3/7/13 Revised Application).

<sup>44</sup> 12/10/13 Tesoro, pp. 10, 29 and Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff remarks on California synergies at 9:27 to 10:13 minutes, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

<sup>45</sup> EIP, Tar Sands: Feeding U.S. Refinery Expansions with Dirty Fuel, June 2008, Available at: [http://environmentalintegrity.org/pdf/publications/Tar\\_Sand\\_Report.pdf](http://environmentalintegrity.org/pdf/publications/Tar_Sand_Report.pdf).

<sup>46</sup> EIP, Tar Sands: Feeding U.S. Refinery Expansions with Dirty Fuel, June 2008, Available at: [http://environmentalintegrity.org/pdf/publications/Tar\\_Sand\\_Report.pdf](http://environmentalintegrity.org/pdf/publications/Tar_Sand_Report.pdf).

3. *The Los Angeles Refinery Is Not Currently Running Bakken*

The above analysis indicates that one purpose of the Project is to facilitate a switch to cost-advantaged crudes, most likely Bakken or tar sands crudes. The Neg.Dec. asserts that the Project would not change "types" of crude oils delivered to the Wilmington Operations. (The Project could deliver crude oil to either refinery, as discussed elsewhere in these Comments). Further, publicly available information reviewed below indicates that neither Wilmington nor Carson currently process significant amounts of North American cost-advantaged crudes, such as Bakken.

In its 10-Q reports to the U.S. Securities & Exchange Commission, Tesoro reported that only its Alaska, North Dakota, and Washington refineries were running Bakken crude:

- For the quarter ended September 30, 2012: "We supply our North Dakota refinery exclusively with Bakken crude oil and our Washington refinery with Canadian Light Sweet crude oil."<sup>47</sup>
- For the quarter ending March 31, 2013: "We supply our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Canadian Light Sweet and Bakken crude oil and our Utah refinery with light sweet crude oil from Wyoming and Montana as well as Uinta Basin waxy crude oil... **Our California refineries run a significant amount of South American heavy crude oil and San Joaquin Valley Heavy ("SJVH"), which continued to be priced at a discount to Brent during the first quarter of 2013.** During the first quarter of 2013, we supplied our Alaska refinery primarily with Alaska North Slope crude oil ("ANS")."<sup>48</sup>
- For the quarter ending March 31, 2014: "We supplied our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Bakken and Canadian Light Sweet crude oil and our Utah refinery with light sweet crude oil from Wyoming and Colorado as well as Uinta Basin waxy crude oil... **Our California refineries run a significant amount of South American**

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<sup>48</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2013, p. 33. Available at: <https://www.sec.gov/Archives/edgar/data/50104/000005010413000029/a2013331-tsox10q.htm>, emphasis added.

heavy crude oil (“Oriente”) and San Joaquin Valley Heavy () and light crude oil from Iran (“Basrah”).<sup>49</sup>

Thus, the 10-Q reports suggest that Tesoro was not refining significant amounts of Bakken in its California refineries in 2012 and 2013 and that Tesoro is not currently refining significant amounts of Bakken at its California refineries.

The CEO of Tesoro, Greg Goff, stated that Tesoro shipped 5,000 to 7,000 bbl/day of Bakken into California in the first quarter of 2014 and the Bakken supply is limited to 10,000 bbl/day due to logistic constraints.<sup>50</sup> These numbers are consistent with known rail imports of Bakken to Tesoro’s Martinez refinery,<sup>51</sup> and further indicate the Los Angeles Refinery is not currently, nor has it historically refined Bakken crudes.

Tesoro’s own statements in its first quarter 2014 earnings call further indicate that Bakken does not constitute the baseline crude slate for the Wilmington Operations. In particular, Mr. Goff stated that the crude slate of the Los Angeles Refinery has not changed materially since the acquisition of Carson and is largely ASN and Basrah. He confirmed that the crude slate will change in the future and the Vancouver Terminal is the “primary way that we want to be able to improve crude supply cost at the Los Angeles facility.”<sup>52</sup>

The Marine Terminal Agreement, Annex D, lists crudes that could be accepted at the Marine Terminal in the baseline, prior to 2013. These do not include Bakken crude or any crude with a vapor pressure as high as Bakken.<sup>53</sup> In fact, this Agreement stipulates a Reid Vapor Pressure limit of 6 psi or less for crudes imported at the Marine

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<sup>49</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2014, p. 28. Available at: <https://www.sec.gov/Archives/edgar/data/50104/000005010414000024/tso10q-20140331.htm>, emphasis added.

<sup>50</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff response to Barclay questions at 28:10 – 28:47 min, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en> and transcript attached as Exhibit D.

<sup>51</sup> Q3 2013 Tesoro Corporation Earnings Conference Call, November 7, 2013 Transcript, George Goff statements at p. 4 (“We also started taking up to 3 unit trains a month of Bakken crude oil into our Martinez refinery...we have the capacity to deliver nearly 350,000 barrels per month of Bakken crude oil into our Martinez, California refinery.”) and 11 (“...what we said was we can deliver three unit trains per month into the Martinez or Golden Eagle refinery as well as some additional manifest cars that we do, which allows us to maximize the use of the facilities. As a result of that, it’s 350,000 barrels per month at the present time.”), Available at: <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-transcriptsarchive>.

<sup>52</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff response to Barclay questions at 28:54 – 30:19 min, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

<sup>53</sup> Marine Terminal Agreement, Sec. 7.0.

Terminal, which excludes the much higher RVP Bakken crudes. This Agreement was amended in December 2013 to eliminate all restrictions.<sup>54</sup>

Further indicating that Bakken is currently not processed at the Refinery, none of the tanks at the Wilmington Operations that are currently permitted to store crude oils have a vapor pressure limit as high as proposed here, a true vapor pressure of 11 psi (which corresponds to a RVP of about 12 psi). The only tanks (e.g., D1078) with a vapor pressure limit of 11 psi RVP store alkylate, a gasoline blendstock.<sup>55</sup>

One of the characteristics of Bakken crudes, as discussed elsewhere in these Comments, is a very high vapor pressure, similar to gasoline. TSBC 2013.<sup>56</sup> The only non-Bakken light crude identified as a feedstock to Tesoro's California refineries reported in its Form 10-Q reports is Basrah, which has a RVP of 3 (Figure 3) to 6 psi. While it is possible that small amounts of Bakken (and tar sands) has been imported to Wilmington via Anacortes<sup>57</sup> or by manifest rail car, a method admitted to have been used for a cost-advantaged, tight shale, mid-continent Permian crude,<sup>58</sup> this is unlikely to have occurred in large amounts as none of the crude oil tanks are permitted to handle high vapor pressure Bakken crudes. Further, it is unlikely that these crudes would have been imported in significant amounts prior to 2012 as transportation out of their area of origin was constrained due to lack of pipeline and rail terminals.

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<sup>54</sup> Amended and Restated Long Beach Berth Access, Use and Throughput Agreement, December 6, 2013, Available at:

<http://www.sec.gov/Archives/edgar/data/50104/000119312513465459/d638208dex109.htm>.

<sup>55</sup> The SCAQMD did not produce the most current version of the Wilmington Title V Permit in time to incorporate into these Comments. The produced version was not searchable. Thus, this statement is based on the only version that was available on the web, which is: Wilmington Refinery Title V Permit, August 12, 2012, Available at:

[http://yosemite.epa.gov/R9/AIR/EPSS.NSF/6924c72e5ea10d5e882561b100685e04/abda60d38b6b117e882577e005c93f3/\\$FILE/1D%20800436%20Tesoro%20Refining%20Marketing%20Co-](http://yosemite.epa.gov/R9/AIR/EPSS.NSF/6924c72e5ea10d5e882561b100685e04/abda60d38b6b117e882577e005c93f3/$FILE/1D%20800436%20Tesoro%20Refining%20Marketing%20Co-)

[Wilmington%20Refinery%20-](http://yosemite.epa.gov/R9/AIR/EPSS.NSF/6924c72e5ea10d5e882561b100685e04/abda60d38b6b117e882577e005c93f3/$FILE/1D%20800436%20Tesoro%20Refining%20Marketing%20Co-Wilmington%20Refinery%20-)

[Final%20Revised%20Title%20V%20Permit%20AN%20502823%20470259%20502824.pdf](http://yosemite.epa.gov/R9/AIR/EPSS.NSF/6924c72e5ea10d5e882561b100685e04/abda60d38b6b117e882577e005c93f3/$FILE/1D%20800436%20Tesoro%20Refining%20Marketing%20Co-Final%20Revised%20Title%20V%20Permit%20AN%20502823%20470259%20502824.pdf).

<sup>56</sup> Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: [http://www.tsb.gc.ca/eng/enquetes-](http://www.tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/lab/20140306/LP1482013.asp)

[investigations/rail/2013/R13D0054/lab/20140306/LP1482013.asp](http://www.tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/lab/20140306/LP1482013.asp)Enbridge Pipelines Inc., 2013 Crude Characteristics (U.S. High Sweet - Clearbrook and Lewiston are Bakken crudes), Available at:

<http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf>.

<sup>57</sup> Kristen Hays, UPDATE 2 - Tesoro Lifts Volumes of Bakken Rail Project, August 2, 2012, Reuters (CEO Goff of Tesoro is quoted as saying: Tesoro "may consider moving crude oil to California" once the Anacortes rail operation is running smoothly at 50,000 bpd.) Available at:

<http://www.reuters.com/article/2012/08/02/tesoro-bakken-idUSL2E8J276M20120802>.

<sup>58</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff response to questions from Barclays at 27:26 to 27:48 min, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

**B. The Neg.Dec. Fails to Analyze the Environmental Impacts of a Crude Switch**

A switch from the current crude slate, which is primarily California heavy crude, ANS, and foreign imports, to a crude slate that replaces ANS and foreign imports with Bakken, increased amounts of tar sands, or other similar cost-advantaged North American crudes, results in two categories of changes to the Los Angeles Refinery that were not disclosed in the Neg.Dec. First, the physical and chemical characteristics of these new crudes are very different from the crudes they would replace. These differences will result in significant environmental impacts not considered in the Neg.Dec. Second, the Los Angeles Refinery may have to be modified to accommodate the changes in crude slate. These changes would result in additional environmental impacts that were not considered in the Neg.Dec.

1. *Unique Chemical and Physical Composition Will Result in Significant Environmental Impacts*

The foreseeable switch from ANS and foreign imports to very light Bakken or larger amounts of tar sands crudes as a result of the Project, described in the above sections, is a feedstock change that should have been identified in the Neg.Dec. The new crudes, facilitated by the Project, are chemically and physically different from the current crude slate. These differences will result in significant impacts not disclosed in the Neg.Dec.

*a. Bakken Crudes:*

Bakken crudes have unique chemical and physical characteristics that distinguish them from currently refined crudes and which would result in significant environmental impacts not identified in the Neg.Dec., including significant risk of upset, air quality, and public health impacts. These unique characteristics include high volatility, flammability,<sup>59</sup> and elevated concentrations of TACs and VOCs. The basis of my conclusion is laid out below as each of the impacts is discussed. See Figure 1 and the composition data for acceptable crudes in the Marine Terminal Agreement, Annex D compared to Bakken composition data reported in the Transportation Safety Board of Canada's analyses. TSBC 2013.

Light crude oils are not unique and have been common since the advent of petroleum production. Bakken and other light crude oils taken straight from the well typically contain large amounts of natural gas liquids (NGLs), known as light ends.

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<sup>59</sup> Flammable crude oils will ignite when they are mixed with air in certain concentration ranges. The lowest temperature at which they produce sufficient vapor to support combustion is called the "flash point".



These include C2 to C5 hydrocarbons -- methane, propane, butane, ethane, and pentane. These are the components most likely to volatilize, burn, or explode when sparks fly in an accident. These light ends have the effect of increasing a crude's vapor pressure, lowering its flash point and lowering its initial boiling point, all of which result in increased environmental risks. These are called "live" crude oils. The high concentration of light ends makes them highly flammable, more likely to form fire balls and BLEVES in accidents. The failure to recognize this resulted in a significant underestimate of hazards in the Neg.Dec.

However, in most petroleum-producing regions, light ends are removed before they are shipped using a stabilizer -- a tall, cylindrical tower that uses heat to separate the light ends, which are then condensed and sent to a fractionator for processing. Crude stabilizers and NGL pipelines to send the recovered NGLs to market are ubiquitous in oil fields that produce light crude oils as crude pipeline specifications set pressure limits that force stripping of the NGLs. However, in the Bakken fields, this infrastructure is rare and most Bakken crude that is shipped by rail is shipped live. This distinguishes it from other light crudes, which are shipped dry, e.g., Eagle Ford crudes in Texas.<sup>60</sup>

Medium-heavy to heavy crudes, on the other hand, such as those from California and Alaska that the Bakken would replace, are hard to ignite because they do not have any combustible light ends. Most light crudes, including the imported foreign crudes currently processed at the Los Angeles Refinery, are stabilized. These stabilized or "dead" crudes will not actively boil at ambient temperature and can be safely shipped, stored, and refined. Thus, while "light" may replace "light", there are major differences in composition that affect environmental impacts. The Neg.Dec. does not impose any condition(s) that require that NGLs be removed from received crudes. Thus, analyses must assume that they will be present.

In addition, Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in many refinery operating issues, which increase emissions. These include fouling of the cold preheat train; desalter upsets; and fouling of hot preheater exchangers and furnaces; as well as corrosion.<sup>61</sup> These operating problems increase emissions.

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<sup>60</sup> 'Degassing' North Dakota Crude Oil Before Shipping Among Safety Ideas, Insurance Journal, May 14, 2014, Available at: <http://www.insurancejournal.com/news/national/2014/05/14/329095.htm>.

<sup>61</sup> Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>.

*b. Tar Sands Crudes:*

The impacts of refining a larger fraction of tar sands crudes than in the current slate would also result in significant environmental impacts including: (1) adverse odor impacts from higher levels of mercaptans and other odiferous sulfur compounds; (2) increased combustion emissions from all fired sources in the refinery; (3) increased potential for accidental releases from corrosion due to high Total Acid Numbers; (5) higher greenhouse gas emissions;<sup>62</sup> (5) higher hydrogen demand, requiring possible expansion of Hydrogen Plant capacity; (6) refinery operational problems that increase startup, shutdown, malfunction and other emissions,<sup>63</sup> among others. These are discussed in more detail in comments that I prepared on the Santa Maria Rail Spur Project, attached to these Comments as Exhibit F.

2. *The Neg.Dec Failed to Identify and Analyze Foreseeable Refinery Modifications Required to Refine Bakken or Other Cost-Advantaged Crudes*

Replacing a significant portion of the current crude slate with Bakken, tar sands, and other cost advantaged crudes requires modifications in the Los Angeles Refinery that will result in significant environmental impacts that were not disclosed in the Neg.Dec. A refiner's choice of crude oil is influenced by the specific collection of processing units at the refinery and their design. Refinery configurations are unique and are typically designed to process a specific crude slate. A refinery's design is matched to the crude slate with the goal of maximizing more valuable light products such as gasoline and diesel.

In the Project baseline, the Wilmington and Carson refineries were full-conversion coking refineries<sup>64</sup>, designed to maximize the yield of more valuable light products from the heaviest fraction of the crude oil barrel, present in large amounts in its current crude slate.

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<sup>62</sup> Greg Karras, Combustion Emissions from Refining Lower Quality Oil: What is the Global Warming Potential?, *Environmental Science & Technology*, v. 33, 2010, pp. 9584-9589. Available at: <http://pubs.acs.org/doi/pdf/10.1021/es1019965>; International Council on Clean Transportation, *Effects of Possible Changes in Crude Oil Slate on the U.S. Refining Sector's CO2 Emissions*, Final Report, March 29, 2013. Available at: [http://www.theicct.org/sites/default/files/publications/ICCT\\_Refinery\\_GHG\\_Study\\_Proj\\_Report\\_Apr\\_2013.pdf](http://www.theicct.org/sites/default/files/publications/ICCT_Refinery_GHG_Study_Proj_Report_Apr_2013.pdf).

<sup>63</sup> Oil and Gas Journal, Special Report: Refiners Processing Heavy Crudes Can Experience Crude Distillation Problems, 11/18/2002. Available at <http://www.ogi.com/articles/print/volume-100/issue-47/special-report/special-report-refiners-processing-heavy-crudes-can-experience-crude-distillation-problems.html>

<sup>64</sup> ND, Fig. 1-4.

A coking refinery that processes heavy sour crude oils such as Wilmington and Carson has the majority of its hardware (and capital investment) designed to handle the bottom or heavy portion of a crude barrel. These refineries are designed specifically to convert the full barrel of heavy crude oil into high-value finished products such as gasoline and diesel. Thus, when they switch from a heavy crude slate to a lighter one, such as the possible switch from the current slate to a larger fraction of light sweet crude such as Bakken (Fig. 2), they have too much processing capacity at the bottom of the barrel and not enough at the top of the barrel. This leads to operational inefficiencies, higher costs, and financial penalties. Further, light crudes such as Bakken yield larger amounts of liquefied petroleum gas (LPG) and naphtha and lower amounts of distillate than crudes they would replace. This runs counter to demand growth patterns.<sup>65</sup> These inefficiencies drive modifications of the refinery to increase processing capacity for the top of the barrel.<sup>66</sup>

The Neg.Dec. failed to describe the baseline refinery with sufficient specificity to identify the changes that would be required (some have already been made) to respond to the change in crude slate facilitated by this Project. However, in general, coking refineries such as Wilmington and Carson are not configured to process large amounts of lighter crudes due to crude distillation column limitations, overhead cooling issues, light ends recovery capacity, naphtha handling capability, and other constraints that must be addressed to efficiently process these crudes. Impacted units include crude and vacuum units, gas plants, debutanizers, naphtha units and sulfur plants.<sup>67</sup> These modifications should have been evaluated in the Neg.Dec. along with the crude switch discussed above.

In fact, Tesoro has been modifying its Los Angeles Refinery in anticipation of refining cost-advantaged crudes, such as Bakken and tar sands, whose import would be facilitated by this Project. The Project is part of a facility-wide plan to remove feedstock constraints to facilitate the shift in crude slate to include a much larger fraction of light Bakken crude, tar sands, and other cost-advantaged crudes.

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<sup>65</sup> John R. Auers, Changing North American Crude Market: Implications, Challenges and Opportunities, April 24, 2014, p. 25, Available at: <http://www.turnermason.com/wp-content/uploads/2014/05/Changing-North-American-Crude-Markets.pdf>.

<sup>66</sup> HIS Energy/IHS Economics Report, US Crude Oil Export Decision. Assessing the Impact of the Export Ban and Free Trade on the US Economy, May 2014, Sec. III (pp. III-4 to III-5). Available at: <http://www.ihs.com/info/0514/crude-oil.aspx>.

<sup>67</sup> John R. Auers, The North American Crude Boom: How Changing Quality Will Impact Refiners, March 1, 2013, Available at: [http://www.turnermason.com/wp-content/uploads/2013/05/North\\_American\\_Crude\\_Boom-platt-2013.pdf](http://www.turnermason.com/wp-content/uploads/2013/05/North_American_Crude_Boom-platt-2013.pdf).

Some of the changes required to process a larger amount of lighter crudes have already been made or will be made as part of the on-going Carson integration project.<sup>68</sup> These include debottlenecking the hydrocrackers and hydrotreaters and installing a crude blending system.<sup>69</sup> Mr. Goff explained that: "The processing projects focus on removing feedstock constraints; fully utilizing the assets; improving our conversion capabilities, and subsequently our yield...we acknowledge the substitution or partial shift in our crude slate from ANS and other lower-value feedstocks to more attractive alternatives, such as Mid-Continent North American advantaged feedstocks."<sup>70</sup> These modifications have been characterized by Tesoro as improving "crude flexibility", which means modifying operations to allow refining cost-advantaged crudes.<sup>71</sup> They also would result in increasing crude throughput, relative to the baseline operations.

These modifications are required to allow the Los Angeles Refinery to process the lighter crude slate facilitated by the Project. The imports from the Marine Terminal can be routed throughout the Los Angeles Refinery as the integration of the Carson and Wilmington refinery linked these facilities with the Marine Terminal. Tesoro explained in its December 10, 2013 Analyst and Investor Presentation that "[t]he logistics investments physically link the two refineries together, as well as those refineries to our Marine and product terminals. Examples include the pipeline installations between the two plants that allow us to efficiently transfer intermediates between the two refineries..." In its most recent earnings call, Tesoro announced a series of additional modifications at its Los Angeles Refinery to improve crude flexibility, i.e., changes in crude slate in response to market conditions.<sup>72</sup>

Based on these completed and planned modifications, Tesoro has announced that Carson will likely process up to 100,000 bbl/day of Bakken crude.<sup>73</sup> and Wilmington will process heavier cost-advantaged crudes, such as tar sands. The President and CEO of Tesoro Corp., Greg Goff, stated in the third quarter 2013 earnings conference call that "...we have the capability to run additional Bakken crude oils, probably with the exception of the Wilmington part of the Los Angeles refinery. Now, that we combined the two facilities into one, that is a heavy crude processing refinery..."<sup>74</sup> The modifications completed to date indicate Wilmington would likely

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<sup>68</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff remarks on California synergies at 9:27 to 10:13 minutes, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

<sup>69</sup> 12/10/13 Tesoro Analyst & Investor Presentation, p. 10, 29.

<sup>70</sup> 12/10/13 Tesoro Analyst & Investor Presentation, pp. 10, 22.

<sup>71</sup> 12/10/13 Tesoro Analyst & Investor Presentation, p. 32.

<sup>72</sup> Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014 (Q1 2014 Tesoro Earnings Call), Goff remarks on California synergies at 9:27 to 10:13 minutes, Webcast available at: <http://edge.media-server.com/m/p/th8e4nzb/lan/en>.

<sup>73</sup> 12/10/13 Tesoro Analyst & Investor Presentation, pp. 10, 22.

<sup>74</sup> Q3 Tesoro Corporation Earnings Conference Call, November 7, 2013 (Q3 Tesoro Earnings Call), p. 17, Transcript available at: <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-transcriptsarchive>.

process tar sands crude. Tesoro, for example, replaced a vacuum distillation unit at the Wilmington facility to allow it to upgrade heavy ends to clean products.<sup>75</sup> This is consistent with setting up Wilmington to process tar sands, rather than Bakken.

Thus, the statement in the Neg.Dec. that “no [Project-related] modifications will occur at the Carson Operations” is not correct.<sup>76</sup> Modifications have been made and additional modifications are planned to allow Carson to process a lighter slate with a significant fraction of Bakken crudes, imported through the Marine Terminal via two new 300,000 bbl floating roof storage tanks, permitted specifically to store the much lighter Bakken crude to be accommodated by the Project.

The modifications that have been made and that are planned to allow the Los Angeles Refinery to process cost-advantaged crudes will result in increases in air emissions, hazards, and public health risks that were not disclosed in the Neg.Dec. There will be emissions, for example, from the new blending facility required to blend these new crudes into the slate; emissions from the newly started up hydrogen plant; and increases in emissions from fugitive components throughout the refinery that handle these new crudes, etc.

### C. The Tank Farm and Marine Terminal Throughputs Would Increase

The Neg.Dec. frames the Project as increasing the rate of crude oil unloading from ships while not increasing the frequency of ship deliveries.<sup>77</sup> However, the Neg.Dec. incorrectly claims that the increased unloading rate would not lead to an increase in throughput of the Marine Terminal and Tank Farm and would lead to a decrease in ship emissions from decreased unloading time.<sup>78</sup>

Increased ship unloading efficiency does not exclude the possibility of unloading a greater proportion of bigger ships, as compared to baseline operations, or even unloading ships on more days. Simply put, if ships can be unloaded faster, more or larger ships can be unloaded, increasing imports and exports. Other parts of the Project are designed to increase throughput. The Neg.Dec. fails to identify the fairly obvious larger goal of the Project, which is to increase the throughput of the Tank Farm and the Marine Terminal.

First, Table I shows the tank modifications will increase the throughput of just the tanks modified by the Project from a baseline throughput of 458,121 bbl/mo to

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<sup>75</sup> Tesoro Aims to Increase Throughput of Domestic Crude Over the Next Few Years, Investment Thesis, July 24, 2013, Available at: <http://analysisreport.morningstar.com/stock/archive?t=TSO&region=USA&culture=en-US&productcode=MLE&docId=604033>.

<sup>76</sup> ND, p. 1-4.

<sup>77</sup> ND, p. 1-1.

<sup>78</sup> ND, pp. 2-20/21.

3,850,000 bbl/mo. This is a factor of 8 increase, amounting to 3.4 million barrel per month, which would be supplied by an increase in throughput from the Marine Terminal.

Table 1.  
Tank Throughput Increase  
(bbl/mo)

Tank	2010-211 Baseline Throughput <sup>79</sup>	SCAQMD Application	Project Throughput ND, Table 1-1
80038	30,782	Ap. 554668	350,000
80079	350,000	Ap. 556835	500,000
300035	32,276*	Ap. 545646	1,500,000
300036	45,063*	Ap. 545745	1,500,000
<b>Total</b>	<b>458,121</b>		<b>3,850,000</b>

\*Throughput for tanks 80035 & 80036, which were replaced by tanks 300035 and 300036 under the Project.

Second, the Project accommodates the increase in Tank Farm and Marine Terminal throughput by replacing all of the existing 12-inch diameter piping that connects “the new tanks as well as to other tanks throughout the tank farm” with a 42-inch diameter aboveground pipeline.<sup>80</sup> The flow rate through a pipeline is directly proportional to the diameter of the pipe, squared. Thus, increasing the diameter of the pipeline connecting the tanks from 12 inches to 42 inches would allow an increase in throughput of the Tank Farm by a factor of 12.25.<sup>81</sup>

The Neg.Dec. does not include a figure that shows the pipeline layout and pipeline connections between the Los Angeles Refinery, Marine Terminal, and Tank Farm (or the boundaries of the Tank Farm and Marine Terminal). Assuming the Tank Farm is linked by pipeline with the Marine Terminal, as implied by Neg.Dec. Figure 1-5, this new pipeline would also debottleneck flow between the Marine Terminal and the Tank Farm, as the existing pipeline through the Marine Terminal is 24-inch diameter

<sup>79</sup> For Tank 80038, Ap. 554668: 2010 at pdf 42 (33,598.22 bbl/mo) and 2011 at pdf 44 (27,966.04 bbl/mo). For Tank 80079: Ap. 556835. This tank was out of service in 2010 to retrofit an internal floating roof (pdf 30). Thus, 2010 throughput is not representative of normal operation. The throughput reported in Table 1 is the permit limit, which is higher than actual 2011 throughput of (158,278 bbl/mo at pdf 36.) For Tanks 300035/36: Ap. Tank 80035 2010-2011 baseline throughput reported as 32,276 bbl/mo (pdf 52) and Tank 80036 2010-2011 baseline throughput reported as 45,063 bbl/mo (pdf 74).

<sup>80</sup> ND, pp. 1-4, B-3.

<sup>81</sup> The increase in flow rate in the new pipeline:  $Q=(\pi/4)D^2V$ . Thus, the increase in Q, all else held constant, would be  $42^2/12^2 = 12.25$ .

(with a greater throughput capacity than the existing 12-inch<sup>82</sup> diameter Tank Farm piping). This would allow throughput increases at both facilities.

Third, the Neg.Dec. fails to disclose what the new pipeline connects with on each end. This is critical information, required to assess the throughput impacts of the new pipeline. The figure that locates the pipeline<sup>83</sup> shows it extending a significant distance beyond tanks involved in the Project and exiting the Wilmington Operations at the northeast corner. Where does this pipeline go? The facilities adjacent to this northeast boundary include rail lines and a tank farm that is part of the Phillips 66 refinery. Will the pipeline facilitate imports to the adjacent Phillips 66 refinery or imports to the Wilmington Operations from Phillips 66?

The Neg.Dec. fails entirely to address impacts related to the throughput increases at the Tank Farm and Marine Terminal. The throughput increases allow for a dramatic increase in the shipment of cost-advantaged crudes from the Marine Terminal to the Tank Farm and on to Tesoro's Los Angeles Refinery, and from the Tank Farm to the Marine Terminal for export of finished products.

The Neg. Dec. also fails to address additional pipeline modifications related to the throughput increases at both the Tank Farm and Marine Terminal that are reflected in the Applicant's revised SCAQMD application, dated March 7, 2013 and other Project materials in the District's possession. In particular, the revised SCAQMD application states: "The existing 24" crude receiving pipeline will remain [presumably in the Marine Terminal]. **The existing 8" pipeline extending across the length of the refinery to the new tanks will be replaced with 24" pipeline.**"<sup>84</sup> The District's Project file further notes: "24" pipeline replacing 8" pipeline through - Port - Refinery (24" existing Marine Terminal Refinery 8" → 24" (replacement))."<sup>85</sup> Thus, in addition to replacing piping within the Tank Farm, the Applicant is also proposing to replace piping "along the length of the refinery."

The modifications described in the March 7, 2013 application are consistent with Tesoro's public representations. Tesoro explained in its December 10, 2013 Analyst and Investor Presentation that "[t]he logistics investments physically link the two refineries together, as well as those refineries to our Marine and product terminals."

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<sup>82</sup> The Neg.Dec., p. 1-14, states the Tank Farm pipeline is 12-inch, but the SCAQMD file, Ap. 545745, pdf 4, suggests it is 8 inches.

<sup>83</sup> ND, Fig. 1-3.

<sup>84</sup> Tesoro, Revisions for Application for Permit to Construct, AQMD Application Nos. 545646 & 545745, Tank No. 300035 and Tank No. 300036, PRN 545646, March 7, 2013 (3/7/13 Revised Application), pdf 41, emphasis added.

<sup>85</sup> Handwritten notes on the December 18, 2012 "Agenda" for a "kick-off meeting" in the SCAQMD's file #545745.

As the Marine Terminal<sup>86</sup> does not have any throughput limits, the above modifications, which increase the Tank Farm throughput by increasing tank and pipeline throughput, potentially allow the Marine Terminal to realize 100% of its current design capacity of 32,000 bbl/hr. The above modifications, absent any new throughput limits on the Marine Terminal and Tank Farm, provide sufficient excess capacity to allow the Marine Terminal to nearly double its baseline throughput, from 32,000 bbl/hr to 61,250 bbl/hr ( $12.25 \times 5,000 = 61,250$  bbl/hr) once the vapor recovery constraint is removed by the Project and the new Tank Farm pipeline is in place.

I cannot estimate the increase in throughputs as the Project description is incomplete. It, for example, does not identify the 20 tanks in the "Tank Farm," (e.g., all of the figures in the Neg.Dec. show many more than the claimed 20 tanks in the Tank Farm). The Neg.Dec. also does not identify the tanks that would be connected to the new pipeline and their permitted throughputs, the baseline Tank Farm and Marine Terminal throughputs and design capacities, nor the design flow rate of the new pipeline.

Thus, the larger Tank Farm pipeline debottlenecks the entire system. Imports from the Marine Terminal can be routed throughout the Los Angeles Refinery as the integration of the Carson and Wilmington refinery linked these facilities with the Marine Terminal. Thus, debottlenecking the Tank Farm, debottlenecks everything connected to it.

The Project is also related to Tesoro's larger "Southern California Logistics" project which includes opening Tesoro's Southern California terminals to third-party business, and also expanding its Southern California terminals. 1/9/14 Tesoro Presentation, p. 24. The Project facilitates the Southern California Logistics projects by allowing more ship calls at the expanded terminals through the more rapid and efficient unloading of ships.

An increase in Marine Terminal throughput is consistent with public announcements by Tesoro Logistics. Tesoro Logistics has announced it plans to expand the capacity of its marine terminals.<sup>87</sup> In its May 1, 2014 earnings call, Philip Anderson, President of Tesoro Logistics LP stated:

"We have two of our terminals are being expanded (sic) to handle additional capacity, and those expansions will come online this summer. And that will

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<sup>86</sup> Tesoro Logistics Operations LLC Long Beach, 820 Carrack Ave., Long Beach, Facility ID: 172878, September 27, 2013 (Marine Terminal Title V Permit).

<sup>87</sup> Tesoro Logistics, 2012 Citi MLP/Midstream Infrastructure Conference, August 2012, pp. 12-13, Available at <http://phx.corporate-ir.net/phoenix.zhtml?c=79122&p=irol-presentations>. See also: 1/9/14 Tesoro Presentation, p. 24.



allow us to bump up volumes either very late in the second quarter or early in the third quarter.”<sup>88</sup>

Elsewhere in the same conference call, Mr. Anderson responded to a question from RBC Capital Markets further identifying which terminals would be expanded and by how much:

“Our marine facility down there [referring to its terminals in Long Beach], 121, which is the large neighbor de-berth in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, P-2 in Long Beach. And between P-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity.”<sup>89</sup>

The 100,000 bbl/day of unused throughput capacity is consistent with similar estimates published elsewhere.<sup>90</sup> This analysis reported Berths 76-78 had 43,000 bbl/day and Berths 84-87 59,000 bbl/day of unused capacity for a total of 102,000 bbl/day. Thus, with no physical modifications to the Marine Terminal itself, the Project, by removing the vapor recovery capacity constraint, and increasing the diameter of the connecting pipeline, would allow an increase in currently unused throughput of about 59,000 bbl/day.

More modifications are planned to capture additional throughput increases, allowed by the Project’s increase in tank and pipeline throughput. In its most recent earning call, the President of Tesoro Logistics, Phillip Anderson, stated: “The remainder of the organic growth is focused primarily in our Southern California assets, where we’re expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. Once we have that, we’ll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate.”<sup>91</sup> A project is currently pending at the POLB, the Berths 84-87 Tesoro Facility Improvements project.<sup>92</sup> The SCAQMD should address whether these modifications are related to the

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<sup>88</sup> Thomson Reuters Streetevents Edited Transcript, TLLP - Q12014 Tesoro Logistics LP Earnings Conference Call, p. 6, Available at: <http://www.tesorologistics.com/phoenix.zhtml?c=242247&p=irol-calendar>.

<sup>89</sup> Thomson Reuters Streetevents Edited Transcript, TLLP - Q1 2014 Tesoro Logistics LP Earnings Conference Call, May 1, 2014, pp .6-7.

<sup>90</sup> Pacific L.A. Marine Terminal SEIR/DSEIR, Appx. D1, pp. D1-20/21.

<sup>91</sup> Tesoro Logistics LP Management Discusses Q4 2013 Results - Earnings Call Transcript, February 6, 2014. Available at: <http://seekingalpha.com/article/2001121-tesoro-logistics-lp-management-discusses-q4-2013-results-earnings-call-transcript?page=4&p=qanda&l=last> and transcript attached as Exhibit G

<sup>92</sup> G.J. Cardamonte, Port of Long Beach 2012 Capital Program Update, September 2012, pdf 37 (“Berths 84-87 Tesoro Facility Improvements”), Available at: [http://www.cmaasc.org/pdfs/092012\\_portoflb.pdf](http://www.cmaasc.org/pdfs/092012_portoflb.pdf). See also: <http://www.polb.com/civica/filebank/blobdload.asp?BlobID=11974>.

Project.

**A. The Throughput of the Los Angeles Refinery Could Increase**

The Neg.Dec. claims that the Project would not increase “refinery output beyond existing permit limits.” ND, p. B-3. Elsewhere, the Neg.Dec. argues “the refining capacity is currently constrained by factors unrelated to storage capacity (e.g., equipment permit limit conditions, equipment design parameters, market demand, equipment maintenance schedules, and crude oil characteristics).” ND, p. 1-15. However, existing constraints, whatever they may be, are not relevant for the purpose of the District’s analysis if it is reasonably foreseeable that the Applicant plans to eliminate such constraints.

The “Marine Terminal Agreement”<sup>93</sup> indicates a 24-inch diameter crude oil pipeline and a 14-inch diameter diesel/clear VGO pipeline each connects the berths at the Marine Terminal, the Tanks Farm, and the Wilmington Refinery. Thus, it is reasonably foreseeable that increasing the diameter of pipelines that connect tanks within the Tank Farm up to the boundary with the Marine Terminal and Refinery debottlenecks the throughput of crude oil from the Marine Terminal to the Refinery and of diesel and VGO from the Refinery to the Marine Terminal.

Further, Tesoro’s description of the proposed Carson-Wilmington integration project indicates it will increase throughput and finished product output. As noted elsewhere, Mr. Goff explained that: “The processing projects focus on removing feedstock constraints; fully utilizing the assets; improving our conversion capabilities, and subsequently our yield.”<sup>94</sup> “Removing feedstock constraints” means debottlenecking units so that more feedstock can be processed, which increases throughput. “Fully using the assets” implies that bottlenecks will be removed, such as inadequate hydrogen supply, to allow an increase in throughput. Improving “yield” means that more finished products will be produced, which will increase exports through the Marine Terminal. Tesoro Logistics anticipates that it will “[c]apture

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<sup>93</sup> Marine Terminal Agreement, p. 1, Recitals: “Customer owns (i) one 24” dark oil pipeline (the “Crude Oil Pipeline”), depicted on Schedule A as Items No. 1, between the Wharf and Customer’s Los Angeles Refinery located in Carson and Los Angeles, California (the “Wilmington Refinery”), (ii) one 16” gasoline pipeline (the “Gasoline Pipeline”), depicted on Schedule A as Item No. 2, between the Wharf and the Wilmington Refinery, and (iii) one 14” diesel/clear VGO pipeline (the “Clear Products Pipeline,” depicted on Schedule A as Item No. 3, between the Wharf and the Wilmington Refinery; and together with the Gasoline Pipeline, the “Refined Products Pipelines”; and collectively, the Refined Products Pipelines and the Crude Oil Pipeline, the “Pipelines”).

<sup>94</sup> 12/10/13 Tesoro Analyst & Investor Presentation, pp. 10, 22.

incremental volumes in the Southern California pipeline system as a result of Tesoro's refining complex integration."<sup>95</sup>

The Neg.Dec. asserts that "Tesoro has operated the refining processes at the Wilmington Operations at the maximum capacity in the past and are expected to continue to operate up to or at maximum capacity in the future" ( ND, p. 1-5) and "[t]he refining processing rates fluctuate and have achieved maximum capacity periodically in the past and are expected to periodically in the future."<sup>96</sup> However, this is the wrong test to determine if the Project will result in an increase in throughput and hence emissions from the Refinery.

The proper baseline to evaluate impacts under CEQA is the average throughput in the 2 years prior to the preparation of the CEQA document. The test is not whether the facility may have hit the maximum occasionally. The test, rather, is based on the annual average over the baseline years. The Neg.Dec.'s Project description is inadequate because it does not contain any Terminal or Refinery throughput information, which is required to determine increases in throughput and resulting environmental impacts. Thus, the Project description is inadequate and does not support the claim that no increase in Refinery throughput will occur. Debottlenecking the pipeline in the Tank Farm could certainly could debottleneck the Refinery itself.

## II. CANCER RISKS ARE SIGNIFICANT

The Neg.Dec. discloses an increase in volatile organic compound (VOC) emissions of 84.1 lb/day, relative to baseline emissions.<sup>97</sup> These VOCs contain various TACs. Thus, a health risk analysis (HRA) was prepared to evaluate the increase in cancer and noncancer acute and chronic health risks.<sup>98</sup> This analysis concluded that Project health risks are not significant. I disagree with this conclusion.

The Neg.Dec. estimated that Project operational emissions would result in incremental cancer risks of 0.32 excess cancer cases per one million at the maximum exposed individual resident (MEIR), located 300 meters (984 ft) west of the Wilmington Operations boundary. Because the modeled cancer risk is below the SCAQMD's significance threshold of 10 in one million, the Neg.Dec. concluded that cancer health risks due to the Project would be less than significant.<sup>99</sup> However, the Neg.Dec.'s

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<sup>95</sup> Tesoro Logistics, National Association of Publicly Traded Partnerships MLP Investor Conference (NAPTP) Conference, May 2014, p. 14, Available at: <http://www.tesorologistics.com/phoenix.zhtml?c=242247&p=irol-calendar>.

<sup>96</sup> ND, p. 2-18.

<sup>97</sup> ND, Table 2-5.

<sup>98</sup> ND, pp. 2-24 to 2-27 & Appx. B.

<sup>99</sup> ND, p. 2-25.

methodology for assessing cancer risks is flawed and fails to identify significant impacts.

The HRA underestimated TAC emissions, did not evaluate the entire Project, and failed to analyze early-in-life exposure to cancer risks. When these errors and omissions are corrected, the cancer risk increases to 16.8 in one million, which exceeds the District's 10 in one million significance threshold and is a significant health impact.

**A. The HRA Used the Wrong TAC Emission Speciation Profile**

The Project TAC emissions would be released when transporting, storing and moving crude oils and other petroleum products into and out of tanks and associated equipment, such as connectors and valves. A "speciation profile" for a petroleum product identifies each chemical in the liquid and its concentration, reported as volume or weight percent. A speciation profile for a crude oil with a RVP of 10.5 psi, for example, is shown in Appendix A at page A-17, and also in Appendix B at page B-22.

The speciation profile used to estimate health impacts in the Neg. Dec. is based on "a hybrid liquid speciation of commodities that could be stored in the tanks. This hybrid liquid speciation was created by selecting the maximum amount of TACs present in each speciation of petroleum product that would be stored in each of the tanks and combining them into one speciation."<sup>100</sup> The resulting speciation profile is reported in the Neg.Dec., p. B-22. However, the resulting speciation profile is entirely hypothetical. The speciation profile for each commodity that was considered in selecting the maxima and supporting test data was not provided nor cited to a traceable source.

The Neg.Dec. asserts that "[t]he proposed project does not change the types of crude oils or feedstocks delivered to or processed at the Wilmington Operations. Therefore, the crude oil speciation used for existing operations is appropriate to represent the crude oil to be stored in the proposed storage tanks."<sup>101</sup> The conclusion that the hypothetical speciation profile used in the Neg.Dec. is appropriate to evaluate Project impacts is unsupported. The Neg.Dec. does not identify the baseline crude slate or any of the materials imported, transported, or stored in Project facilities. In addition, the assumption in the Neg.Dec. that there would be no change in baseline crude slate is contradicted by the Neg.Dec. and the Project application materials.

As described above, the higher vapor pressure limits (up to 11 psi) on the proposed new and modified tanks and aspects of tank design (heating coils) indicate that the Project would facilitate a crude switch, to light Bakken crude oils and heavy

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<sup>100</sup> ND, p. 2-24.

<sup>101</sup> ND, p. 2-4.

sour tar sands crude oils. These have different chemical characteristics than baseline materials stored at the Tank Farm. See discussion elsewhere in the Comments.

My review of the HRA speciation profile indicates that it is not based on the maximum of each TAC found in the crude oils and other materials that could be stored in the tanks. Material Safety Data Sheets (MSDSs) submitted by Tesoro in its applications to the SCAQMD for the two new 300,000 bbl tanks (3/7/13 Revised Application, pdf 96 - 115) and revised Tank 80079<sup>102</sup> indicate that much higher concentrations of TACs could be present in the crude oils stored at the Tank Farm during Project operations than assumed in the HRA. Additionally, MSDS's submitted by Tesoro in support of its Vancouver Terminal,<sup>103</sup> which would supply the Marine Terminal, includes many of the same MSDSs attached to the SCAQMD applications. These MSDSs indicate that much higher concentrations of benzene, ethyl benzene, toluene, hexane, and xylene will be present in the materials stored in the subject tanks.

The upper bound values from these MSDSs are summarized in Table 2 and compared with the speciation profile used in the HRA. This table shows that the HRA significantly underestimated all of the TACs for which comparative data are available.

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<sup>102</sup> Tank 80079 Throughput Increase Application, October 3, 2013, PRN 556835 (10/3/13 Application), MSDS for Light Sweet Crude, pdf 12.

<sup>103</sup> See Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf>.

Table 2.  
Comparison of HRA Speciation Profile  
With Maxima Reported in MSDS(s)  
For the Project and the Applicant's Vancouver Terminal<sup>104</sup>

TAC	Weight Percent	
	HRA Speciation Profile	Maxima MSDS
Benzene	0.209	7
PAH	0.005	NR
Chrysene	1.48	NR
Ethyl Benzene	0.143	7
Hexane	1.749	11
Naphthalene	0.437	NR
Phenol	0.01	NR
Toluene	0.399	7
Xylenes	0.766	7

NR = not reported

Table 1 shows that the risk assessment underestimated the amount of benzene, ethyl benzene, hexane, toluene and xylenes in emissions by factors of 6 (hexane) to 50 (ethyl benzene). I did not find any chemical composition data for either chrysene, or other PAHs in crude oil or other products that would be stored in the subject tanks. However, it is likely that tar sands crudes would have high higher concentrations of these chemicals. These compounds are the major contributor to risk in the Project HRA. Analytical data supporting the assumed chrysene and other PAH content should be provided to support these estimates.

I revised the HRA to use the maximum TAC concentrations, summarized in Table 1, based on crudes that would be stored in the subject tanks, as described in the Applicant's application materials for this Project. These calculations are summarized in Table 3, which shows that using the maximum reported values doubles the cancer risk from 0.3 in one million to 0.6 in one million.

<sup>104</sup> Tesoro Savage, Application for Site Certification Agreement, vol. 2, Appendix G: Material Safety Data Sheets for Enbridge Bakken (n-hexane = 11%); sour heavy crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%); sweet heavy crude oil (toluene = 7%); light sweet crude oil (benzene = 7%; toluene = 7%; ethylbenzene = 7%; xylene = 7%), August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%2011%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%2011.pdf>. See also 3/7/13 Revised Application, pdf 96-115.

Table 3.  
Revised Cancer Risk  
Based on Modified Speciation Profile

TAC	Speciation Profile Weight Percent		Cancer Risk Cases per Million	
	HRA Speciation Profile	Maxima MSDS	HRA Cancer Risk ND, p. B-27	Revised Cancer Risk (Maxima/HRA)
Benzene	0.209	7	0.00831	0.278
PAH	0.005	NR	0.076	0.076
Chrysene	1.48	NR	0.227	0.227
Ethyl Benzene	0.143	7	4.180E-4	0.020
Hexane	1.749	11	0.000	0.000
Naphthalene	0.437	NR	0.007	0.007
Phenol	0.01	NR	0.000	0.000
Toluene	0.399	7	0.000	0.000
Xylenes	0.766	7	0.000	0.000
<b>TOTAL CANCER RISK</b>			<b>0.311</b>	<b>0.609</b>

**B. The HRA Failed to Consider Tank Farm Throughput Increases Caused By the Proposed Pipeline Upgrades**

As discussed elsewhere in these Comments, the Project would replace the existing 12-inch diameter pipeline connecting the Tank Farm with the Marine Terminal and the Refinery with a new 42-inch diameter pipeline. This effectively allows a 12.25 factor increase in both the Tank Farm and also debottlenecks the Marine Terminal throughput, which has a 24-inch diameter pipeline. This increase was not considered in the HRA.

As cancer risk is directly proportional to tank throughput for the entire Tank Farm, the increase in throughput allowed by the larger diameter pipeline would further increase cancer risk. As the Neg.Dec. does not contain any baseline VOC emissions for the balance of the Tank Farm, I estimated a potential lower bound increase in VOC emissions that could result from increasing Tank Farm throughput with the new pipeline. See Comment III.B.5. These calculations indicate a lower bound increase in VOC emissions of a factor of 12.25, relative to the Project VOC increase used to estimate

TACs. Thus, this increases cancer risk, which is directly proportional to VOC emissions, increases from 0.609 cancer cases per one million at the MEIR to at least 7.46 cancer cases ( $0.609 \times 12.25 = 7.46$ ). The increase could be much higher, depending on actual baseline VOC emissions, which are not disclosed in the Neg.Dec. and supporting files.

**C. The HRA Failed To Address Early-in-Life Exposure**

The HRA determined the incremental cancer risk at the nearest residence, the MEIR, only for an adult receptor without adjusting for increased risk during the first 16 years of life, during which a large fraction of lifetime (70-year) cancer risk is incurred. To address the higher risk of early-in-life exposure, California's Office of Environmental Health Hazard Assessment (OEHHA) and EPA recommend the use of age-dependent adjustment factors, or age sensitivity factors, to account for the higher risks during early stages of life. Specifically, OEHHA recommends:

In order to address the issue of early-in life exposures, OEHHA has adopted a policy, based on the available scientific data, of weighting cancer risk from exposures from the third trimester to <2 yrs of age by a factor of ten, and exposures from age two to less than sixteen years by a factor of three. In addition to innate sensitivities to some carcinogens, children have greater exposures due to physiological and behavioral factors. As a result, a greater proportion of total lifetime risk is accrued by age 16 with lifetime exposure to a constant air concentration than was previously recognized.<sup>105</sup>

EPA recommends the same age-dependent adjustment factors.<sup>106</sup> Because children may be present at residential locations, age-dependent excess cancer risk must be determined. The results of including age sensitivity factors in a health risk assessment are commonly referred to as "child cancer risk."

I calculated the incremental child cancer risk based on the adult cancer risk of 7.46 in one million for a 70-year exposure as revised above to account for a worst-case speciation profile and debottlenecking of the Tank Farm and Marine Terminal. My calculations are summarized in Table 4.

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<sup>105</sup> OEHHA, Air Toxics Hot Spots Program Risk Assessment Guidelines, Technical Support Document for Exposure Assessment and Stochastic Analysis, Final, August 2012 (hereafter OEHHA Technical Support Document"), pp. 11-2 (internal citations omitted), Available at: [http://oehha.ca.gov/air/hot\\_spots/pdf/2012tsd/TSDportfolio2012.pdf](http://oehha.ca.gov/air/hot_spots/pdf/2012tsd/TSDportfolio2012.pdf).

<sup>106</sup> EPA, Cancer Risk Calculations, Available at: <http://www.epa.gov/oswer/riskassessment/sghandbook/riskcalcs.htm>.



Table 4.  
Child Cancer Risk  
Accounting for Age Sensitivity Factors

Risk Year	Period (years)	Age Sensitivity Factor	Incremental Child Cancer Risk* (per million)
3rd trimester	0.3	10	0.32
1	1	10	1.07
2-15	14	3	4.48
16-70	55	1	5.86
<b>Σ cancer risk child:</b>			<b>11.73</b>
<b>Exceeds 10 in one million significance threshold?</b>			<b>YES</b>

\* Calculated as: [(adult cancer risk 7.46E-06)/(70 years)] × [(age sensitivity factor) × (period in years)]

As shown in Table 4, excess child cancer risk resulting from emissions associated with the Project are 11.7 in one million. This exceeds the SCAQMD’s significance threshold of 10 in one million, adopted as the significance threshold in the Neg.Dec. ND, p. 2-24. This is a significant impact that the Neg.Dec. fails to identify and, consequently, fails to mitigate.

**D. The TAC Emissions from the Project Tanks Are Underestimated**

The emission calculations in the Neg.Dec., Appendix A, underestimated the VOC emissions from three of the tanks by using a lower vapor pressure than would be allowed by the permit conditions. Correcting this error increases VOC emissions, TAC emissions, and cancer risk by a factor of 1.43. See Comment III.B.2. Thus, the revised cancer risk, considering these higher tank VOC emissions, is 16.8 in one million (11.73 × 1.43 = 16.8). This exceeds the SCAQMD’s significance threshold of 10 in one million. This confirms the significant cancer impact noted above.

The actual cancer risk is higher than estimated here as it does not include other sources of TAC emissions. The Neg.Dec. does not account for all TAC emission sources including Project construction;<sup>107</sup> emissions from the vapor recovery system; increases in ship emissions; and tank roof landing, degassing cleaning, and flashing emissions, among others discussed elsewhere in these Comments.

<sup>107</sup> Off-road construction equipment, diesel-fueled trucks, and diesel-fueled generators emit diesel particulate matter (DPM), which is a potent carcinogen. An HRA should have been conducted for the construction phase of the Project and added to the overall health risk of the Project. See, for example, the recent DEIR for the Carson Revitalization Project Specific Plan. City of Carson, Shell Oil Products US Carson Revitalization Project Specific Plan Environmental Impact Report, Draft EIR, February 2014 (Carson DEIR), Impact 4.12-12B, p. 4.2-55, Available at: [http://ci.carson.ca.us/content/files/pdfs/planning/Shell\\_CRP/Web\\_PDFs/06\\_Sec4-2\\_AirQuality.pdf](http://ci.carson.ca.us/content/files/pdfs/planning/Shell_CRP/Web_PDFs/06_Sec4-2_AirQuality.pdf).

### III. THE PROJECT'S AIR QUALITY IMPACTS ARE SIGNIFICANT

The Neg.Dec. concluded that air quality impacts from Project operational VOC emissions are not significant as emission reduction credits (ERCs) would be used to offset otherwise significant increases in VOC emissions. The conclusion in the Neg.Dec. that Project VOC emissions are insignificant is incorrect. The Neg.Dec. fails to identify significant VOC emissions and the use of ERCs does not reduce Project VOC emissions. Moreover, the VOC emissions disclosed in the Neg.Dec are significantly underestimated and would not be offset by the Applicant's ERCs.

In addition, emissions are underestimated as they exclude important sources of emissions, including from debottlenecking the Tank Farm and Marine Terminal; tank roof landing, degassing, and cleaning emissions; tank flashing emissions; tank water draw emissions; and vapor recovery emissions. Emissions from three of the tanks were underestimated as material vapor pressures were underestimated. Finally, ship emissions would increase as Terminal throughput is debottlenecked. When these errors are corrected, air quality impacts from VOCs, nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), particulate matter with an aerodynamic diameter less than 10 microns (PM<sub>10</sub>), and particulate matter with an aerodynamic diameter less than 2.5 microns (PM<sub>2.5</sub>) are significant.

#### A. ERCs Do Not Mitigate Significant Emission Increases

The Neg.Dec. estimated a net increase in VOC emissions of 84.1 lb/day from Project operations.<sup>108</sup> This exceeds the SCAQMD significance threshold for VOCs of 55 lb/day and is thus a significant air quality impact. However, the Neg.Dec. concludes that air quality impacts from operational emissions are not significant as the net increase in VOC emissions, relative to the baseline, would be offset under SCAQMD Rule 1303.<sup>109</sup>

Thus, the Neg.Dec. did not evaluate the impacts of these emissions in the vicinity of the facility after the Project is implemented. While the HRA evaluated nine of the chemicals included in these VOCs for health impacts, these nine compounds (Table 2) comprise a very small fraction of the total VOCs. For Tank 80079, 71.7% of the VOCs were not included in the HRA or even identified. For the two new tanks, 94.8% of the VOCs were not included in the HRA or identified. ND, p. A-25 ("unidentified components").

The Neg.Dec. proposes to "offset" the Project's VOC emissions using credits previously earned for reducing emissions (emission reduction credits or ERCs) rather than implementing on-site mitigation measures. Emission increases from the Tank

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<sup>108</sup> ND, Table 2-5.

<sup>109</sup> ND, Table 2.5 & pp. 2-21 to 2-22.

Farm's new and modified sources are subject to offset requirements under the federal Nonattainment New Source Review requirements (NSR), implemented by SCAQMD Regulation 1303. Offsets usually rely on emission reductions that have occurred in the past at a different location than the increases they are offsetting. The SCAQMD verifies emission reductions and issues ERCs to the facility owner that reduced emissions. These ERCs can then be purchased by others, such as Tesoro, and used to "offset" emission increases from other facilities in the future. In other words, the emission reductions used to "offset" the Project's VOC emissions occurred at a different place and time than the proposed VOC increases.

Thus, they have no impact on actual emissions today, but rather represent the prevention of a future emission increase and a region-wide "on paper" decrease in allowable emissions. Thus, while ERCs may reduce future allowable emissions, using ERC retirement as mitigation will result in an increase in emissions above baseline levels.

On a common sense level, it is not logical to assume that offsets, which rely on emission reductions that may have occurred decades ago in a different location and with a difference chemical makeup, will do anything to counteract contemporary emission increases from petroleum product gases in an air basin plagued with air quality problems. However, we obtained them from SCAQMD as the ERCs are referenced and relied upon in the Neg.Dec.<sup>110</sup> The ERCs (145 lb/day) that Tesoro is proposing to rely on are as follows:

- 25 lb/day, created in Santa Monica in 1990 (AQ012941)
- 20 lb/day, created in Santa Monica in 1990 (AQ012942)
- 16 lb/day, created in Santa Monica in 1990 (AQ012943)
- 7 lb/day, created in Santa Fe Springs in 1998 (AQ012992)
- 37 lb/day, created in Santa Monica in 1990 (AQ007213)
- 20 lbs/day, created in South Gate in 1992 (AQ013813)
- 9 lbs/day, created in South Gate in 1991 (AQ013174)
- 11 lbs/day, created in South Gate in 1991 (AQ013173)

None of these ERCs occur contemporaneously with the Project nor did the emissions reductions occur in or near the neighborhoods affected by the Project. The Neg.Dec. contains no demonstration of a net air quality benefit from using these ERCs, e.g., ozone modeling, nor does it disclose the type of source that generated the ERCs so that chemical speciation can be compared. Rather, this approach would increase the

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<sup>110</sup> Letter from Barbara Radlein, SCAQMD, to Elizabeth Klebaner, ABJC, Re: Request for Additional Referenced Documents in the Draft Negative Declaration for the Tesoro Storage Tank Replacement and Modification Project, May 23, 2012 (5/23/14 Radlein Letter), Response to Item #4: ERCs referenced in Neg.Dec., p. 2-21.

exposure of residents in the vicinity of the Project and regionally in the air basin to unhealthy pollutant levels.

Thus, while offsets might reduce air pollution in California or the general region (depending on where actual reductions took place), and satisfy Rule 1303, they will not mitigate the specific impacts of this Project – localized air pollution impacts in the community where the Project is located. To address specific local impacts, CEQA requires SCAQMD to identify and address all potentially significant Project impacts – and require the Project Applicant to achieve – all feasible emission reductions of localized air pollutants to reduce impacts to a less than significant level.

Because the Project would result in significant VOC emissions, the SCAQMD is required to examine the impact of the increase in localized VOC emissions from the Project on the local community and identify mitigation that is capable of reducing or eliminating these local impacts to below a level of significance. To mitigate the Project's potentially significant VOC emissions, the SCAQMD should consider feasible mitigation measures such as the use of zero-leak fugitive components, external floating roof tanks with geodesic domes commonly used on tanks that store RVP 11 crude oils, cable-suspended, full-contact floating roofs, or use geodesic domes on existing fixed roof tanks.<sup>111</sup> Further, the proposed internal floating roof tanks are not suitable for unstable liquids, such as "live" Bakken crudes, which can produce enough vapor pressure beneath the floating roof to damage the roof itself or the perimeter seal, causing failure of the floating roof.<sup>112</sup>

**B. The Neg.Dec Underestimates VOC Emissions from the Tank Farm**

**1. Roof Landing, Degassing, and Cleaning Emissions Omitted**

VOC and TAC emissions from the two new storage tanks and modifications to existing tanks were calculated using EPA's TANKS 4.0.9d model (TANKS).<sup>113</sup> However, this model only estimates rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. It does not estimate roof landing losses, inspection losses, or flashing losses. Thus, it underestimated tank emissions. These emissions should be estimated and added to other tank emissions.

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<sup>111</sup> See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Draft Negative Declaration (Carson Neg.Dec.), Available at [https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft\\_ND\\_Phillips\\_66\\_Crude\\_Storage.pdf](https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft_ND_Phillips_66_Crude_Storage.pdf) and City of Richmond, Chevron Refinery Modernization Project DEIR (Chevron DEIR), Chapter 4.3, pp. 4.3-92, Available at: [http://chevronmodernization.com/wp-content/uploads/2014/03/4.3\\_Air-Quality.pdf](http://chevronmodernization.com/wp-content/uploads/2014/03/4.3_Air-Quality.pdf).

<sup>112</sup> An Introduction to Aluminum Internal Floating Roofs, Available at: <http://www.caldwelltanks.com/an-introduction-to-aluminum-internal-floating-roofs/>.

<sup>113</sup> ND, Appx. A, pp. A-16 to A-50, TANKS 4.0 Report.

The Project includes two new internal floating roof tanks (300035, 300036) and an increase in throughput of an existing internal floating roof tank (80079). The new tanks can be constructed with a leg-supported or self-supporting roof. The TANKS model input in Appendix A indicates that the roofs are not self supported. See, e.g., pp. A-16, A-22, A-43 (Self Supp. Roof? (y/n) = N).

In floating roof tanks with leg-supported roofs, the roof floats on the surface of the liquid inside the tank and reduces evaporative losses during normal operations. However, when the tank is emptied, the roof sits on the legs and is essentially uncontrolled.

In February 2010, the EPA explained that the TANKS model does not include roof landings, and recommended that they be estimated with the equations in AP-42. In other words, the EPA TANKS model estimates evaporative emissions for normal operations only, *i.e.*, it assumes that the floating tank roof is always floating.<sup>114</sup> However, when a tank is emptied to the point that the roof no longer floats on the liquid but lands on deck legs, evaporative losses occur.

After the floating roof is landed and the liquid level in the tank continues to drop, a vacuum is created which could cause the floating roof to collapse. To prevent damage and to equalize the pressure, a breather vent is actuated. Then, a vapor space is formed between the floating roof and the liquid. The breather vent remains open until the roof is again floated, so whenever the roof is landed, vapor can be lost through this vent.<sup>115</sup>

These losses are called “roof landing losses.”

In addition, “degassing and cleaning losses” occur when tanks are drained and degassed for inspection and/or cleaning. These include both roof landing emissions, complete tank degassing, and emissions from cleaning out accumulated sludge. These emissions are essentially uncontrolled tank emissions.<sup>116</sup>

The tank cleaning emissions could be substantially higher for Bakken crudes than for others. Bakken crudes deposit waxy deposits in pipelines and tanks, which

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<sup>114</sup> EPA, TANKS Software Frequent Questions, Updated February 2010; <http://www.epa.gov/ttnchie1/faq/tanksfaq.html>. (“How can I estimate emissions from roof landing losses in the tanks program? ... In November 2006, Section 7.1 of AP42 was updated with subsection 7.1.3.2.2 Roof Landings. The TANKS program has not been updated with these new algorithms for internal floating roof tanks. It is based on the 1997 version of section 7.1.”).

<sup>115</sup> EPA, AP-42, Chapter 7.1 Organic Liquid Storage Tanks, November 2006; <http://www.epa.gov/ttn/chie1/ap42/ch07/final/c07s01.pdf>.

<sup>116</sup> See EPA guidance on estimating these emissions at: <http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13>.

require more frequent cleaning,<sup>117</sup> and thus higher emissions, than the crudes they would replace. Environmental impacts from chemical dispersants used to control these waxy deposits in tanks and pipelines also should be evaluated.

The EPA recommends methods to estimate emissions from degassing and cleaning and roof landing losses.<sup>118</sup> The method for estimating emissions depends on the construction of the tank, *e.g.*, the flatness of the tank bottom and the position of the withdrawal line (the so-called liquid "heel"). Degassing and cleaning and roof landing losses continue until the tank is refilled to a sufficient level to again float the tank roof. Total VOC emissions from floating roof tanks during a roof landing is the sum of standing idle losses and filling losses. They can be estimated using formulas contained in EPA's *Compilation of Air Pollutant Emission Factors* ("AP-42"), Chapter 7.1, Organic Liquid Storage Tanks, Section 7.1.3.2.2. These emissions are routinely included in emission inventories. They are required to be reported, for example, in Texas.<sup>119</sup> They are also included in the emission inventory for Tesoro's Vancouver Terminal.<sup>120</sup>

To reduce emissions from degassing and cleaning and roof landing losses, the SCAQMD should require the Applicant to modify the design of the two new tanks to include self-supporting roofs or external floating roof tanks, equipped with geodesic domes. The SCAQMD should also require the Applicant to retrofit Tank 80079 with a dome that satisfies BACT standards, thus avoiding the increase in emissions from increased throughput.

The Massachusetts Department of Environmental Protection, for example, requires cable-suspended, full-contact floating roofs as BACT for bulk gasoline storage tanks and specifically prohibits leg-supported floating roofs.<sup>121</sup> A similar project to increase crude storage capacity, recently proposed at the nearby Phillips 66 Los Angeles Carson Refinery, required external floating roof tanks with geodesic domes to store

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<sup>117</sup> Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>.

<sup>118</sup> "How Can I Estimate Emissions from Degassing and Cleaning Operation During a Tank Turnaround? And How Can I Estimate Emissions from Roof Landing Losses in the TANKS Program?", Available at: <http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13>.

<sup>119</sup> Memorandum from Dan Eden, Deputy Director, Office of Permitting, Remediation, and Registration; David C. Schanbacher, Chief Engineer; and John Steib, Deputy Director, Office of Compliance and Enforcement, Re: Air Emissions During Tank Floating Roof Landings, December 5, 2006, Available at: [http://www.tceq.state.tx.us/assets/public/permitting/air/memos/tank\\_landing\\_final.pdf](http://www.tceq.state.tx.us/assets/public/permitting/air/memos/tank_landing_final.pdf).

<sup>120</sup> Tesoro Savage, Application for Site Certification Agreement, Section 5.1.2.1.4, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf>.

<sup>121</sup> MassDep, Top Case Best Available Control Technology (BACT) Guidelines for VOC Emitting Sources; <http://www.mass.gov/eea/docs/dep/air/approvals/bactvoc.doc>.

crude oil with an RVP of 11.<sup>122</sup> Similarly, Chevron proposes<sup>123</sup> to use domes on several existing tanks to mitigate VOC emission increases at its Richmond Refinery.<sup>124</sup> The crudes that would be stored in the Project tanks have proposed vapor pressure limitations that are comparable to gasoline (TSBC 2013, Sec. 3.2.7), justifying the use of geodesic domes or self-supporting roofs as BACT to control these and tank emissions.

2. Vapor Pressure Errors

The Neg.Dec. calculated emissions from the new and modified tanks using the U.S. EPA TANKS 4.0.9d model. One of the key inputs into this model is the vapor pressure of the material contained in the tank. The TANKS model inputs and outputs are included in Neg.Dec. Appendix A. My review of this information indicates that the vapor pressures used in the TANKS calculations for three of the tanks are less than the permit limits proposed in the Neg.Dec, Table 1-1. As VOC (and TAC) emissions from tanks are directly proportional to vapor pressure, the VOC (and TAC) emissions and thus health risks were thus underestimated by a factor of 1.43 as summarized in Table 5 and further explained below.

Table 5.  
Revised VOC Emissions  
(lb/day)

Source	Baseline ND Table 2-5	Project ND Table 2-5	Project Net Increase	Revised Project Emissions	Revised Net Increase
Tank 300035		29.7	29.7	33.9	33.9
Tank 300036		29.7	29.7	33.9	33.9
Tank 80038	24.3	44.4	20.1	73.3	49.0
Tank 80079	7.2 <sup>125</sup>	8.9	1.7	-	1.7
Fugitives		2.9	2.9	-	2.0
<b>TOTAL</b>	<b>31.5</b>	<b>115.6</b>	<b>84.1</b>	<b>-</b>	<b>120.5</b>

<sup>122</sup> See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Table 1-1, Draft Negative Declaration, Available at: [https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft\\_ND\\_Phillips\\_66\\_Crude\\_Storage.pdf](https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft_ND_Phillips_66_Crude_Storage.pdf)

<sup>123</sup> City of Richmond, Chevron Refinery Modernization Project, Environmental Impact Report, Volume 1: Draft EIR, March 2014 (Chevron DEIR), Available at: <http://chevronmodernization.com/project-documents/>.

<sup>124</sup> Chevron DEIR, Chapter 4.3.

<sup>125</sup> The net increase in emissions from this tank were based on the permitted throughput in the baseline as tank operation in the baseline years were not representative of routine operation. However, Application 556835 for Tank 80079 at pdf 36 indicates that this tank operated in violation of its throughput limit of 350,000 lb/mo in 2012 (2,067,903 bbl/mo).

3. *VOC Emissions from Tanks 300035/300036 are Underestimated*

The proposed permit conditions in the Neg.Dec. include a true vapor pressure limit of <11.0 psi for the two new 300,000 bbl tanks.<sup>126</sup> This corresponds to a Reid Vapor Pressure (RVP) of about 12 psi at the liquid bulk temperature of 66.5 F analyzed in the Tank model.<sup>127</sup> However, the tank analysis in Appendix A analyzed a crude with a RVP of 10.5 psi. The higher the RVP, the higher the VOC emissions. Thus, the tank analyses underestimated VOC and TAC emissions from these tanks by roughly a factor of  $12/10.5 = 1.14$  by underestimating vapor pressure.

4. *VOC Emissions from Tank 80038 are Underestimated*

Tank 80038 is a 80,000 bbl fixed roof tank currently permitted to store petroleum distillate products with true vapor pressure less than 0.5 psi. The Project proposes to modify permit conditions for this tank to allow it to store petroleum distillate products at a temperature of up to 190 F with a true vapor pressure of  $\leq 5.0$  psi and to impose a throughput limit of 600,000 bbl/mo.<sup>128</sup> The tank would be connected to the existing vapor recovery system, replacing capacity formerly used by Tanks 80035 and 80036, which will be removed from vapor recovery and retired.<sup>129</sup> The baseline (2010-2011) throughput of existing Tank 80038 was 61,076 bbl/mo.<sup>130</sup>

The Applicant's permit application submitted to the SCAQMD for this tank and the Neg.Dec., Table 1-1, indicate that Tank 80038 would be permitted with a true vapor pressure of  $\leq 5$  psi at 190 F as gas oil and distillate products stored in this tank may come directly from a process unit at temperatures of about 190 F. Application 554668, pdf 63, 87. The higher the temperature of the stored material, the higher the VOC emissions. This permit application estimated VOC emissions of 73.3 lb/day (at pdf p. 118), assuming the proposed permit limit true vapor pressure of  $\leq 5$  psia at 190 F and a vapor recovery control efficiency of 99%.<sup>131</sup>

However, the TANKS analysis in Appendix A of the Neg.Dec. calculated VOC emissions of 44.4 lb/day, assuming a true vapor pressure of 3 psi at 150 F and a vapor recovery control efficiency of 99%.<sup>132</sup> Thus, the VOC emissions were underestimated.

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<sup>126</sup> ND, Table 1-1.

<sup>127</sup> ND, Appx. A.

<sup>128</sup> July 16, 2013 Application #554668 for Alteration/Modification - Storage Tank 80038 (D587; Process 15, System 1) and Vapor Recovery System (Process 21, System 3), (7/16/13 Application 554668), pdf 82-129.

<sup>129</sup> ND, p. 1-4.

<sup>130</sup> Application 554668, pdf 43-44.

<sup>131</sup> The July 16, 2013 Application assumed a control efficiency of 99.9%, but the SCAQMD, in email correspondence date November 1, 2013 (Sawsan Andrawis to Royann Winchester), required the use of a 99% control efficiency, pdf 32.

<sup>132</sup> ND, p. A-42.



The Neg. Dec. underestimated VOC and TAC emissions by assuming a vapor pressure 3 psi at 150 F when the permitted value would be 5 psi at 160 F, or by a factor of 1.67 ( $5/3=1.67$ ).

5. *Pipeline Throughput Emission Increases*

As discussed elsewhere in these Comments, the Project includes replacing all 12-inch diameter tank interconnecting pipeline with 42-inch diameter pipeline, which would allow an increase in throughput, both imports to and exports from the Tank Farm by a factor of 12.25. The Neg.Dec. does not contain any of the information required to estimate the resulting increase in VOC and TAP emissions, including a list of the tanks that would be connected to the new pipeline, their permit IDs, contents, any throughput limits, whether they are connected to vapor recovery, and their baseline VOC emissions. It only states that the new pipeline will "reconnect other tanks throughout the tank farm", without even clarifying the boundaries of the "tank farm". The Title V permit identifies many more than 20 tanks.

The only thing the Neg.Dec. discloses about other tanks at the Tank Farm is that "[t]he Wilmington Operations currently utilize 20 storage tanks (see Figure 1-2) to store crude oil and other heavy petroleum liquids (18 have a capacity of 80,000 barrel (bbl) and two have a capacity of 125,000 bbl.)"<sup>133</sup> The Project would eliminate two of the 80,000 bb fixed roof tanks and change the service of two others, leaving 14 additional unidentified 80,000-bbl fixed roof tanks and two 125,000-bbl floating roof tanks whose emissions could increase in proportion to the increase in the diameter of the pipeline if they are not restricted by throughput limits. Assuming that each of these 16 tanks emitted the same amount of VOCs as Tank 80038 in the baseline (Table 2-5: 24.3 lb/day), the increase in VOC emissions from these 16 unidentified tanks would be 4,373 lb/day.<sup>134</sup> This is a conservative, lower-bound estimate of the potential increase as Tank 80038 stored low volatility petroleum distillates (TVP<0.5 psi) in the baseline (ND, Table 1-1) and thus would have lower emissions than tanks that stored more volatile material, which is most everything else. Even if one assumed that each of the 16 unidentified tanks emitted only 1 lb/day in the baseline, the increase in VOC emissions from debottlenecking Tank Farm throughput would be 180 lb/day, which is still highly significant compared to the significance threshold of 55 lb/day.

The HRA is based on the net increase in VOC emissions from the Project of 84.1 lb/day from only the modified tanks in Table 1-1. Assuming the other 16 tanks increased their emissions to 4,373 lb/day, as estimated above, this amounts to an increase in VOC emissions from the Tank Farm of a factor of 52 (4,373/84.1 = 52). Thus, increasing the cancer and other health risks estimated by the Neg.Dec. by a factor of 52 would be justified. I, however, conservatively assumed only an increase of 12.25, the same as the increase in throughput, which is based on 5 lb/day for each of the 16 unidentified tanks.

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<sup>133</sup> ND, p. 1-1.

<sup>134</sup> Increase in VOC emissions: (24.3 lb/day)(12.25)(16) - (24.3 lb/day)(16) = 4374 lb/day.

6. *Tank Flashing Emissions Omitted*

Most Bakken crudes are transported raw, without stabilization, due to the lack of facilities in the oil fields, as discussed elsewhere these Comments. Unstabilized or “live” crude oils have high concentrations of volatile materials entrained in the bulk crude oil. Tank flashing emissions occur when these crude oils, such as Bakken, are exposed to temperature increases or pressure drops. When this occurs, some of the compounds that are liquids at the initial pressure/ temperature transform into gases and are released or “flashed” from the liquid. These emissions are in addition to working and breathing emissions from tanks and are not estimated by the EPA TANKS 4.0.9d model. These emissions can be calculated using standard procedures.<sup>135</sup> The Neg.Dec. did not mention or calculate these emissions, nor does it include permit conditions that would allow only stabilized crude oils to be received.

7. *Water Draw Tank Emissions Omitted*

Crude oil typically contains small amounts of water, which is separated from the crude oil and accumulates in the bottom of storage tanks. This accumulated water, referred to as water draw, is typically transferred from the crude oil storage tanks into a smaller water draw surge tank for processing prior to disposal. Over time, a thick layer of crude oil forms in the water draw surge tank. The water draw surge tank and processing of wastewaters from it emit VOC and TACs. The Neg.Dec. does not mention water draw, or include emissions from storing or processing it, which would increase as the throughput of crude oil through the Tank Farm would increase.

C. **Vapor Recovery System Emissions Omitted**

The Neg.Dec. asserts the purpose of the Project is to relax a capacity constraint in the vapor recovery system. The vapor recovery system collects organic vapors from throughout the Refinery, compresses them, routes them through an amine absorber where H<sub>2</sub>S is removed, and routes them to the Refinery fuel gas system, where they are blended with natural gas and combusted in heaters and boilers throughout the Refinery.

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<sup>135</sup> See, e.g., calculation methods at: Paul Peacock, Marathon, Bakken Oil Storage Tank Emission Models, March 23, 2010, Available at: <file:///C:/Users/Phyllis/Downloads/Peacock - March 23 2010. ppt.pdf>; TCEQ, Air Permit Reference Guide APDG 594I, Available at: [http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance\\_flas\\_hemission.pdf](http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance_flas_hemission.pdf); Kansas Dept. of Health & Environment, Available at: [http://www.kdheks.gov/bar/download/Calculation\\_Flashing\\_Losses\\_Handout.pdf](http://www.kdheks.gov/bar/download/Calculation_Flashing_Losses_Handout.pdf); B. Gidney and S. Pena, Upstream Oil and Gas Storage Tank Project Flash Emissions Models Evaluation, July 16, 2009, Available at: <http://www.bdlaw.com/assets/htmldocuments/TCEQ%20Final%20Report%20Oil%20Gas%20Storage%20Tank%20Project.pdf>.

Natural gas is a clean burning fuel and emits less greenhouse gases and other combustion emissions than refinery fuel gas when burned in heaters and boilers throughout the refinery. The more refinery fuel gas in the blend, the higher these emissions. The increase in throughput of the vapor recovery system increases the amount of refinery fuel gas burned in heaters and boilers throughout the refinery. The Project would increase throughput of the vapor recovery system, as explained below.

The total capacity of the vapor recovery system is 800,000 standard cubic feet per hour (scfh). The average load on this system prior to the Project was 353,322 scfh and the maximum daily average load was 539,002 scfh.<sup>136</sup> Thus, the baseline system had substantial unused capacity. As explained below, the Project will use up this excess capacity and thus increase emissions.

The two existing 80,000 bbl fixed roof tanks that were routed to the system in the baseline (2010-2011) processed 32,276 bbl/mo (80035) and 45,063 bbl/mo (80036), or an average of 45,063 bbl/mo.<sup>137</sup> These tanks will be removed from the vapor recovery system and the freed-up capacity shifted to tank 80038.<sup>138</sup> However, the throughput that tank 80038 would be permitted to handle is 600,000 bbl/mo, or 13 times more than displaced from the shutdown of tanks 80035/36. Thus, the full capacity of the vapor recovery system would be utilized by the Project. Further, it is reasonably foreseeable that if the proposed throughput of tank 80038 (600,000 bbl/mo) is realized, an increase in vapor recovery capacity would be required. The resulting increase in emissions from these changes must be included in the HRA and air quality analysis.

#### **IV. THE PROJECT WILL RESULT IN SIGNIFICANT EMISSIONS OF CRITERIA AIR POLLUTANTS FROM THE UNLOADING OF CRUDES AT THE MARTINE TERMINAL**

The Neg.Dec. assumes that the Project would reduce emissions from marine vessels at the Marine Terminal. The assumption is unsupported and is incorrect. Tesoro currently unloads crude oil for the Wilmington Operations at the Port of Long Beach Berths 84-87.<sup>139</sup> The Neg.Dec. asserts that ship emissions will decline as the higher unloading rate facilitated by the Project, from 5,000 bbl/hr to 15,000 bbl/hr, would allow ships to unload more quickly and thus remain at berth for less time, assuming no increase in throughput. The Neg.Dec. asserts this would reduce emissions

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<sup>136</sup> Application 554668, pdf 40-41.

<sup>137</sup> Letter from Daniel L. Carlson, Tesoro, to Sawsan Andrawis, SCAQMD, Re: Revisions for Application for Permit to Construct AQMD Application Nos. 545646 & 545745 for Tank No. 300035 and Tank No. 300036, March 7, 2013, SCAQMD File 545646 (3/7/13 Revised Application). Tank 80035 2010-2011 baseline throughput reported as 32,276 bbl/mo at pdf 52 and Tank 80036 2010-2011 baseline throughput reported at 45,063 bbl/mo at pdf 74.

<sup>138</sup> ND, pp. 1-1, 1-8 & Table 1-1.

from auxiliary engines and boilers used while hoteling.<sup>140</sup> However, the Neg.Dec. does not propose any limitations on Marine Terminal nor Tank Farm throughput to assure there would be no increase in ship calls. Further, the Title V permit for the Marine Terminal does not contain any throughput limits. Finally, Tesoro Logistics has announced it plans to increase the throughput of this Terminal.

As discussed elsewhere in these Comments, the Project debottlenecks both the Tank Farm and Marine Terminal. Further, Tesoro and Tesoro LP have proposed to increase the throughput of the Marine Terminal, which currently has excess unused capacity. Thus, emissions from loading and unloading more crude oil and petroleum distillate would increase. There would be two sources of increased emissions: (1) auxiliary engines and boilers while ships hotels and (2) emissions from the vapor recovery system and tanks at the Marine Terminal.

**A. Ship Emissions Would Increase**

The Neg.Dec. estimated a decrease in ship emissions, based on faster unloading.<sup>141</sup> Faster ship unloading would allow more ship calls and more big ships, which would increase ship emissions from auxiliary engines and boilers while hoteling, absent a condition restricting it.

The Marine Terminal is currently limited to a discharge capacity of 5,000 bbl/hr by a vapor recovery system constraint, but has a design capacity of 32,000 bbl/hr.<sup>142</sup> The design capacity could be completely utilized after the Project is operational as the pipeline connecting the Tank Farm with the Marine Terminal will be increased to 42 inches. This is greater than the Marine Terminal pipeline at 24 inches, which removes the pipeline bottleneck from the Tank Farm to the Terminal. The Neg.Dec. estimated existing emissions for Panamax (320,000 bbl capacity) and Aframax (720,000 bbl capacity) ships in pounds per 1000 barrels of crude unloaded.<sup>143</sup>

I revised the Neg.Dec.'s emission factors in lb/1000 bbl to assume an unloading rate of 32,000 lb/hr, but otherwise using all of the Neg.Dec.'s assumptions. The resulting emission factors and increase in ship emissions are summarized in Table 6 for a Panamax ship and in Table 7 for an Aframax ship. Using these emission factors, the increase in criteria pollutant emissions allowed by the Project would result in significant

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<sup>139</sup> ND, p. 1-1.

<sup>140</sup> ND, p. 2-20 & Table 2-6.

<sup>141</sup> The ship emission summary in the Neg.Dec., Table 2-6, is incorrect. It reports alleged emissions reductions in lb/100,000 bbl delivered. However, the emission calculations in Appendix A indicate that the values in this table are actually lb/1000 bbl delivered.

<sup>142</sup> Port of Long Beach, Tesoro Refining & Marketing - Pier B, Available at: <http://www.polb.com/economics/cargotenant/liquid/tesoro.asp>.

<sup>143</sup> ND, pp. A-55 & A-56.

**APPENDIX G1: RESPONSE TO COMMENTS**

emissions of all criteria pollutants from the Marine Terminal for Panamax ships and for all criteria pollutant except PM10 for Aframax ships. The CO<sub>2e</sub> emissions are not significant for either type of ship. These are significant impacts that were not disclosed in the Neg.Dec.

**Table 6.  
Increase in Emissions from Unloading Panamax Ships**

Pollutant	Revised Emission Factor <sup>144</sup> (lb/1000 bbl)	Emission Increase <sup>145</sup> (lb/day)	Significance Threshold ND, Table 2-5 (lb/day)	Significant?
VOC	1.0	648	55	Yes
CO	2.4	1,555	550	Yes
NOx	28	18,144	55	Yes
Sox	0.8	518	150	Yes
PM10	0.5	454	150	
PM2.5	0.4	324	55	
CO <sub>2e</sub>	0.6	713	10,000 MT/yr	No

The emission calculations for Aframax ships in Appendix A contain an error that overestimates emissions from these ships. The calculations divided the total emissions by the size of a Panamax ship (320,000 bbl) to calculate emission factors in lb/1000 bbl, rather than the size of a Aframax ship (720,000 bbl) in the last step of the calculations.<sup>146</sup> I corrected this error in my revised calculations.

<sup>144</sup> Emission factors per 1000 barrels delivered reported in the Neg.Dec. for Panamax ships (p. A-55) revised to reduce hoteling emissions, based on an increase in unloading rate from 15,000 bbl/hr to 32,000 bbl/hr: as follows: =  $[(\text{total Project emissions} - \text{hoteling emissions} + (15/32) \times (\text{hotelling emissions})) / 320 \text{ bbl}]$ . Example for VOCs:  $[338.91 - 27.0 + (15/32)(27.0)] / 320 = 1.014 \text{ lb/1000 bbl}$ .

<sup>145</sup> Emission increase:  $(\text{lb/1000 bbl})(32,000 - 5,000 \text{ bbl/hr})(24 \text{ hr/day})$ . For VOCs:  $(1.0 \text{ lb/1000 bbl})(32,000 - 5,000 \text{ bbl/hr})(24 \text{ hr/day}) = 648 \text{ lbs}$ .

<sup>146</sup> ND, p. A-56.

Table 7.  
Increase in Emissions from Unloading Aframax Ships

Pollutant	Revised Emission Factor <sup>147</sup> (lb/1000 bbl)	Emission Increase <sup>148</sup> (lb/day)	Significance Threshold ND, Table 2-5 (lb/day)	Significant?
VOC	0.6	389	55	Yes
CO	1.4	907	550	Yes
NOx	16	10,368	55	Yes
SOx	0.7	454	150	Yes
PM10	0.2	130	150	No
PM2.5	0.2	130	55	Yes
CO <sub>2e</sub>	0.4	259	10,000 MT/yr	No

**B. Marine Vessel Unloading Emissions Were Omitted**

In addition to an increase in ship hoteling emissions, unloading increased amounts of crude oil and loading increased amounts of refined products at the Marine Terminal would increase VOC and combustion emissions from the unloading operation. These were not disclosed in the Neg.Dec.

The Marine Terminal contains a number of emission sources, including five fixed roof tanks, loading/unloading arms, pumps, and a vapor recovery system. The Marine Terminal Title V Permit limits emissions from all equipment subject to Rule 1142 to 2 lb/1000 bbl organic liquid loaded. Assuming an increase in loading rate from 5,000 bbl/hr to 32,000 bbl/hr, the VOC emissions would increase by 1,296 lb/day<sup>149</sup>, which exceeds the VOC significance threshold of 55 lb/day by a significant amount and is a significant undisclosed air quality impact.

**V. RISK OF UPSET IMPACTS ARE SIGNIFICANT**

The Neg. Dec. conducted a fire hazard analysis to determine if accidents involving the modified tanks would result in significant impacts. Fires generate thermal radiation or "heat flux" (i.e., the amount of heat per unit area of exposed surface). Heat flux is potentially injurious (i.e., burns the skin), depending on its level.

<sup>147</sup> Emission factors per 1000 barrels delivered reported in the Neg.Dec. for Aframax ships (p. A-56) revised to correct ship size error (use of 320,000 bbl rather than 720,000 bbl) and to reduce hoteling emissions, based on an increase in unloading rate from 15,000 bbl/hr to 32,000 bbl/hr: as follows: = [[total Project emissions - hoteling emissions + (15/32)×(hoteling emissions)]]/720 bbl]]. Example for VOCs: [446.39 - 58.5 + (15/32)(58.5)]/720 = 0.58 lb/1000 bbl.

<sup>148</sup> Emission increase: (lb/1000 bbl)(32,000-5,000 bbl/hr)(24 hr/day). For VOCs: (0.6 lb/1000 bbl)(32,000-5,000 bbl/hr)(24 hr/day) =230.4 lb/day.

<sup>149</sup> Increase in VOC emissions from increased marine vessel unloading: 24x (32,000 - 5,000) x 2 lb/1000 bbl = 1,296 lb/day.

The Neg.Dec. selected a heat flux significance threshold 5 kilowatts per square meter (kW/m<sup>2</sup>). ND, Table 2-10. Serious injuries would start to be experienced at and above 5 kW/m<sup>2</sup>. The Neg.Dec. analyzed only the heat flux impacts, but omitted other impacts of a fire, including explosions (e.g., BLEVES) and inhalation of smoke and toxics.

The CANARY model was used to predict the maximum downwind distance that would experience a heat flux of 5 kW/m<sup>2</sup>. If the downwind distance fell within the boundary of the Wilmington Operations, the Neg.Dec. concluded impacts would not be significant as there were no off-site receptors.<sup>150</sup> Although not explicitly stated, if the downwind distance fell outside of the facility boundary, off-site receptors could be exposed and the impact would be significant. Using this methodology, the Neg.Dec. concluded that all proposed tank modifications would not result in a significant impact.<sup>151</sup> However, the fire hazard analysis failed to analyze all plausible accident scenarios. As discussed below, the Project would result in significant fire hazards.

**A. Fire Hazards to Workers Are Significant**

The Neg.Dec. only evaluated the fire hazards to off-site receptors. However, on-site workers would be the most exposed parties and should be considered. Any person, including workers, located between the accident site up to the reported impact distance would experience significant impacts. Between the tank and the maximum impact distance, where workers are likely to be present, 100% of the exposed population would be injured, including second-degree burns in 14 seconds, 10% fatality at 60 seconds, and significant fatalities near the tanks. At a heat flux of 5 kW/m<sup>2</sup>, 10% injury would be experienced. These are significant impacts.

**B. Fire Hazards From New Crude Oil Tanks (300035/36) Are Significant**

The Project would replace two 80,000 bbl HCU feedstock storage tanks with two new 300,000 bbl crude oil storage tanks. Thus, the amount of crude oil involved in an accident will increase by a factor of 3.75 (300/80 =3.75). Further, the throughput of these tanks would increase even more, from an average of 45,063 bbl/mo to 1,500,000 bbl/mo. Thus, if an accident occurred while the tank(s) were being filled, far more than just the capacity of the tank could be spilled. In addition, as discussed elsewhere in these comments, the composition of the material stored in the tanks will change. All of these changes will increase the consequences of a fire involving the tanks.

The Neg.Dec. conducted a fire hazard analysis of the increase in storage capacity only and concluded that the impacts were not significant because the fire hazard zone (280 ft. from the tanks) was contained within the Tank Farm boundary (375 ft. from the

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<sup>150</sup> ND, p. 2-56.

<sup>151</sup> ND, Table 2-10 & p. 2-56.



tanks).<sup>152</sup> This conclusion is based on a pool fire involving any one of the subject tanks.<sup>153</sup> However, due to the proximity of the new storage tanks, as well as many other surrounding storage tanks (ND, Fig. 3, p. C-7), the possibility that multiple tanks could catch on fire should have been assessed. Multiple-tank fires at tank farms have occurred. For example, in 1990, a fire at the Stapleton IAP Denver, CO, tank farm burned multiple tanks for 56 hours.<sup>154</sup> At the Pennzoil Refinery in Pennsylvania in 1995, a fire in one tank ignited by an ignition source flashed back into the tank, causing the tank to fail along its bottom seam. The burning liquid released from the first tank caused ignition of flammable vapors in the adjacent tank.<sup>155</sup>

The impact of both new 300,000 bbl tanks catching fire can be extrapolated from the results presented in the Neg.Dec., Table 2-10. Assuming two 300,000 bbl tanks were involved in a pool fire, the maximum distance from the center of the fire to the thermal radiation significance criterion used in the Neg.Dec. (5 kW/m<sup>2</sup>) would be 504 ft.,<sup>156</sup> based on the applicant's analysis. This extends 129 ft. outside of the Wilmington Operations boundary and encompasses portions of Alameda Street, a public highway. Thus, off-site receptors could be exposed. Therefore, this is a significant impact that was not disclosed in the Neg.Dec. Further, actual impacts are likely even greater than indicated by this analysis for several reasons.

First, as the tanks are close together, a pool fire that starts at either or both of the new 300,000 bbl tanks could spread to other nearby tanks.<sup>157</sup> Thus, more than two tanks could be involved in a pool fire.

Second, a pool fire is not the worst case accident that could occur at these tanks. If the crude oil stored in the new tanks spilled, flashed and ignited quickly, as is likely in an earthquake, or due to derailment of a nearby train, a fireball would be more likely than a pool fire due to the chemical composition of Bakken crude oil. Bakken crude oil has a very high vapor pressure (RVP > 9 psi) and a very low flash point (<35 F), which is much lower than ambient temperatures in the area.<sup>158</sup> In fact, these new tanks are being permitted to store material with a true vapor pressure up to 11 psi, anticipating

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<sup>152</sup> ND, p. 2-56.

<sup>153</sup> ND, pp. 2-56, C-1.

<sup>154</sup> For example: [https://www.youtube.com/watch?v=8moBLzA0\\_dw](https://www.youtube.com/watch?v=8moBLzA0_dw).

<sup>155</sup> U.S. EPA, EPA Chemical Accident Investigation Report. Pennzoil Product Company Refinery, Rouseville, Pennsylvania, Report EPA 550-R-98-001, March 1998, Available at: <http://www.epa.gov/oem/docs/chem/pennzoil.pdf>.

<sup>156</sup> The analysis in Neg.Dec., Table 2-10 indicates that increasing the volume of material involved in a fire from 80,000 bbl to 300,000 bbl ( $300/80 = 3.75$ ) increases the distance to the 5 kW/m<sup>2</sup> criterion from 190 ft to 280 ft ( $280/190 = 1.5$ ). Thus, increasing the volume of material from 300,000 bbl to 600,000 bbl ( $600/300 = 2$ ) will increase the distance to the 5 kW/m<sup>2</sup> criterion from 280 ft. by a factor 0.8 ( $2 \times 1.5/3.75 = 0.8$ ). Thus, the distance from the tanks to the maximum hazard distance is 280 ft. +  $0.8 \times 280 = 504$  ft.

<sup>157</sup> See, for example, Neg.Dec., Appx. C, Fig. 4, p. C-8.

<sup>158</sup> TSBC 2013.

highly volatile material such as Bakken crudes. Thus, vapors would flash when released and if they encountered an ignition source, would immediately ignite. In these situations, the result is usually a fireball, not a pool fire.

Spilled material that does not ignite immediately, on the other hand, spreads out and accumulates in a pool.<sup>159</sup> This latter scenario was assumed in the Neg.Dec. and is not the worst case. Immediate ignition cannot be eliminated in an accident that would release all of the tank contents as sparks from tank collapse would be present. A fireball would result in much more significant impacts than those discussed above.

Third, the fire hazard analysis appears to be based on the capacity of the tanks, rather than the maximum amount of material that could be released. This is evident as the fire hazard zone for all of the 80,000 bbl tanks (80035/36, 80038, 80079) is 190 ft. even though the throughput of one of them was increased. This could only occur if the analyses were based on both the same amount of material released (and the same material composition.) Both of these assumptions are wrong. If material were moving through the tank(s) at the time of an accident, more could be released than the capacity of the tank. As the Project would increase the throughput of Tanks 80035/36 from 45,063 bbl/mo to 1,500,000 bbl/mo, this increased throughput must be evaluated.

Fourth, the fire hazard analysis in the Neg.Dec. is not supported and appears to have been based on the same baseline petroleum product (which is not Bakken crude oil) in all tanks. The distance to the chosen fire thermal radiation significance threshold of 5 kW/m<sup>2</sup> depends on several factors, including wind speed, relative humidity, ambient temperature, volume of crude spilled, the discharge temperature of the crude oil, the assumed average flame temperature, average emissive power, the burning rate of the crude oil, the release duration, and the release rate, among others.

The supporting analysis in Appendix C reports the assumed ambient conditions, but fails to disclose the identity of or any of the characteristics of the material involved in the pool fire, including the assumed discharge temperature of the crude oil and its burning rate, which are the key factors that determine the propagation of flames. Rather, it appears to assume the same baseline hydrocarbon material in each analysis. As Bakken crude oil is a likely material for Project implementation, the Neg.Dec. should have considered Bakken for the purpose of a hazards impacts analysis. Bakken crudes are highly flammable and thus would have a much higher burning rate than other crudes that have been historically handled at the Tank Farm. Based on my experience, I would expect a pool fire at a 300,000 bbl tank of Bakken crude to have a much greater radius of impact than suggested in the Neg.Dec.'s analysis.

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<sup>159</sup> TSBC 2013, Sec. 3.5.6 & Fig. 5.

Finally, the fire hazard analysis in the Neg.Dec. is based on a wind speed of only 20 mi/hr, as this is the "worst case for fires as flame is bent downward."<sup>160</sup> However, wind speeds in Long Beach can be much higher.<sup>161</sup> Higher speeds spread the fire hazard zone over a larger area than disclosed in the Neg.Dec. Further, higher wind speeds can carry a vapor cloud long distances, into residential areas, before it ignites. Thus, the Neg.Dec. underestimates impacts by selecting an unreasonably low wind speed for its worst case analysis.

**C. Fire Hazards of Other Storage Tanks Underestimated**

The Project involves modifications to four 80,000 bbl tanks. The Neg.Dec. reports the same fire hazard zone for all of these tanks, 190 ft., suggesting the Neg.Dec. assumed the same material composition and tank capacity in its analyses.<sup>162</sup> However, this is not plausible as the Project would change the service and/or throughput of these tanks, which would change the fire hazard zone. The failure to consider actual Project changes underestimates impacts.

First, Tank 80038 is currently permitted to store petroleum distillate with a true vapor pressure less than 0.5 psi. This material is not highly flammable. The Project will change the service to light hot gas oil (RVP likely much greater than 0.5 psi) and connect it to the vapor recovery system. Thus, the new material stored in Tank 80038 will be more flammable and more likely to result in a greater fire hazard than the original tank. The fire hazard analysis shows no change in the distance to the 5 kW/m<sup>2</sup> boundary in the before and after cases. Both are reported as 190 ft. ND, Table 2-10. Thus, it is evident that the Neg.Dec.'s fire analysis did not consider the chemical and physical properties of the stored materials and thus is fundamentally flawed.

The much more volatile material in the modified tank would have a higher burning rate and be much more likely to result in a fire ball, rather than a pool fire. The distance to the 5 kW/m<sup>2</sup> flux boundary for the modified tank would thus be greater than 190 ft. Because 190+ ft. falls outside of the 117 ft. distance to the facility boundary, the impact is per se significant under the Neg.Dec.'s analysis scheme.

Second, the permitted throughput of Tank 80079 is proposed to increase from 80,000 bbl/mo to 500,000 bbl/mo. This means that in an accident, more material could be released after the Project than before. In spite of this obvious fact, the Neg.Dec. reports the same hazard zone for the existing and modified tank. ND, Table 2-10.

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<sup>160</sup> ND, p. C-3

<sup>161</sup> Long Beach Weather Data, Available at: <http://www.642weather.com/weather/stats.php> and <http://www.wunderground.com/personal-weather-station/dashboard?ID=KWALONGB2>.

<sup>162</sup> ND, Table 2-10, p. 2-56.

**D. Fire Hazards from Pipeline Accident Are Significant**

The stated purpose of the Project is to increase the rate of unloading of ships from the current restrained rate of 5,000 bbl/hr to 15,000 bbl/hr.<sup>163</sup> To accommodate this increase, the Project also includes replacing the existing 12-inch diameter pipeline connecting all of the tanks with the pipeline from the Marine Terminal with a 42-inch diameter pipeline.<sup>164</sup>

The flow rate through a pipeline is directly proportional to the diameter of the pipeline, squared. Thus, increasing the diameter of the pipelines connecting the tanks would allow an increase in throughput of a factor of 12.25.<sup>165</sup> This would allow an increase in flow through the new pipeline from 5,000 bbl/hr to 61,250 bbl/hr ( $5,000 \times 12.25 = 61,250$ ). The consequences of accidents involving the release of crude from this new bigger pipeline that would contain more crude oil were not evaluated. A factor of 12.25 increase in the flow rate, and thus, the amount of crude oil and other petroleum products that could spill, would be significant. The new pipeline will be located above ground.<sup>166</sup> Thus, accidents involving this pipeline could result in the release of significant amounts of crude. Vapor clouds formed by such a spill could travel long distances before finding an ignition source and involve more than the spilled crude in an accident.

A pipeline accident was recently analyzed for another similar project, the Phillips 66 Rail Spur Extension Project in a Draft Environmental Impact Report (Phillips 66 DEIR).<sup>167</sup> This DEIR includes a crude pipeline accident analysis for a pool fire, assuming a spill of 692,000 barrels of crude for wind speeds of 2 mi/hr and 45 mi/hr, a reasonable range for a coastal location.<sup>168</sup> This magnitude accident is possible at the Wilmington Operations Tank Farm if the 42-inch diameter pipeline were running at maximum capacity during ship unloading and burst during an earthquake. The Marine Terminal, for example, currently can unload two ships that contain from 400,000 bbl to 720,000 bbls.<sup>169</sup> Thus, the Phillips 66 accident is comparable to a worst-case pipeline accident at the Tesoro Tank Farm. The results of the pool fire hazard analysis for this accident are summarized in Table 7.

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<sup>163</sup> ND, pp. 1-1, 1-12.

<sup>164</sup> ND, p. 1-4.

<sup>165</sup> The increase in flow rate in the new pipeline:  $Q=(\pi/4)D^2V$ . Thus, the increase in  $Q$ , all else held constant, would be  $42^2/12^2 = 12.25$ .

<sup>166</sup> ND, Fig. 1-5.

<sup>167</sup> Marine Research Specialists (MRS), Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Assessment, November 2013.

<sup>168</sup> Phillips 66 DEIR, Appx. H, pp. H-14 to H-17.

<sup>169</sup> ND, p. 1-1.

Table 7.  
Crude Pipeline Accident Pool Fire  
(Phillips 66 DEIR, Appx. H)

Heat Flux (kW/m <sup>2</sup> ) =	5	10	12.5
Wind Speed (ft/sec)	Impact Distance (ft)		
2	1647	889	764
45	2641	1555	1273

This analysis calculated impact distances for three heat fluxes. Serious injuries would start to be realized at and above 5 kW/m<sup>2</sup>, the significance threshold used in the Neg.Dec. All persons exposed to 10 kW/m<sup>2</sup> would suffer serious injuries. Exposure to thermal radiation levels in excess of 10 kW/m<sup>2</sup> would likely begin to generate fatalities in less than 1 minute. Thus, workers in the tank farm would suffer serious injuries.

Any population located between the accident site up to the reported impact distance, e.g., as far away as 2,641 feet in Table 7, would experience significant impacts. At a heat flux of 5 kW/m<sup>2</sup>, 10% injury would be experienced in the exposed population up to 2,641 feet from the accident if the wind were blowing at 45 mi/hr during the accident. Up to 1,555 feet from the accident, 100% of the exposed population would be injured, including second-degree burns in 14 seconds and 10% fatality at 60 seconds. And up to 1,273 feet from the accident, significant fatalities would occur.

A pipeline accident could occur anywhere along the pipeline route, shown in Fig. 1-3, but would most likely occur within the Tank Farm, where the crude oil is transferred into tankage. Assuming a pipeline accident at the Tank Farm under calm wind conditions (2 mi/hr), significant impacts would occur up to 1,647 feet from the accident site. At a wind speed of 45 mi/hr, all persons up to 2,641 feet away would be seriously impacted and within a radius of 1,273 feet from the accident site, they would all be killed.

Off-site receptors fall within these distances. In fact, the closest resident is located about 2,000 feet southwest of the Wilmington operations.<sup>170</sup> Thus, the impacts are per se significant. Further, sensitive receptors based on the Health Risk Assessment also fall within these distances. The Maximum Impact Location Map in the Neg.Dec. (Appx. B, p. B-12) indicates that both the maximum exposed individual resident (MEIR) and maximum exposed individual worker (MEIW) are within 2600 feet of locations within the Tank Farm where the pipeline may plausibly rupture.<sup>171</sup> The MEIW is only about 400 feet from one of the plausible locations of the release and the MEIR only about 1800 feet away.

<sup>170</sup> ND, p. 1-7 & Fig. 1-2.

<sup>171</sup> ND, Fig. 1-3.

Thus, clearly, a pipeline accident has the potential to result in significant off-site (as well as even more significant on-site worker) impacts that were not evaluated in the Neg.Dec.

**E. Fire and Other Hazards From Ship Accidents Are Significant**

The Neg.Dec. asserts that the throughput of the Marine Terminal would not increase. Thus, it did not evaluate the consequences of an accident involving ships importing larger quantities of crude. However, my analysis elsewhere in these Comments indicates that the Project will increase the throughput of the Marine Terminal from 5,000 bbl/hr to the current Terminal capacity of 32,000 bbl/hr and allow a potential further doubling of Terminal capacity in the future. Thus, ship accidents should have been evaluated.

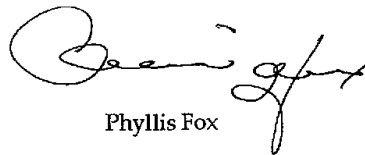
**F. Smoke And Inhalation Hazards Were Not Assessed**

A fire results in other environmental damages, besides heat injury. A fire releases TACs and smoke, which cause significant health impacts. A recent fire at the Chevron Richmond Refinery, which was contained on site, sent 15,000 people from the surrounding area for medical treatment due to the release and created huge black clouds of pollution billowing across the San Francisco Bay.<sup>172</sup> The fires evaluated in the Neg.Dec. involving similar materials would affect many far away offsite receptors. This is a significant impact that was not disclosed in the Neg.Dec.

**VI. CONCLUSION**

This concludes my analysis of the Neg.Dec. and the Project's environmental impacts. If you have any questions regarding these comments, please do not hesitate to contact me.

Sincerely,



Phyllis Fox

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<sup>172</sup> US Chemical Safety and Hazard Investigation Board, 2013, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

Index of Commonly Used Abbreviations and Terms

Marine Terminal Agreement	Long Beach Berth Access, Use and Throughput Agreement
Vancouver Application	Tesoro Savage, Application for Site Certification Agreement
Pacific L.A. Marine Terminal SEIR/DSEIR	Pacific L.A. Marine Terminal LLC Crude Oil Terminal Draft Supplemental Environmental Impact Statement/Draft Subsequent Environmental Impact Report
2/27/14 Tesoro Presentation	Tesoro, Transformation through Distinctive Performance, Simmons Energy Conference, February 27, 2014. Available at: <a href="http://phx.corporate-ir.net/phoenix.zhtml?c=79122&amp;p=irol-presentations">http://phx.corporate-ir.net/phoenix.zhtml?c=79122&amp;p=irol-presentations</a>
1/9/14 Tesoro Presentation	Tesoro, Deutsche Bank Energy Conference, January 9, 2014. Available at: <a href="http://phx.corporate-ir.net/phoenix.zhtml?c=79122&amp;p=irol-presentations">http://phx.corporate-ir.net/phoenix.zhtml?c=79122&amp;p=irol-presentations</a> .
3/7/13 Revised Application	Tesoro, Revisions for Application for Permit to Construct AQMD Application Nos. 545646 & 545745 Tank No. 300035 and Tank No. 300036, March 7, 2013
12/10/13 Tesoro Analyst & Investor Presentation	Thomas Reuters Streetevents Edit Transcript, 12/10/13 Tesoro Analyst and Investor Presentation
Q3 2013 Tesoro Earnings Call	November 7, 2013, Transcript available at: <a href="http://phx.corporate-ir.net/phoenix.zhtml?c=79122&amp;p=irol-transcriptsarchive">http://phx.corporate-ir.net/phoenix.zhtml?c=79122&amp;p=irol-transcriptsarchive</a>
VOCs	volatile organic compounds
TAN	total acid number
API gravity	The American Petroleum Institute gravity is a measure of how heavy or light a petroleum liquid is compared to water. If greater than 10, it is lighter and floats on water. If less than 10, it is heavier and sinks.
RVP	Reid vapor pressure in psi
TACs	toxic air contaminants
TVP	total vapor pressure in psi
ERC	Emission Reduction Credit
NSR	New Source Review
BACT	Best Available Control Technology
H2S	hydrogen sulfide
HCU	Hydrocracker Unit
bbl	Barrel
TSBC	Transportation Safety Board of Canada
Scfh	Standard cubic feet per hour
POLB	Port of Long Beach
Marine Terminal Title V Permit	Tesoro Logistics Operations LLC Long Beach, 820 Carrack Ave., Long Beach, Facility ID: 172878, September 27, 2013.
Bbl/mo	Barrel per month
ANS	Alaska North Slope
NGL	Natural gas liquids

EXHIBIT A





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Dr. Fox has over 40 years of experience in the field of environmental engineering, including air pollution control (BACT, BART, MACT, LAER, RACT), cost effectiveness analyses, air quality management, water quality and water supply investigations, hazardous waste investigations, environmental permitting, nuisance investigations (odor, noise), environmental impact reports, CEQA/NEPA documentation, risk assessments, and litigation support.

**EDUCATION**

Ph.D. Environmental/Civil Engineering, University of California, Berkeley, 1980.  
M.S. Environmental/Civil Engineering, University of California, Berkeley, 1975.  
B.S. Physics (with high honors), University of Florida, Gainesville, 1971.

**REGISTRATION**

Registered Professional Engineer: Arizona (2001-present; #36701), California (2002-present; CH 6058), Florida (2001-present; #57886), Georgia (2002-present; #PE027643), Washington (2002-present; #38692), Wisconsin (2005-present; #37595-006)  
Board Certified Environmental Engineer, American Academy of Environmental Engineers,  
Certified in Air Pollution Control (DEE #01-20014), 2002-present  
Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice (QEP #02-010007), 2001-present

**PROFESSIONAL HISTORY**

Environmental Management, Principal, 1981-present  
Lawrence Berkeley National Laboratory, Principal Investigator, 1977-1981  
University of California, Berkeley, Program Manager, 1976-1977  
Bechtel, Inc., Engineer, 1971-1976, 1964-1966

**PROFESSIONAL AFFILIATIONS**

American Chemical Society (1981-2010)  
Phi Beta Kappa (1970-present)  
Sigma Pi Sigma (1970-present)

*Who's Who Environmental Registry*, PH Publishing, Fort Collins, CO, 1992.  
*Who's Who in the World*, Marquis Who's Who, Inc., Chicago, IL, 11th Ed., p. 371, 1993-present.  
*Who's Who of American Women*, Marquis Who's Who, Inc., Chicago, IL, 13th Ed., p. 264, 1984-present.  
*Who's Who in Science and Engineering*, Marquis Who's Who, Inc., New Providence, NJ, 5<sup>th</sup> Ed., p. 414, 1999-present.  
*Who's Who in America*, Marquis Who's Who, Inc., 59<sup>th</sup> Ed., 2005.  
*Guide to Specialists on Toxic Substances*, World Environment Center, New York, NY, p. 80, 1980.  
National Research Council Committee on Irrigation-Induced Water Quality Problems (Selenium), Subcommittee on Quality Control/Quality Assurance (1985-1990).  
National Research Council Committee on Surface Mining and Reclamation, Subcommittee on Oil Shale (1978-80)

#### REPRESENTATIVE EXPERIENCE

Performed environmental and engineering investigations, as outlined below, for a wide range of industrial and commercial facilities including: petroleum refineries and upgrades thereto; reformulated fuels projects; refinery upgrades to process heavy sour crudes, including tar sands and light sweet crudes from the Eagle Ford and Bakken Formations; petroleum distribution terminals; coal, coke, and ore/mineral export terminals; LNG export, import, and storage terminals; crude-by-rail projects; shale oil plants; crude oil rail terminals; coal gasification & liquefaction plants; conventional and thermally enhanced oil production; underground storage tanks; pipelines; gasoline stations; landfills; railyards; hazardous waste treatment facilities; nuclear, hydroelectric, geothermal, wood, biomass, waste, tire-derived fuel, gas, oil, coke and coal-fired power plants; transmission lines; airports; hydrogen plants; petroleum coke calcining plants; coke plants; activated carbon manufacturing facilities; asphalt plants; cement plants; incinerators; flares; manufacturing facilities (e.g., semiconductors, electronic assembly, aerospace components, printed circuit boards, amusement park rides); lanthanide processing plants; ammonia plants; nitric acid plants; urea plants; food processing plants; almond hulling facilities; composting facilities; grain processing facilities; grain elevators; ethanol production facilities; soy bean oil extraction plants; biodiesel plants; paint formulation plants; wastewater treatment plants; marine terminals and ports; gas processing plants; steel mills; iron nugget production facilities; pig iron plant, based on blast furnace technology; direct reduced iron plant; acid regeneration facilities; railcar refinishing facility; battery manufacturing plants; pesticide manufacturing and repackaging facilities; pulp and paper mills; olefin plants; methanol plants; ethylene crackers; selective catalytic reduction (SCR) systems; selective noncatalytic reduction (SNCR) systems; halogen acid furnaces; contaminated property redevelopment projects (e.g., Mission Bay, Southern Pacific Railyards, Moscone Center expansion, San Diego Padres

Ballpark); residential developments; commercial office parks, campuses, and shopping centers; server farms; transportation plans; and a wide range of mines including sand and gravel, hard rock, limestone, nacholite, coal, molybdenum, gold, zinc, and oil shale.

*EXPERT WITNESS/LITIGATION SUPPORT*

- For plaintiffs, expert witness in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1997-2000) at the Cemex cement plant in Lyons, Colorado. Reviewed produced documents, prepared expert and rebuttal reports on PSD applicability based on NOx emission calculations for a collection of changes considered both individually and collectively. Deposed August 2011. *United States v. Cemex, Inc.*, In U.S. District Court for the District of Colorado (Civil Action No. 09-cv-00019-MSK-MEH). Case settled June 13, 2013.
- For plaintiffs, in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1988 – 2000) at James De Young Units 3, 4, and 5. Reviewed produced documents, analyzed CEMS and EIA data, and prepared netting and BACT analyses for NOx, SO2, and PM10 (PSD case). Expert report February 24, 2010 and affidavit February 20, 2010. *Sierra Club v. City of Holland, et al.*, U.S. District Court, Western District of Michigan (Civil Action 1:08-cv-1183). Case settled. Consent Decree 1/19/14.
- For plaintiffs, in civil action alleging failure to obtain MACT permit, expert on potential to emit hydrogen chloride (HCl) from a new coal-fired boiler. Reviewed record, estimated HCl emissions, wrote expert report June 2010 and March 2013 (Cost to Install a Scrubber at the Lamar Repowering Project Pursuant to Case-by-Case MACT), deposed August 2010 and March 2013. *Wildearth Guardian et al. v. Lamar Utilities Board*, Civil Action No. 09-cv-02974, U.S. District Court, District of Colorado. Case settled August 2013.
- For plaintiffs, expert witness on permitting, emission calculations, and wastewater treatment for coal-to-gasoline plant. Reviewed produced documents. Assisted in preparation of comments on draft minor source permit. Wrote two affidavits on key issues in case. Presented direct and rebuttal testimony 10/27 - 10/28/10 on permit enforceability and failure to properly calculate potential to emit, including underestimate of flaring emissions and omission of VOC and CO emissions from wastewater treatment, cooling tower, tank roof landings, and malfunctions. *Sierra Club, Ohio Valley Environmental Coalition, Coal River Mountain Watch, West Virginia Highlands Conservancy v. John Benedict, Director, Division of Air Quality, West Virginia Department of Environmental Protection and TransGas Development System, LLC*, Appeal No. 10-01-AQB. Virginia Air Quality Board remanded the permit on March 28, 2011 ordering reconsideration of potential to emit calculations, including: (1) support for assumed flare efficiency; (2) inclusion of startup, shutdown and

malfunction emissions; and (3) inclusion of wastewater treatment emissions in potential to emit calculations.

- For plaintiffs, expert on BACT emission limits for gas-fired combined cycle power plant. Prepared declaration in support of CBE's Opposition to the United States' Motion for Entry of Proposed Amended Consent Decree. Assisted in settlement discussions. *U.S. EPA, Plaintiff, Communities for a Better Environment, Intervenor Plaintiff, v. Pacific Gas & Electric Company, et al.*, U.S. District Court, Northern District of California, San Francisco Division, Case No. C-09-4503 SI.
- Technical expert in confidential settlement discussions with large coal-fired utility on BACT control technology and emission limits for NO<sub>x</sub>, SO<sub>2</sub>, PM, PM<sub>2.5</sub>, and CO for new natural gas fired combined cycle and simple cycle turbines with oil backup. (July 2010). Case settled.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1998-99) at Gallagher Units 1 and 3. Reviewed produced documents, prepared expert and rebuttal reports on historic and current-day BACT for SO<sub>2</sub>, control costs, and excess emissions of SO<sub>2</sub>. Deposed 11/18/09. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Settled 12/22/09.
- For plaintiffs, expert witness on MACT, BACT for NO<sub>x</sub>, and enforceability in an administrative appeal of draft state air permit issued for four 300-MW pet-coke-fired CFBs. Reviewed produced documents and prepared prefiled testimony. Deposed 10/8/09 and 11/9/09. Testified 11/10/09. *Application of Las Brisas Energy Center, LLC for State Air Quality Permit*; before the State Office of Administrative Hearings, Texas. Permit remanded 3/29/10 as LBEC failed to meet burden of proof on a number of issues including MACT. Texas Court of Appeals dismissed an appeal to reinstate the permit. The Texas Commission on Environmental Quality and Las Brisas Energy Center, LLC sought to overturn the Court of Appeals decision but moved to have their appeal dismissed in August 2013.
- For defense, expert witness in unlawful detainer case involving a gasoline station, minimart, and residential property with contamination from leaking underground storage tanks. Reviewed agency files and inspected site. Presented expert testimony on July 6, 2009, on causes of, nature and extent of subsurface contamination. *A. Singh v. S. Assaedi*, in Contra Costa County Superior Court, CA. Settled August 2009.
- For plaintiffs, expert witness on netting and enforceability for refinery being upgraded to process tar sands crude. Reviewed produced documents. Prepared expert and rebuttal reports addressing use of emission factors for baseline, omitted sources including coker, flares, tank landings and cleaning, and enforceability. Deposed. *In the Matter of Objection to the Issuance of Significant Source Modification Permit No. 089-25484-00453 to BP*

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*Products North America Inc., Whiting Business Unit, Save the Dunes Council, Inc., Sierra Club, Inc., Hoosier Environmental Council et al., Petitioners, B. P. Products North American, Respondents/Permittee*, before the Indiana Office of Environmental Adjudication.

- For plaintiffs, expert witness on BACT, MACT, and enforceability in appeal of Title V permit issued to 600 MW coal-fired power plant burning Powder River Basin coal. Prepared technical comments on draft air permit. Reviewed record on appeal, drafted BACT, MACT, and enforceability pre-filed testimony. Drafted MACT and enforceability pre-filed rebuttal testimony. Deposed March 24, 2009. Testified June 10, 2009. *In Re: Southwestern Electric Power Company*, Arkansas Pollution Control and Ecology Commission, Consolidated Docket No. 08-006-P. Recommended Decision issued December 9, 2009 upholding issued permit. Commission adopted Recommended Decision January 22, 2010.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1989-1992) at Wabash Units 2, 3 and 5. Reviewed produced documents, prepared expert and rebuttal report on historic and current-day BACT for NO<sub>x</sub> and SO<sub>2</sub>, control costs, and excess emissions of NO<sub>x</sub>, SO<sub>2</sub>, and mercury. Deposed 10/21/08. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Testified 2/3/09. Memorandum Opinion & Order 5-29-09 requiring shutdown of Wabash River Units 2, 3, 5 by September 30, 2009, run at baseline until shutdown, and permanently surrender SO<sub>2</sub> emission allowances.
- For plaintiffs, expert witness in liability phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for three historic modifications (1997-2001) at two portland cement plants involving three cement kilns. Reviewed produced documents, analyzed CEMS data covering subject period, prepared netting analysis for NO<sub>x</sub>, SO<sub>2</sub> and CO, and prepared expert and rebuttal reports. *United States v. Cemex California Cement*, In U.S. District Court for the Central District of California, Eastern Division, Case No. ED CV 07-00223-GW (JCRx), Settled 1/15/09.
- For intervenors Clean Wisconsin and Citizens Utility Board, prepared data requests, reviewed discovery and expert report. Prepared prefiled direct, rebuttal and surrebuttal testimony on cost to extend life of existing Oak Creek Units 5-8 and cost to address future regulatory requirements to determine whether to control or shutdown one or more of the units. Oral testimony 2/5/08. Application for a Certificate of Authority to Install Wet Flue Gas Desulfurization and Selective Catalytic Reduction Facilities and Associated Equipment for Control of Sulfur Dioxide and Nitrogen Oxide Emissions at Oak Creek Power Plant Units 5, 6, 7 and 8, WPSO Docket No. 6630-CE-299.
- For plaintiffs, expert witness on alternatives analysis and BACT for NO<sub>x</sub>, SO<sub>2</sub>, total PM<sub>10</sub>, and sulfuric acid mist in appeal of PSD permit issued to 1200 MW coal fired power plant burning Powder River Basin and/or Central Appalachian coal (Longleaf). Assisted in drafting

technical comments on NOx on draft permit. Prepared expert disclosure. Presented 8+ days of direct and rebuttal expert testimony. Attended all 21 days of evidentiary hearing from 9/5/07 – 10/30/07 assisting in all aspects of hearing. *Friends of the Chatahooche and Sierra Club v. Dr. Carol Couch, Director, Environmental Protection Division of Natural Resources Department, Respondent, and Longleaf Energy Associates, Intervener*. ALJ Final Decision 1/11/08 denying petition. ALJ Order vacated & remanded for further proceedings, Fulton County Superior Court, 6/30/08. Court of Appeals of GA remanded the case with directions that the ALJ's final decision be vacated to consider the evidence under the correct standard of review, July 9, 2009. The ALJ issued an opinion April 2, 2010 in favor of the applicant. Final permit issued April 2010.

- For plaintiffs, expert witness on diesel exhaust in inverse condemnation case in which Port expanded maritime operations into residential neighborhoods, subjecting plaintiffs to noise, light, and diesel fumes. Measured real-time diesel particulate concentrations from marine vessels and tug boats on plaintiffs' property. Reviewed documents, depositions, DVDs, and photographs provided by counsel. Deposed. Testified October 24, 2006. *Ann Chargin, Richard Hackett, Carolyn Hackett, et al. v. Stockton Port District*, Superior Court of California, County of San Joaquin, Stockton Branch, No. CV021015. Judge ruled for plaintiffs.
- For plaintiffs, expert witness on NOx emissions and BACT in case alleging failure to obtain necessary permits and install controls on gas-fired combined-cycle turbines. Prepared and reviewed (applicant analyses) of NOx emissions, BACT analyses (water injection, SCR, ultra low NOx burners), and cost-effectiveness analyses based on site visit, plant operating records, stack tests, CEMS data, and turbine and catalyst vendor design information. Participated in negotiations to scope out consent order. *United States v. Nevada Power*. Case settled June 2007, resulting in installation of dry low NOx burners (5 ppm NOx averaged over 1 hr) on four units and a separate solar array at a local business.
- For plaintiffs, expert witness in appeal of PSD permit issued to 850 MW coal fired boiler burning Powder River Basin coal (Iatan Unit 2) on BACT for particulate matter, sulfuric acid mist and opacity and emission calculations for alleged historic violations of PSD. Assisted in drafting technical comments, petition for review, discovery requests, and responses to discovery requests. Reviewed produced documents. Prepared expert report on BACT for particulate matter. Assisted with expert depositions. Deposed February 7, 8, 27, 28, 2007. *In Re PSD Construction Permit Issued to Great Plains Energy, Kansas City Power & Light – Iatan Generating Station, Sierra Club v. Missouri Department of Natural Resources, Great Plains Energy, and Kansas City Power & Light*. Case settled March 27, 2007, providing offsets for over 6 million ton/yr of CO2 and lower NOx and SO2 emission limits.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications of coal-fired boilers and associated equipment. Reviewed produced documents, prepared expert

report on cost to retrofit 24 coal-fired power plants with scrubbers designed to remove 99% of the sulfur dioxide from flue gases. Prepared supplemental and expert report on cost estimates and BACT for SO<sub>2</sub> for these 24 complaint units. Deposed 1/30/07 and 3/14/07. *United States and State of New York et al. v. American Electric Power*, In U.S. District Court for the Southern District of Ohio, Eastern Division, Consolidated Civil Action Nos. C2-99-1182 and C2-99-1250. Settlement announced 10/9/07.

- For plaintiffs, expert witness on BACT, enforceability, and alternatives analysis in appeal of PSD permit issued for a 270-MW pulverized coal fired boiler burning Powder River Basin coal (City Utilities Springfield Unit 2). Reviewed permitting file and assisted counsel draft petition and prepare and respond to interrogatories and document requests. Reviewed interrogatory responses and produced documents. Assisted with expert depositions. Deposed August 2005. Evidentiary hearings October 2005. *In the Matter of Linda Chipperfield and Sierra Club v. Missouri Department of Natural Resources*. Missouri Supreme Court denied review of adverse lower court rulings August 2007.
- For plaintiffs, expert witness in civil action relating to plume touchdowns at AEP's Gavin coal-fired power plant. Assisted counsel draft interrogatories and document requests. Reviewed responses to interrogatories and produced documents. Prepared expert report "Releases of Sulfuric Acid Mist from the Gavin Power Station." The report evaluates sulfuric acid mist releases to determine if AEP complied with the requirements of CERCLA Section 103(a) and EPCRA Section 304. This report also discusses the formation, chemistry, release characteristics, and abatement of sulfuric acid mist in support of the claim that these releases present an imminent and substantial endangerment to public health under Section 7002(a)(1)(B) of the Resource Conservation and Recovery Act ("RCRA"). *Citizens Against Pollution v. Ohio Power Company*, In the U.S. District Court for the Southern District of Ohio, Eastern Division, Civil Action No. 2-04-cv-371. Case settled 12-8-06.
- For petitioners, expert witness in contested case hearing on BACT, enforceability, and emission estimates for an air permit issued to a 500-MW supercritical Power River Basin coal-fired boiler (Weston Unit 4). Assisted counsel prepare comments on draft air permit and respond to and draft discovery. Reviewed produced file, deposed (7/05), and prepared expert report on BACT and enforceability. Evidentiary hearings September 2005. *In the Matter of an Air Pollution Control Construction Permit Issued to Wisconsin Public Service Corporation for the Construction and Operation of a 500 MW Pulverized Coal-fired Power Plant Known as Weston Unit 4 in Marathon County, Wisconsin*, Case No. IH-04-21. The Final Order, issued 2/10/06, lowered the NO<sub>x</sub> BACT limit from 0.07 lb/MMBtu to 0.06 lb/MMBtu based on a 30-day average, added a BACT SO<sub>2</sub> control efficiency, and required a 0.0005% high efficiency drift eliminator as BACT for the cooling tower. The modified permit, including these provisions, was issued 3/28/07. Additional appeals in progress.



- For plaintiffs, adviser on technical issues related to Citizen Suit against U.S. EPA regarding failure to update New Source Performance Standards for petroleum refineries, 40 CFR 60, Subparts J, VV, and GGG. *Our Children's Earth Foundation and Sierra Club v. U.S. EPA et al.* Case settled July 2005. CD No. C 05-00094 CW, U.S. District Court, Northern District of California – Oakland Division. Proposed revisions to standards of performance for petroleum refineries published 72 FR 27178 (5/14/07).
- For interveners, reviewed proposed Consent Decree settling Clean Air Act violations due to historic modifications of boilers and associated equipment at two coal-fired power plants. In response to stay order, reviewed the record, selected one representative activity at each of seven generating units, and analyzed to identify CAA violations. Identified NSPS and NSR violations for NO<sub>x</sub>, SO<sub>2</sub>, PM/PM<sub>10</sub>, and sulfuric acid mist. Summarized results in an expert report. *United States of America, and Michael A. Cox, Attorney General of the State of Michigan, ex rel. Michigan Department of Environmental Quality, Plaintiffs, and Clean Wisconsin, Sierra Club, and Citizens' Utility Board, Intervenor, v. Wisconsin Electric Power Company, Defendant*, U.S. District Court for the Eastern District of Wisconsin, Civil Action No. 2:03-CV-00371-CNC. Order issued 10-1-07 denying petition.
- For a coalition of Nevada labor organizations (ACE), reviewed preliminary determination to issue a Class I Air Quality Operating Permit to Construct and supporting files for a 250-MW pulverized coal-fired boiler (Newmont). Prepared about 100 pages of technical analyses and comments on BACT, MACT, emission calculations, and enforceability. Assisted counsel draft petition and reply brief appealing PSD permit to U.S. EPA Environmental Appeals Board (EAB). Order denying review issued 12/21/05. *In re Newmont Nevada Energy Investment, LLC, TS Power Plant*, PSD Appeal No. 05-04 (EAB 2005).
- For petitioners and plaintiffs, reviewed and prepared comments on air quality and hazardous waste based on negative declaration for refinery ultra low sulfur diesel project located in SCAQMD. Reviewed responses to comments and prepared responses. Prepared declaration and presented oral testimony before SCAQMD Hearing Board on exempt sources (cooling towers) and calculation of potential to emit under NSR. Petition for writ of mandate filed March 2005. Case remanded by Court of Appeals to trial court to direct SCAQMD to re-evaluate the potential environmental significance of NO<sub>x</sub> emissions resulting from the project in accordance with court's opinion. California Court of Appeals, Second Appellate Division, on December 18, 2007, affirmed in part (as to baseline) and denied in part. *Communities for a Better Environment v. South Coast Air Quality Management District and ConocoPhillips and Carlos Valdez et al v. South Coast Air Quality Management District and ConocoPhillips*. Certified for partial publication 1/16/08. Appellate Court opinion upheld by CA Supreme Court 3/15/10. (2010) 48 Cal.4th 310.
- For amici seeking to amend a proposed Consent Decree to settle alleged NSR violations at Chevron refineries, reviewed proposed settlement, related files, subject modifications, and emission calculations. Prepared declaration on emission reductions, identification of NSR

and NSPS violations, and BACT/LAER for FCCUs, heaters and boilers, flares, and sulfur recovery plants. *U.S. et al. v. Chevron U.S.A.*, Northern District of California, Case No. C 03-04650. Memorandum and Order Entering Consent Decree issued June 2005. Case No. C 03-4650 CRB.

- For petitioners, prepared declaration on enforceability of periodic monitoring requirements, in response to EPA's revised interpretation of 40 CFR 70.6(c)(1). This revision limited additional monitoring required in Title V permits. 69 FR 3203 (Jan. 22, 2004). *Environmental Integrity Project et al. v. EPA* (U.S. Court of Appeals for the District of Columbia). Court ruled the Act requires all Title V permits to contain monitoring requirements to assure compliance. *Sierra Club v. EPA*, 536 F.3d 673 (D.C. Cir. 2008).
- For interveners in application for authority to construct a 500 MW supercritical coal-fired generating unit before the Wisconsin Public Service Commission, prepared pre-filed written direct and rebuttal testimony with oral cross examination and rebuttal on BACT and MACT (Weston 4). Prepared written comments on BACT, MACT, and enforceability on draft air permit for same facility.
- For property owners in Nevada, evaluated the environmental impacts of a 1,450-MW coal-fired power plant proposed in a rural area adjacent to the Black Rock Desert and Granite Range, including emission calculations, air quality modeling, comments on proposed use permit to collect preconstruction monitoring data, and coordination with agencies and other interested parties. Project cancelled.
- For environmental organizations, reviewed draft PSD permit for a 600-MW coal-fired power plant in West Virginia (Longview). Prepared comments on permit enforceability; coal washing; BACT for SO<sub>2</sub> and PM<sub>10</sub>; Hg MACT; and MACT for HCl, HF, non-Hg metallic HAPs, and enforceability. Assist plaintiffs draft petition appealing air permit. Retained as expert to develop testimony on MACT, BACT, offsets, enforceability. Participate in settlement discussions. Case settled July 2004.
- For petitioners, reviewed record produced in discovery and prepared affidavit on emissions of carbon monoxide and volatile organic compounds during startup of GE 7FA combustion turbines to successfully establish plaintiff standing. *Sierra Club et al. v. Georgia Power Company* (Northern District of Georgia).
- For building trades, reviewed air quality permitting action for 1500-MW coal-fired power plant before the Kentucky Department for Environmental Protection (Thoroughbred).
- For petitioners, expert witness in administrative appeal of the PSD/Title V permit issued to a 1500-MW coal-fired power plant. Reviewed over 60,000 pages of produced documents, prepared discovery index, identified and assembled plaintiff exhibits. Deposed. Assisted counsel in drafting discovery requests, with over 30 depositions, witness cross examination, and brief drafting. Presented over 20 days of direct testimony, rebuttal and sur-rebuttal, with cross examination on BACT for NO<sub>x</sub>, SO<sub>2</sub>, and PM/PM<sub>10</sub>; MACT for Hg and non-Hg

metallic HAPs; emission estimates for purposes of Class I and II air modeling; risk assessment; and enforceability of permit limits. Evidentiary hearings from November 2003 to June 2004. *Sierra Club et al. v. Natural Resources & Environmental Protection Cabinet, Division of Air Quality and Thoroughbred Generating Company et al.* Hearing Officer Decision issued August 9, 2005 finding in favor of plaintiffs on counts as to risk, BACT (IGCC/CFB, NO<sub>x</sub>, SO<sub>2</sub>, Hg, Be), single source, enforceability, and errors and omissions. Assist counsel draft exceptions. Cabinet Secretary issued Order April 11, 2006 denying Hearing Offer's report, except as to NO<sub>x</sub> BACT, Hg, 99% SO<sub>2</sub> control and certain errors and omissions.

- For citizens group in Massachusetts, reviewed, commented on, and participated in permitting of pollution control retrofits of coal-fired power plant (Salem Harbor).
- Assisted citizens group and labor union challenge issuance of conditional use permit for a 317,000 ft<sup>2</sup> discount store in Honolulu without any environmental review. In support of a motion for preliminary injunction, prepared 7-page declaration addressing public health impacts of diesel exhaust from vehicles serving the Project. In preparation for trial, prepared 20-page preliminary expert report summarizing results of diesel exhaust and noise measurements at two big box retail stores in Honolulu, estimated diesel PM10 concentrations for Project using ISCST, prepared a cancer health risk assessment based on these analyses, and evaluated noise impacts.
- Assisted environmental organizations to challenge the DOE Finding of No Significant Impact (FONSI) for the Baja California Power and Sempra Energy Resources Cross-Border Transmissions Lines in the U.S. and four associated power plants located in Mexico (DOE EA-1391). Prepared 20-page declaration in support of motion for summary judgment addressing emissions, including CO<sub>2</sub> and NH<sub>3</sub>, offsets, BACT, cumulative air quality impacts, alternative cooling systems, and water use and water quality impacts. Plaintiff's motion for summary judgment granted in part. U.S. District Court, Southern District decision concluded that the Environmental Assessment and FONSI violated NEPA and the APA due to their inadequate analysis of the potential controversy surrounding the project, water impacts, impacts from NH<sub>3</sub> and CO<sub>2</sub>, alternatives, and cumulative impacts. *Border Power Plant Working Group v. Department of Energy and Bureau of Land Management*, Case No. 02-CV-513-IEG (POR) (May 2, 2003).
- For Sacramento school, reviewed draft air permit issued for diesel generator located across from playfield. Prepared comments on emission estimates, enforceability, BACT, and health impacts of diesel exhaust. Case settled. BUG trap installed on the diesel generator.
- Assisted unions in appeal of Title V permit issued by BAAQMD to carbon plant that manufactured coke. Reviewed District files, identified historic modifications that should have triggered PSD review, and prepared technical comments on Title V permit. Reviewed responses to comments and assisted counsel draft appeal to BAAQMD hearing board, opening brief, motion to strike, and rebuttal brief. Case settled.

- Assisted California Central Coast city obtain controls on a proposed new city that would straddle the Ventura-Los Angeles County boundary. Reviewed several environmental impact reports, prepared an air quality analysis, a diesel exhaust health risk assessment, and detailed review comments. Governor intervened and State dedicated the land for conservation purposes April 2004.
- Assisted Central California city to obtain controls on large alluvial sand quarry and asphalt plant proposing a modernization. Prepared comments on Negative Declaration on air quality, public health, noise, and traffic. Evaluated process flow diagrams and engineering reports to determine whether proposed changes increased plant capacity or substantially modified plant operations. Prepared comments on application for categorical exemption from CEQA. Presented testimony to County Board of Supervisors. Developed controls to mitigate impacts. Assisted counsel draft Petition for Writ. Case settled June 2002. Substantial improvements in plant operations were obtained including cap on throughput, dust control measures, asphalt plant loadout enclosure, and restrictions on truck routes.
- Assisted oil companies on the California Central Coast in defending class action citizen's lawsuit alleging health effects due to emissions from gas processing plant and leaking underground storage tanks. Reviewed regulatory and other files and advised counsel on merits of case. Case settled November 2001.
- Assisted oil company on the California Central Coast in defending property damage claims arising out of a historic oil spill. Reviewed site investigation reports, pump tests, leachability studies, and health risk assessments, participated in design of additional site characterization studies to assess health impacts, and advised counsel on merits of case. Prepare health risk assessment.
- Assisted unions in appeal of Initial Study/Negative Declaration ("IS/ND") for an MTBE phaseout project at a Bay Area refinery. Reviewed IS/ND and supporting agency permitting files and prepared technical comments on air quality, groundwater, and public health impacts. Reviewed responses to comments and final IS/ND and ATC permits and assisted counsel to draft petitions and briefs appealing decision to Air District Hearing Board. Presented sworn direct and rebuttal testimony with cross examination on groundwater impacts of ethanol spills on hydrocarbon contamination at refinery. Hearing Board ruled 5 to 0 in favor of appellants, remanding ATC to district to prepare an EIR.
- Assisted Florida cities in challenging the use of diesel and proposed BACT determinations in prevention of significant deterioration (PSD) permits issued to two 510-MW simple cycle peaking electric generating facilities and one 1,080-MW simple cycle/combined cycle facility. Reviewed permit applications, draft permits, and FDEP engineering evaluations, assisted counsel in drafting petitions and responding to discovery. Participated in settlement discussions. Cases settled or applications withdrawn.

- Assisted large California city in federal lawsuit alleging peaker power plant was violating its federal permit. Reviewed permit file and applicant's engineering and cost feasibility study to reduce emissions through retrofit controls. Advised counsel on feasible and cost-effective NO<sub>x</sub>, SO<sub>x</sub>, and PM<sub>10</sub> controls for several 1960s diesel-fired Pratt and Whitney peaker turbines. Case settled.
- Assisted coalition of Georgia environmental groups in evaluating BACT determinations and permit conditions in PSD permits issued to several large natural gas-fired simple cycle and combined-cycle power plants. Prepared technical comments on draft PSD permits on BACT, enforceability of limits, and toxic emissions. Reviewed responses to comments, advised counsel on merits of cases, participated in settlement discussions, presented oral and written testimony in adjudicatory hearings, and provided technical assistance as required. Cases settled or won at trial.
- Assisted construction unions in review of air quality permitting actions before the Indiana Department of Environmental Management ("IDEM") for several natural gas-fired simple cycle peaker and combined cycle power plants.
- Assisted coalition of towns and environmental groups in challenging air permits issued to 523 MW dual fuel (natural gas and distillate) combined-cycle power plant in Connecticut. Prepared technical comments on draft permits and 60 pages of written testimony addressing emission estimates, startup/shutdown issues, BACT/LAER analyses, and toxic air emissions. Presented testimony in adjudicatory administrative hearings before the Connecticut Department of Environmental Protection in June 2001 and December 2001.
- Assisted various coalitions of unions, citizens groups, cities, public agencies, and developers in licensing and permitting of over 110 coal, gas, oil, biomass, and pet coke-fired power plants generating over 75,000 MW of electricity. These included base-load, combined cycle, simple cycle, and peaker power plants in Alaska, Arizona, Arkansas, California, Colorado, Georgia, Florida, Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Oregon, Texas, West Virginia, Wisconsin, and elsewhere. Prepared analyses of and comments on applications for certification, preliminary and final staff assessments, and various air, water, wastewater, and solid waste permits issued by local agencies. Presented written and oral testimony before various administrative bodies on hazards of ammonia use and transportation, health effects of air emissions, contaminated property issues, BACT/LAER issues related to SCR and SCONOX, criteria and toxic pollutant emission estimates, MACT analyses, air quality modeling, water supply and water quality issues, and methods to reduce water use, including dry cooling, parallel dry-wet cooling, hybrid cooling, and zero liquid discharge systems.
- Assisted unions, cities, and neighborhood associations in challenging an EIR issued for the proposed expansion of the Oakland Airport. Reviewed two draft EIRs and prepared a health risk assessment and extensive technical comments on air quality and public health impacts.

The California Court of Appeals, First Appellate District, ruled in favor of appellants and plaintiffs, concluding that the EIR "2) erred in using outdated information in assessing the emission of toxic air contaminants (TACs) from jet aircraft; 3) failed to support its decision not to evaluate the health risks associated with the emission of TACs with meaningful analysis," thus accepting my technical arguments and requiring the Port to prepare a new EIR. See *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598.

- Assisted lessor of former gas station with leaking underground storage tanks and TCE contamination from adjacent property. Lessor held option to purchase, which was forfeited based on misrepresentation by remediation contractor as to nature and extent of contamination. Remediation contractor purchased property. Reviewed regulatory agency files and advised counsel on merits of case. Case not filed.
- Advised counsel on merits of several pending actions, including a Proposition 65 case involving groundwater contamination at an explosives manufacturing firm and two former gas stations with leaking underground storage tanks.
- Assisted defendant foundry in Oakland in a lawsuit brought by neighbors alleging property contamination, nuisance, trespass, smoke, and health effects from foundry operation. Inspected and sampled plaintiff's property. Advised counsel on merits of case. Case settled.
- Assisted business owner facing eminent domain eviction. Prepared technical comments on a negative declaration for soil contamination and public health risks from air emissions from a proposed redevelopment project in San Francisco in support of a CEQA lawsuit. Case settled.
- Assisted neighborhood association representing residents living downwind of a Berkeley asphalt plant in separate nuisance and CEQA lawsuits. Prepared technical comments on air quality, odor, and noise impacts, presented testimony at commission and council meetings, participated in community workshops, and participated in settlement discussions. Cases settled. Asphalt plant was upgraded to include air emission and noise controls, including vapor collection system at truck loading station, enclosures for noisy equipment, and improved housekeeping.
- Assisted a Fortune 500 residential home builder in claims alleging health effects from faulty installation of gas appliances. Conducted indoor air quality study, advised counsel on merits of case, and participated in discussions with plaintiffs. Case settled.
- Assisted property owners in Silicon Valley in lawsuit to recover remediation costs from insurer for large TCE plume originating from a manufacturing facility. Conducted investigations to demonstrate sudden and accidental release of TCE, including groundwater modeling, development of method to date spill, preparation of chemical inventory, investigation of historical waste disposal practices and standards, and on-site sewer and

storm drainage inspections and sampling. Prepared declaration in opposition to motion for summary judgment. Case settled.

- Assisted residents in east Oakland downwind of a former battery plant in class action lawsuit alleging property contamination from lead emissions. Conducted historical research and dry deposition modeling that substantiated claim. Participated in mediation at JAMS. Case settled.
- Assisted property owners in West Oakland who purchased a former gas station that had leaking underground storage tanks and groundwater contamination. Reviewed agency files and advised counsel on merits of case. Prepared declaration in opposition to summary judgment. Prepared cost estimate to remediate site. Participated in settlement discussions. Case settled.
- Consultant to counsel representing plaintiffs in two Clean Water Act lawsuits involving selenium discharges into San Francisco Bay from refineries. Reviewed files and advised counsel on merits of case. Prepared interrogatory and discovery questions, assisted in deposing opposing experts, and reviewed and interpreted treatability and other technical studies. Judge ruled in favor of plaintiffs.
- Assisted oil company in a complaint filed by a resident of a small California beach community alleging that discharges of tank farm rinse water into the sanitary sewer system caused hydrogen sulfide gas to infiltrate residence, sending occupants to hospital. Inspected accident site, interviewed parties to the event, and reviewed extensive agency files related to incident. Used chemical analysis, field simulations, mass balance calculations, sewer hydraulic simulations with SWMM44, atmospheric dispersion modeling with SCREEN3, odor analyses, and risk assessment calculations to demonstrate that the incident was caused by a faulty drain trap and inadequate slope of sewer lateral on resident's property. Prepared a detailed technical report summarizing these studies. Case settled.
- Assisted large West Coast city in suit alleging that leaking underground storage tanks on city property had damaged the waterproofing on downgradient building, causing leaks in an underground parking structure. Reviewed subsurface hydrogeologic investigations and evaluated studies conducted by others documenting leakage from underground diesel and gasoline tanks. Inspected, tested, and evaluated waterproofing on subsurface parking structure. Waterproofing was substandard. Case settled.
- Assisted residents downwind of gravel mine and asphalt plant in Siskiyou County, California, in suit to obtain CEQA review of air permitting action. Prepared two declarations analyzing air quality and public health impacts. Judge ruled in favor of plaintiffs, closing mine and asphalt plant.
- Assisted defendant oil company on the California Central Coast in class action lawsuit alleging property damage and health effects from subsurface petroleum contamination.

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Reviewed documents, prepared risk calculations, and advised counsel on merits of case. Participated in settlement discussions. Case settled.

- Assisted defendant oil company in class action lawsuit alleging health impacts from remediation of petroleum contaminated site on California Central Coast. Reviewed documents, designed and conducted monitoring program, and participated in settlement discussions. Case settled.
- Consultant to attorneys representing irrigation districts and municipal water districts to evaluate a potential challenge of USFWS actions under CVPIA section 3406(b)(2). Reviewed agency files and collected and analyzed hydrology, water quality, and fishery data. Advised counsel on merits of case. Case not filed.
- Assisted residents downwind of a Carson refinery in class action lawsuit involving soil and groundwater contamination, nuisance, property damage, and health effects from air emissions. Reviewed files and provided advise on contaminated soil and groundwater, toxic emissions, and health risks. Prepared declaration on refinery fugitive emissions. Prepared deposition questions and reviewed deposition transcripts on air quality, soil contamination, odors, and health impacts. Case settled.
- Assisted residents downwind of a Contra Costa refinery who were affected by an accidental release of naphtha. Characterized spilled naphtha, estimated emissions, and modeled ambient concentrations of hydrocarbons and sulfur compounds. Deposed. Presented testimony in binding arbitration at JAMS. Judge found in favor of plaintiffs.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects from several large accidents as well as routine operations. Reviewed files and prepared analyses of environmental impacts. Prepared declarations, deposed, and presented testimony before jury in one trial and judge in second. Case settled.
- Assisted business owner claiming damages from dust, noise, and vibration during a sewer construction project in San Francisco. Reviewed agency files and PM10 monitoring data and advised counsel on merits of case. Case settled.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects. Prepared declaration in opposition to summary judgment, deposed, and presented expert testimony on accidental releases, odor, and nuisance before jury. Case thrown out by judge, but reversed on appeal and not retried.
- Presented testimony in small claims court on behalf of residents claiming health effects from hydrogen sulfide from flaring emissions triggered by a power outage at a Contra Costa County refinery. Analyzed meteorological and air quality data and evaluated potential health risks of exposure to low concentrations of hydrogen sulfide. Judge awarded damages to plaintiffs.



- Assisted construction unions in challenging PSD permit for an Indiana steel mill. Prepared technical comments on draft PSD permit, drafted 70-page appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analysis for electric arc furnace and reheat furnace and faulty permit conditions, among others, and drafted briefs responding to four parties. EPA Region V and the EPA General Counsel intervened as amici, supporting petitioners. EAB ruled in favor of petitioners, remanding permit to IDEM on three key issues, including BACT for the reheat furnace and lead emissions from the EAF. Drafted motion to reconsider three issues. Prepared 69 pages of technical comments on revised draft PSD permit. Drafted second EAB appeal addressing lead emissions from the EAF and BACT for reheat furnace based on European experience with SCR/SNCR. Case settled. Permit was substantially improved. See *In re: Steel Dynamics, Inc.*, PSD Appeal Nos. 99-4 & 99-5 (EAB June 22, 2000).
- Assisted defendant urea manufacturer in Alaska in negotiations with USEPA to seek relief from penalties for alleged violations of the Clean Air Act. Reviewed and evaluated regulatory files and monitoring data, prepared technical analysis demonstrating that permit limits were not violated, and participated in negotiations with EPA to dismiss action. Fines were substantially reduced and case closed.
- Assisted construction unions in challenging PSD permitting action for an Indiana grain mill. Prepared technical comments on draft PSD permit and assisted counsel draft appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analyses for heaters and boilers and faulty permit conditions, among others. Case settled.
- As part of a consent decree settling a CEQA lawsuit, assisted neighbors of a large west coast port in negotiations with port authority to secure mitigation for air quality impacts. Prepared technical comments on mobile source air quality impacts and mitigation and negotiated a \$9 million CEQA mitigation package. Represented neighbors on technical advisory committee established by port to implement the air quality mitigation program. Program successfully implemented.
- Assisted construction unions in challenging permitting action for a California hazardous waste incinerator. Prepared technical comments on draft permit, assisted counsel prepare appeal of EPA permit to the Environmental Appeals Board. Participated in settlement discussions on technical issues with applicant and EPA Region 9. Case settled.
- Assisted environmental group in challenging DTSC Negative Declaration on a hazardous waste treatment facility. Prepared technical comments on risk of upset, water, and health risks. Writ of mandamus issued.
- Assisted several neighborhood associations and cities impacted by quarries, asphalt plants, and cement plants in Alameda, Shasta, Sonoma, and Mendocino counties in obtaining

mitigations for dust, air quality, public health, traffic, and noise impacts from facility operations and proposed expansions.

- For over 100 industrial facilities, commercial/campus, and redevelopment projects, developed the record in preparation for CEQA and NEPA lawsuits. Prepared technical comments on hazardous materials, solid wastes, public utilities, noise, worker safety, air quality, public health, water resources, water quality, traffic, and risk of upset sections of EIRs, EISs, FONSI, initial studies, and negative declarations. Assisted counsel in drafting petitions and briefs and prepared declarations.
- For several large commercial development projects and airports, assisted applicant and counsel prepare defensible CEQA documents, respond to comments, and identify and evaluate "all feasible" mitigation to avoid CEQA challenges. This work included developing mitigation programs to reduce traffic-related air quality impacts based on energy conservation programs, solar, low-emission vehicles, alternative fuels, exhaust treatments, and transportation management associations.

#### *SITE INVESTIGATION/REMEDATION/CLOSURE*

- Technical manager and principal engineer for characterization, remediation, and closure of waste management units at former Colorado oil shale plant. Constituents of concern included BTEX, As, 1,1,1-TCA, and TPH. Completed groundwater monitoring programs, site assessments, work plans, and closure plans for seven process water holding ponds, a refinery sewer system, and processed shale disposal area. Managed design and construction of groundwater treatment system and removal actions and obtained clean closure.
- Principal engineer for characterization, remediation, and closure of process water ponds at a former lanthanide processing plant in Colorado. Designed and implemented groundwater monitoring program and site assessments and prepared closure plan.
- Advised the city of Sacramento on redevelopment of two former railyards. Reviewed work plans, site investigations, risk assessment, RAPS, RI/FSs, and CEQA documents. Participated in the development of mitigation strategies to protect construction and utility workers and the public during remediation, redevelopment, and use of the site, including buffer zones, subslab venting, rail berm containment structure, and an environmental oversight plan.
- Provided technical support for the investigation of a former sanitary landfill that was redeveloped as single family homes. Reviewed and/or prepared portions of numerous documents, including health risk assessments, preliminary endangerment assessments, site investigation reports, work plans, and RI/FSs. Historical research to identify historic waste disposal practices to prepare a preliminary endangerment assessment. Acquired, reviewed,

and analyzed the files of 18 federal, state, and local agencies, three sets of construction field notes, analyzed 21 aerial photographs and interviewed 14 individuals associated with operation of former landfill. Assisted counsel in defending lawsuit brought by residents alleging health impacts and diminution of property value due to residual contamination. Prepared summary reports.

- Technical oversight of characterization and remediation of a nitrate plume at an explosives manufacturing facility in Lincoln, CA. Provided interface between owners and consultants. Reviewed site assessments, work plans, closure plans, and RI/FSs.
- Consultant to owner of large western molybdenum mine proposed for NPL listing. Participated in negotiations to scope out consent order and develop scope of work. Participated in studies to determine premining groundwater background to evaluate applicability of water quality standards. Served on technical committees to develop alternatives to mitigate impacts and close the facility, including resloping and grading, various thickness and types of covers, and reclamation. This work included developing and evaluating methods to control surface runoff and erosion, mitigate impacts of acid rock drainage on surface and ground waters, and stabilize nine waste rock piles containing 328 million tons of pyrite-rich, mixed volcanic waste rock (andesites, rhyolite, tuff). Evaluated stability of waste rock piles. Represented client in hearings and meetings with state and federal oversight agencies.

*REGULATORY (PARTIAL LIST)*

- In March and April 2014, prepared declarations on air permits issued for two crude-by-rail terminals in California, modified to switch from importing ethanol to importing Bakken crude oils by rail and transferring to tanker cars. Permits were issued without undergoing CEQA review.
- In March 2014, prepared technical comments on Negative Declaration for a proposed modification of the air permit for a bulk petroleum and storage terminal to allow the import of tar sands and Bakken crude oil by rail and its export by barge, under the New York State Environmental Quality Review Act (SEQRA).
- In February 2014, prepared technical comments on proposed modification of air permit for midwest refinery upgrade/expansion to process tar sands crudes.
- In January 2014, prepared technical report on Environmental Impact Report for Phillips 66 Rail Spur Extension Project, Santa Maria, CA. Comments addressed project description (piecemealing, crude slate), risk of upset analyses, mitigation measures, alternative analyses and cumulative impacts.

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- In November 2013, prepared technical report on Environmental Impact Report for the Phillips 66 Propane Recovery Project, Rodeo, CA. Comments addressed project description (piecemealing, crude slate) and air quality impacts.
- In July 2013, prepared technical report on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063.
- In July 2013, prepared technical report on fugitive particulate matter emissions from coal train staging at the proposed Coyote Island Terminal, Oregon, for draft Permit No. 25-0015-ST-01.
- In July 2013, prepared technical comments on air quality impacts of the Finger Lakes LPG Storage Facility as reported in various Environmental Impact Statements.
- In June 2013, prepared technical report on a Mitigated Negative Declaration for a new rail terminal at the Valero Benicia Refinery to import increased amounts of "North American" crudes. Comments addressed air quality impacts of refining increased amounts of tar sands crudes.
- In May 2013, prepared comments on draft PSD permit for major expansion of midwest refinery to process 100% tar sands crudes, including a complex netting analysis involving debottlenecking, piecemealing, and BACT analyses.
- In April 2013, prepared technical report on the Draft Supplemental Environmental Impact Statement (DSEIS) for the Keystone XL Pipeline on air quality impacts from refining increased amount of tar sands crudes at Refineries in PADD 3.
- In October 2012, prepared technical report on the Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow on fugitive particulate matter emissions.
- Prepared cost analyses and comments on New York's proposed BART determinations for NO<sub>x</sub>, SO<sub>2</sub>, and PM and EPA's proposed approval of BART determinations for Danskammer Generating Station under New York Regional Haze State Implementation Plan and Federal Implementation Plan, 77 FR 51915 (August 28, 2012).
- Prepared cost analyses and comments on NO<sub>x</sub> BART determinations for Regional Haze State Implementation Plan for State of Nevada, 77 FR 23191 (April 18, 2012) and 77 FR 25660 (May 1, 2012).
- Prepared analyses of and comments on New Source Performance Standards for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 FR 22392 (April 13, 2012).
- Prepared comments on CASPR-BART emission equivalency and NO<sub>x</sub> and PM BART determinations in EPA proposed approval of State Implementation Plan for Pennsylvania Regional Haze Implementation Plan, 77 FR 3984 (January 26, 2012).

- Prepared comments and statistical analyses on hazardous air pollutants (HAPs) emission controls, monitoring, compliance methods, and the use of surrogates for acid gases, organic HAPs, and metallic HAPs for proposed National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 76 FR 24976 (May 3, 2011).
- Prepared cost analyses and comments on NOx BART determinations and emission reductions for proposed Federal Implementation Plan for Four Corners Power Plant, 75 FR 64221 (October 19, 2010).
- Prepared cost analyses and comments on NOx BART determinations for Colstrip Units 1- 4 for Montana State Implementation Plan and Regional Haze Federal Implementation Plan, 77 FR 23988 (April 20, 2010).
- For EPA Region 8, prepared report: Revised BART Cost Effectiveness Analysis for Tail-End Selective Catalytic Reduction at the Basin Electric Power Cooperative Leland Olds Station Unit 2 Final Report, March 2011, in support of 76 FR 58570 (Sept. 21, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station, November 2010, in support of 76 FR 52388 (Aug. 22, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Flue Gas Desulfurization at Coal-Fired Electric Generating Units in Oklahoma: Sooner Units 1 & 2, Muskogee Units 4 & 5, Northeastern Units 3 &4, October 2010, in support of 76 FR 16168 (March 26, 2011). My work was upheld in: *State of Oklahoma v. EPA*, App. Case 12-9526 (10th Cir. July 19, 2013).
- Identified errors in N<sub>2</sub>O emission factors in the Mandatory Greenhouse Gas Reporting Rule, 40 CFR 98, and prepared technical analysis to support Petition for Rulemaking to Correct Emissions Factors in the Mandatory Greenhouse Gas Reporting Rule, filed with EPA on 10/28/10.
- Assist interested parties develop input for and prepare comments on the Information Collection Request for Petroleum Refinery Sector NSPS and NESHAP Residual Risk and Technology Review, 75 FR 60107 (9/29/10).
- Technical reviewer of EPA's "Emission Estimation Protocol for Petroleum Refineries," posted for public comments on CHIEF on 12/23/09, prepared in response to the City of Houston's petition under the Data Quality Act (March 2010).
- Prepared comments on SCR cost effectiveness for EPA's Advanced Notice of Proposed Rulemaking, Assessment of Anticipated Visibility Improvements at Surrounding Class I Areas and Cost Effectiveness of Best Available Retrofit Technology for Four Corners Power Plant and Navajo Generating Station, 74 FR 44313 (August 28, 2009).

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- Prepared comments on Proposed Rule for Standards of Performance for Coal Preparation and Processing Plants, 74 FR 25304 (May 27, 2009).
- Prepared comments on draft PSD permit for major expansion of midwest refinery to process up to 100% tar sands crudes. Participated in development of monitoring and controls to mitigate impacts and in negotiating a Consent Decree to settle claims in 2008.
- Reviewed and assisted interested parties prepare comments on proposed Kentucky air toxic regulations at 401 KAR 64:005, 64:010, 64:020, and 64:030 (June 2007).
- Prepared comments on proposed Standards of Performance for Electric Utility Steam Generating Units and Small Industrial-Commercial-Industrial Steam Generating Units, 70 FR 9706 (February 28, 2005).
- Prepared comments on Louisville Air Pollution Control District proposed Strategic Toxic Air Reduction regulations.
- Prepared comments and analysis of BAAQMD Regulation, Rule 11, Flare Monitoring at Petroleum Refineries.
- Prepared comments on Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electricity Utility Steam Generating Units (MACT standards for coal-fired power plants).
- Prepared Authority to Construct Permit for remediation of a large petroleum-contaminated site on the California Central Coast. Negotiated conditions with agencies and secured permits.
- Prepared Authority to Construct Permit for remediation of a former oil field on the California Central Coast. Participated in negotiations with agencies and secured permits.
- Prepared and/or reviewed hundreds of environmental permits, including NPDES, UIC, Stormwater, Authority to Construct, Prevention of Significant Deterioration, Nonattainment New Source Review, Title V, and RCRA, among others.
- Participated in the development of the CARB document, *Guidance for Power Plant Siting and Best Available Control Technology*, including attending public workshops and filing technical comments.
- Performed data analyses in support of adoption of emergency power restoration standards by the California Public Utilities Commission for “major” power outages, where major is an outage that simultaneously affects 10% of the customer base.
- Drafted portions of the Good Neighbor Ordinance to grant Contra Costa County greater authority over safety of local industry, particularly chemical plants and refineries.

- Participated in drafting BAAQMD Regulation 8, Rule 28, Pressure Relief Devices, including participation in public workshops, review of staff reports, draft rules and other technical materials, preparation of technical comments on staff proposals, research on availability and costs of methods to control PRV releases, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and cost of low-leak technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pumps and Compressors, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak and seal-less technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 5, Storage of Organic Liquids, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of controlling tank emissions, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors at Petroleum Refinery Complexes, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 22, Valves and Flanges at Chemical Plants, etc, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pump and Compressor Seals, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability of low-leak technology, and presentation of testimony before the Board.
- Participated in the development of the BAAQMD Regulation 2, Rule 5, Toxics, including participation in public workshops, review of staff proposals, and preparation of technical comments.
- Participated in the development of SCAQMD Rule 1402, Control of Toxic Air Contaminants from Existing Sources, and proposed amendments to Rule 1401, New Source Review of

Toxic Air Contaminants, in 1993, including review of staff proposals and preparation of technical comments on same.

- Participated in the development of the Sunnyvale Ordinance to Regulate the Storage, Use and Handling of Toxic Gas, which was designed to provide engineering controls for gases that are not otherwise regulated by the Uniform Fire Code.
- Participated in the drafting of the Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries, including participation in workshops, review of draft plans, preparation of technical comments on draft plans, and presentation of testimony before the SWRCB.
- Participated in developing Se permit effluent limitations for the five Bay Area refineries, including review of staff proposals, statistical analyses of Se effluent data, review of literature on aquatic toxicity of Se, preparation of technical comments on several staff proposals, and presentation of testimony before the Bay Area RWQCB.
- Represented the California Department of Water Resources in the 1991 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on a striped bass model developed by the California Department of Fish and Game.
- Represented the State Water Contractors in the 1987 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on natural flows, historical salinity trends in San Francisco Bay, Delta outflow, and hydrodynamics of the South Bay.
- Represented interveners in the licensing of over 20 natural-gas-fired power plants and one coal gasification plant at the California Energy Commission and elsewhere. Reviewed and prepared technical comments on applications for certification, preliminary staff assessments, final staff assessments, preliminary determinations of compliance, final determinations of compliance, and prevention of significant deterioration permits in the areas of air quality, water supply, water quality, biology, public health, worker safety, transportation, site contamination, cooling systems, and hazardous materials. Presented written and oral testimony in evidentiary hearings with cross examination and rebuttal. Participated in technical workshops.
- Represented several parties in the proposed merger of San Diego Gas & Electric and Southern California Edison. Prepared independent technical analyses on health risks, air quality, and water quality. Presented written and oral testimony before the Public Utilities Commission administrative law judge with cross examination and rebuttal.
- Represented a PRP in negotiations with local health and other agencies to establish impact of subsurface contamination on overlying residential properties. Reviewed health studies



prepared by agency consultants and worked with agencies and their consultants to evaluate health risks.

*WATER QUALITY/RESOURCES*

- Directed and participated in research on environmental impacts of energy development in the Colorado River Basin, including contamination of surface and subsurface waters and modeling of flow and chemical transport through fractured aquifers.
- Played a major role in Northern California water resource planning studies since the early 1970s. Prepared portions of the Basin Plans for the Sacramento, San Joaquin, and Delta basins including sections on water supply, water quality, beneficial uses, waste load allocation, and agricultural drainage. Developed water quality models for the Sacramento and San Joaquin Rivers.
- Conducted hundreds of studies over the past 40 years on Delta water supplies and the impacts of exports from the Delta on water quality and biological resources of the Central Valley, Sacramento-San Joaquin Delta, and San Francisco Bay. Typical examples include:
  1. Evaluate historical trends in salinity, temperature, and flow in San Francisco Bay and upstream rivers to determine impacts of water exports on the estuary;
  2. Evaluate the role of exports and natural factors on the food web by exploring the relationship between salinity and primary productivity in San Francisco Bay, upstream rivers, and ocean;
  3. Evaluate the effects of exports, other in-Delta, and upstream factors on the abundance of salmon and striped bass;
  4. Review and critique agency fishery models that link water exports with the abundance of striped bass and salmon;
  5. Develop a model based on GLMs to estimate the relative impact of exports, water facility operating variables, tidal phase, salinity, temperature, and other variables on the survival of salmon smolts as they migrate through the Delta;
  6. Reconstruct the natural hydrology of the Central Valley using water balances, vegetation mapping, reservoir operation models to simulate flood basins, precipitation records, tree ring research, and historical research;
  7. Evaluate the relationship between biological indicators of estuary health and down-estuary position of a salinity surrogate (X2);
  8. Use real-time fisheries monitoring data to quantify impact of exports on fish migration;
  9. Refine/develop statistical theory of autocorrelation and use to assess strength of relationships between biological and flow variables;

10. Collect, compile, and analyze water quality and toxicity data for surface waters in the Central Valley to assess the role of water quality in fishery declines;
  11. Assess mitigation measures, including habitat restoration and changes in water project operation, to minimize fishery impacts;
  12. Evaluate the impact of unscreened agricultural water diversions on abundance of larval fish;
  13. Prepare and present testimony on the impacts of water resources development on Bay hydrodynamics, salinity, and temperature in water rights hearings;
  14. Evaluate the impact of boat wakes on shallow water habitat, including interpretation of historical aerial photographs;
  15. Evaluate the hydrodynamic and water quality impacts of converting Delta islands into reservoirs;
  16. Use a hydrodynamic model to simulate the distribution of larval fish in a tidally influenced estuary;
  17. Identify and evaluate non-export factors that may have contributed to fishery declines, including predation, shifts in oceanic conditions, aquatic toxicity from pesticides and mining wastes, salinity intrusion from channel dredging, loss of riparian and marsh habitat, sedimentation from upstream land alternations, and changes in dissolved oxygen, flow, and temperature below dams.
- Developed, directed, and participated in a broad-based research program on environmental issues and control technology for energy industries including petroleum, oil shale, coal mining, and coal slurry transport. Research included evaluation of air and water pollution, development of novel, low-cost technology to treat and dispose of wastes, and development and application of geohydrologic models to evaluate subsurface contamination from in-situ retorting. The program consisted of government and industry contracts and employed 45 technical and administrative personnel.
  - Coordinated an industry task force established to investigate the occurrence, causes, and solutions for corrosion/erosion and mechanical/engineering failures in the waterside systems (e.g., condensers, steam generation equipment) of power plants. Corrosion/erosion failures caused by water and steam contamination that were investigated included waterside corrosion caused by poor microbiological treatment of cooling water, steam-side corrosion caused by ammonia-oxygen attack of copper alloys, stress-corrosion cracking of copper alloys in the air cooling sections of condensers, tube sheet leaks, oxygen in-leakage through condensers, volatilization of silica in boilers and carry over and deposition on turbine blades, and iron corrosion on boiler tube walls. Mechanical/engineering failures investigated

included: steam impingement attack on the steam side of condenser tubes, tube-to-tube-sheet joint leakage, flow-induced vibration, structural design problems, and mechanical failures due to stresses induced by shutdown, startup and cycling duty, among others. Worked with electric utility plant owners/operators, condenser and boiler vendors, and architect/engineers to collect data to document the occurrence of and causes for these problems, prepared reports summarizing the investigations, and presented the results and participated on a committee of industry experts tasked with identifying solutions to prevent condenser failures.

- Evaluated the cost effectiveness and technical feasibility of using dry cooling and parallel dry-wet cooling to reduce water demands of several large natural-gas fired power plants in California and Arizona.
- Designed and prepared cost estimates for several dry cooling systems (e.g., fin fan heat exchangers) used in chemical plants and refineries.
- Designed, evaluated, and costed several zero liquid discharge systems for power plants.
- Evaluated the impact of agricultural and mining practices on surface water quality of Central Valley streams. Represented municipal water agencies on several federal and state advisory committees tasked with gathering and assessing relevant technical information, developing work plans, and providing oversight of technical work to investigate toxicity issues in the watershed.

*AIR QUALITY/PUBLIC HEALTH*

- Prepared or reviewed the air quality and public health sections of hundreds of EIRs and EISs on a wide range of industrial, commercial and residential projects.
- Prepared or reviewed hundreds of NSR and PSD permits for a wide range of industrial facilities.
- Designed, implemented, and directed a 2-year-long community air quality monitoring program to assure that residents downwind of a petroleum-contaminated site were not impacted during remediation of petroleum-contaminated soils. The program included real-time monitoring of particulates, diesel exhaust, and BTEX and time integrated monitoring for over 100 chemicals.
- Designed, implemented, and directed a 5-year long source, industrial hygiene, and ambient monitoring program to characterize air emissions, employee exposure, and downwind environmental impacts of a first-generation shale oil plant. The program included stack monitoring of heaters, boilers, incinerators, sulfur recovery units, rock crushers, API separator vents, and wastewater pond fugitives for arsenic, cadmium, chlorine, chromium, mercury, 15 organic indicators (e.g., quinoline, pyrrole, benzo(a)pyrene, thiophene, benzene), sulfur gases, hydrogen cyanide, and ammonia. In many cases, new methods had to be

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developed or existing methods modified to accommodate the complex matrices of shale plant gases.

- Conducted investigations on the impact of diesel exhaust from truck traffic from a wide range of facilities including mines, large retail centers, light industrial uses, and sports facilities. Conducted traffic surveys, continuously monitored diesel exhaust using an aethalometer, and prepared health risk assessments using resulting data.
- Conducted indoor air quality investigations to assess exposure to natural gas leaks, pesticides, molds and fungi, soil gas from subsurface contamination, and outgassing of carpets, drapes, furniture and construction materials. Prepared health risk assessments using collected data.
- Prepared health risk assessments, emission inventories, air quality analyses, and assisted in the permitting of over 70 1 to 2 MW emergency diesel generators.
- Prepare over 100 health risk assessments, endangerment assessments, and other health-based studies for a wide range of industrial facilities.
- Developed methods to monitor trace elements in gas streams, including a continuous real-time monitor based on the Zeeman atomic absorption spectrometer, to continuously measure mercury and other elements.
- Performed nuisance investigations (odor, noise, dust, smoke, indoor air quality, soil contamination) for businesses, industrial facilities, and residences located proximate to and downwind of pollution sources.

**PUBLICATIONS AND PRESENTATIONS (Partial List - Representative Publications)**

J.P. Fox, T.P. Rose, and T.L. Sawyer, *Isotope Hydrology of a Spring-fed Waterfall in Fractured Volcanic Rock*, 2007.

C.E. Lambert, E.D. Winegar, and Phyllis Fox, *Ambient and Human Sources of Hydrogen Sulfide: An Explosive Topic*, Air & Waste Management Association, June 2000, Salt Lake City, UT.

San Luis Obispo County Air Pollution Control District and San Luis Obispo County Public Health Department, *Community Monitoring Program*, February 8, 1999.

The Bay Institute, *From the Sierra to the Sea. The Ecological History of the San Francisco Bay-Delta Watershed*, 1998.

J. Phyllis Fox, *Well Interference Effects of HDPP's Proposed Wellfield in the Victor Valley Water District*, Prepared for the California Unions for Reliable Energy (CURE), October 12, 1998.

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J. Phyllis Fox, *Air Quality Impacts of Using CPVC Pipe in Indoor Residential Potable Water Systems*, Report Prepared for California Pipe Trades Council, California Firefighters Association, and other trade associations, August 29, 1998.

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Mineralogical Society of America/Geochemical Society, 11/00.  
Design of Gas Turbine Combined Cycle and Cogeneration Systems, Thermoflow, 12/00  
Air-Cooled Steam Condensers and Dry- and Hybrid-Cooling Towers, Power-Gen, 12/01  
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Power-Gen, 12/01  
CEQA Update, UC Berkeley Extension, 3/02  
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Noise Exposure Assessment: Sampling Strategy and Data Acquisition, AIHA PDC 205, 6/02  
Noise Exposure Measurement Instruments and Techniques, AIHA PDC 302, 6/02  
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**EXHIBIT B**



6/10/2014

Tesoro Gets FTC OK for BP Carson... - Bakken Oil Business Journal

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**Bakken Oil Business Journal**  
May 17, 2013 ·

Tesoro Gets FTC OK for BP Carson Refinery Acquisition  
05/17/2013 at 11:46 AM

Tesoro will be increasing receiving shipments of Bakken crude oil by rail.

Tesoro Corporation said on Friday that the Federal Trade Commission (FTC) has cleared the company's planned acquisition of BP's fully integrated Southern California Refining and Marketing business and that Tesoro intends to close the acquisition during the second quarter, subject to customary closing conditions.

The clearance from the FTC came without any impacts to the assets or operations in the transaction as announced in August of last year.

The purchase price of BP's assets is \$1.075 billion, plus the market value of inventory, currently estimated at \$1.300 billion. This amount includes a \$100 million purchase price reduction for the clearance with regulatory authorities.

Tesoro currently owns and operates 263,000-b/d of refining capacity in the state of California. Upon closing the transaction, Tesoro will begin the process of combining and reconfiguring the two West Coast systems to drive significant operational synergies through the integrated supply of crude oil, optimization of intermediate feedstocks and product distribution costs, improvements in light product yield and reductions in manufacturing costs and stationary source air emissions.

This will include creating one Los Angeles refining complex by combining its existing Los Angeles refinery with the newly acquired and adjoining Carson refinery.

This West Coast system work is expected to result in annual synergies of approximately \$250 million with an additional capital investment of approximately \$225 million.

In addition to the previously announced synergies, the company plans to drive additional value from the crude oil sourcing flexibility expected through the recently announced unit train unloading and marine loading facility at the Port of Vancouver, Wash.

The Carson refinery, originally built to run Alaska North Slope crude oil, is an ideal home for cost-advantaged Bakken crude oil from Eastern Montana and North Dakota.

The Port of Vancouver logistics project, combined with the marine terminal facilities at Carson, is expected to drive an additional advantage for the combined Tesoro Los Angeles refining complex, Tesoro said.

The transaction includes about 800 dealer operated retail stations in Southern California, Nevada and Arizona, the ARCO brand and associated registered trademarks, and a master franchisee license for the ampm convenience store brand.

The addition of these retail stations to Tesoro's existing retail network will result in a total Southern California station count of about 1,350 retail stations, ensuring ratable off-take for the combined refinery complex gasoline production.

This transaction is expected to drive the company's refining and marketing integration, a focus for Tesoro, to about 83%, a five percentage point improvement relative to today.

The transaction also includes two complementary assets which are located near the Carson refinery.

The first is a 51% ownership in the 400 megawatt gas supplied Watson cogeneration (cogen) facility. This company-operated cogen, the largest in California, provides reliable electricity to the Carson refinery and sells excess electricity to the local utility grid. Post integration, the company expects the Watson cogen to provide electricity to Tesoro's Wilmington refinery, driving additional operational availability.

The second is a 350,000 metric ton per year anode coke calcining operation. This asset upgrades coke from the Carson refinery into calcined anode-grade coke for the aluminum industry. These assets are expected to provide additional cash flow and drive earnings diversification for Tesoro.

Tesoro and Tesoro Logistics LP (TLLP) have reached an agreement for TLLP to

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6/10/2014

Tesoro Gets FTC OK for BP Carson... - Bakken Oil Business Journal

acquire a portion of the Carson logistics assets from Tesoro for an expected transaction value of approximately \$640 million. Closing of the logistics transaction is expected to occur concurrent with the BP transaction close.

These assets, with expected annual logistics EBITDA of between \$60 to \$65 million, include six marketing and storage terminal facilities with a total combined throughput capacity of about 225,000 b/d and approximately 6.4 million barrels of total storage capacity including 4.5 million barrels which is dedicated commercial storage capacity.

The transaction price is expected to include cash of \$544 million and Tesoro Logistics equity valued at \$96 million.

The company expects to enter into terminalling and throughput agreements with minimum volume commitments, consistent with prior transactions. The remaining Carson logistics assets, consisting of dedicated storage capacity, pipelines and marine terminals, are expected to be offered to TLLP within twelve months post-closing, and have an expected market value of between \$450 and \$550 million.

The company expects to fund the estimated \$2.375 billion transaction with between \$500 and \$750 million of cash, \$500 million in term loan borrowings and nearly \$550 million of cash proceeds from the acquisition of logistics assets by TLLP.

The remainder of required funds is expected to be sourced with borrowings under Tesoro Corporation's revolving credit facility, which was recently expanded to \$3.0 billion.

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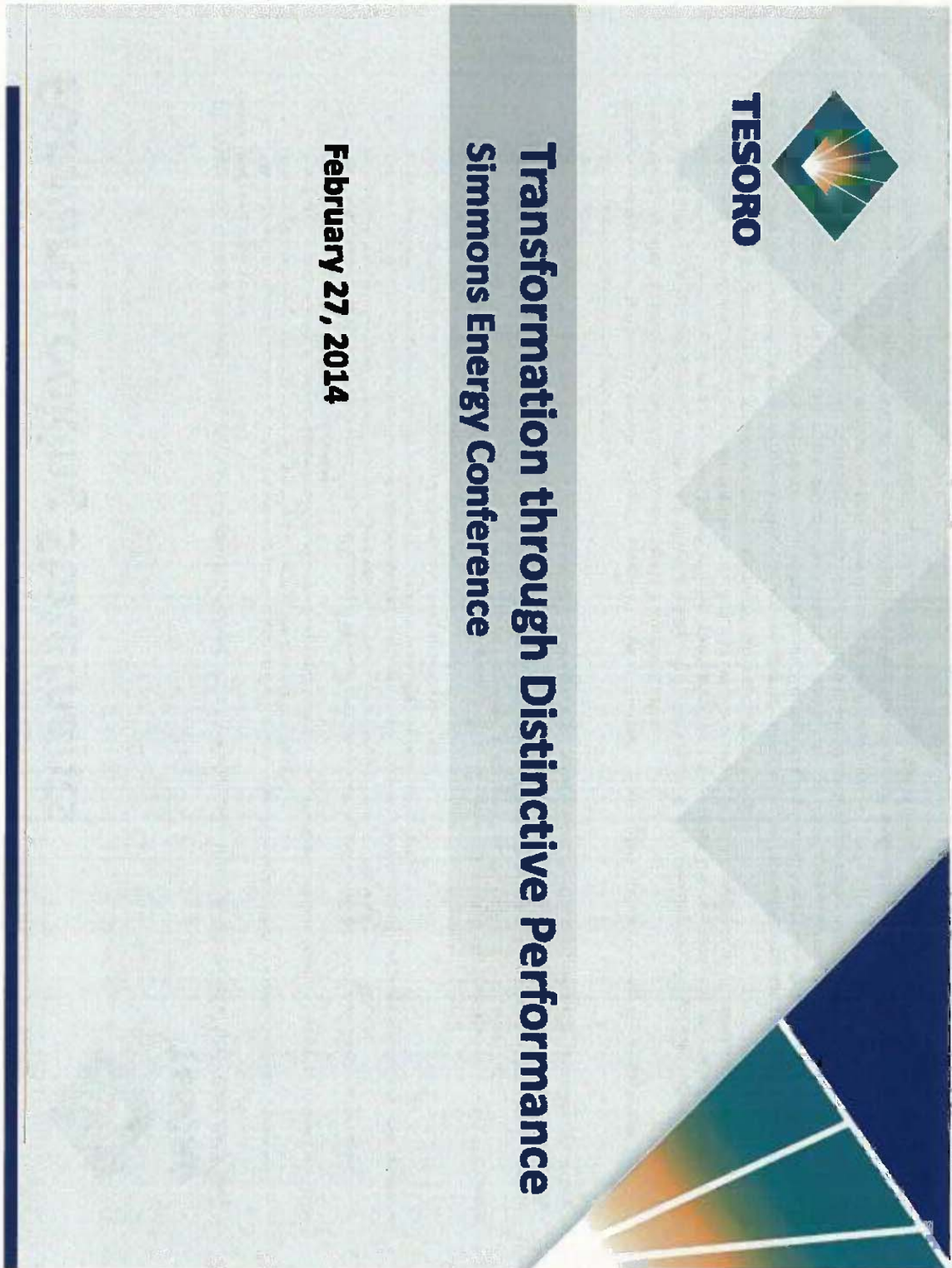
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**EXHIBIT C**





# Forward Looking Statements



**TESORO**

This Presentation includes forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements relate to, among other things:

- The execution and effects of our strategic priorities, including achieving improvements in operational efficiency and effectiveness including safety performance, developing commercial excellence, and maintaining financial discipline and a high performing culture;
  - The market outlook, including expectations regarding crude oil production growth, feedstock costs, differentials, spreads, import and export opportunities, the Tesoro In-Case and the anticipated costs of crude movements;
  - The timing, value and type of expected synergies from our acquisition of BP's Southern California refining and marketing business in June 2013 and the capital expenditures needed to realize such synergies, as well as our California emissions and the impact of the California regulatory environment;
  - Tesoro's competitive position and competitive advantages, including its advantageous feedstock position, the costs, benefits and timing of projects designed to enhance gross margin capture, earnings diversification and market optimization through brand expansion and growth;
  - West Coast logistics development, transportation advantages and refining system opportunities;
  - The timing and results of Tesoro's disciplined improvement program;
  - The results of Tesoro's logistics growth strategy, including plans for Tesoro Logistics LP ("TLLP"), the potential value of possible future asset sales to TLLP, TLLP's organic growth opportunities, the value to Tesoro of distributions from TLLP, the implied enterprise value of TLLP and the value of Tesoro's stake in TLLP;
  - Maintenance of Tesoro's financial priorities, including balance sheet strength, Tesoro's target debt capitalization, and TLLP's target debt to EBITDA level;
  - Capital expenditures, turnaround spending, and the cost, timing and return on capital projects, including expectations regarding incremental EBITDA improvements; expectations regarding free cash flow, the implementation of Tesoro's cash strategy and the return of excess cash flow to shareholders through dividends and share repurchases; and
  - Growth opportunities for both Tesoro and TLLP.
- We have used the words "anticipate", "believe", "could", "estimate", "expect", "intend", "may", "plan", "predict", "project", "should", "will" and similar terms and phrases to identify forward-looking statements in this Presentation.
- Although we believe the assumptions upon which these forward-looking statements are based are reasonable, any of these assumptions could prove to be inaccurate and the forward-looking statements based on these assumptions could be incorrect. Our operations and anticipated transactions involve risks and uncertainties, many of which are outside our control, and any one of which, or a combination of which, could materially affect our results of operations and whether the forward-looking statements ultimately prove to be correct.
- Actual results and trends in the future may differ materially from those suggested or implied by the forward-looking statements depending on a variety of factors which are described in greater detail in our filings with the SEC. All future written and oral forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by the previous statements. We undertake no obligation to update any information contained herein or to publicly release the results of any revisions to any forward-looking statements that may be made to reflect events or circumstances that occur, or that we become aware of, after the date of this Presentation.
- We have included various estimates of EBITDA and free cash flow, each of which are non-GAAP financial measures, throughout the presentation. Please see Appendix for the definition and reconciliation of these EBITDA and free cash flow estimates.



# Tesoro

Key Metrics	2010	2013
Enterprise Value (\$ billions)	3.5	10.5
Market Cap (\$ billions)	2.0	7.7
Refining Capacity (MBD)	665	850
Refining Complexity	9.8	11.5
Branded Retail Stations	880	2,264
Marketing Integration (%)	53	87
Employees	5,300	7,000
Retail Sales (4Q13 MBD)	87	266

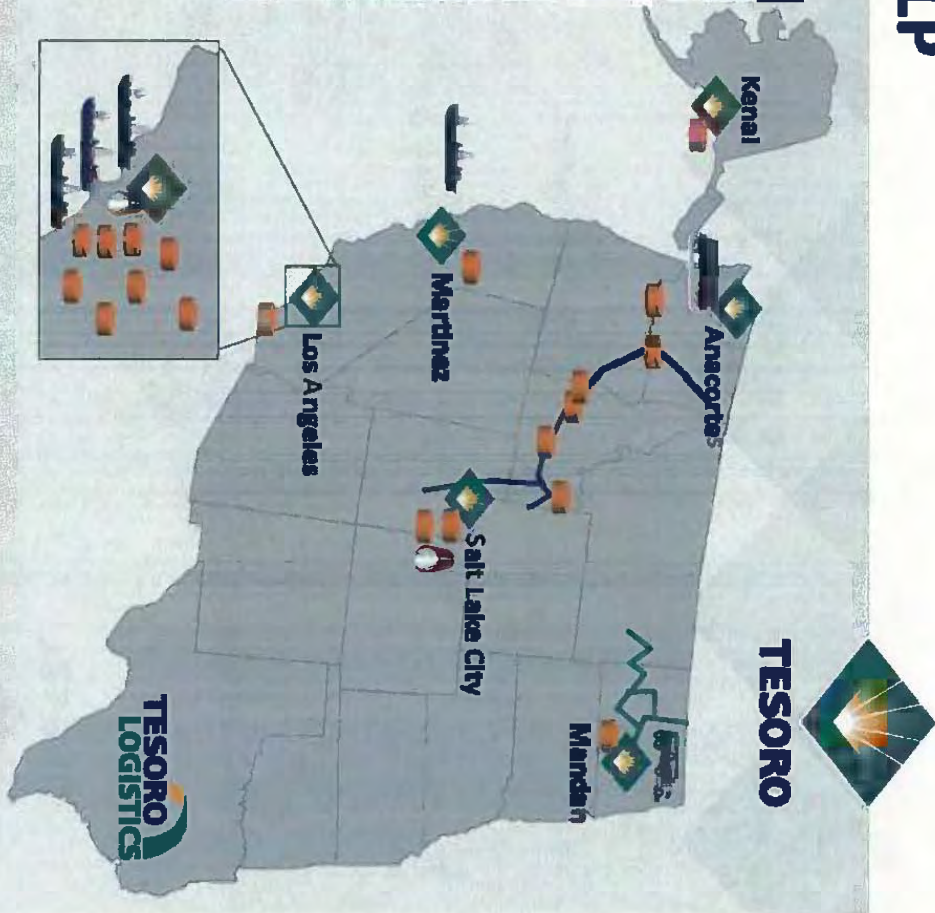
As of 3/31/10 and 12/31/2013



# Tesoro Logistics LP

	Key Metrics
Enterprise Value (\$ billions)	4.0
Market Cap (\$ billions)	2.9
Crude Oil and Refined Product Pipelines	1,570 miles
High Plains Pipeline Throughput	90+ MBD
High Plains Trucking Volume	45 MBD
Marketing Terminal Capacity	636 MBD
Marine Terminal Capacity	795 MBD
Rail Terminal Capacity	50 MBD
Dedicated Storage Capacity	7,700 MBBLS

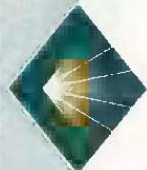
As of 12/31/2013



TLLP growing rapidly into a premier Western US logistics provider



# Market Outlook - Overview



**TESORO**

Key Drivers	Tesoro's View
Global Economic Outlook	Moderate growth
U.S. Economic Outlook	2 – 2.5% GDP growth
Global Refining Capacity	Capacity exceeds demand
U.S. Refining Utilization	High due to low feedstock and natural gas prices
U.S. Crude Oil Supply	Strong growth in North American crude oil production
World Product Demand Growth	Gasoline ~1%; diesel ~2% per year
U.S. Product Demand Growth	Gasoline flat; diesel ~1% per year
U.S. Product Exports	Strong and growing supported by U.S. competitive position
Renewable Fuel Growth	Delays in development of advanced fuels
Regulatory Environment	Challenges and uncertainty

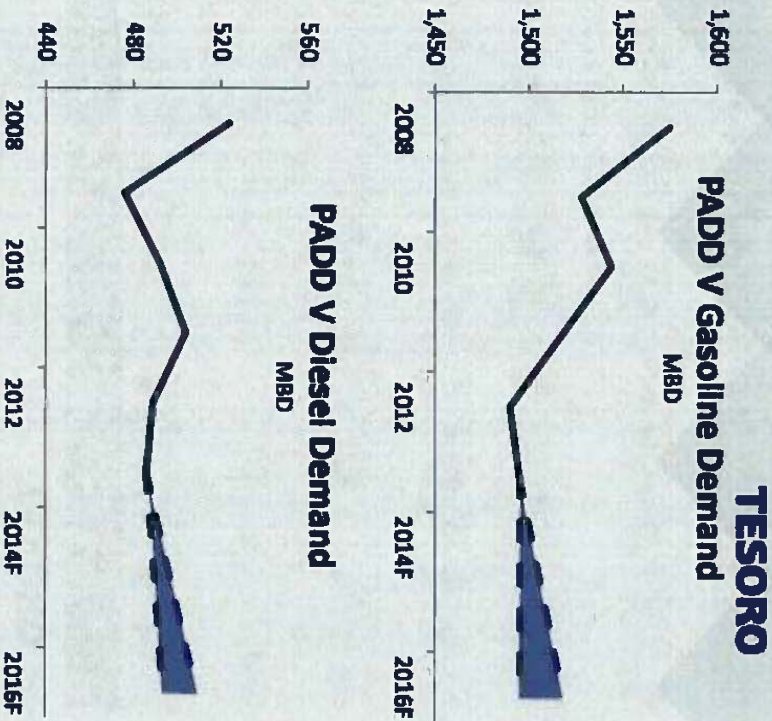
Source: Internal Tesoro estimates.



# PADD V Fundamentals



- Gasoline demand expected to grow 0 to 0.5% annually through 2016
- Diesel demand expected to grow 1.0% annually
- Net clean product exports expected to remain 100-150 MBD
- California unemployment 8.7%, down from over 10% last year
- Tesoro's gasoline refining production is highly integrated with marketing



West Coast economy improved and demand stabilizing

Source: EIA monthly data, forecast based on Internal Tesoro forecasts.

## Keys to Distinction on the West Coast



**TESORO**

- **Operating cost advantage**
- **Flexible yield structure**
- **Access to cost-advantaged crude oil**
- **Integrated logistics infrastructure**
- **Secure and ratable refinery off-take**
- **Cost-advantaged regulatory compliance**



Los Angeles acquisition transforms our capabilities

# Strategic Priorities



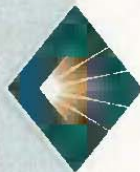
- Operational efficiency and effectiveness
  - Safety and reliability
  - Cost leadership
  - System improvements
- Commercial excellence
- Financial discipline
- Value-driven growth
- High performing culture



Enduring commitment to execution



## Execution of Strategic Priorities



**TESORO**

### **Distinctive Performance: 2014 and 2015**

- **Deliver California synergies**
- **Enhance gross margin**
- **Improve the base**
- **Grow logistics**
- **Maintain financial discipline**

**Targeting \$370 to \$430 million of EBITDA improvements in 2014**

# Distinctive Performance Objectives



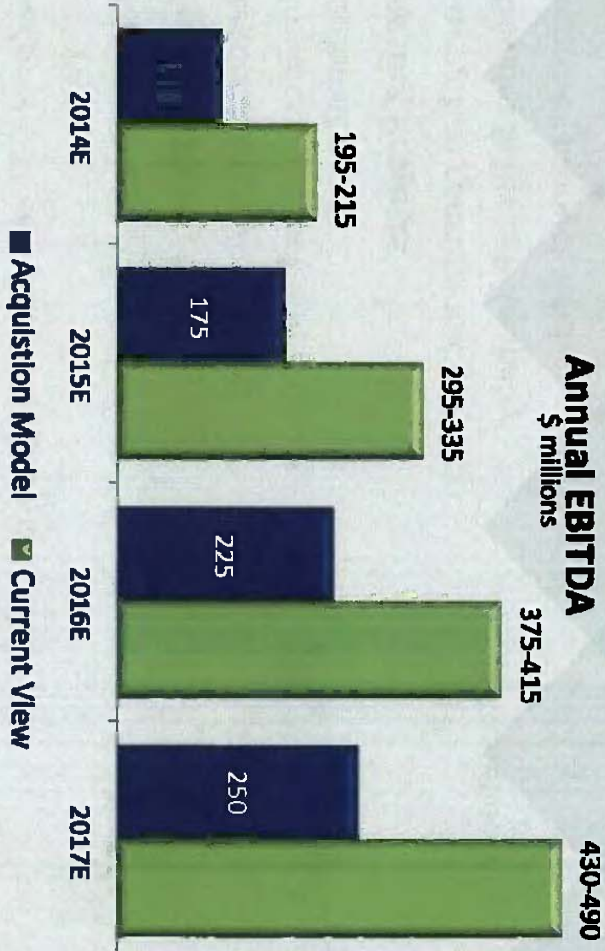
- Distinctive Performance Objectives

\$ million	2014	2015
Deliver California Synergies	160 – 180	260 – 300
Enhance gross margin	140 – 160	250 – 290
Improve the base	70 – 90	80 – 120
<b>Annual EBITDA Improvement<sup>1</sup></b>	<b>370 – 430</b>	<b>590 – 710</b>

- Grow Logistics
  - Grow EBITDA by \$200 million by 2015
  - Deliver incremental Tesoro shareholder value of \$1 billion
- Maintain financial discipline
  - Maintain balance sheet strength, drive toward investment grade
  - Invest free cash flow in high-return capital projects
  - Return excess cash to shareholders

<sup>1</sup>) Improvements over 2013 results.

# California Synergy EBITDA



- Feedstock Advantage
- Logistics Optimization
- Production Optimization
- Operating Cost Improvements

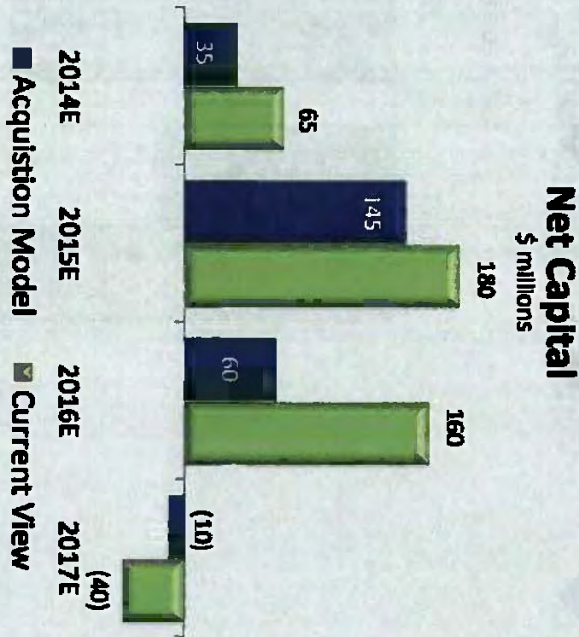
Synergy value and pace of capture significantly improved



# California Synergy Capital Expenditures



- **Los Angeles Refinery Integration Project**
  - Optimizes processing capability
  - Provides 30-40 MBD product flexibility
  - Reduces CO2 emission 500,000 tons per year
- **Logistics Projects**
  - Link logistics assets
  - Reduce third party fees
  - Provides feedstock and product optionality
- **Processing Projects**
  - Strengthen conversion capability
  - Provides feedstock flexibility
  - Improves product yields



**Disciplined delivery of high return capital investments**

Note: Net synergy capital of ~\$375 MM (including savings beyond 2017, which are reflected in 2017E), capital plan net of capital avoidance, 2017. emissions estimate is subject to final project scope and detailed engineering.

# Tesoro's Advantaged Feedstock Opportunity



## Opportunities by Refinery

- **Kenai**
  - Currently up to 25% Cook Inlet
  - Potentially up to 67% Cook Inlet and Bakken
- **Martinez**
  - Currently up to 45% California Heavy and Bakken
  - Potentially up to 67% California Heavy and Bakken
- **Los Angeles**
  - Currently up to 15% California Heavy
  - Potentially up to 50% California Heavy and Bakken

## Potential impact on ANS crude oil

- Competitive pricing
- Relative refining value

Extending the advantaged crude oil to West Coast

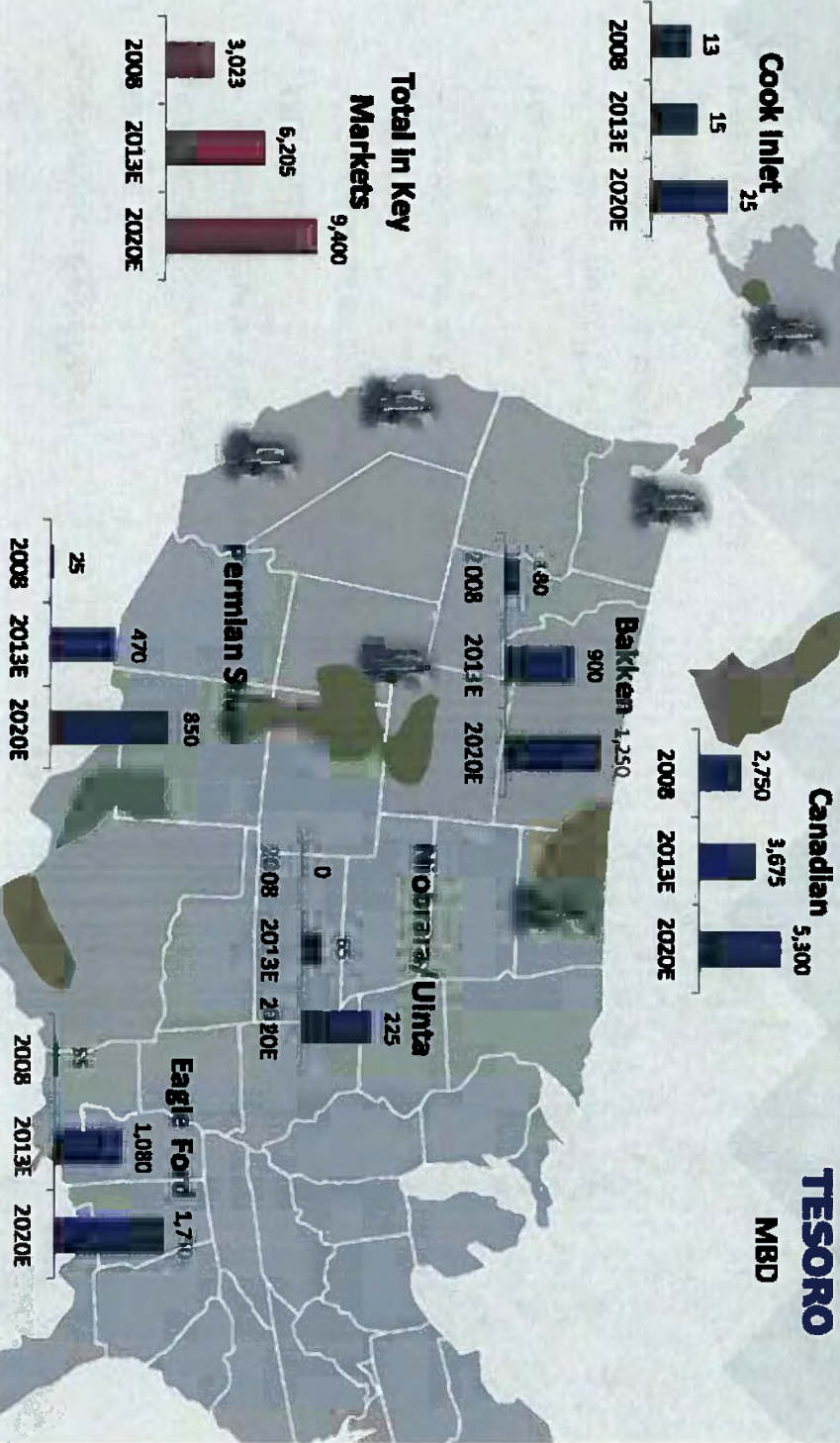




# Crude Oil Production Growth

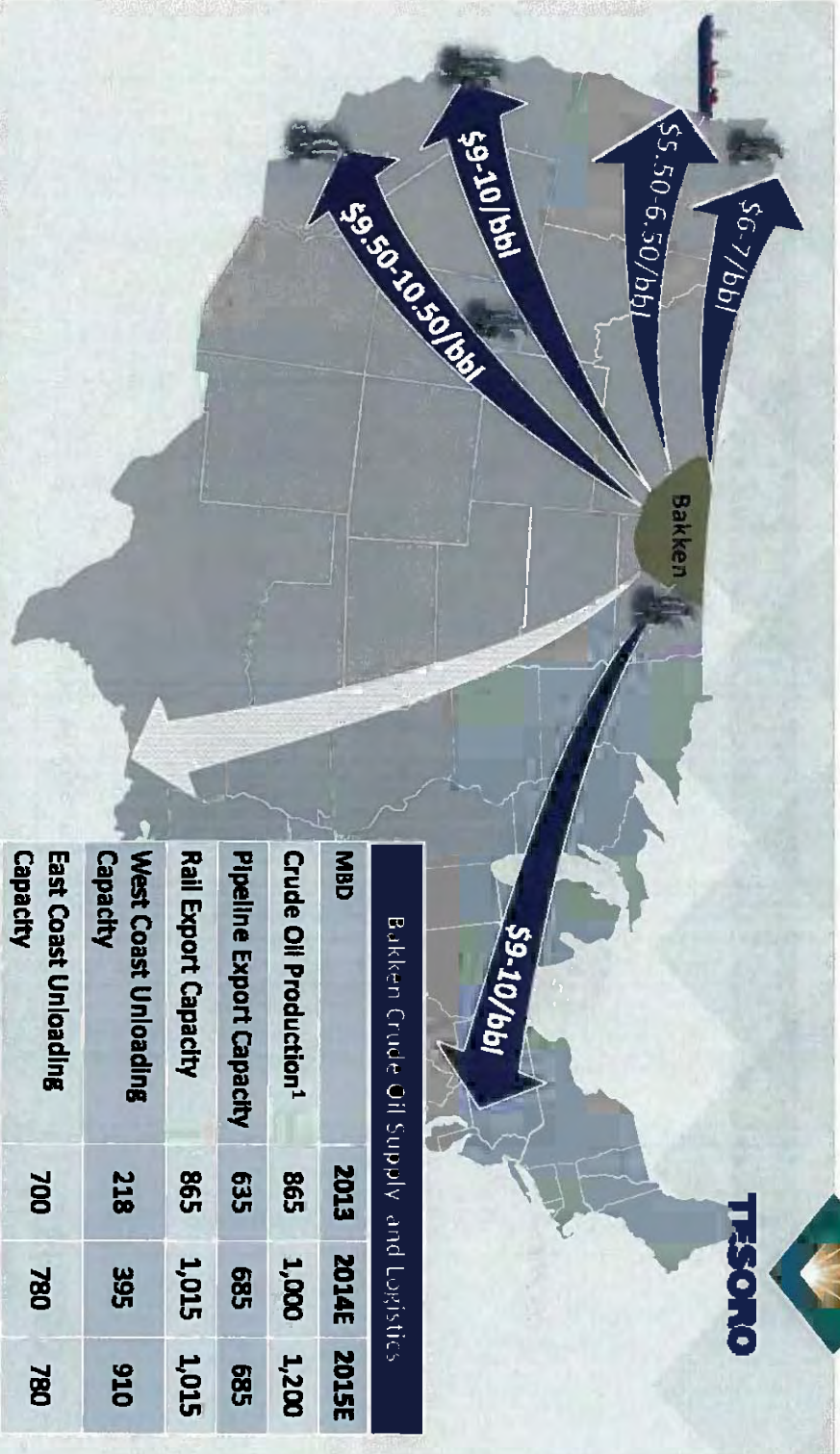
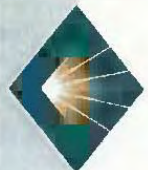


## Key Tesoro Markets



Source: 2008 EIA and Canadian NEB, 2013E and 2020E estimates based on independent consultants/TSO Analysis.

# Rail Costs to Clear Bakken



Bakken Crude Oil Supply and Logistics			
MBD	2013	2014E	2015E
Crude Oil Production <sup>1</sup>	865	1,000	1,200
Pipeline Export Capacity	635	685	685
Rail Export Capacity	865	1,015	1,015
West Coast Unloading Capacity	218	395	910
East Coast Unloading Capacity	700	780	780

## West and East Coasts clearing destinations for Bakken crude oil

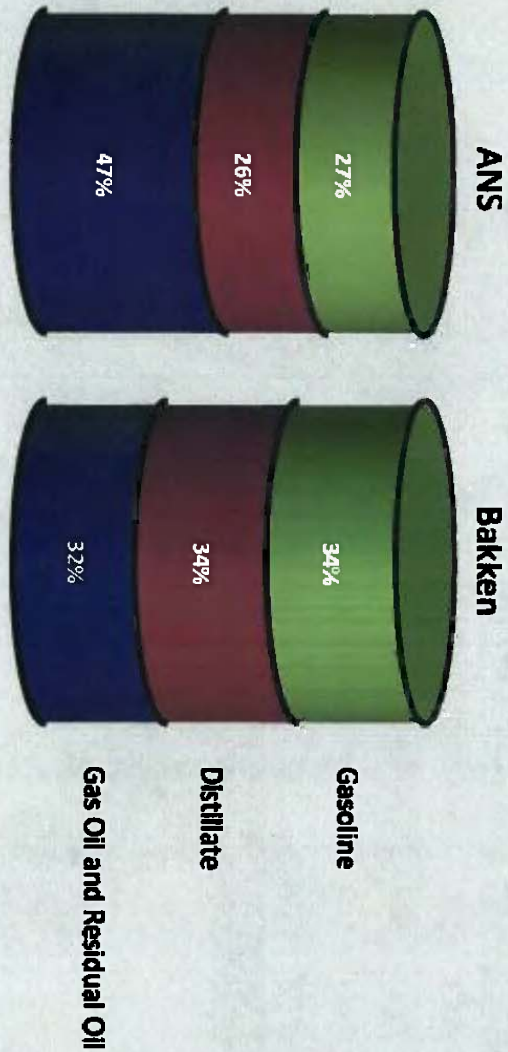
Note: Rail cost estimates include only the railroad tariff.  
 1) Average annual crude oil production, export capacity and price discount estimates based on industry consultant and Tesoro market outlook.



# Anacortes Yield Comparison



## Crude Oil Yields



Bakken crude oil yields 14% to 16% more gasoline and distillate than ANS

# Port of Vancouver

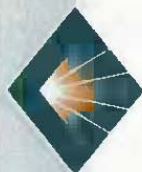
- Up to 300 MBD Rail-to-Marine Terminal
  - Joint venture with Savage Companies
- Port of Vancouver advantages
  - Flexibility to deliver to all West Coast refineries
  - Competitive with direct rail cost to California
  - Existing rail and marine infrastructure
- Port of Vancouver granted lease 3Q13



	Completed Facility
Capacity	Up to 300 MBD
Estimated Completion	4Q14 – 4Q15
Tesoro Initial Committed Capacity	60 MBD

A premier advantaged crude oil facility for the West Coast

# West Coast Refining System Opportunity



Advantage crude oil strategy enhances realized margins

1) WTI crude oil includes all grades of N. American crude oil other than those stated in other categories.



# Marketing Brands

- Deploy a premium and value branding strategy within each region
- New brands allow for site optimization and conversion
- Leverage Shell<sup>®</sup>, Exxon<sup>®</sup> and Mobil<sup>®</sup> premium brand value to improve marketing channels
- Leverage ARCO<sup>®</sup>, Tesoro and USA value brand proposition to drive high utilization



Emphasis on growing ARCO<sup>®</sup>, Shell<sup>®</sup>, Exxon<sup>®</sup> and Mobil<sup>®</sup> outlets

# Solomon Based Cost Reductions

## Total Operating Expense Gap (Non-energy)<sup>1</sup>

\$/M1	2010	2011	2012
California	1.70	1.10	0.85
Pacific Northwest	NA	0.05	0.30
Mid-Continent	0.30	0.15	1.10
<b>Weighted Average</b>	<b>1.15</b>	<b>0.55</b>	<b>0.75</b>



- Captured cost improvements in California, opportunities remain
- Mid-Continent performance reflects increased spending to strengthen long-term reliability
- Maintenance, personnel efficiency and improved reliability driving per barrel operating cost improvement

Targeting first tercile cost position in California

<sup>1</sup>) Versus Solomon Refinery Supply Corridor (RSC) 3<sup>rd</sup> Tercile, Pacific Northwest adjusted in 2010 and 2011 to exclude the impact of the Anacortes incident.

# TLLP Strategic Drivers



**TESORO**

## Focus on Stable, Fee-Based Business

- Fee-based committed businesses
- Maintain stable cash flow

## Optimize Existing Asset Base

- Increase third-party volumes
- Consolidate Tesoro business into TLLP terminals

## Pursue Organic Expansion Opportunities

- Execute growth projects
- Leverage low cost of capital

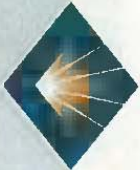
## Grow Through Strategic Acquisitions

- Pursue acquisitions that fit Western-US footprint
- Strategic partner in Tesoro's growth plan

Increase EBITDA and cash distributions through fee-based logistics business model

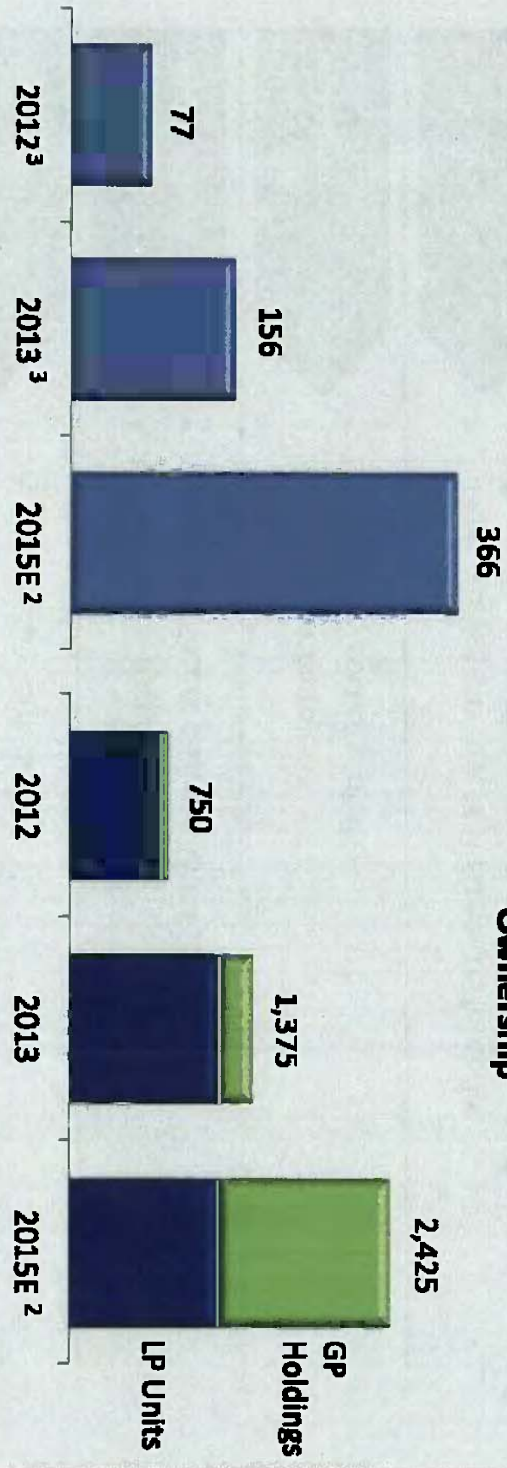


# TLLP Value Proposition to Tesoro



\$ millions

## TLLP EBITDA

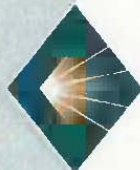


Implied value per Tesoro share	2012	2013	2015E <sup>2</sup>
	\$5.50	\$10.47	\$17.20

**TLLP's growth drives significant Tesoro shareholder value creation**

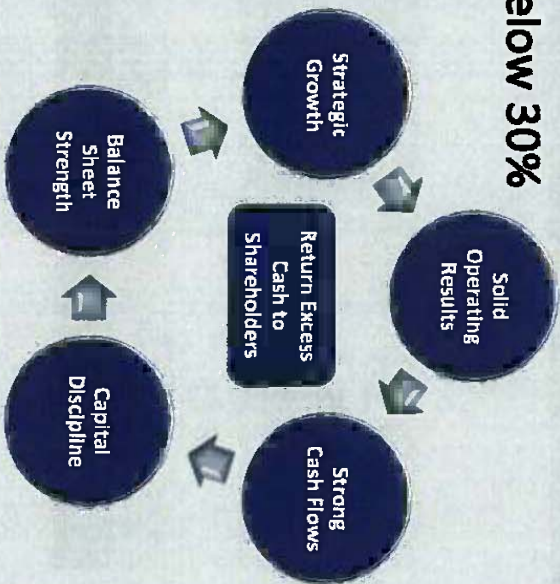
- 1) TSO Market Cap as of 2/19/14, LP value based on market price, GP value based on 20X distributions.
- 2) Estimates based on TLLP first call consensus EBITDA figures as of 12/31/13.
- 3) Adjusted EBITDA, excludes predecessor results

# Financial Priorities



**TESORO**

- Maintain a minimum cash balance of \$600 to \$800 million
- Target TSO debt to capitalization<sup>1</sup> below 30%
- Target TLLP debt at 3x to 4x EBITDA
- Invest in growth opportunities to drive further value creation
- Return excess cash to shareholders
- Drive towards investment-grade credit rating



1) Excluding TLLP debt and equity.

# Appropriate Leverage for Growth



**TESORO**

<i>\$ millions</i>	TSO <sup>1</sup>	TLLP <sup>1</sup>	Consolidated
Total Debt	1,665	1,164	2,829
Total Equity	4,302	1,183 <sup>3</sup>	5,485
Debt to Total Capitalization	28%	50%	34%
Total Debt to EBITDA <sup>2</sup>	0.8x	4.1x	1.4x

**Tesoro leverage in target range less than 8 months after Los Angeles acquisition**

1) As of December 31, 2013  
 2) EBITDA forecast based on latest 2014 consensus analyst research estimates of \$2.0 billion for TSO and \$287 million for TLLP  
 3) Represents non-controlling interest as of December 31, 2013

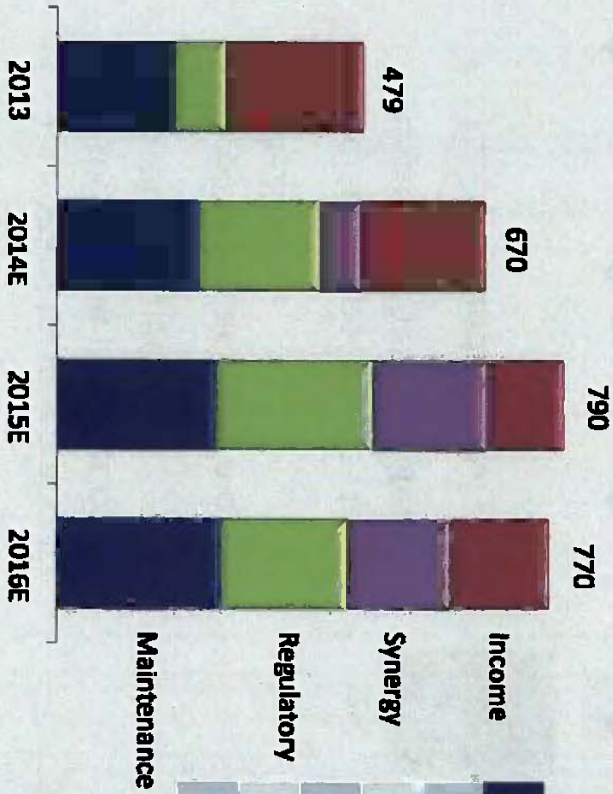


# Summary Capital Spending



## Tesoro Capital Spending<sup>1</sup>

\$ in millions



## Summary Capital Expenditures

\$ millions	2013	2014E	2015E	2016E
Maintenance	182	220	245	255
Regulatory	81	190	245	200
Synergy <sup>2</sup>	0	65	180	160
Income	216	195	120	155
<b>Total</b>	<b>479</b>	<b>670</b>	<b>790</b>	<b>770</b>

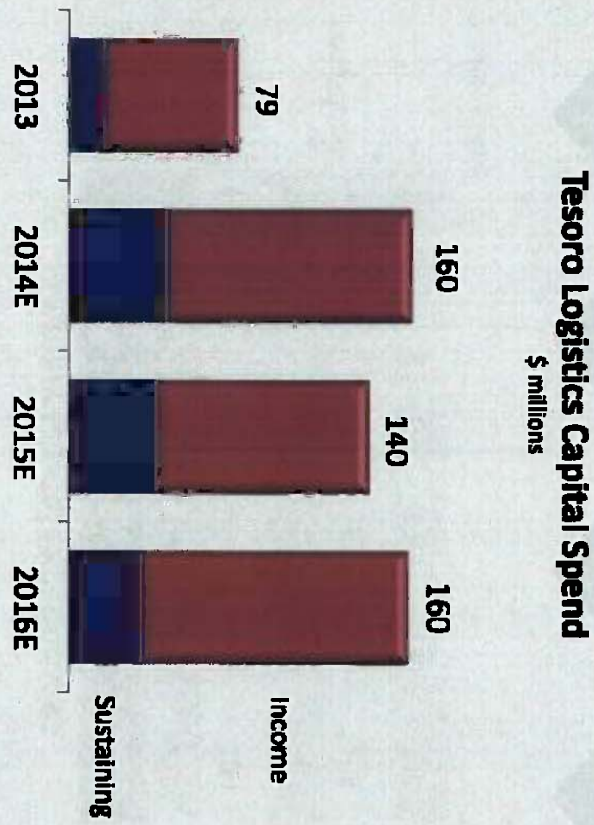
Capital spending plans well supported by strong and growing EBITDA

1) Excludes self-funded TLP capital expenditures. All references to capital spending on this page are estimated.  
 2) Net synergy capital.

# TLLP Capital Spending



- TLLP plans to spend about \$100 million per year on income projects
- Typical project return of 15-25%
- Pursuing opportunities to expand gathering system
- TLLP self funds capital

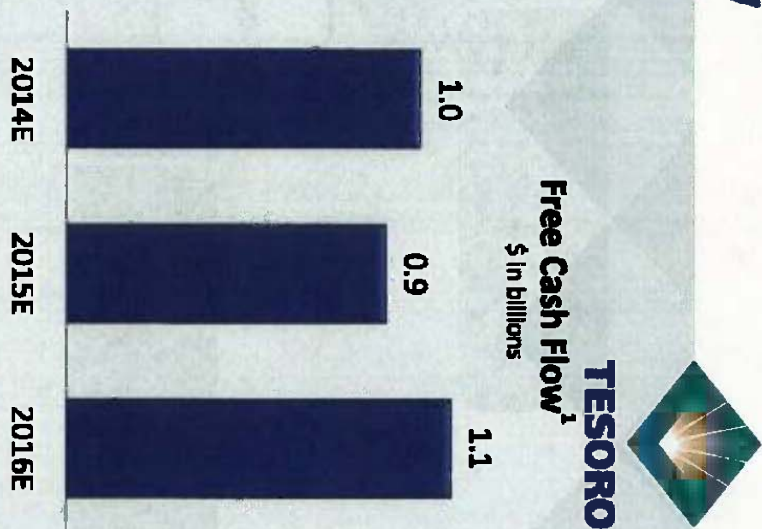


Income capital expected to support significant organic growth

Note: Maintenance and regulatory capital before reimbursements. All references to capital spending on this page are estimated.

# Delivering Free Cash Flow

- Expect to generate approximately \$3.0 billion in free cash flow over next three years
- Before potential \$1.5 billion of further logistics asset sales to TLLP
- Plan to spend less than a third on high-return income capital projects
- Tesoro well positioned for further growth and returning cash to shareholders

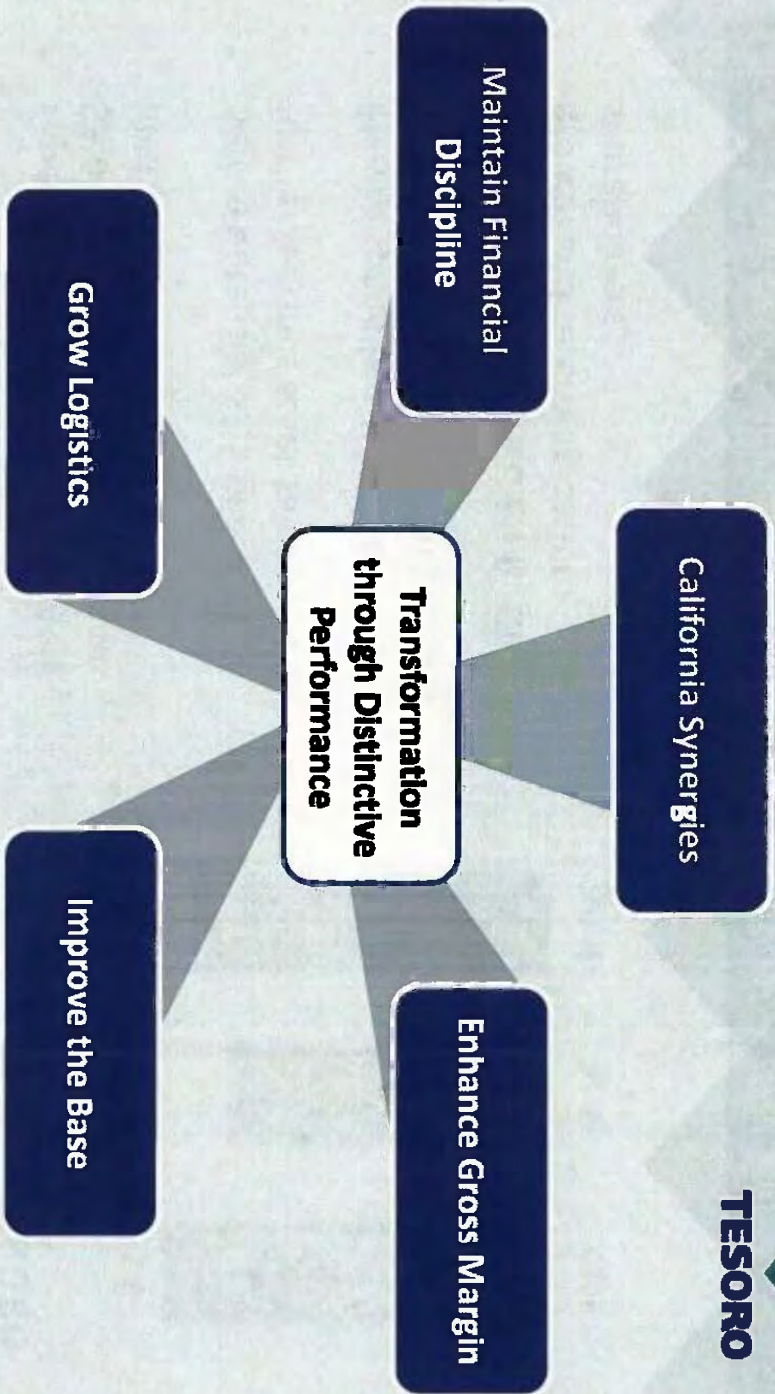


**Strong financial position and significant free cash flow in 2014 and beyond**

(1) Defined as EBITDA less cash interest and taxes, sustaining capital, turnaround spending and TLLP distributions. EBITDA estimates based on consensus analyst research estimates as of November 19, 2013 and incremental improvements in this presentation above base Los Angeles synergies announced at time of acquisition. Interest, taxes, sustaining capital, turnaround spending and TLLP distributions based on Tesoro's 2014 Business Plan.



# Delivering Shareholder Value



# Non-GAAP Financial Measures



EBITDA represents earnings before interest and financing costs, net, interest income, income taxes, and depreciation and amortization expense. We present EBITDA because we believe some investors and analysts use EBITDA to help analyze our cash flows including our ability to satisfy principal and interest obligations with respect to our indebtedness and to use cash for other purposes, including capital expenditures. EBITDA is also used by some investors and analysts to analyze and compare companies on the basis of operating performance and by management for internal analysis. EBITDA should not be considered as an alternative to net earnings, earnings before income taxes, cash flows from operating activities or any other measure of financial performance presented in accordance with accounting principles generally accepted in the United States of America. EBITDA may not be comparable to similarly titled measures used by other entities.

*(In millions) Unaudited*

	California Synovry EBITDA - Acquisition Model		
	2014E	2015E	2017E
Projected net earnings	\$ 67	\$ 104	\$ 133
Add income tax expense	41	63	82
Add depreciation and amortization expense	2	8	10
EBITDA <sup>(1)</sup>	\$ 110	\$ 175	\$ 225

*(In millions) Unaudited*

	California Synovry EBITDA - Current View		
	2014E	2015E	2017E
Projected net earnings	\$ 127	\$ 193	\$ 239
Add income tax expense	75	113	141
Add depreciation and amortization expense	3	9	15
EBITDA <sup>(1)</sup>	\$ 205	\$ 315	\$ 395

(1) When a range of estimated EBITDA has been disclosed and/or previously disclosed, we have included the EBITDA reconciliation for the mid-point range.



# Non-GAAP Financial Measures



*(In millions) Unaudited*

	Gross Margin Capture Improvements EBITDA	
	2014E	2015E
Projected net earnings	\$ 88 \$	163
Add Income tax expense	51	96
Add depreciation and amortization expense	11	11
<b>EBITDA <sup>(1)</sup></b>	<b>\$ 150 \$</b>	<b>270</b>

*(In millions) Unaudited*

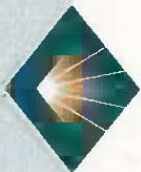
	Improve the Base EBITDA	
	2014E	2015E
Projected net earnings	\$ 50 \$	63
Add Income tax expense	30	37
Add depreciation and amortization expense	0	0
<b>EBITDA <sup>(1)</sup></b>	<b>\$ 80 \$</b>	<b>100</b>

*(In millions) Unaudited*

	Free Cash Flow Reconciliation		
	2014E	2015E	2016E
Net Cash Flow from Operating Activities	\$ 1.5 \$	1.5 \$	1.8
Less Sustaining Capital	0.4	0.5	0.5
Less TLP Distributors	0.1	0.1	0.2
<b>Free Cash Flow</b>	<b>\$ 1.0 \$</b>	<b>0.9 \$</b>	<b>1.1</b>

(1) When a range of estimated EBITDA has been disclosed and/or previously disclosed, we have included the EBITDA reconciliation for the mid-point range.  
 (2) TLP EBITDA is not representative of Tesoro consolidated EBITDA as intercompany transactions between TLP and Tesoro are eliminated upon consolidation.

# Non-GAAP Financial Measures



**TESORO**

*(In millions) Unaudited*

TLP EBITDA December 31, 2012 <sup>(1)</sup>			
	Tesoro Logistics LP (Partnership)	Predecessor	Total Tesoro Logistics LP
Net earnings	\$ 57	\$ (1)	\$ 56
Add interest and financing costs, net	9	0	9
Add depreciation and amortization expense	11	2	13
EBITDA	\$ 77	\$ 1	\$ 78

*(In millions) Unaudited*

TLP EBITDA December 31, 2013 <sup>(1)</sup>			
	Tesoro Logistics LP (Partnership)	Predecessor	Total Tesoro Logistics LP
Net earnings	\$ 80	\$ (36)	\$ 42
Add interest and financing costs, net	40	-	40
Add depreciation and amortization expense	37	6	43
Less interest income	(3)	-	(3)
EBITDA	\$ 156	\$ (32)	\$ 124

*(In millions) Unaudited*

TLP Projected EBITDA <sup>(1)</sup>	
	2015E
Net earnings	\$ 215
Add interest and financing costs, net	75
Add depreciation and amortization expense	76
EBITDA	\$ 366

(1) When a range of estimated EBITDA has been disclosed and/or previously disclosed, we have included the EBITDA reconciliation for the mid-point range.  
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EXHIBIT D

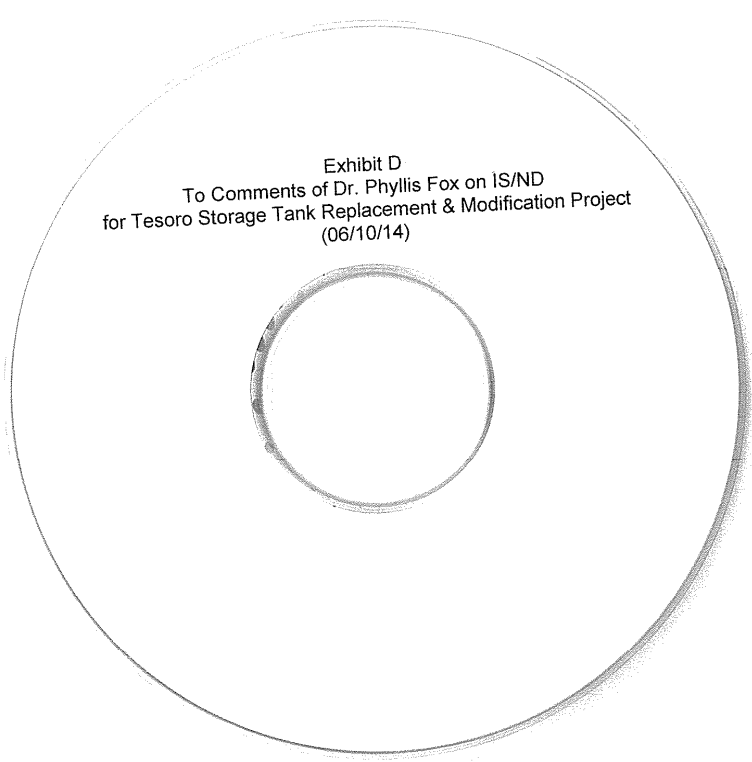
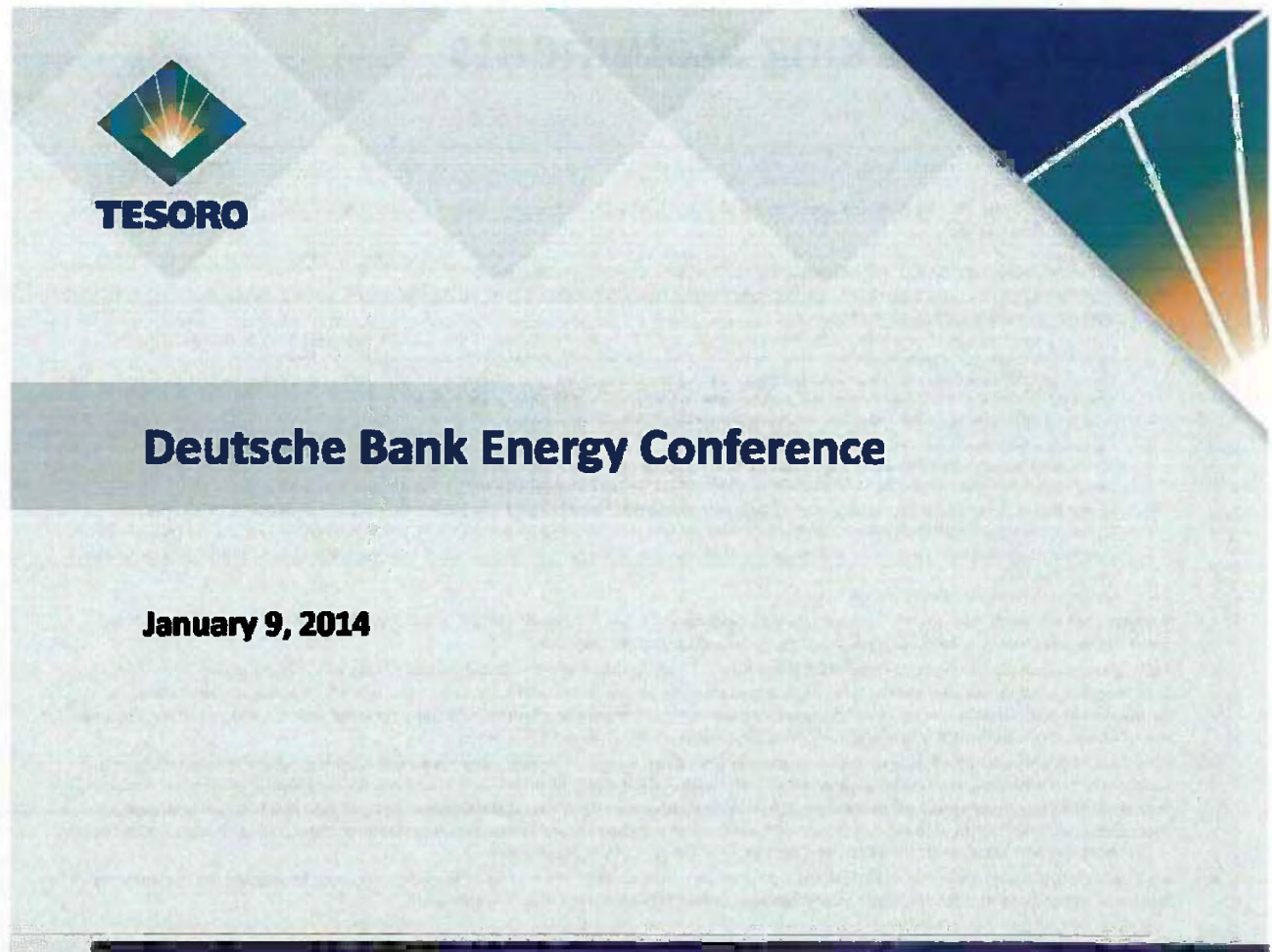


Exhibit D  
To Comments of Dr. Phyllis Fox on IS/ND  
for Tesoro Storage Tank Replacement & Modification Project  
(06/10/14)

**EXHIBIT E**









## Forward Looking Statements



- This Presentation includes forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements relate to, among other things:
  - The execution and effects of our strategic priorities, including achieving improvements in operational efficiency and effectiveness including safety performance, developing commercial excellence, and maintaining financial discipline and a high performing culture;
  - The market outlook, including expectations regarding crude oil production growth, feedstock costs, differentials, spreads, import and export opportunities, the Tesoro Index and the anticipated costs of crude movements;
  - The timing, value and type of expected synergies from our acquisition of BP's Southern California refining and marketing business in June 2013 and the capital expenditures needed to realize such synergies, as well as our California emissions and the impact of the California regulatory environment;
  - Tesoro's competitive position and competitive advantages, including its advantaged feedstock position, the costs, benefits and timing of projects designed to enhance gross margin capture, earnings diversification and marketing optimization through brand expansion and growth;
  - West Coast logistics development, transportation advantages and refining system opportunities;
  - The timing and results of Tesoro's disciplined improvement program;
  - The results of Tesoro's logistics growth strategy, including plans for Tesoro Logistics LP ("TLLP"), the potential value of possible future asset sales to TLLP, TLLP's organic growth opportunities, the value to Tesoro of distributions from TLLP, the implied enterprise value of TLLP and the value of Tesoro's stake in TLLP;
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## Strategic Priorities



**TESORO**

- **Operational efficiency and effectiveness**
  - Safety and reliability
  - Cost leadership
  - System improvements
- **Commercial excellence**
- **Financial discipline**
- **Value-driven growth**
- **High performing culture**



**Enduring commitment to execution**



## 2011 – 2013 Transformation



- Salt Lake waxy crude oil and capacity/yield project
- Mandan capacity and yield projects



- Transformational Los Angeles acquisition, creating world scale refining complex
- Sale of Hawaii business



- Increased supply of advantaged crude oil
- Anacortes unloading facility



- Added ARCO®, Exxon® and Mobil® brands



- \$2 billion of asset proceeds from TLLP
- Acquisition of Northwest Products System

**Strong foundation, positioned for significant value creation**

# Tesoro

Key Metrics	2010	2013
Enterprise Value (\$ billions)	3.5	10.5
Market Cap (\$ billions)	2.0	7.8
Refining Capacity (MBD)	665	850
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Employees	5,300	7,100
Retail Sales (3Q13 MBD)	87	270

As of 3/31/10 and 11/30/2013





## Performance Objectives



- **Deliver California synergies**
- **Enhance gross margin**
- **Improve the base**
- **Grow logistics**
- **Maintain financial discipline**

**Transformation through Distinctive Performance**

## Market Outlook - Overview



Key Drivers	Tesoro's View
Global Economic Outlook	Moderate growth
U.S. Economic Outlook	2 – 2.5% GDP growth
Global Refining Capacity	Capacity exceeds demand
U.S. Refining Utilization	High due to low feedstock and natural gas prices
U.S. Crude Oil Supply	Strong growth in North American crude oil production
World Product Demand Growth	Gasoline ~1%; diesel ~2% per year
U.S. Product Demand Growth	Gasoline flat; diesel ~1% per year
U.S. Product Exports	Strong and growing supported by U.S. competitive position
Renewable Fuel Growth	Delays in development of advanced fuels
Regulatory Environment	Challenges and uncertainty

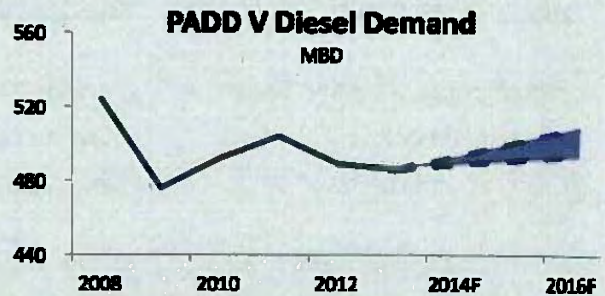
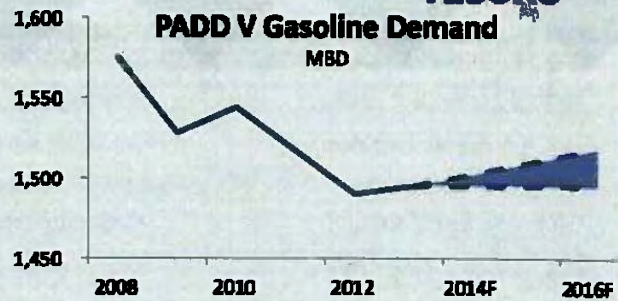
Source: Internal Tesoro estimates.



## PADD V Fundamentals



- Gasoline demand expected to grow 0 to 0.5% annually through 2016
- Diesel demand expected to grow 1.0% annually
- Net clean product exports expected to remain 100-150 MBD
- California unemployment 8.7%, down from over 10% last year
- Tesoro's gasoline refining production is highly integrated with marketing



**West Coast economy improved and demand stabilizing**

Source: EIA monthly data, forecast based on internal Tesoro forecasts.

## Distinctive Performance Objectives



**TESORO**

- Distinctive Performance Objectives

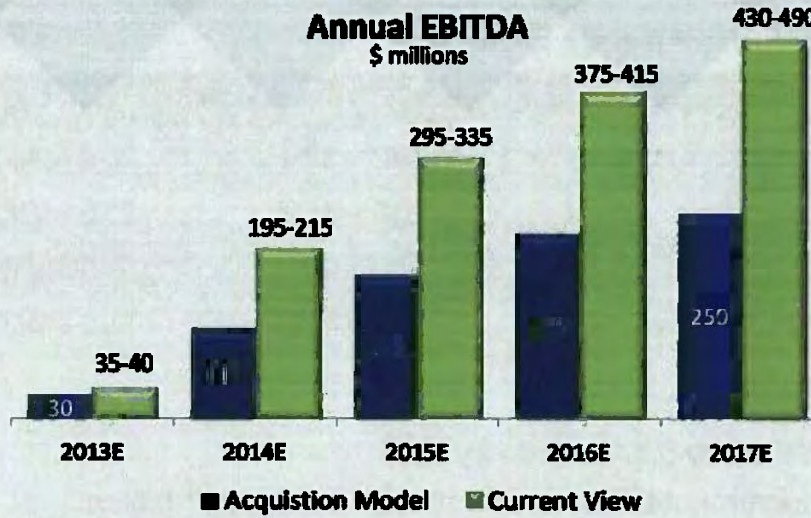
\$ million	2014	2015
Deliver California Synergies	160 – 180	260 – 300
Enhance gross margin	140 – 160	250 – 290
Improve the base	70 – 90	80 – 120
<b>Annual EBITDA Improvement<sup>1</sup></b>	<b>370 – 430</b>	<b>590 – 710</b>

- Grow logistics
  - Grow EBITDA by \$200 million by 2015
  - Deliver incremental Tesoro shareholder value of \$1 billion
- Maintain financial discipline
  - Maintain balance sheet strength, drive toward investment grade
  - Invest free cash flow in high-return capital projects
  - Return excess cash to shareholders

<sup>1</sup> Improvements over 2013 results.



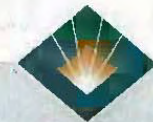
## California Synergy EBITDA



- Feedstock Advantage
- Logistics Optimization
- Production Optimization
- Operating Cost Improvements

Synergy value and pace of capture significantly improved

## California Synergy Capital Expenditures



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- **Los Angeles Refinery Integration Project**
  - Optimizes processing capability
  - Provides 30-40 MBD product flexibility
  - Reduces CO2 emission 500,000 tons per year
- **Logistics Projects**
  - Link logistics assets
  - Reduce third party fees
  - Provides feedstock and product optionality
- **Processing Projects**
  - Strengthen conversion capability
  - Provides feedstock flexibility
  - Improves product yields



**Disciplined delivery of high return capital investments**

Note: Net synergy capital of ~\$375 MM (including savings beyond 2017, which are reflected in 2017E), capital plan net of capital avoidance, 2017 emissions estimate is subject to final project scope and detailed engineering.

## Keys to Distinction on the West Coast



- Operating cost advantage
- Flexible yield structure
- Access to cost-advantaged crude oil
- Integrated logistics infrastructure
- Secure and ratable refinery off-take
- Cost-advantaged regulatory compliance



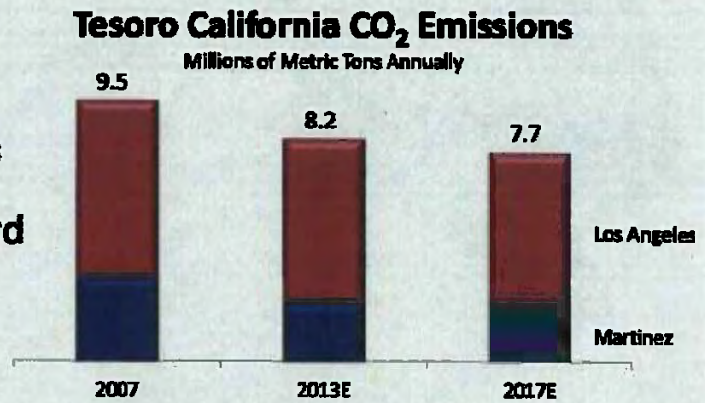
**Los Angeles acquisition transforms our capabilities**



## California Regulatory Environment



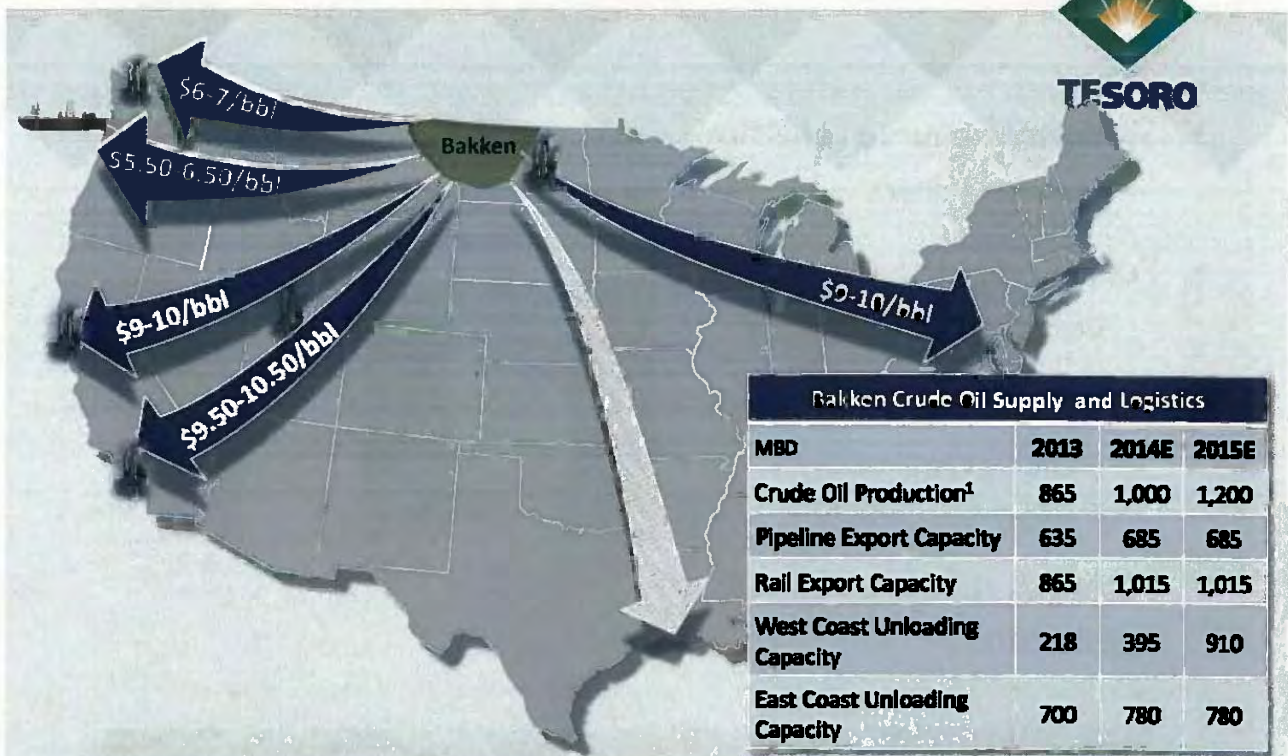
- Stationary source emissions
  - Low cost impact
- Fuels under the cap
  - Cost passed to consumers
- Low Carbon Fuel Standard
  - Blending requirements expected to moderate
- Potential refinery safety regulations



**Challenging but manageable operating environment**

Note: 2017 emissions estimate is subject to final project scope and detailed engineering. Los Angeles includes both Wilmington and Carson.

## Rail Costs to Clear Bakken



### West and East Coasts clearing destinations for Bakken crude oil

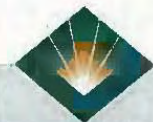
Note: Rail cost estimates include only the railroad tariff.

1. Average annual crude oil production, export capacity, and price discount estimates based on industry consultant and Tesoro market outlook.

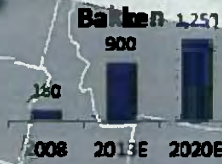
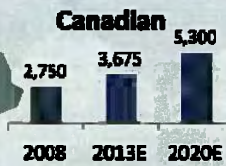


# Crude Oil Production Growth

## Key Tesoro Markets



**TESORO**  
MBD



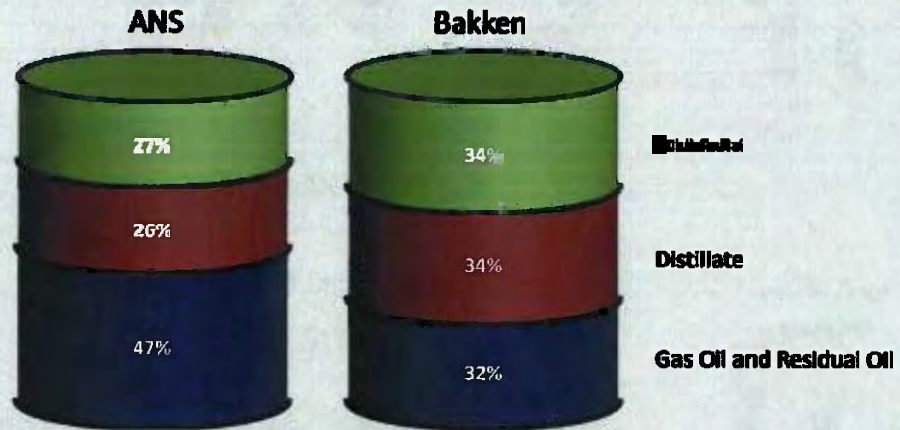
Source: 2008 EIA and Canadian NEB, 2013E and 2020E estimates based on independent consultants/TSO Analysis.

## Anacortes Yield Comparison



TESORO

### Crude Oil Yields



**Bakken crude oil yields 14% to 16% more gasoline and distillate than ANS**

## Tesoro's Advantaged Feedstock Opportunity

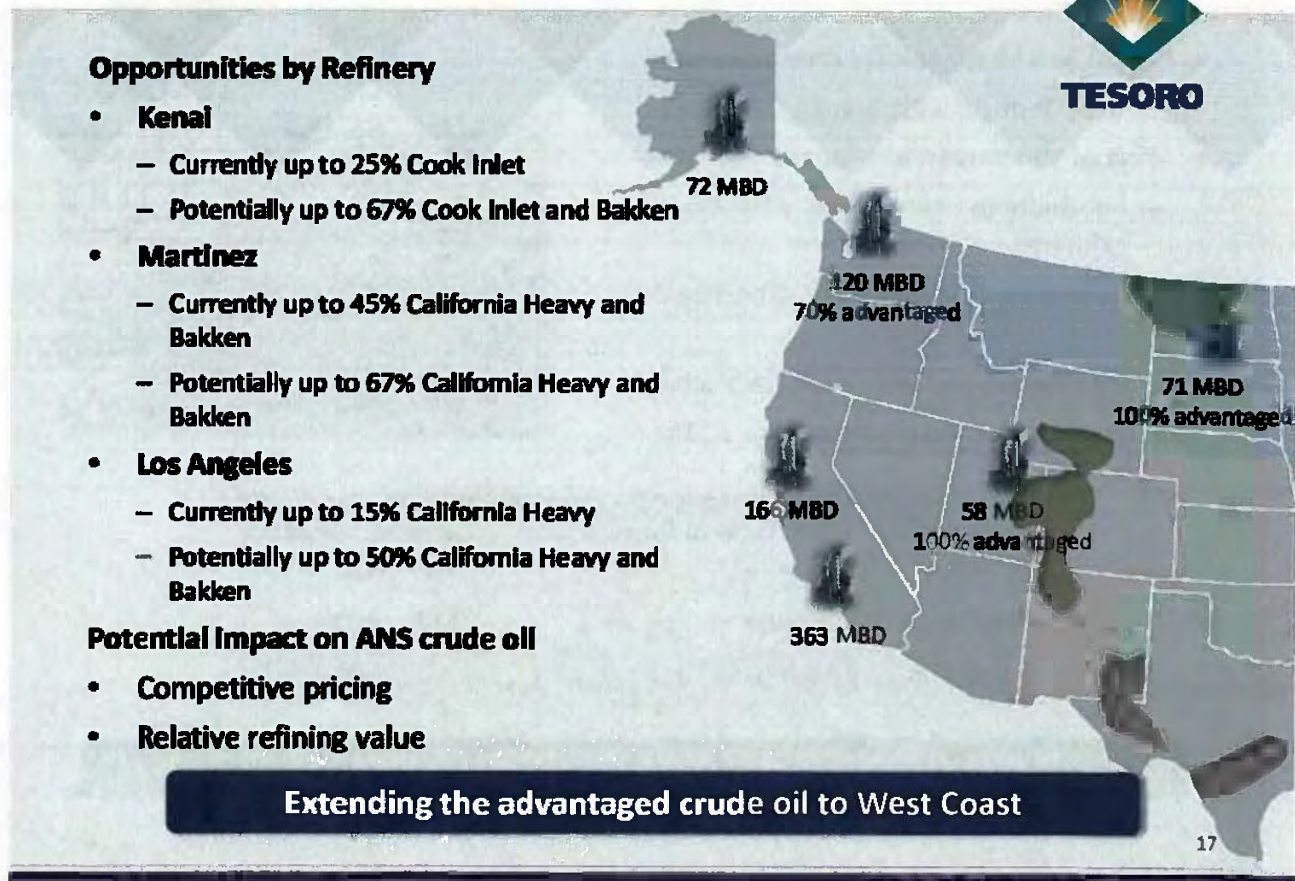


### Opportunities by Refinery

- **Kenai**
  - Currently up to 25% Cook Inlet
  - Potentially up to 67% Cook Inlet and Bakken
- **Martinez**
  - Currently up to 45% California Heavy and Bakken
  - Potentially up to 67% California Heavy and Bakken
- **Los Angeles**
  - Currently up to 15% California Heavy
  - Potentially up to 50% California Heavy and Bakken

### Potential Impact on ANS crude oil

- Competitive pricing
- Relative refining value



**Extending the advantaged crude oil to West Coast**



## Port of Vancouver

- **Up to 300 MBD Rail-to-Marine Terminal**
  - Joint venture with Savage Companies
- **Port of Vancouver advantages**
  - Flexibility to deliver to all West Coast refineries
  - Competitive with direct rail cost to California
  - Existing rail and marine infrastructure
- **Port of Vancouver granted lease 3Q13**



	Completed Facility
<b>Capacity</b>	<b>Up to 300 MBD</b>
<b>Estimated Completion</b>	<b>4Q14 – 4Q15</b>
<b>Tesoro Initial Committed Capacity</b>	<b>60 MBD</b>

**A premier advantaged crude oil facility for the West Coast**

## West Coast Transportation Advantages



### Tesoro enjoys advantaged waterborne logistics capabilities

- Access to domestic and foreign cost advantaged crude oil
- Feedstock optimization across 720 MBD of PADD V refining capacity
- Flexibility to source and leverage advantage feedstocks regardless of origin



**Capturing advantaged crude oil supply on West Coast**

## West Coast Refining System Opportunity

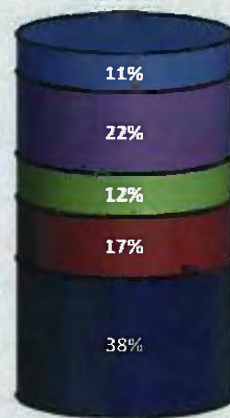
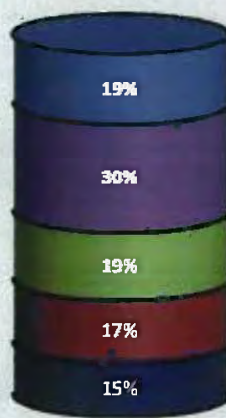


**TESORO**

**Tesoro Consolidated  
West Coast Index**



**Tesoro Crude Oil Throughput**



Foreign Heavy  
Foreign Light  
ANS  
California  
WTI<sup>1</sup>

3Q 2013

YE 2015E

**Advantage crude oil strategy enhances realized margins**

1) WTI crude oil includes all grades of N. American crude oil other than those stated in other categories.



## Marketing Brands

- Deploy a premium and value branding strategy within each region
- New brands allow for site optimization and conversion
- Leverage Shell®, Exxon® and Mobil® premium brand value to improve marketing channels
- Leverage ARCO®, Tesoro and USA value brand proposition to drive high utilization



## Solomon Based Cost Reductions



### Total Operating Expense Gap (Non-energy)<sup>1</sup>

\$/bbl	2010	2011	2012
California	1.70	1.10	0.85
Pacific Northwest	NA	0.05	0.30
Mid-Continent	0.30	0.15	1.10
Weighted Average	1.15	0.55	0.75

- Captured cost improvements in California, opportunities remain
- Mid-Continent performance reflects increased spending to strengthen long-term reliability
- Maintenance, personnel efficiency and improved reliability driving per barrel operating cost improvement

**Targeting first tercile cost position in California**

<sup>1</sup>) Versus Solomon Refinery Supply Corridor (RSC) 1<sup>st</sup> tercile, Pacific Northwest adjusted in 2010 and 2011 to exclude the impact of the Anacortes Incident.



# Tesoro Logistics LP

	Key Metrics
Enterprise Value (\$ billions)	3.6
Market Cap (\$ billions)	2.8
Crude Oil and Refined Product Pipelines	1,570 miles
High Plains Pipeline Throughput	90+ MBD
High Plains Trucking Volume	45 MBD
Marketing Terminal Capacity	565 MBD
Marine Terminal Capacity	845 MBD
Rail Terminal Capacity	50 MBD
Dedicated Storage Capacity	7,700 MBBLs



**TLLP growing rapidly into a premier Western US logistics provider**

## TLLP Organic Growth Opportunities



### **Bakken Crude Oil Gathering**

- **Expand High Plains System interconnection points**
- **Aggregate volumes for Port of Vancouver**
- **Develop major Bakken storage hub**
- **Expand pipeline gathering network**

### **Terminalling, Transportation and Storage**

- **Consolidate Tesoro volumes on Southern California distribution system**
- **Open Southern California terminals to third-party business**
- **Support capture of Southern California logistics synergies**
- **Expand terminals and add biofuel blending capabilities**

**Significant opportunities to further grow the base business**



## TLLP Future Logistics Opportunities



### Tesoro Legacy Assets

Kenai Marine Logistics

Kenai Pipeline & Products System

Anacortes Marine and Products Terminals

Martinez Marine Products Terminal

Martinez Products Terminal

### Assets Under Development

Port of Vancouver Rail to Marine Terminal

Alaska Cook Inlet Crude Oil Pipeline

Uinta Crude Oil Pipeline

Southern California Logistics



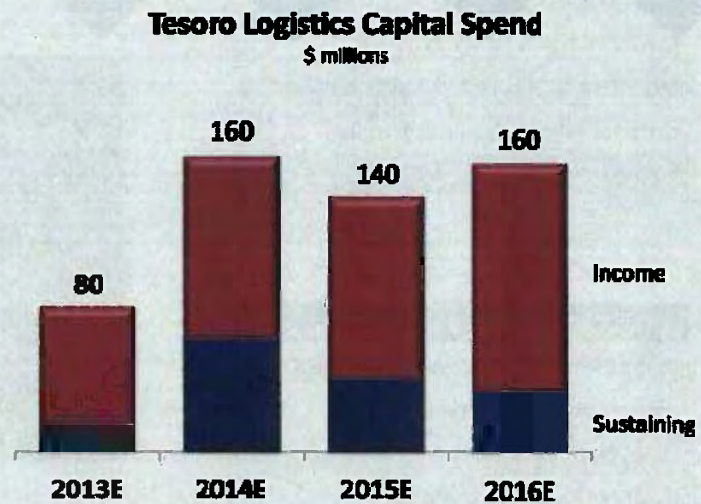
**Tesoro could realize in excess of \$1.5 billion in cash from future TLLP asset sales**



## TLLP Capital Spending



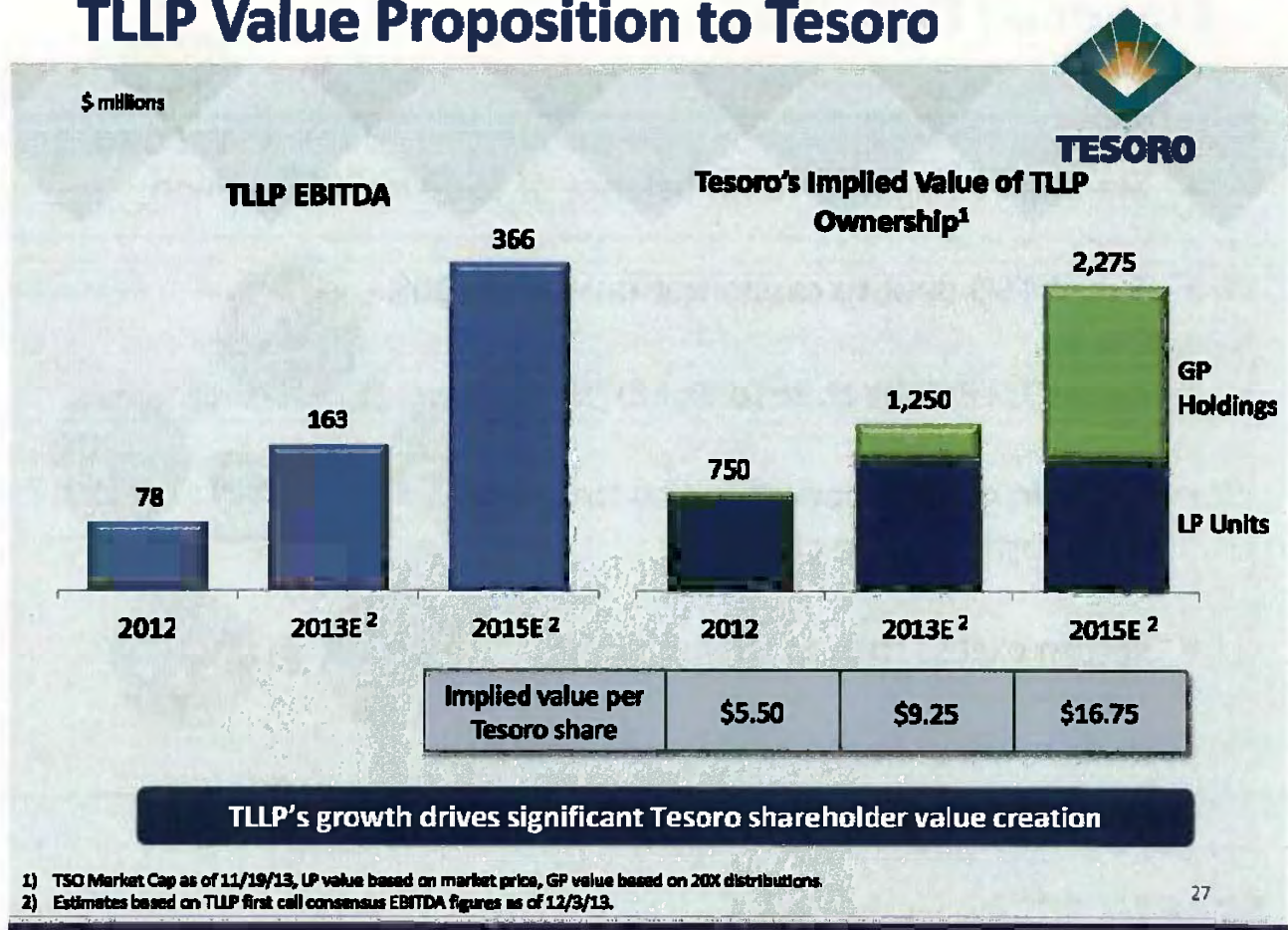
- TLLP plans to spend about \$100 million per year on income projects
- Typical project return of 15-25%
- Pursing opportunities to expand gathering system
- TLLP self funds capital



**Income capital expected to support significant organic growth**

Note: Maintenance and regulatory capital before reimbursements. All references to capital spending on this page are estimated.

## TLLP Value Proposition to Tesoro

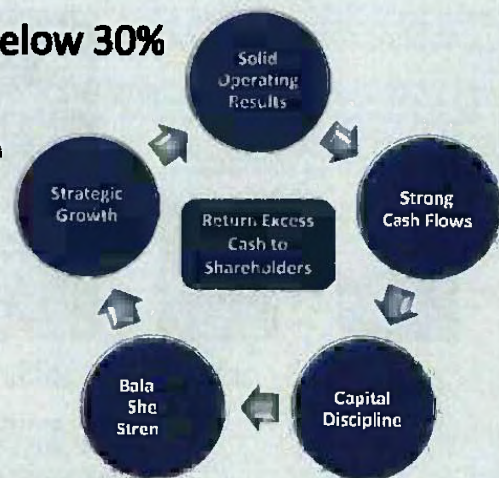




## Financial Priorities



- **Maintain a minimum cash balance of \$600 to \$800 million**
- **Target TSO debt to capitalization<sup>1</sup> below 30%**
- **Target TLLP debt at 3x to 4x EBITDA**
- **Invest in growth opportunities to drive further value creation**
- **Return excess cash to shareholders**
- **Drive towards investment-grade credit rating**



1) Excluding TLLP debt and equity.

## Los Angeles Acquisition Summary



Los Angeles Acquisition Summary	
Property, Plant and Equipment	1.0
Logistics Asset Sales to TLLP	(1.3)
<b>Net Investment in R&amp;M Assets</b>	<b>(0.3)</b>
Working Capital	1.3
Working Capital Reductions	(0.2)
<b>Net Working Capital</b>	<b>1.1</b>
<b>Net R&amp;M Investment</b>	<b>0.8</b>

**Low investment delivers significant cash-on-cash returns**



## Appropriate Leverage for Growth



<i>\$ millions</i>	TSO <sup>1</sup>	TLLP <sup>2</sup>	Consolidated
<b>Total Debt</b>	<b>1,666</b>	<b>1,159</b>	<b>2,825</b>
<b>Total Equity</b>	<b>4,415</b>	<b>1,185<sup>4</sup></b>	<b>5,600</b>
<b>Debt to Total Capitalization</b>	<b>27%</b>	<b>49%</b>	<b>34%</b>
<b>Total Debt to EBITDA<sup>3</sup></b>	<b>0.8x</b>	<b>3.9x</b>	<b>1.4x</b>

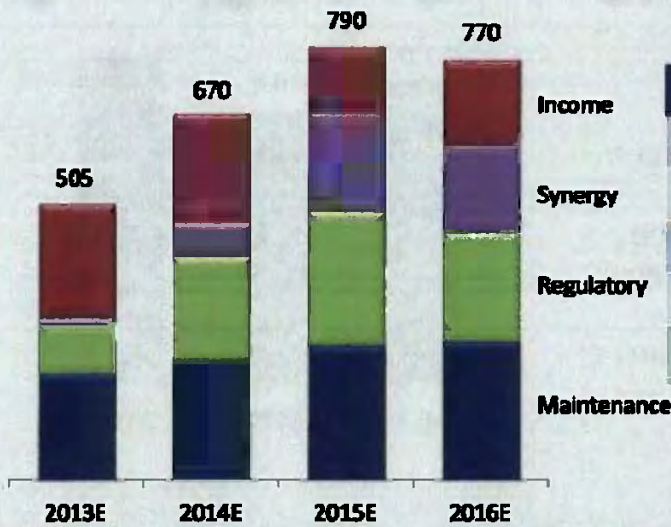
**Tesoro leverage in target range less than 7 months after Los Angeles acquisition**

- 1) As of September 30, 2013 pro forma for an additional \$800 million of subsequent debt reduction. Excludes TLLP debt and non-controlling interest.
- 2) As of September 30, 2013 pro forma for the second purchase of Los Angeles logistics assets for \$650 million including \$250 million of new debt.
- 3) EBITDA forecast based on latest 2014 consensus analyst research estimates.
- 4) Represents non-controlling interest as of 9/30/13 adjusted for November 2013 equity offering.

# Summary Capital Spending



**Tesoro Capital Spending<sup>1</sup>**  
\$ in millions



**Summary Capital Expenditures**

\$ in millions	2013E	2014E	2015E	2016E
Maintenance	195	220	245	255
Regulatory	90	190	245	200
Synergy <sup>2</sup>	15	65	180	160
Income	205	195	120	155
<b>Total</b>	<b>505</b>	<b>670</b>	<b>790</b>	<b>770</b>

**Capital spending plans well supported by strong and growing EBITDA**

1) Excludes self-funded TLP capital expenditures. All references to capital spending on this page are estimated.  
 2) Net synergy capital.

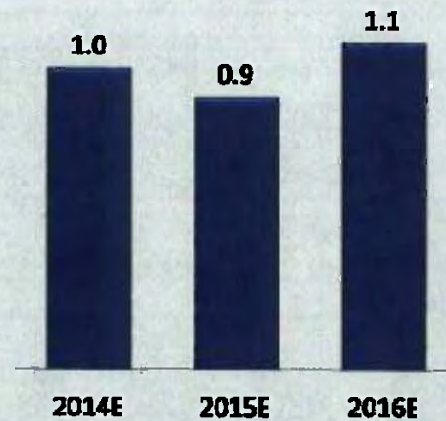


## Delivering Free Cash Flow



**TESORO**

**Free Cash Flow<sup>1</sup>**  
\$ in billions

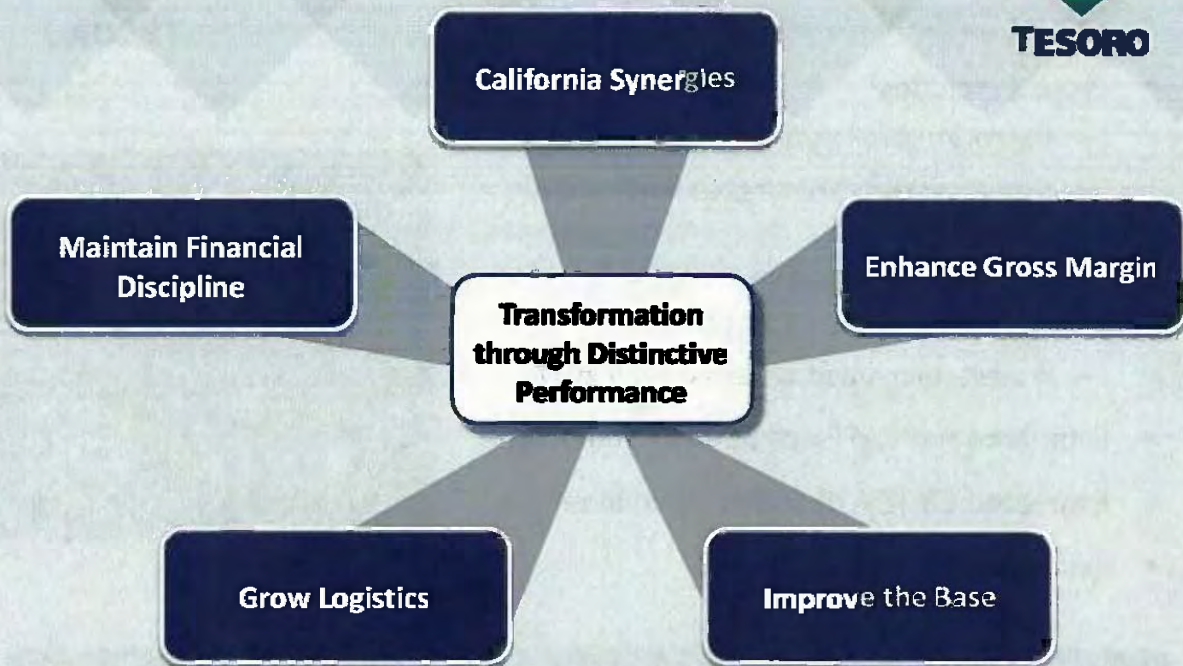


- Expect to generate approximately \$3.0 billion in free cash flow over next three years
- Before potential \$1.5 billion of further logistics asset sales to TLLP
- Plan to spend less than a third on high-return income capital projects
- Tesoro well positioned for further growth and returning cash to shareholders

**Strong financial position and significant free cash flow in 2014 and beyond**

(1) Defined as EBITDA less cash interest and taxes, sustaining capital, turnaround spending and TLLP distributions. EBITDA estimates based on consensus analyst research estimates as of November 19, 2013 and incremental improvements in this presentation above base Los Angeles synergies announced at time of acquisition. Interest, taxes, sustaining capital, turnaround spending and TLLP distributions based on Tesoro's 2014 Business Plan.

## Delivering Shareholder Value





## Los Angeles Refinery Integration Project



- **Largest California synergy capital project**
- **Project includes<sup>1</sup>**
  - **Improved gasoline/distillate yield flexibility**
  - **Decommissions Wilmington fluid catalytic cracking unit**
  - **Reduces CO2 emissions**
  - **Final scope expected 2Q14**
  - **Project completion expected early 2017**
- **Estimated net CAPEX of \$140 to 160 million**
- **Estimated EBITDA of \$50 to 75 million**
- **Estimated IRR over 30%**



**Significantly improves Los Angeles refinery competitive position**

<sup>1)</sup> Based on original acquisition plans, subject to final project scope and detailed engineering.

## Salt Lake City Conversion Project



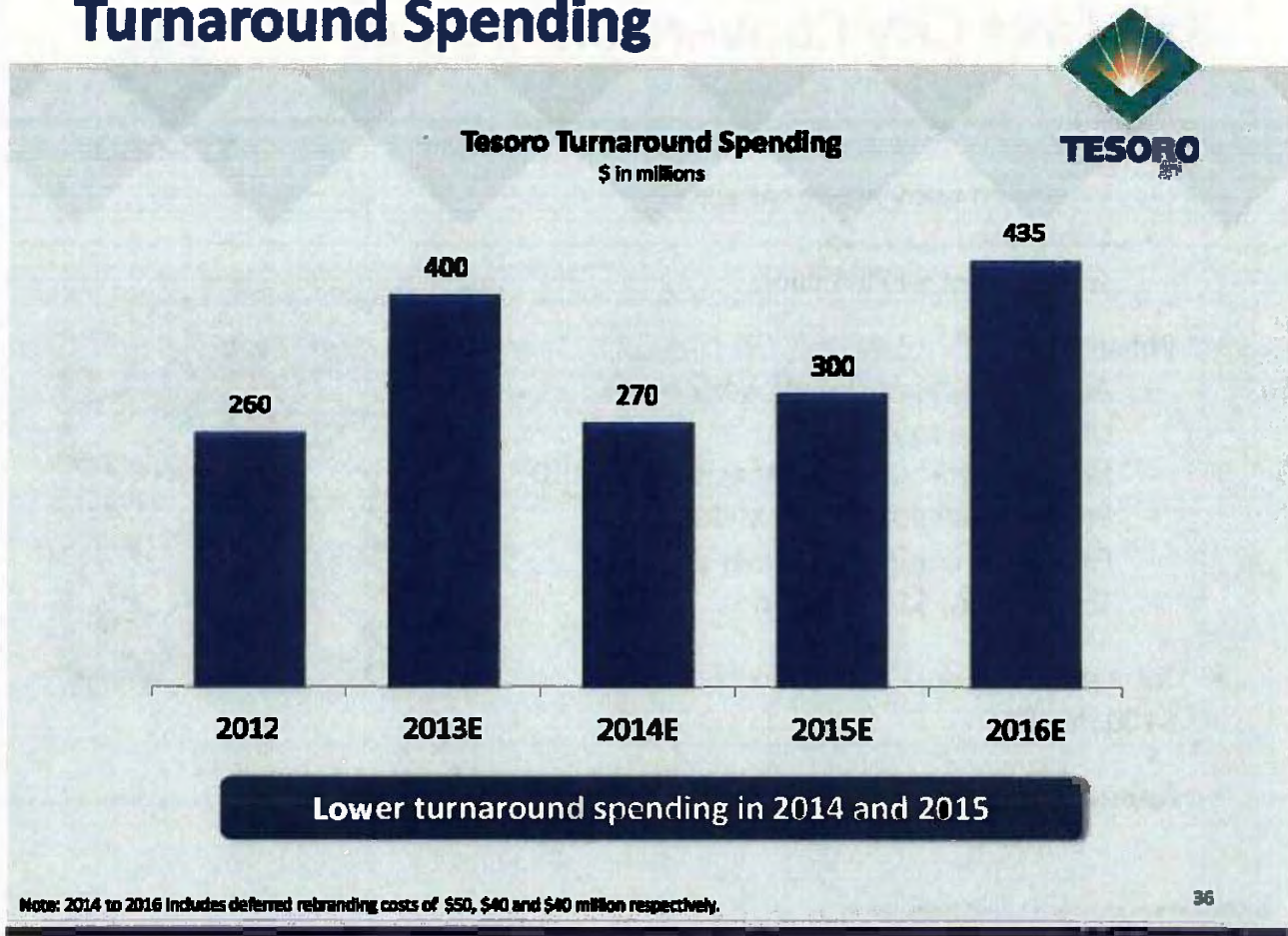
- **Phase 1**
  - Expanded waxy crude capacity
  - Completed 2Q 2013
  - Total cost of \$175 million
  
- **Phase 2**
  - Additional expansion of waxy crude capacity up to 22 MBD
  - Increases throughput capacity by 4 MBD
  - Enhances clean product yields
  - Estimated completion early 2015
  - Total cost of \$100 million
  
- **Total project annual EBITDA<sup>1</sup> contribution \$100 million**
  
- **Approximately 30% IRR**



<sup>1</sup>) EBITDA estimate consistent with Tesoro market outlook.



## Turnaround Spending



## Non-GAPP Financial Measures



EBITDA represents earnings before interest and financing costs, net interest income, income taxes, and depreciation and amortization expense. We present EBITDA because we believe some investors and analysts use EBITDA to help analyze our cash flows including our ability to satisfy principal and interest obligations with respect to our indebtedness and to use cash for other purposes, including capital expenditures. EBITDA is also used by some investors and analysts to analyze and compare companies on the basis of operating performance and by management for internal analysis. EBITDA should not be considered as an alternative to net earnings, earnings before income taxes, cash flows from operating activities or any other measure of financial performance presented in accordance with accounting principles generally accepted in the United States of America. EBITDA may not be comparable to similarly titled measures used by other entities.

(In millions) Unaudited

	California Synergy EBITDA - Acquisition Model				
	2013E	2014E	2015E	2016E	2017E
Projected net earnings	\$ 18	\$ 67	\$ 104	\$ 133	\$ 149
Add income tax expense	11	41	63	82	91
Add depreciation and amortization expense	1	2	8	10	10
EBITDA <sup>(1)</sup>	\$ 30	\$ 110	\$ 175	\$ 225	\$ 250

(In millions) Unaudited

	California Synergy EBITDA - Current View				
	2013E	2014E	2015E	2016E	2017E
Projected net earnings	\$ 23	\$ 127	\$ 193	\$ 239	\$ 280
Add income tax expense	14	75	113	141	165
Add depreciation and amortization expense	0	3	9	13	15
EBITDA <sup>(1)</sup>	\$ 37	\$ 205	\$ 315	\$ 393	\$ 460

(In millions) Unaudited

	Gross Margin Capture Improvements EBITDA	
	2014E	2015E
Projected net earnings	\$ 88	\$ 163
Add income tax expense	51	96
Add depreciation and amortization expense	11	11
EBITDA <sup>(1)</sup>	\$ 150	\$ 270

(1) When a range of estimated EBITDA has been disclosed and/or previously disclosed, we have included the EBITDA reconciliation for the mid-point range.



## Non-GAPP Financial Measures



(In millions) Unaudited

	Improve the Race EBITDA	
	2014E	2015E
Projected net earnings	\$ 50	\$ 63
Add income tax expense	30	37
Add depreciation and amortization expense	0	0
EBITDA <sup>(1)</sup>	\$ 80	\$ 100

(In millions) Unaudited

	TLLP EBITDA <sup>(2)</sup>		
	2012	2013E	2015E
Projected net earnings	\$ 56	\$ 83	\$ 215
Add interest and financing costs, net	9	43	75
Add depreciation and amortization expense	13	37	76
EBITDA	\$ 78	\$ 163	\$ 366

(In millions) Unaudited

	Free Cash Flow Reconciliation		
	2014E	2015E	2016E
Net Cash Flow from Operating Activities	\$ 1.5	\$ 1.5	\$ 1.8
Less Sustaining Capital	0.4	0.5	0.5
Less TLLP Distributions	0.1	0.1	0.2
Free Cash Flow	\$ 1.0	\$ 0.9	\$ 1.1

(In millions) Unaudited

	Annual EBITDA Estimate	
	Salt Lake City Waxy	
	Crude Project Phase I and II	IA Refinery Integration Project
Projected net earnings	\$ 57	\$ 33
Add income tax expense	33	19
Add depreciation and amortization expense	10	10
EBITDA	\$ 100	\$ 62

(1) When a range of estimated EBITDA has been disclosed and/or previously disclosed, we have included the EBITDA reconciliation for the mid-point range.

(2) TLLP EBITDA is not representative of Tesoro consolidated EBITDA as intercompany transactions between TLLP and Tesoro are eliminated upon consolidation.

EXHIBIT F

**Comments**  
**on**  
**Environmental Impact Report**  
**for the**  
**Phillips 66**  
**Rail Spur Extension Project**

Santa Maria, California

Prepared  
for  
Sierra Club  
San Francisco, CA

January 27, 2014

Prepared by  
Phyllis Fox, Ph.D., PE  
Consulting Engineer  
745 White Pine Ave.  
Rockledge, FL 32955



## I. INTRODUCTION

The Phillips 66 Santa Maria Refinery (SMR), located in San Louis Obispo County, is proposing to modify an existing rail spur to accommodate train delivery of crude oil, to replace local supplies. The proposed tracks and unloading facilities would be designed to accommodate unit trains of up to 80 tank cars and associated locomotives and other supporting cars as well as periodic manifest trains of fewer cars not dedicated to SMR oil. (Project). I was asked by the Sierra Club to review the Draft Environmental Impact Report (DEIR)<sup>1</sup> on this Project and prepare comments on the adequacy of the project description and the hazards and hazardous materials section.

My evaluation, presented below, indicates the DEIR's Project description is incomplete. First, it fails to disclose the baseline crude slate composition, which determines the CEQA baseline emissions from crude import through refining. Second, it fails to disclose the link between the Rail Spur Project and two other directly related projects: (1) the Propane Recovery Project at Phillips 66's Rodeo facility,<sup>2</sup> which is linked by pipeline to the Rodeo Refinery, and (2) the Throughput Increase Project at the Santa Maria Refinery<sup>3</sup>. The impacts of these directly related projects should be evaluated as a single project. Together, they result in many significant impacts that were not disclosed in the Rail Spur Project DEIR.

The DEIR fails to evaluate the impacts resulting from a significant switch in crude slate, the *raison d'etre* for the Project. The entire Project, including crude slate change, would result in significant unmitigated air quality, global warming, worker and public health, odor, risk of upset, public safety, visual, noise, and other impacts, either not disclosed or not mitigated in the DEIR. Finally, the DEIR fails to evaluate reasonable alternatives to the Project and to impose all feasible mitigation.

My resume is included in Attachment 1 to these comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports, including CEQA/NEPA documentation; risk assessments; and litigation support.

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed

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<sup>1</sup> Marine Research Specialists (MRS), Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Assessment, November 2013.

<sup>2</sup> Contra Costa County Department of Conservation and Development, Phillips 66 Propane Recovery Project, Final Environmental Impact Report, November 2013 (FEIR).

<sup>3</sup> Marine Research Specialists, Phillips 66 Santa Maria Refinery Throughput Increase Project, Final Environmental Impact Report, October 2012 (SMF FEIR), Available at: <http://slocleanair.org/phillips66feir>.

professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers; and a Qualified Environmental Professional, certified by the Institute of Professional Environmental Practice.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 CEQA documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries as well as various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York. I was a consultant to a former owner of the subject Refinery on CEQA and other environmental issues for over a decade and am thus very familiar with both the Rodeo Refinery and the Santa Maria Refinery and their joint operations.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310.

## II. THE PROJECT IS PIECEMEALED

The DEIR only evaluated a portion of the Project. The Project as described in the DEIR is narrowly defined as a modification to an existing rail spur extension to allow crude to be delivered to the Santa Maria Refinery by train for processing. DEIR, p. 2-1. However, as explained below, the Rail Spur Project is actually only one of the components of a much larger project consisting of at least three parts: (1) Throughput Increase Project; (2) Rail Spur Project; and (3) Propane Recovery Project at Rodeo.

The Santa Maria Refinery currently receives all crude oil by pipeline from various mostly local sources, including the Outer Continental Shelf (60-85%), Price Canyon/Santa Maria Valley/San Joaquin Valley (5-20%), San Ardo (5-10%), and Canada (2-7%). DEIR, p. 2-27. Most all of these sources, particularly the major ones -- offshore platforms and local oil fields -- are in decline. DEIR, p. ES-18 ("However, if and when local crude oil production (the major source of oil for the SMR) declines, the Rail Spur Project...would allow the SMR to maintain operating up to its permitted throughput levels."), p. 2-30 ("In addition, production from offshore Santa Barbara County [the major source of SMR's crude] has been in decline for a number of years... This declining production... generates the need for the Rail Spur Project."), p. 6-3 ("California production of crude oil per year has been in decline since 1986...The decline has average about 1.7% per year since 1995. More recently, the decline has averaged over 3% annually since the year 2000... Delivery of other North American crudes to California could help to offset the need for foreign imports as local production declines.") Thus, the

Throughput Project likely could not be implemented but for the Rail Spur Project, which allows crudes to be imported to replace declining local sources.

**A. Link With Crude Throughput Increase Project**

Thus, Phillips 66 is arguing on the one hand that the Rail Spur Project is required to replace dwindling local crude supplies while on the other it has proposed to increase its throughput capacity, without disclosing the source of the new crude. Clearly, Phillips 66 anticipated the need to increase its crude supply, given the diminishing local supplies, when it was planning the Crude Throughput Increase Project in 2008,<sup>4</sup> at a time it faced dwindling local crude supplies at high costs. Thus, the need to import more cost-effective crudes from distant sources, accessible only by rail, must have been on the table at the time the Throughput Increase Project was developed.

The decline in local crude supplies is not news and has long been known.<sup>5</sup> In fact, given the admitted declining local sources of crude, it is not believable that the SMR could increase its throughput by 10%, when a 3% annual decline in its major source of oil is projected, without changing its source of crude. This is prima facie evidence that the Throughput Increase Project and the Rail Spur project are related and were likely planned together. Thus, one of the key purposes of the Rail Spur Project is to build the infrastructure to allow crude oil to be imported from distant sources to replace declining local crude oil sources and facilitate a 10% increase in crude throughput, separately permitted.

The average baseline crude throughput for Santa Maria (2010-2012) is 38,029 barrels per day (BPD). DEIR Table 2.7. The Throughput Increase Project increased the permit level from 44,500 BPD (Throughput FEIR, p. ES-4) by 10% to a maximum of 48,950 BPD or by 4,450 BPD. Throughput FEIR, p. 1-1. Thus, the SMR was operating at 6,471 BPD below the CEQA baseline for the Rail Spur Project and 10,921 BPD below the projected future daily maximum throughput. It is unlikely that the permitted crude throughput of 48,950 BPD (DEIR, p. 2-28) could be supplied locally, given the decline in locally available crudes.

Thus, the Rail Spur Project is required to achieve the increase in throughput. The Rail Spur Project essentially opens up new markets for the Santa Maria Refinery, allowing it to replace declining local sources, supply the 10% permitted throughput increase, and compete with any increase in locally produced crudes. This ties the Rail Spur Project directly to the Throughput Increase Project. Thus, these two projects are different sides of the same coin and should have been evaluated as a single project.

The Rail Spur Project will allow an increase in crude processing of up to 10,921 BPD. The DEIR did not, but must, analyze all of the impacts of this increase in

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<sup>4</sup> The DEIR was issued August 2011, Available at: <http://www.slocleanair.org/COP3.php>.

<sup>5</sup> California Energy Commission, Transportation Energy Forecasts and Analyses for the 2009 Integrated Energy Policy Report, May 2010.

crude throughput processing capacity, including the increase in emission of processing an additional 10,921 BPD of crude and the increase in emissions of a change in the crude slate itself. The DEIR analyzes none of the impacts associated with a 10,921 BPD increase in crude throughput or the change in crude slate.

**B. Link With Propane Recovery Project at Rodeo**

Both of these Santa Maria projects are directly related to a third project at Phillips 66's San Francisco Refinery, located in Rodeo in the San Francisco Bay Area. The Rodeo Refinery and the Santa Maria Refinery are connected by a 200-mile pipeline, used to transport semirefined products from Santa Maria to Rodeo for finishing into market products. DEIR, p. 2-3. These two locations, although more than 200 miles apart, are considered one location.<sup>6</sup> The Phillips 66 website similarly describes these facilities thus: "The San Francisco Refinery is comprised of two facilities linked by a 200-mile pipeline. The Santa Maria facility is located in Arroyo Grande, Calif., while the Rodeo facility is in the San Francisco Bay Area."<sup>7</sup>

The two facilities operate in unison, the Santa Maria Refinery supplying feedstocks, naphtha and gas oil, to Rodeo via pipeline to be upgraded into finished petroleum products, such as gasoline and jet fuel. DEIR, p. 2-3. Thus, these two refineries are inextricably linked. Changes in operations at one of them manifest as changes in the other. A change in crude slate at Santa Maria, for example, will manifest as changes in emissions from refining the resulting semi-refined products at Rodeo.

The Rodeo Refinery is proposing to recover an additional 4,200 barrels per day (BPD) of propane and 3,800 BPD of butane from the refinery fuel gas (RFG) (collectively known as "liquefied petroleum gas" or LPG) to export for sale (Project).<sup>8</sup> My review of the FEIR for that project indicates that the Rodeo Refinery as operated in the baseline would be unable to recover this amount of LPG without increases in the amount of propane- and butane-containing feed to the affected units. Fox Report<sup>9</sup>, Comment II.

The partially refined products from the increase in crude throughput at Santa Maria will be sent to the Rodeo Refinery for further processing. As explained below, these partially refined products include significant amounts of propane and butane that will be recovered at Rodeo under the Propane Recovery Project to meet its design LPG recovery goal. Thus, cumulative impacts of these three projects -- crude throughput

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<sup>6</sup> BAAQMD, Review of Current Air Monitoring Capabilities near Refineries in the San Francisco Bay Area, July 3, 2013; p. 1-5, Available at: [http://www.baaqmd.gov/~media/Files/Technical%20Services/DRI\\_Final\\_Report\\_061113.ashx](http://www.baaqmd.gov/~media/Files/Technical%20Services/DRI_Final_Report_061113.ashx).

<sup>7</sup> <http://www.phillips66.com/EN/about/our-businesses/refining-marketing/refining/Pages/index.aspx>.

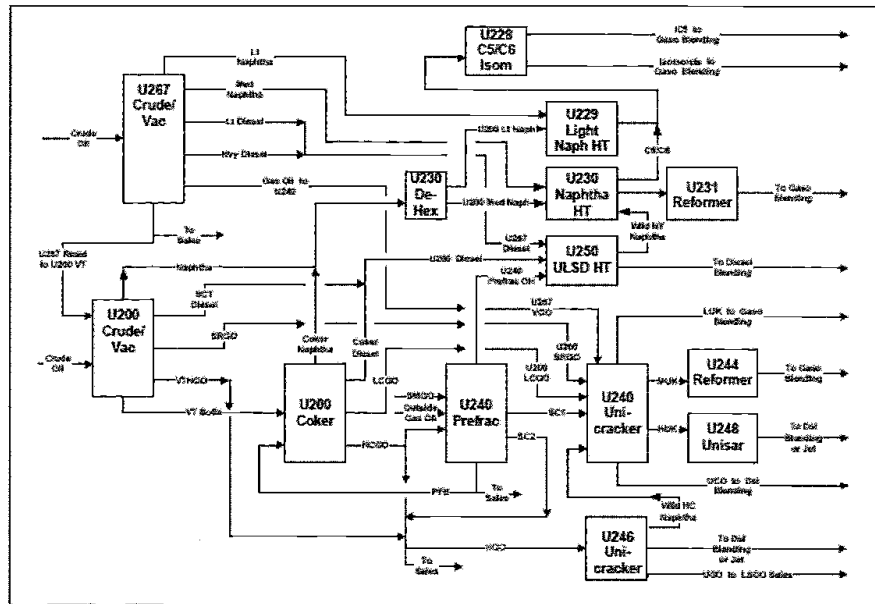
<sup>8</sup> Contra Costa County Department of Conservation and Development, Phillips 66 Propane Recovery Project, Final Environmental Impact Report, November 2013 (FEIR).

<sup>9</sup> See Fox Rodeo Report, Comment II.

increase + rail spur to supply the increased crude + project to recover propane/butane from the increased throughput -- should have been evaluated as a single project.

The link between the Santa Maria Refinery semi-refined products (gas oil, naphtha) and the Rodeo Propane Recovery Project is clearly shown in the Rodeo Refinery block flow diagrams from the Rodeo Propane Recovery DEIR. The block flow diagram for the existing Rodeo Refinery (Rodeo DEIR Figure 3-4) shows "SMGO" entering the Refinery at the U-240 Prefractionator unit (Prefrac unit). See Rodeo DEIR, p. 3-12 ("Heavy gas oil (HGO) streams from Unit 200 and HGO purchased from outside of the Refinery are fractionated in the Unit 240 prefractionator.") SMGO is Santa Maria Gas Oil. This Rodeo DEIR figure is reproduced here as Figure 1 for ease of reference. The U-240 Prefrac unit at Rodeo separates Santa Maria gas oil and other gas oils into lighter hydrocarbon fractions that are currently blended into the Rodeo Refinery Fuel Gas, shown in Rodeo DEIR Figure 3-5 (see lower left hand corner, blue arrow labeled U-240/244/248 S-RFG being routed to U-240 Fuel Gas Treating), but which will be further processed into propane and butane in new units added to the Rodeo Refinery as part of the Propane Recovery Project.

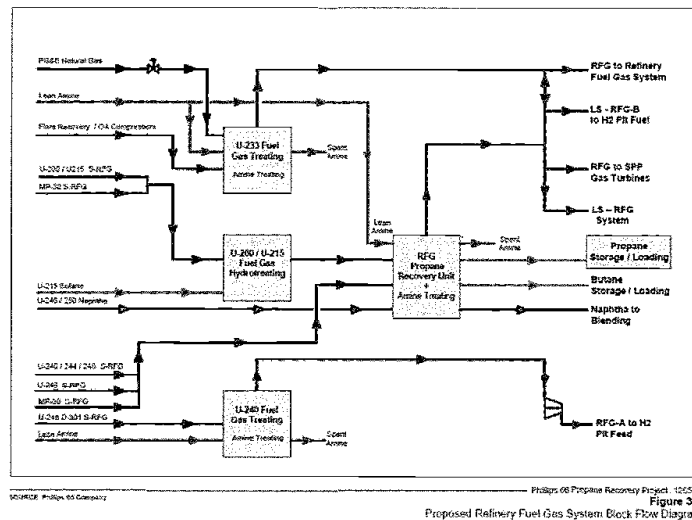
Figure 1  
Overall Existing Rodeo Refinery  
Block Flow Diagram



Philips 66 Propane Recovery Project - 12/25/44  
Figure 3-4  
Overall Block Flow Diagram of Refinery

Under the Propane Recovery Project at Rodeo, the output from the Prefrac unit is sent to the proposed “RFG Propane Recovery Unit” instead of the Refinery Fuel Gas system. This unit is the heart of the Propane Recovery Project. Rodeo DEIR, Table 3-2. Propane and butane are recovered in this unit. This new propane/butane extraction unit is shown in Propane Recovery Project DEIR in Figure 3-6, which is reproduced here as Figure 2 for ease of reference.

**Figure 2  
Proposed Rodeo Refinery  
Fuel Gas System Block Flow Diagram**



The RFG Propane Recovery Unit is the big yellow box in the middle of Figure 2. Blue arrows in the lower left hand corner of Figure 2 identify the inputs to this unit, which are various refinery streams. These streams include “U-240/244/248 S-RFG.” This designation means that Refinery Fuel Gas (RFG) from Unit U-240 is sent to the RFG Propane Recovery Unit. (This stream was formerly sent to the U-240 Fuel Gas Treating Unit. Rodeo DEIR, Fig. 3-6.) As Santa Maria Gas Oil (SMGO) is one of the inputs to Unit U-240, changes at the Santa Maria Refinery would be transmitted directly to the Propane Recovery Project via the U-240 Prefrac Unit at Rodeo.

This establishes a direct link between the Rodeo Propane Recovery Project and the two modifications at the Santa Maria Refinery -- the Throughput Increase Project and the Rail Spur Project to supply the increase in crude. This is the “nexus” to the larger project with the potential to change crude oil feedstocks.

The increase in throughput at the Santa Maria Refinery would increase the amount of SMGO and naphtha processed at Rodeo into propane and butane. As

discussed elsewhere in these comments, the new rail spur at the Santa Maria Refinery would enable tar sands and other crudes to be imported to and processed at Santa Maria. Tar sands crudes imported by rail are blended with a diluent that is rich in butane and propane. Other potential imports, including Bakken crudes, also are rich in propane and butane feedstocks required at Rodeo. Thus, both projects proposed for the Santa Maria Refinery will have a direct impact on the amount of propane and butane available for recovery at Rodeo, making up for the deficit in the propane and butane in Rodeo refinery fuel gas for LPG recovery.

Thus, there is both a direct pipeline link between the two facilities, an explicit statement that the Santa Maria Throughput Increase Project was developed to send more semi-refined product to the Rodeo Refinery, a pipeline linking the two facilities, and a direct process link between those products and the input to the Propane Recovery Project disclosed on the process flow diagrams. These factors establish a nexus between the Santa Maria Rail Spur and Throughput Increase Projects and the Propane Recovery Project at Rodeo. Thus, these projects are integrally related and should be evaluated as a single project under CEQA.

### **III. THE PROJECT WOULD REPLACE THE EXISTING CRUDE SLATE WITH CHEMICALLY DISTINCT CRUDES**

The DEIR strongly hints that the Project would import Bakken crudes, noting the Rail Spur Project would import crude oil “sourced from oilfields throughout North America based on market economics and other factors. The most likely sources would be the Bakken field in North Dakota or Canada.” DEIR, p. ES-3. Elsewhere, the DEIR indicates: “These could include fields as far away as the Bakken field in North Dakota or Canada.” DEIR, p. 2-21. See also: “The most likely sources of crude oil for the SMR would be North Dakota, Canadian, and Mid Continent area.” DEIR, p. 4.12-21. This crude is chemically distinct from the existing crude slate. Further, as discussed below, the Rail Spur Project is also designed to import Canadian tar sands crudes. These tar sands crudes are also chemically distinct from the baseline crude slate. These differences in crude slate composition will result in significant impacts that were not disclosed in the DEIR.

#### **A. Bakken Crudes As Feedstock for the Santa Maria Refinery**

The Project description suggests that Bakken crudes would be imported by rail. While we believe this is unlikely for the reasons outlined below, the DEIR must nevertheless, given its assertions, evaluate the impact of refining this crude, which is chemically distinct from the current crude slate and from tar sands.

A refiner’s choice of crude oil is influenced by the specific collection of processing units at the refinery and their design. Refinery configurations are unique and are typically designed to process a specific crude slate. The challenge for a refinery, then, is finding the cheapest crude that is compatible with the refinery's design.



The Santa Maria Refinery is designed to refine heavy, high sulfur crudes, such as those available locally with a general composition as summarized in Table 1, below. DEIR, p. 2-3.

**Table 1**  
**Properties of Crude Oil Currently Refined at Santa Maria (DEIR, Table 2.6).**

Characteristic	Value
Gravity, API	19
Specific Gravity at 60 degrees Fahrenheit	0.9377
Hydrogen Sulfide Concentration	< 1 parts per million by weight
Sulfur content	4.6 % by weight
Light ends (propane thru Hexanes)	Approximately 6 %
Vapor Pressure (dry equivalent, DVPE)	6.95 pounds per square inch
Kinematic Viscosity at 104 degrees Fahrenheit	245 centistokes

The Santa Maria Refinery consists of atmospheric pressure distillation, vacuum distillation, delayed coking, and sulfur recovery, designed specifically to breakdown these local heavy high sulfur crudes into semirefined products. The semi-refined products -- gas oil and naphtha -- require additional refining at Rodeo to convert them into gasoline and other finished products. DEIR, Sec. 2.0. Thus, major changes in the crude slate at Santa Maria would necessarily result in major design changes at both the Santa Maria and Rodeo Refineries. More naphtha, especially lighter naphthas, and less gas oil would be produced at Santa Maria, requiring accommodations in throughputs and process design at Rodeo, e.g., contributing to propane and butane that would be recovered at Rodeo with the Propane Recovery Project. The DEIR does not disclose any refinery design changes at either location. Thus, the DEIR is either deficient in this regard, i.e., for not disclosing design changes and their impacts, or Bakken crude is not a serious option.

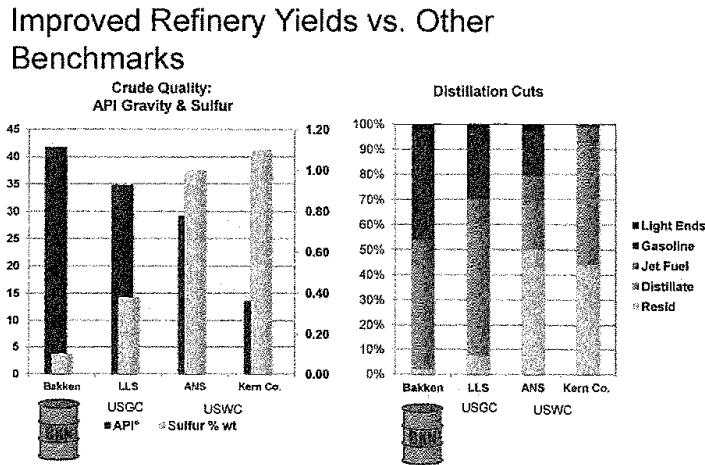
All refineries have criteria for accepting crudes for processing. These were not disclosed in the DEIR and should have been as environmental impacts cannot be fully assessed without them. The switch from a heavy high sulfur crude (current) to very light low sulfur crude (Bakken) would require process design changes, such as changes to the distillation units, idling of the coker and sulfur recovery units, and new tankage. The DEIR does not disclose any refinery design changes.

Bakken crude<sup>10</sup> is a “light” (i.e., very volatile) crude with a high API gravity (>40°) and very low sulfur content (<0.2%)<sup>11</sup> that is not similar to the current crude

<sup>10</sup> Cenovus, Bakken Light Crude Oil, Available at: [http://www.cenovus.com/contractor/docs/CenovusMSDS\\_BakkenOil.pdf](http://www.cenovus.com/contractor/docs/CenovusMSDS_BakkenOil.pdf). See also crude composition data at: Enbridge Pipelines Inc. 2013 Crude Characteristics No. 44, Available at: <http://www.enbridge.com/DeliveringEnergy/Shippers/~media/www/Site%20Documents/Delivering%20Energy/2013%20Mainline%20Crude%20Characteristics.pdf>.

feedstock shown in Table 1. When refined, it yields very little residuum (coker feed) and large amounts of gasoline. Figure 3 The current slate, which is similar to the Kern County crude shown in Figure 3, consists of heavy (API 19°) (i.e., not volatile), sour (4.6% sulfur) crude. When refined, it yields large amounts of residuum, which must be processed in the cokers to extract lighter products amenable to pipelines transport and further processing at Rodeo.

**Figure 3**  
**Composition of Bakken Compared to**  
**Typical Heavy Crude (Kern)**



The Rail Spur Project is being designed to import essentially 100% of the Refinery’s permitted daily throughput crude capacity by rail<sup>12</sup> and 73% of its annual

<sup>11</sup> Bakken has recently soured and sulfur content of 0.17-2.0 ppm are now reported. Prices fell with the souring. See <https://www.onepetro.org/conference-paper/SPE-141434-MS>; <http://www.reuters.com/article/2013/05/29/column-kemp-bakken-pipelines-idUSL5N0EA3SU20130529>.

<sup>12</sup> In the Rail Spur baseline, assumed to be 2010 to 2012, the Refinery processed an average of 38,029 BPD. DEIR, Table 2.7. The permitted maximum daily throughput in the baseline is 44,500 BPD. DEIR, Table 3.1. The Rail Spur Project is designed to import one unit train per day, carrying up to 2,190,000 gallons or up to 51,143 BPD of crude oil. DEIR, pp. ES-5, 1-4. An FEIR has been issued for a throughput increase project which would increase the daily permit level by 10% to a maximum of 48,950 BPD (DEIR, p. 2-28 and Table 3.2) and the annual throughput from 16,242,500 BPY to 17,866,750 BPY. Throughput FEIR, p. 2-26.

average throughput.<sup>13</sup> While small amounts of Bakken could be blended with locally sourced or heavy high sulfur crudes or imported tar sand crudes without significant refinery design changes, it is unlikely that Bakken would ever comprise a large fraction of the Santa Maria crude slate without major capital projects not disclosed in the DEIR. The Santa Maria Refinery is not designed to process light sweet crude. Further, as discussed elsewhere in these comments, light sweet crudes such as Bakken generally command a premium in the market. Thus, it is unlikely that Bakken crudes would comprise a significant fraction of the Santa Maria slate as long as cheaper Canadian tar sands crudes are available.

A switch to Bakken would require significant modifications at both the Santa Maria and Rodeo Refineries that are not disclosed in the DEIR. The cokers and sulfur recovery unit, for example, would likely be idled or modified to reduce their processing rates if large amounts of Bakken were refined as Bakken contains very little residuum, *i.e.*, the coker feed, and very little sulfur. New storage tanks would be required, or an increase in permitted throughputs of existing storage tanks and changes in the design of tank vapor control systems to handle higher vapor pressure materials would be required. The capital investment in most of the existing refining equipment would be lost along with the income from selling sulfur and coke. An entirely different refinery would be required to capture maximum value from Bakken crude. No such changes are disclosed in the DEIR.

Further, emissions from the Refinery and pump stations along the pipeline connecting Santa Maria and Rodeo would be significantly different from those in the baseline. If the crude slate were switched to Bakken, combustion emissions at the Santa Maria Refinery would decrease, offsetting some of the increases in locomotive emissions. However, volatile organic compound (VOC) and hazardous air pollutant (e.g., benzene) emissions from tanks and fugitive components, including pump stations along the pipeline (Santa Margarita, Shandon, Cuesta), would significantly increase, likely enough to trigger PSD review for the rail spur as a major modification. These increases would also result in significant worker and public health impacts.

Changes in the type and amount of semi-refined products sent to Rodeo would also change, resulting in changes in emissions at Rodeo. The DEIR does not disclose any changes in emissions at the Santa Maria or Rodeo Refineries from processing the rail-imported crude. This omission either eliminates Bakken as the major crude import, pointing to a heavy, higher sulfur crude, such as tar sands, or renders the DEIR deficient for failing to analyze the impacts of the crude switch.

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<sup>13</sup> The 2012 throughput was 13,274,829 bbl/year, 3-year average throughput was 13,858,563 bbl/year. The project maximum delivery assuming 250 trains/year @ 73 rail cars/train and 30,000 bbl/car = **13,035,714 bbl/year** or 73% of the permitted throughput of **17,866,750 bbl/year**. DEIR, p. 2-26.

### B. Tar Sands Crudes as Feedstock for the Santa Maria Refinery

Canadian tar sands crudes are a “North American sourced crude” that could be imported by the Rail Spur Project. These crudes are also chemically distinct from the current crude slate. The DEIR does not mention Canadian tar sands crudes, which we believe are the most likely crude source. They are likely not mentioned as tar sands crudes have numerous well documented environmental problems<sup>14</sup> and would not be welcome in California due to their well known adverse impacts. However, the Project design and various other information in the DEIR indicate the Project is being designed to import both tar sands crudes and Bakken crudes. Thus, the DEIR must be revised to evaluate the impacts of importing up to 100% of both crudes, which have different impacts. The evidence indicating the Project is designed to import tar sands crudes is summarized in this comment.

The Project description indicates the Rail Spur Project would import crude oil “sourced from oilfields throughout North America based on market economics and other factors...” DEIR, p. ES-3. Tar sands crudes are North American sourced crudes. Further, as defined by the International Energy Agency, and acknowledged in the Land Use Permit Application, the term “crude oil” comprises crude oil, natural gas liquids, refinery feedstocks, and additives as well as other hydrocarbons (including emulsified oils, synthetic crude oil, mineral oils extracted from bituminous minerals such as oil shale, bituminous sand, etc., and oils from coal liquefaction). Crude oil is a mineral oil consisting of a mixture of hydrocarbons of natural origin and associated impurities, such as sulphur.<sup>15</sup> The DEIR does not propose any condition excluding tar sands crudes. Thus, tar sands crudes cannot be ruled out. In fact, the Project is being designed to import tar sands crude. The evidence supporting this is outlined below.

#### 1. Tank Car Capacity

The Project is designed to use two different sized rail cars in the unit trains: (1) 80 rail cars carrying 23,500 gallons each and (2) 73 railcars carrying 30,000 gallons each. DEIR ES-5. The capacity of a rail car is determined by the weight of the loaded car and the maximum allowed weight on the rail line, which is ultimately determined by the density of the material contained in the car. The maximum allowable weight on most freight rail lines coming out of Canada is 286,000 lbs, including the weight of the car.<sup>16</sup>

For light crudes, such as Bakken, the ideal rail tank car has a capacity of 30,000 to 32,000 gallons, given the 286,000 lb rail line weight restriction. For heavier crudes, such

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<sup>14</sup> EIP, Tar Sands: Feeding U.S. Refinery Expansions with Dirty Fuel, June 2008, Available at: [http://environmentalintegrity.org/pdf/publications/Tar\\_Sand\\_Report.pdf](http://environmentalintegrity.org/pdf/publications/Tar_Sand_Report.pdf).

<sup>15</sup> <http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/phillipslanduse.pdf>.

<sup>16</sup> Allowable Gross Weight Map, Available at: [http://www.uprr.com/aboutup/maps/attachments/allow\\_gross\\_full.pdf](http://www.uprr.com/aboutup/maps/attachments/allow_gross_full.pdf). See also 49 CFR 179.13, Tank Car Capacity and Gross Weight Limitation.

as tar sands, the ideal tank car has a capacity of about 25,000 gallons, given this limit.<sup>17</sup> Thus, the Project described in the DEIR contemplates both Bakken and tar sands, as it describes the Project as using tank cars carrying either 23,500 gallons (a classic tar sands railcar) or 30,000 gallons (a classic light crude railcar) of crude oil. The Bakken train configuration option would allow the import of more crude than the permitted maximum daily crude throughput (51,143 BPD vs 48,950 BPD).

2. Hydrogen Sulfide Levels

The DEIR includes an odor impact analysis that assumes “the expected H<sub>2</sub>S content of the crude oil vapor could be about one percent” based on the Applicant's expected H<sub>2</sub>S content of crude oil vapor. DEIR, p. 4.3-51. This is much higher than H<sub>2</sub>S levels in Bakken crude vapors. Bakken crude oil contains less than 0.2% H<sub>2</sub>S and the headspace vapors would be significantly lower. Thus, the Applicant is expecting to import high H<sub>2</sub>S crudes. Tar sands crudes contains high H<sub>2</sub>S concentrations.<sup>18</sup>

3. Vapor Pressure Limits

Phillips 66 asserted in its responses to comments on the Draft EIR for the Propane Recovery Project at Rodeo that: “Prior to shipment of the intermediates produced at Santa Maria, the semi-refined material is stored in tankage. The tankage has vapor pressure limits imposed by the County Air District which acts as a constraint regarding how much butane/propane can be included in the intermediates. Accordingly... no new propane/butane can be added to the intermediates sent from Santa Maria to Rodeo regardless of the types of crude that may be processed at Santa Maria.”<sup>19</sup> If true, this eliminates Bakken as a crude that would imported by the rail spur, as it contains high concentrations of volatile components that would significantly increase vapor pressure of material stored in tanks. This points to the import of tar sand crudes, which are similar to the heavy crudes currently refined at Santa Maria.

4. Cost-Advantaged Crudes

The DEIR indicates one of the purposes of the Project is to obtain “competitively priced crude oil.” DEIR, p. 2-30. Tar sands and Bakken are both “competitively priced”, cost-advantaged crudes because they are stranded, with no pipeline access and thus must be delivered by rail.<sup>20</sup> As refineries are not equipped to take delivery of large amounts of

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<sup>17</sup> Association of American Railroads, Moving Crude Petroleum by Rail, May 2013, p. 10.

<sup>18</sup> <http://www.crudemonitor.ca/home.php>.

<sup>19</sup> Letter from Mark E. Evans, Phillips 66 San Francisco Refinery Manager, to Chair Karen Mitchoff and Members of the Contra Costa County Board of Supervisors, Re: Phillips 66 Propane Recovery Project, p. 6, January 6, 2014, Available at: [http://64.166.146.155/docs/2014/BOS/20140121\\_330/16707\\_Exhibit7-P66Response.pdf](http://64.166.146.155/docs/2014/BOS/20140121_330/16707_Exhibit7-P66Response.pdf).

<sup>20</sup> Small amounts of Canadian tar sands crudes are currently arriving on the west coast by ship. However, the pipeline capacity to transport the tar sands crude to the west coast and the rail capacity to transport it to the west coast for subsequent water delivery is currently very limited. However, projects are underway to

crude by rail, which requires large unit trains, significant infrastructure improvements, such as the Santa Maria Rail Spur Project, are required to import them to the west coast. The most cost advantaged of those available is tar sands crudes, which are both closer to Santa Maria and have less value in the refining market due to their composition, which is similar to the heavy sour crudes now processed at Santa Maria.

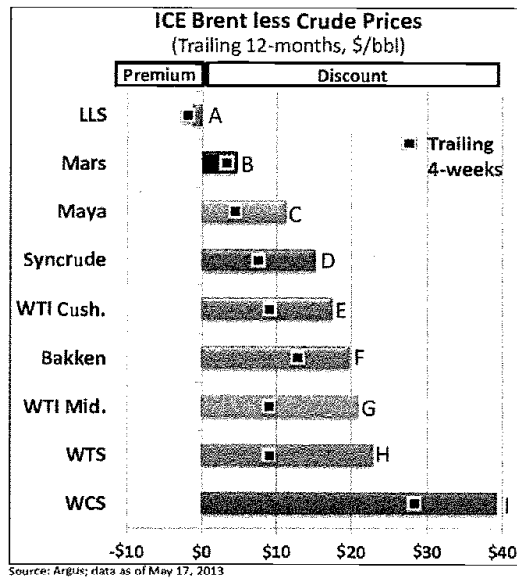
Cost-advantaged crude sells at a discount relative to crude oils tied to the global benchmark, North Sea Brent crude. A recent presentation by a Phillips 66 competitor identified tar sands crudes as the most competitively priced crudes to import into the California market by rail.<sup>21</sup> The cost-advantaged crude oils identified by Valero are shown in Figure 4.

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alleviate these bottlenecks, including a Phillips 66 project at its Ferndale facility in Washington. The Ferndale project would allow direct import of tar sands crude at the Rodeo Marine Terminal.

<sup>21</sup> Valero, UBS Global Oil and Gas Conference, May 21-22, 2013, p. 10, Available at: <http://www.valero.com/InvestorRelations/Pages/EventsPresentations.aspx>, provided as Appendix D to TGG Comments.

**Figure 4**  
**Cost-Advantaged Crudes**  
**That Could Be Imported By Rail<sup>22</sup>**

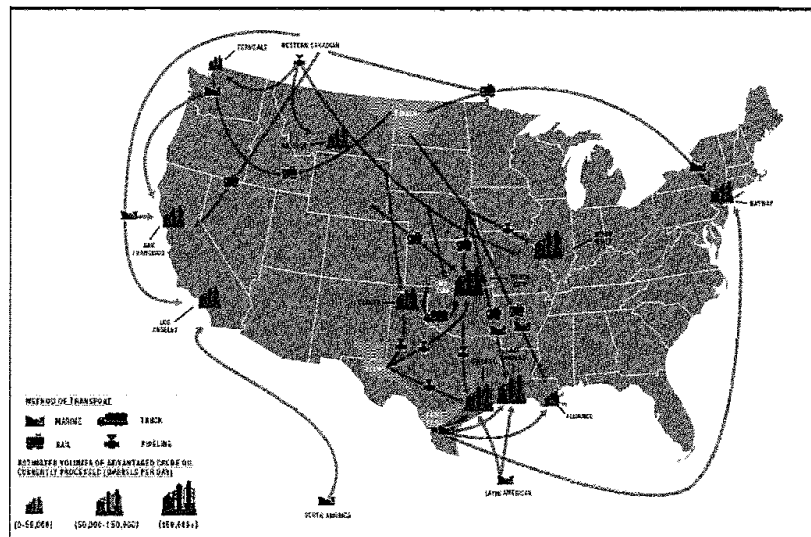


<sup>22</sup> **Brent** is light sweet crude oil sourced from the North Sea, priced at export point there. It has an API gravity of 37.9° and 0.45% sulfur. **LLS** is light Louisiana sweet, priced at St. James, LA. It has an API gravity of 37.0° and 0.38% sulfur. **MARS** is a medium sour blended crude marketed into the Gulf coast and mid-continent regions, priced at Clovelly LA. It has an API gravity of 28.7° and 1.8% sulfur. **Maya** is a heavy sour crude oil from Mexico, priced at export point there. It has an API gravity of 22° and 3.3% sulfur. **WTI Cush.** is West Texas Intermediate crude priced at Cushing, OK, a major trading hub for crude oil. It is a light crude oil with an API gravity of 39.0° and 0.4% sulfur (see also [http://en.wikipedia.org/wiki/West\\_Texas\\_Intermediate](http://en.wikipedia.org/wiki/West_Texas_Intermediate)). **WTI Mid.** is West Texas Intermediate (API gravity of 39.0° and 0.4% sulfur) priced at Midland TX (proximate to Permian Basin production). **WTS** is west Texas Sour priced at Midland, TX and an API gravity of 33.5° and 1.9% sulfur. **Syncrude** is a light sweet synthetic Canadian tar sands crude consisting of a bottomless blend of hydrotreated naphtha, distillate, and gas oil fractions produced from a coker and hydrocracker based upgrader facility in Canada; priced at Edmonton Alberta. It typically has an API gravity of 31.0° to 33.0° and 0.1% to 0.2% sulfur (see also <http://www.crudemonitor.ca/crude.php?acr=SYN>). **WCS** is Western Canadian Select, priced at Hardesty, Alberta. This is a tar sands DilBit crude with API gravity of 20.0° to 21.0° and 3.4% to 3.7% sulfur (see also <http://www.crudemonitor.ca/crude.php?acr=WCS>). Sources: Valero crude price data (in Figure 2) are sourced to Argus, so crude specifications in this footnote are based on Argus Methodology and Specifications: Americas Crude (Last Updated: May 2013) [http://media.argusmedia.com/~media/Files/PDFs/Meth/argus\\_americas\\_crude.pdf](http://media.argusmedia.com/~media/Files/PDFs/Meth/argus_americas_crude.pdf) and (for Brent) Argus Crude (Updated: June 2013) [http://media.argusmedia.com/~media/Files/PDFs/Meth/argus\\_crude.pdf](http://media.argusmedia.com/~media/Files/PDFs/Meth/argus_crude.pdf). The pricing locations specified are those shown in Valero, UBS Global Oil and Gas Conference, May 21-22, 2013, p. 8, A available at: <http://www.valero.com/InvestorRelations/Pages/EventsPresentations.aspx>, provided as Appendix D to TGG Comments.



The largest growth in cost-advantaged crudes is coming from U.S. shale crudes and heavy Canadian tar sands crudes, both of which are “North American-sourced crude oils.” Valero’s list of cost-advantaged crudes in Figure 4 indicates that the most cost-advantaged crude is Western Canadian Select (WCS).<sup>23</sup> A recent Phillips 66 presentation, Figure 5, indicates it is clearly considering Canadian tar sands crude options.<sup>24</sup>

**Figure 5**  
**Phillips 66 Cost Advantaged Crude Activities**



Western Canadian Select is a “DilBit”, which is Canadian tar sands bitumen diluted to pipeline specifications with 25% to 30% diluent. The diluent is typically natural gas condensate, pentanes, or naphtha.<sup>25</sup> Most of the tar sands crudes are too heavy to flow in a pipeline or to be transported in the type of railcars proposed for the Project (i.e., no steam coils or steaming facilities at Santa Maria). Thus, they must be

<sup>23</sup> Cenovus Energy, Western Canadian Select (WCS) Fact Sheet, Available at: <http://www.cenovus.com/operations/doing-business-with-us/marketing/western-canadian-select-fact-sheet.html>. See also CrudeMonitor.ca - Canadian Crude Quality Monitoring, Available at: <http://www.crudemonitor.ca/crude.php?acr=WCS>.

<sup>24</sup> Phillips 66, Crude by Rail & Intermodal Supply Chain, Optimization and Opportunities, Refiner-Led Summit 2013, Opening Keynote Panel, August 21, 2013.

<sup>25</sup> Gary R. Brierley, Visnja A. Gembicki, and Tim M. Cowan, Changing Refinery Configurations for Heavy and Synthetic Crude Processing, Available at: <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138>.

diluted or thinned with a lighter hydrocarbon stream to reduce viscosity and density to meet pipeline specifications.

The potential rail import of DilBits cannot be eliminated and is the most likely rail import due to economic considerations. The failure to disclose the potential import of tar sands crudes, which are chemically distinct from the current crude slate, is a significant omission as the emissions from handling this material are different from the baseline crude slate. The emissions of some pollutants, VOCs and HAPs, for example, are large and will result in significant air quality, odor, and worker and public health impacts.

Western Canadian Select sells for a discount of nearly \$40/bbl compared to ICE Brent.<sup>26</sup> Assuming Valero's reported light crude rail delivery cost of about \$13/bbl to \$15/bbl,<sup>27</sup> WCE would arrive at Santa Maria at a discount of about \$23/bbl to \$25/bbl relative to ICE Brent. Rail delivery costs for heavy crude would be somewhat higher, and heavy, sour crudes are less valuable than Brent (the global benchmark for light, sweet crudes). Still, the price of WCS delivered to Santa Maria is likely lower (and very likely competitive), compared with all the other cost-advantaged crudes (Fig. 4). Thus, the most likely crude to be imported by rail is one of the tar sands crudes, which are compatible with the design of the Santa Maria Refinery.

The cost advantage of delivering North American-sourced light sweet crudes (e.g., Bakken) by rail is less than for tar sands crudes. The North American light crudes are discounted less relative to conventional light sweet crudes (ICE Brent) as North American light crudes have more desirable qualities and are further away from Santa Maria than Canadian tar sands. The cost advantage of these crudes, e.g., Bakken, may be small (or completely disappear) after adding the cost of transport by rail to Santa Maria. However, the competitive position of Bakken (and other crudes) will depend in part on the pricing dynamics in the crude markets,<sup>28</sup> and also how specific refineries are configured.<sup>29</sup> Thus, Bakken cannot be eliminated and must be analyzed in the DEIR.

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<sup>26</sup> Brent crude is a major trading classification of sweet light crude oil sourced from the North Sea. Brent is the leading global price benchmark for Atlantic basin crude oils and is used to price two thirds of the world's internationally traded crude oil supplies. It contains about 0.37% sulfur and has an API gravity of 38.06°. It is traded on the electronic IntercontinentalExchange, known as ICE. See: [http://en.wikipedia.org/wiki/Brent\\_Crude](http://en.wikipedia.org/wiki/Brent_Crude).

<sup>27</sup> Valero, May 21-22, 2013, p. 11. This is consistent with recently reported rail delivery rates to Los Angeles of \$9.50 - \$10.50/bbl (Tesoro, Deutsche Bank Energy Conference, January 9, 2014, pdf 14).

<sup>28</sup> Crude pricing is highly dynamic and varies in part based on crude flows. To the extent that California (and other North American coastal markets) are importing Brent and other waterborne crudes, delivered costs typically include a small premium to cover the cost of importing the crudes by tanker. In Valero's analysis in Figure 4, Brent-priced crude is assumed to be imported into East Coast US (PA/NJ), with the delivered price there at a \$2 premium over Brent. Market analysis typically assumes that overseas tanker delivery (e.g., from Brent to East or Gulf Coast) costs about \$2/barrel.

<sup>29</sup> Bakken and other light, sweet shale crudes are especially attractive for less complex refineries that are configured for light, sweet crudes, as opposed to more complex refineries that can process heavier, sour feedstocks.

**IV. ENVIRONMENTAL IMPACTS FROM CRUDE SLATE CHANGES NOT EVALUATED**

The Project would replace up to 100% of the current crude slate with crudes imported from other unidentified and chemically distinct sources, e.g., Bakken light sweet crudes or Canadian tar sands crudes. The environmental impacts of refining depend upon the composition of the crude slate, as discussed elsewhere in these comments. The specific chemicals emitted during refining depend upon the chemicals in the starting crude. Thus, the composition of the baseline crude slate is essential to determine environmental impacts.

**A. Why Crude Slate Composition Matters**

The Project proposes to dramatically change 100% of the crude slate, from heavy high sulfur locally sourced crudes to light low sulfur crude or heavy high sulfur tar sands crudes. However, the DEIR is silent on the composition of these new crude(s) that would be imported by rail and the resulting impacts relative to the baseline crude slate. The composition of the crude slate determines air quality, worker and public health, risk of upset, and other impacts of the Project and must be disclosed. The specific chemicals emitted during refining depend upon the chemicals in the starting crude. Thus, the composition of the baseline crude slate is essential to determine environmental impacts.

Volatile chemicals in the crude, such as benzene, hydrogen sulfide, and mercaptans, for example, are emitted from tanks, pumps, connectors, and valves that transport, store and process the crude. Total crude sulfur content as reported in the DEIR cannot be used to evaluate odor and health impacts from transport, storing, and processing this crude as the impacts depend upon the concentration of specific sulfur compounds in rail-imports versus the current slate, e.g., the amount of hydrogen sulfide and mercaptans, which most commonly cause odor problems at refineries. The DEIR does not relate even the single crude analysis to any of its impact analyses. In fact, the DEIR did not analyze any of the impacts of a crude switch.

Hazardous air pollutants or HAPs (e.g., benzene) and other Toxic Air Contaminants (TACs (e.g., H<sub>2</sub>S)) are present in the crude slate and its semi-refined byproducts. These are emitted from thousands of fittings, valves, pumps, compressors, vents, and tanks at the Refinery and along the pipeline connecting Santa Maria and Rodeo. These emissions were not evaluated in the DEIR.

Refining rearranges the composition of the crude to make marketable products. This requires the input of electricity, heat, and steam. These are generated by burning fuel, which releases large amounts of greenhouse gases, nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), and other chemicals of concern. The amount of electricity, heat and steam depend upon the chemicals in the crude. Some of the potential "North American sourced

crudes" may require much more electricity, heat, and steam to refine than the current slate, increasing emissions and other impacts relative to the baseline crude slate.

**B. Crude Slate Baseline Is Not Identified**

As this Project involves replacing up to 100% of the current crude slate with dramatically different crudes, baseline crude composition must be reported and impacts must be estimated for the crude switch, relative to baseline crudes. The DEIR does not include baseline crude composition nor does it evaluate any environmental impacts resulting from importing a new crude slate.

The DEIR only includes one analysis of a current crude, a sample collected in March 2008, which is not even in the baseline years and is incomplete. See Table 1. It is unknown where the sample was collected, how it was analyzed, and how it relates to the long-term average slate in the baseline years 2010 - 2012. The Santa Maria Refinery processes crudes from many local and offshore sources that change over time. Is the sample in Table 1 of just one of these crudes, or is it the typical blend that is refined in the baseline? Regardless, one snapshot sample is not sufficient to establish the 2010 - 2012 baseline crude composition.

Further, the reported crude sample data is just for gross lumped parameters such as API gravity and total sulfur content. These lumped parameters are not useful for evaluating environmental impacts. The specific chemicals in the crude and their concentrations are required to evaluate impacts. A good crude assay is essential for comprehensive crude oil evaluation.<sup>30</sup> The type of data required to evaluate emissions would require, at a minimum, the following information for both the current slate and the unidentified "North American-sourced crudes":

- Trace elements (As, B, Cd, Cl, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, Se, U, V, Zn)
- Nitrogen (total & basic)
- Sulfur (total, mercaptans, H<sub>2</sub>S)
- Residue properties (saturates, aromatics, resins)
- Acidity
- Aromatics content
- Asphaltenes (pentane, hexane and heptane insolubles)
- Hydrogen content
- Carbon residue (Ramsbottom, Conradson)
- Distillation yields
- Properties by cut

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<sup>30</sup> CCQTA February 7, 2012, p. 10.

- Hydrocarbon analysis by gas chromatography
- Flammability

This type of information is reported in a crude assay or “fingerprint” of the oil, which are likely available to Phillips 66 but were excluded from the DEIR, foreclosing any meaningful public review of environmental impacts. The DEIR does not identify any specific “North American-sourced crudes” that would be imported, contains only a single, limited crude assay for the current refinery slate which is inadequate to assess the baseline (a 2 year period, not a snapshot sample), or the crude(s) that would be imported by rail. The DEIR also does not contain an analysis of the impact of changes in crude quality on air emissions, odor impact, worker and public health impact, risk of upset, and other impact areas. Thus, the public is left to guess what the impacts might be.

The DEIR should have evaluated the impacts of refining the alternate crude slates the Project is being designed for, as reflected in the unit train specifications. These include both light sweet Bakken and heavy sour tar sands crudes. Alternatively, the DEIR should evaluate these impacts and include mitigation conditions prohibiting their import as publicly available information indicates that Phillips 66 is considering both as they would likely arrive at the Refinery with pricing that is competitive relative to other crudes.

The specific chemicals in the crude, for example, determine which ones will be volatile and lost through equipment leaks and outgassed from tanks, which ones will be difficult to remove at Santa Marian and Rodeo (thus determining how much hydrogen and energy must be expended to remove them), which ones will cause malodors, and which ones might aggravate corrosion, leading to accidental releases from pipelines and other refinery equipment.

**V. SIGNIFICANT IMPACTS OF CRUDE SLATE CHANGES NOT DISCLOSED**

The Project would change up to 100% of the baseline crude slate from locally sourced heavy high sulfur crudes to a light low sulfur crude or heavy high sulfur tar sands crudes. None of the impacts of the crude switch were disclosed in the DEIR nor any of the information required to assess these impacts.

**A. Impacts From Unique Suite Of Sulfur Compounds Not Evaluated**

The DEIR reports the amount of total sulfur in a single sample of a currently refined crude. The DEIR also analyzes the odor impacts of unloading an unidentified crude, assuming a crude vapor concentration of 1% H<sub>2</sub>S (9600 ppm). DEIR, p. 4.3-51 and Appx. B, p. B-10. The basis for this assumption, e.g., the type of crude and the identification and concentration of all sulfur compounds in its vapors were not disclosed. Odor impacts were just evaluated for unloading, but nowhere else, e.g., crude tanks at the Refinery, processing units within the Refinery. Worker and public health impacts from

emissions of sulfur species were not identified nor were risk of accidents from sulfur-induced corrosion.

The DEIR's assumption that 100% of the sulfur is H<sub>2</sub>S is wrong. Sulfur in the potential import crudes comprises a complex collection of individual chemical compounds including hydrogen sulfide, mercaptans, thiophene, benzothiophene, methyl sulfonic acid, dimethyl sulfone, thiacyclohexane, etc. Each crude has a different suite of individual sulfur chemicals. The environmental impacts of "sulfur", including odor, health impacts and risk of upset, depend upon the specific sulfur chemicals and their relative concentrations, not on the "gross" amount of total sulfur expressed as weight percent sulfur in the crude oil, or only as H<sub>2</sub>S in unidentified crude vapors.

The role of specific sulfur compounds was clearly and tragically demonstrated in the recent (August 2012) catastrophic accident at the Chevron Richmond Refinery. This accident was caused by the erroneous assumption that sulfur is sulfur, which led to significant corrosion. See next comment. Similarly, while the lighter sulfur compounds such as mercaptans and disulfides found in light sweet crudes may not significantly increase the overall weight percent sulfur in the crude slate, they do lead to impacts, such as aggressive sulfidation corrosion, which can lead to accidental releases. These compounds concentrate in the lower boiling naphtha fractions produced at Santa Maria and would contribute to aggressive sulfidation corrosion in the convection section of naphtha hydrotreating furnaces at Rodeo.<sup>31</sup>

The specific sulfur compounds in a crude also will determine which compounds will be emitted from storage tanks and fugitive component, some of which could result in significant odor impacts, e.g., mercaptans, and health impacts. The DEIR is silent on sulfur speciation, lumping all sulfur into only H<sub>2</sub>S. DEIR, pp. 4.3-51, B-5.

Regardless of what crude might be brought in by rail, there are potentially significant environmental impacts that will result due to the unique sulfur speciation profile of each crude that have not been disclosed in the DEIR. The DEIR lumps all sulfur compounds together.

#### **B. Accidental Releases From The Refinery May Increase**

The Santa Maria Refinery was built in 1955 before current American Petroleum Institute (API) standards were developed to control corrosion and before piping manufacturers began producing carbon steel in compliance with current metallurgical codes. Thus, the metallurgy used throughout much of the Refinery is likely not adequate to handle the unique chemical composition of tar sands crudes without significant upgrades. There is no assurance that required metallurgical upgrades would occur if tar sands crudes dominate the crude slate, as they are very expensive and are not required by any regulatory framework. Experience with changes in crude slate at the Chevron

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<sup>31</sup> See, for example, Jim McLaughlin, Changing Your Crude Slate, Becht News, May 24, 2013, Available at: <http://becht.com/news/becht-news/>.

Refinery in Richmond suggest required metallurgical upgrades are ignored, leading to catastrophic accidents.<sup>32</sup> The DEIR is silent on corrosion issues and metallurgical conditions of the Refinery.

Both DilBit and SynBit crudes, which are cost-advantaged North American crudes that could be imported by rail, have high Total Acid Numbers (TAN), which indicates high organic acid content, typically naphthenic acids. These acids are known to cause corrosion at high temperatures, such as occur in many refining units, e.g., in the feed to cokers. As a rule-of-thumb, crude oils with a TAN number greater than 0.5 mgKOH/g<sup>33</sup> are considered to be potentially corrosive and indicates a level of concern. A TAN number greater than 1.0 mgKOH/g is considered to be very high. Canadian tar sands crudes are high TAN crudes. The DilBits, for example, range from 0.98 to 2.42 mgKOH/g.<sup>34</sup>

Sulfidation corrosion from elevated concentrations of sulfur compounds in some of the heavier distillation cuts is also a major concern, especially in the vacuum distillation column, coker, and hydrotreater units. The specific suite of sulfur compounds may lead to increased corrosion. The IS/MND did not disclose either the specific suite of sulfur compounds or the TAN for the proposed crude imports.

A crude slate change could result in corrosion from, for example, the particular suite of sulfur compounds or naphthenic acid content, that leads to significant accidental releases, even if the crude slate is within the current design slate basis, due to compositional differences.

This recently occurred at the Chevron Richmond Refinery in the San Francisco Bay. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit. The sulfur composition at Chevron Richmond significantly changed over time.<sup>35</sup> This change increased corrosion rates in the 4-sidecut line, which led to a catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This release sent 15,000 people from the surrounding area for medical treatment due to the release and created huge black clouds of pollution billowing across the San Francisco Bay.

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<sup>32</sup> U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013, Available at: <http://www.csb.gov/chevron-refinery-fire/>.

<sup>33</sup> The Total Acid Number measures the composition of acids in a crude. The TAN value is measured as the number of milligrams (mg) of potassium hydroxide (KOH) needed to neutralize the acids in one gram of oil.

<sup>34</sup> [www.crudemonitor.ca](http://www.crudemonitor.ca).

<sup>35</sup> US Chemical Safety and Hazard Investigation Board, 2013, p.34 (“While Chevron stayed under its established crude unit design basis for total wt. % sulfur of the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.”).



These types of accidents can be reasonably expected to result from incorporating tar sands crudes into crude oils processed at the SMR. Even if the range of sulfur and gravity of the crudes remains the same, unless significant upgrades in metallurgy occur, as these crudes have a significant concentration of sulfur in the heavy components of the crude coupled with high TAN and high solids, which aggravate corrosion. The gas oil and vacuum residue piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from tar sands crudes, leading to catastrophic releases.<sup>36</sup> Catastrophic releases of air pollution from these types of accidents were not considered in the IS/MND.

Refinery emissions released in upsets and malfunctions can, in some cases, be greater than total operational emissions recorded in formal inventories. For example, a recent investigation of 18 Texas oil refineries between 2003 and 2008 found that “upset events” were frequent, with some single upset events producing more toxic air pollution than what was reported to the federal Toxics Release Inventory database for the entire year.<sup>37</sup>

### C. Emissions From Diluent Were Not Evaluated

The majority of the crudes that will be imported by rail will likely be a blend of bitumen and diluent due to their discounted price compared to conventional light sweet crudes such as Bakken. Pure undiluted tar sands bitumen is unlikely as the Project description does not disclose any equipment that would be necessary to handle pure bitumen, e.g., rail cars with steam soils, steaming facilities. Undiluted bitumen would eliminate the diluent impacts discussed in this section, but would significantly increase the impacts from refining the heavy ends from increased use of utilities that increase combustion emissions. Setting aside undiluted bitumen, this leaves the question of the amount of diluent that would be mixed with the crude, which ultimately determines impacts.

When heavy crude is shipped by pipeline, it needs to be diluted so that it will flow in the pipe. Bitumen blended to pipeline specifications can be loaded on and off conventional rail tank cars like other light crudes. However, bitumen can also be transported by rail as “RailBit”, using 15% to 20% diluent. The amount of diluent depends on the type of rail tank car and design details of the offloading facilities, which are not disclosed in the DEIR, which suggests conventional rail cars designed for DilBits and a conventional unloading terminal. Thus, I assume that one of the materials that will be transported by rail is conventional pipeline-quality DilBits with 20% to 30% diluent.

The mixture of diluent and bitumen does not behave the same as a conventional heavy crude, such as present in the current crude slate, because the distribution of hydrocarbons is very different. The blended lighter diluent generally evaporates readily

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<sup>36</sup> See, for example, Turini and others, 2011.

<sup>37</sup> J. Ozymy and M.L. Jarrell, *Upset over Air Pollution: Analyzing Upset Event Emissions at Petroleum Refineries*, *Review of Policy Research*, v. 28, no. 4, 2011.

when exposed to ambient conditions, leaving behind the heavy ends, the vacuum gas oil (VGO) and residuum.<sup>38</sup> Thus, when a DilBit is released accidentally, it will generally create a difficult to cleanup spill as the heavier bitumen will be left behind.<sup>39</sup> Further, in a storage tank, the diluent also can be rapidly evaporated and emitted through tank openings, emitting high amounts of VOCs and HAPs.

These conventional DilBits, which are the most likely “North American-sourced crudes” to be imported by rail over the long term, given the current economic outlook, are sometimes referred to as “dumbbell” or “barbell” crudes as the majority of the diluent is C<sub>5</sub> to C<sub>12</sub> and the majority of the bitumen is C<sub>30+</sub> boiling range material, with very little in between.<sup>40</sup> This means these crudes have a lot of material boiling at each end of the boiling point curve, but little in the middle. Thus, they yield very little middle distillate fuels, such as diesel, heating oil, kerosene, and jet fuel and more coke, than other heavy crudes. A typical DilBit, for example, will have 15% to 20% by weight light material, basically the added diluent, 10% to 15% middle distillate, and the balance, >75% is heavy residual material (vacuum gas oil and residue) exiting the distillation column. These characteristics distinguish DilBits from crudes currently refined at Santa Maria.<sup>41</sup> Thus, they could generate more coke than the current crude slate, which was not disclosed in the DEIR.

The large amount of light material that distills below 149 C is very volatile and can be emitted to the atmosphere from storage tanks and equipment leaks of fugitive components (pumps, compressors, valves, fittings) in much larger amounts than other heavy crudes that it would replace. The DEIR does not indicate whether other heavy crudes processed at the Refinery currently arrive with diluent. Thus, the use of diluent to transport tar sands crudes is likely an important difference between the current heavy crude slates processed at the Refinery and the tar sands crudes that could replace them. This diluent will have impacts during railcar unloading as well as within the Refinery.

The diluent is a low molecular weight organic material with a high vapor pressure that contains high levels of VOCs, sulfur compounds, and HAPs. These would be emitted during unloading and present in emissions from the crude tank(s) and fugitive components from its entry into the Refinery with the crude until it is recovered and marketed at Rodeo. The presence of diluent would increase the vapor pressure of the

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<sup>38</sup> The residuum is the residue obtained from the oil after nondestructive distillation has removed all of the volatile materials. Residua are black, viscous materials. They may be liquid at room temperature (from the atmospheric distillation tower) or almost solid (generally vacuum residua), depending upon the nature of the crude oil.

<sup>39</sup> A Dilbit Primer: How It's Different from Conventional Oil, Inside Climate News. Available at: <http://insideclimatenews.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar-sands-Alberta-Kalamazoo-Keystone-XL-Enbridge?page=show>.

<sup>40</sup> Gary R. Brierley and others, Changing Refinery Configuration for Heavy and Synthetic Crude Processing, 2006, Available at: <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138>.

<sup>41</sup> Stratiev and others, 2010, Table 1, compared to DilBit crude data on [www.crudemonitor.ca](http://www.crudemonitor.ca).

crude, substantially increasing VOC and HAP emissions from tanks and fugitive component leaks compared to those from displaced heavy crudes not blended with diluent and does not address diluent-derived emissions.

The composition of some typical diluents/condensates is reported on the website, [www.crudemonitor.ca](http://www.crudemonitor.ca).<sup>42</sup> The specific diluents that would be present in imported crudes is unknown. The CrudeMonitor information indicates that diluents contain very high concentrations (based on 5-year averages, v/v basis) of the hazardous air pollutants (HAPs) benzene (7,200 ppm to 9,800 ppm); toluene (10,300 ppm to 25,300 ppm); ethyl benzene (900 ppm to 2,900 ppm); and xylenes (4,600 ppm to 23,900 ppm).

The sum of these four compounds is known as “BTEX” or benzene-toluene-ethylbenzene-xylene. The BTEX in diluent ranges from 27,000 ppm to 60,900 ppm. The BTEX in DilBits, blended from these materials, ranges from 8,000 ppm to 12,300 ppm.<sup>43</sup> Similarly, the BTEX in synthetic crude oils (SCOs) ranges from 6,100 ppm to 14,100 ppm.<sup>44</sup> These are very high concentrations that were not considered in the emission calculations in the DEIR or the health risk assessment. These high levels could result in significant worker and public health impacts.

The DEIR does not disclose the BTEX concentrations in the baseline crude slate nor the BTEX concentrations in the range of crudes that could be imported. Rather, it contains only a single mass fraction crude vapor speciation profile that is used only to estimate canister ROG emissions from unloading of trains. However, BTEX from the crude would be emitted from nearly every tank and fugitive component in the Refinery. The DEIR did not evaluate the worker or public health impacts from these emissions anywhere at the facility. Benzene is a carcinogen, the principal one that would be

<sup>42</sup> Condensate Blend (CRW) - <http://www.crudemonitor.ca/condensate.php?acr=CRW>; Fort Saskatchewan Condensate (CFT) - <http://www.crudemonitor.ca/condensate.php?acr=CFT>; Peace Condensate (CPR) - <http://www.crudemonitor.ca/condensate.php?acr=CPR>; Pembina Condensate (CPM) - <http://www.crudemonitor.ca/condensate.php?acr=CPM>; Rangeland Condensate (CRL) - <http://www.crudemonitor.ca/condensate.php?acr=CRL>; Southern Lights Diluent (SLD) - <http://www.crudemonitor.ca/condensate.php?acr=SLD>.

<sup>43</sup> DilBits: Access Western Blend (AWB) - <http://www.crudemonitor.ca/crude.php?acr=AWB>; Borealis Heavy Blend (BHB) - <http://www.crudemonitor.ca/crude.php?acr=BHB>; Christina Dilbit Blend (CDB) - <http://www.crudemonitor.ca/crude.php?acr=CDB>; Cold Lake (CL) - <http://www.crudemonitor.ca/crude.php?acr=CL>; Peace River Heavy (PH) - <http://www.crudemonitor.ca/crude.php?acr=PH>; Seal Heavy (SH) - <http://www.crudemonitor.ca/crude.php?acr=SH>; Statoil Cheecham Blend (SCB) - <http://www.crudemonitor.ca/crude.php?acr=SCB>; Wabasca Heavy (WH) - <http://www.crudemonitor.ca/crude.php?acr=WH>; Western Canadian Select (WCS) - <http://www.crudemonitor.ca/crude.php?acr=WCS>; Albion Heavy Synthetic (AHS) (DilSynBit) - <http://www.crudemonitor.ca/crude.php?acr=AHS>.

<sup>44</sup> SCOs: CNRL Light Sweet Synthetic (CNS) - <http://www.crudemonitor.ca/crude.php?acr=CNS>; Husky Synthetic Blend (HSB) - <http://www.crudemonitor.ca/crude.php?acr=HSB>; Long Lake Light Synthetic (PSC) - <http://www.crudemonitor.ca/crude.php?acr=PSC>; Premium Albion Synthetic (PAS) - <http://www.crudemonitor.ca/crude.php?acr=PAS>; Shell Synthetic Light (SSX) - <http://www.crudemonitor.ca/crude.php?acr=SSX>; Suncor Synthetic A (OSA) - <http://www.crudemonitor.ca/crude.php?acr=OSA>; Syncrude Synthetic (SYN) - <http://www.crudemonitor.ca/crude.php?acr=SYN>.

emitted by the Project.<sup>45</sup> These emissions would result in significant worker and public health impacts.

**Table 2  
Comparison of BTEX Levels  
in Potential Crude Imports**

	Current Crude Slate (in crude vapors) DEIR, p. B-5 (wt.%) <sup>46</sup>	Diluents (5-yr Avg) <sup>47</sup> (wt.%)	Christina DilBit <sup>48</sup> (5-yr Avg) (wt.%)	Western Canadian Select <sup>49</sup> (5-yr Avg) (wt.%)	Bakken <sup>50</sup> Crude (wt.%)
Benzene	?	0.83-1.27	0.27	0.15	0.1-1.0
Ethylbenzene	?	0.11-0.33	0.06	0.06	0.33
Toluene	?	1.32-2.89	0.44	0.27	0.92
Xylenes	?	0.59-2.71	0.34	0.27	1.4

The CrudeMonitor information also indicates that these diluents contain elevated concentrations of volatile mercaptans (9.9 to 103.5 ppm), which are highly odiferous and toxic compounds that will create odor and nuisance problems at the Refinery in the vicinity of the unloading area, crude storage tanks and supporting fugitive components. Mercaptans can be detected at concentrations substantially lower than will be present in emissions from the crude tanks and fugitive emissions from the unloading rack and

<sup>45</sup> Ethylbenzene was classified by OEHHA as a weak carcinogen in 2007. See: <http://oehha.ca.gov/tcdb/index.asp>.

<sup>46</sup> DEIR did not report BTEX composition of the crudes.

<sup>47</sup> The reported range includes the following diluents: Condensate Blend, Saskatchewan Condensate, Peace Condensate, Pembina Condensate, Rangeland Condensate, and Southern Lights Diluent. The composition data for all of these diluents is found at <http://www.crudemonitor.ca>. Concentrations reported in volume % (v/v) in this source were converted to weight % by dividing by the ratio of compound density in kg/m<sup>3</sup> at 25 C (benzene = 876.5 kg/m<sup>3</sup>, toluene = 866.9 kg/m<sup>3</sup>, ethylbenzene 866.5 kg/m<sup>3</sup>, and the xylenes 863 kg/m<sup>3</sup>) to crude oil density in kg/m<sup>3</sup>, as reported at [www.crudemonitor.ca](http://www.crudemonitor.ca), 5-year average. See also Cenovus Energy Inc. Material Safety Data Sheet, Condensate (Sour) and Condensate (Sweet), Available at: <http://www.cenovus.com/contractor/msds.html>.

<sup>48</sup> Christina DilBit Blend (CDB) - <http://www.crudemonitor.ca/crude.php?acr=CDB>. Concentrations reported in volume % (v/v) converted to weight % as explained in footnote 47.

<sup>49</sup> Western Canadian Select (WCS) - <http://www.crudemonitor.ca/crude.php?acr=WCS>. Concentrations reported in volume % (v/v) converted to weight % as explained in footnote 47.

<sup>50</sup> Cenovus Energy, Material Safety Data Sheet for Light Crude Oil, Bakken (benzene), Available at: [http://www.cenovus.com/contractor/docs/CenovusMSDS\\_BakkenOil.pdf](http://www.cenovus.com/contractor/docs/CenovusMSDS_BakkenOil.pdf). Other components of BTEX from Keystone DEIS, Tables 3.13-1 (density) and 3.13-2 (BTEX). Concentrations reported in volume % (v/v) converted to weight % as explained in footnote 47.

related components, including pumps, valves, flanges, and connectors.<sup>51</sup> In fact, mercaptans are added to natural gas in very tiny amounts so that the gas can be smelled to facilitate detecting leaks.

Thus, unloading, storing, handling and refining bitumens mixed with diluent and shale crudes such as Bakken would emit VOCs, HAPs, and malodorous sulfur compounds, not found in comparable levels in the existing slate of heavy high sulfur local crudes, depending upon the rail-imported DilBit or shale crude source. There are no restrictions on the crudes, diluent source or their compositions nor any requirements to monitor emissions from tanks and leaking equipment where DilBit-blended and other light crudes would be handled.

#### **D. Increased Combustion Emissions From Tar Sands Bitumen Not Evaluated**

Tar sands are one group of crudes that could plausibly be imported by rail, as discussed elsewhere in these comments. The composition of tar sands crudes is chemically different from other heavy crudes currently processed at the Refinery as they are tar sands bitumen mixed with diluent. They are unique for two major reasons: (1) presence of large quantities of volatile diluent full of VOCs and toxic chemicals as discussed above and (2) unique chemical composition of the bitumen, the heavy fraction. The previous comment discussed diluent. This comment discusses the unique composition of tar sands bitumens that require more intense processing and thus result in higher emissions.

Tar sands bitumens are composed of higher molecular weight chemicals and are deficient in hydrogen compared to conventional heavy crudes. This means more energy will be required to convert them into the same slate of refined products. Thus, most fired sources in both the Santa Maria and Rodeo Refiners—heaters, boilers, etc.—will have to work harder to generate the same quantity and quality of refined products. This will increase all utilities required to run the refineries - electricity, natural gas, hydrogen, water, and steam. These increases in emissions were not disclosed in the DEIR. This section discusses these bitumens and their impact on refining emissions.

Refining converts crude oils into transportation fuels. This is done by removing contaminants (sulfur, nitrogen, metals) and breaking down and reassembling chemicals present in the crude oil charge by adding hydrogen, removing carbon as coke, and applying heat, pressure, and steam in the presence of various catalysts. More intensive refining is required to convert tar sands crudes into useful products than other heavy crudes. This means a greater amount of energy must be expended to yield the same product slate. Thus, all of the combustion sources in a refinery, such as heaters and boilers, must work harder and thus emit more pollutants, than when refining conventional heavy and other crudes. The DEIR fails completely to analyze the impact of crude

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<sup>51</sup> American Industrial Hygiene Association, Odor Thresholds for Chemicals with Established Occupational Health Standards, 1989; American Petroleum Institute, Manual on Disposal of Refinery Wastes, Volume on Atmospheric Emissions, Chapter 16 - Odors, May 1976, Table 16-1.

composition on the resulting emissions from generating increased amount of these utilities.

Canadian tar sands bitumen is distinguished from conventional petroleum by the small concentration of low molecular weight hydrocarbons and the abundance of high molecular weight polymeric material.<sup>52</sup> Crudes derived from Canadian tar sands bitumen—DilBits, SCOs and SynBits—are heavier, i.e., have larger, more complex molecules such as asphaltenes,<sup>53</sup> some with molecular weights above 15,000.<sup>54</sup> They generally have higher amounts of coke-forming precursors; larger amounts of contaminants (sulfur, nitrogen nickel, vanadium) that require more intense processing to remove; and are deficient in hydrogen, compared to other heavy crudes.

Thus, to convert them into the same refined products requires more utilities -- electricity, water, heat, and hydrogen. This requires that more fuel be burned in most every fired source at a refinery and that more water be circulated in heat exchangers and cooling towers. Further, this requires more fuel to be burned in any supporting off-site facilities. Under CEQA, these indirect increases in emissions caused by a project must be included in the impact analysis. These increases in fuel consumption release increased amounts of NO<sub>x</sub>, SO<sub>x</sub>, VOCs, CO, PM10, PM2.5, and HAPs as well as greenhouse gas emissions (GHG). Some of the principal differences are identified below, followed by a discussion of the impacts these differences have on emissions.

### 1. Higher Concentrations of Asphaltenes and Resins

The severity (e.g., temperature, amount of catalyst, hydrogen) of hydrotreating depends on the type of compound a contaminant is bound up in. Lower molecular weight compounds are easier to remove. The difficulty of removal increases in this order: paraffins, naphthenes, and aromatics.<sup>55</sup> Most of the contaminants of concern in tar sands crudes are bound up in high molecular weight aromatic compounds such as asphaltenes that are difficult to remove, meaning more heat, hydrogen, and catalyst are required to convert them to lower molecular weight blend stocks. Some tar sands-derived vacuum gas oils (VGOs), for example, contain no paraffins of any kind. All of the molecules are

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<sup>52</sup> O.P. Strausz, *The Chemistry of the Alberta Oil Sand Bitumen*, Available at: [http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22\\_3\\_MONTREAL\\_06-77\\_0171.pdf](http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf).

<sup>53</sup> Asphaltenes are nonvolatile fractions of petroleum that contain the highest proportions of heteroatoms, i.e., sulfur, nitrogen, oxygen. The asphaltene fraction is that portion of material that is precipitated when a large excess of a low-boiling liquid hydrocarbon such as pentane is added. They are dark brown to black amorphous solids that do not melt prior to decomposition and are soluble in benzene and aromatic naphthas.

<sup>54</sup> O.P. Strausz, *The Chemistry of the Alberta Oil Sand Bitumen*, Available at: [http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22\\_3\\_MONTREAL\\_06-77\\_0171.pdf](http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf).

<sup>55</sup> Gary et al., 2007, p. 200.

aromatics, naphthenes, or sulfur species that require large amounts of hydrogen to hydrotreat, compared to other heavy crudes.<sup>56</sup>

Asphaltenes and resins generally occur in tar sands bitumens in much higher amounts than in other heavy crudes. They are the nonvolatile fractions of petroleum and contain the highest proportions of sulfur, nitrogen, and oxygen.<sup>57</sup> They have a marked effect on refining and result in the deposition of high amounts of coke during thermal processing in the coker. They also form layers of coke in hydrotreating reactors, such as those at Rodeo, requiring increased heat input, leading to localized or even general overheating and thus even more coke deposition. This seriously affects catalyst activity resulting in a marked decrease in the rate of desulfurization. They also require more intense processing in the coker required to break them down into lighter products. These factors require increases in steam and heat input, both of which generate combustion emissions -- NO<sub>x</sub>, SO<sub>x</sub>, CO, VOCs, PM10, and PM2.5.

Further, if the crude includes a synthetic crude, SCO, for example, the material has been previously hydrotreated. Thus, the remaining contaminants (e.g., sulfur, nitrogen), while present in small amounts, are much more difficult to remove (due to their chemical form, buried in complex aromatics), requiring higher temperatures, more catalyst, and more hydrogen.<sup>58</sup>

The higher amounts of asphaltenes and resins generate more heavy feedstocks that require more severe processing than lighter feedstocks. The coker, for example, makes more coker distillate and gas oil, that would contribute to the propane and butane that would be recovered at Rodeo, compared to conventional heavy crudes. Similarly, the Crude Unit makes more atmospheric and vacuum gas oils that would be sent to Rodeo,<sup>59</sup> increasing emissions there, including fugitive VOC emissions from equipment leaks and combustion emissions from burning more fuel.

## 2. Hydrogen Deficiency

Tar sands crudes are hydrogen-deficient compared to heavy and conventional crude oils and thus require substantial hydrogen addition during refining, beyond that required to remove contaminants (sulfur, nitrogen, metals) from non-tar-sands crudes. This again means more combustion emissions from burning more fuel. As the refining processes that use hydrogen, e.g., hydrotreating, are all located at Rodeo, this is further

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<sup>56</sup> See, for example, the discussion of hydrotreating and hydrocracking of Athabasca tar sands cuts in Brierley et al. 2006, pp. 11-17.

<sup>57</sup> James G. Speight, The Desulfurization of Heavy Oils and Residua, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Tables A.2, A.3, and A.4.

<sup>58</sup> See, for example, Brierley et al. 2006, p. 8 ("The sulfur and nitrogen species left in the kerosene and diesel cuts are the most refractory, difficult-to-treat species that could not be removed in the upgrader's relatively high-pressure hydrotreaters."); Turini et al. 2011 p. 4.

<sup>59</sup> See, for example, Turini et al. 2011, p. 9.



evidence that a crude slate switch involving tar sands would necessarily be directly linked to Rodeo.

3. Higher Concentrations of Catalyst Contaminants

Tar sands bitumens contain about 1.5 times more sulfur, nitrogen, oxygen, nickel and vanadium than typical heavy crudes.<sup>60</sup> Thus, much more hydrogen per barrel of feed and higher temperatures would be required at Rodeo to remove the larger amounts of these poisons from semi-refined products. These impurities are removed by reacting hydrogen with the crude fractions over a fixed catalyst bed at elevated temperature. The oil feed is mixed with substantial quantities of hydrogen either before or after it is preheated, generally to 500 F to 800 F. The amount of hydrogen required for a particular application depends on the hydrogen content of the feed and products and the amount of the contaminants to be removed. Hydrogen consumption is typically about 70 standard cubic foot per barrel (scf/bbl) of feed per percent sulfur, about 320 scf/bbl feed per percent nitrogen, and 180 scf/bbl per percent oxygen removed.<sup>61</sup>

Canadian tar sands crudes generally have higher nitrogen content, 3,000 to >6,000 ppm<sup>62</sup> and specifically higher organic nitrogen content, particularly in the naphtha range, than other heavy crudes.<sup>63</sup> This nitrogen is mostly bound up in complex aromatic compounds that require a lot of hydrogen to remove. This would affect emissions at Rodeo in five ways.

First, additional hydrotreating is required to remove them, which increases hydrogen and energy input. Second, they deactivate the cracking catalysts, which requires more energy and hence more emissions to achieve the same end result. Third, they increase the nitrogen content of the fuel gas fired in combustion sources, which increases NO<sub>x</sub> emissions from all fired sources that use refinery fuel gas. Fourth, nitrogen in tar sands crudes is present in higher molecular weight compounds than in other heavy crudes and thus requires more hydrogen and energy to remove. Fifth, some of this nitrogen will be converted to ammonia and other chemically bound nitrogen compounds, such as pyridines and pyrroles. These become part of the fuel gas and could increase NO<sub>x</sub> from fired sources. They further may be routed to the flares, where they would increase NO<sub>x</sub>.

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<sup>60</sup> See, for example, USGS, 2007, Table I.

<sup>61</sup> James H. Gary, Glenn E. Handwerk, and Mark J. Kaiser, Petroleum Refining: Technology and Economics, 5th Ed., CRC Press, 2007, p. 200 and A.M. Aitani, Processes to Enhance Refinery-Hydrogen Production, Int. J. Hydrogen Energy, v. 21, no. 4, pp. 267-271, 1996.

<sup>62</sup> Murray R. Gray, Tutorial on Upgrading of Oil Sands Bitumen, University of Alberta, Available at: <http://www.ualberta.ca/~gray/Links%20&%20Docs/Web%20Upgrading%20Tutorial.pdf>.

<sup>63</sup> See, for example, James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Appendix A.

These types of chemical differences between the current crude slate and the new crude slate facilitated by the Rail Spur Project were not addressed at all in the DEIR. While both the Santa Maria and Rodeo Refineries may currently be operating within their permit limits, and may even continue to do so, the potential subject increases must be measured and evaluated relative to the CEQA baseline.

#### **E. Increased Metal Content Not Evaluated**

The baseline slate includes very little tar sands crudes, potentially from 2% to 7% of the crude slate. DEIR, p. 2-27. The Project could increase the import of heavy sour tar sands crude by up to the entire permitted capacity of the Refinery. These crudes have higher metal content than the baseline crude slate.<sup>64</sup> This represents a significant increase in a type of crude that will increase emissions compared to the current Refinery slate. The impacts from this change were not evaluated in the DEIR.

The U.S. Geological Survey ("USGS"), for example, reported that "natural bitumen," the source of all Canadian tar sands-derived oils, contains 102 times more copper, 21 times more vanadium, 11 times more sulfur, six times more nitrogen, 11 times more nickel, and 5 times more lead than conventional heavy crude oil, such as those currently refined from local sources.<sup>65</sup>

The environmental damage caused by these metal pollutants includes bioaccumulation of toxic chemicals up the food chain and a direct health hazard from air emissions. These metals, for example, mostly end up in the coke. Thus, higher levels of metals will be present in the coke. The DEIR indicates that "[m]etals that are present in coke have been detected in groundwater at concentrations above the California Department of Health maximum contamination levels (MCL) in the area around the coke pile runoff area..." DEIR, p. 4.7-39/40. Thus, a switch to tar sands crude could contribute to this existing significant impact from the coke pile, which was not disclosed in the DEIR.

Further, larger amounts of coke may be produced by the tar sands crudes than the current crude slate. The metal content of fugitive dust from coke piles could increase to dangerous levels. The California Air Resources Board, for example, has classified lead

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<sup>64</sup> Straatiev and other, 2010, Table 1; Brian Hitchon and R.H. Filby, *Geochemical Studies - 1 Trace Elements in Alberta Crude Oils*, [http://www.ags.gov.ab.ca/publications/OFR/PDF/OFR\\_1983\\_02.PDF](http://www.ags.gov.ab.ca/publications/OFR/PDF/OFR_1983_02.PDF); F.S. Jacobs and R.H. Filby, *Trace Element Composition of Athabasca Tar Sands and Extracted Bitumens, Atomic and Nuclear Methods in Fossil Energy Research*, 1982, pp 49-59; James G. Speight, *The Desulfurization of Heavy Oils and Residua*, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, *Synthetic Fuels Handbook: Properties, Process, and Performance*, McGraw-Hill, 2008, Tables A.2, A.3, and A.4; Pat Swafford, *Evaluating Canadian Crudes in US Gulf Coast Refineries*, Crude Oil Quality Association Meeting, February 11, 2010, Available at: [http://www.coqa-inc.org/20100211\\_Swafford\\_Crude\\_Evaluations.pdf](http://www.coqa-inc.org/20100211_Swafford_Crude_Evaluations.pdf).

<sup>65</sup> R.F. Meyer, E.D. Attanasi, and P.A. Freeman, *Heavy Oil and Natural Bitumen Resources in Geological Basins of the World*, U.S. Geological Survey Open-File Report 2007-1084, 2007, p. 14, Table 1, Available at <http://pubs.usgs.gov/of/2007/1084/OF2007-1084v1.pdf>.

as a pollutant with no safe threshold level of exposure below which there are no adverse health effects. Thus, just the increase in lead from switching up to tar sands crude is a significant impact that was not disclosed in the DEIR. Accordingly, crude quality is critical for a thorough evaluation of the impacts of a crude switch, such as facilitated by rail import.

sec. 4.11 public services and utilities, does not address how a local train accident would be handled, given existing services and utilities. It couldn't be, which is a significant unmitigated impact.

**VI. HAZARDS AND HAZARDOUS MATERIALS IMPACTS ARE SIGNIFICANT**

Section 4.7 of the DEIR contains the "hazards and hazardous materials" impact analyses, sometimes call the risk of upset analysis. This section evaluates two separate impacts: (1) on-site accidents from crude oil unloading through pipeline transport to storage tanks at the Refinery and (2) rail transport accidents. The supporting material includes extensive discussion of the applicable regulatory framework and general methods used to analyze these types of impacts. However, the project-specific results and conclusions appear magically, with no support for or explanation of how the conclusions were reached. The available information indicates that the DEIR's analysis is fatally flawed and the risk of upset impacts are highly significant.

**A. Crude Slate Not Disclosed**

As explained elsewhere in these comments, the composition of the crude slate must be known to evaluate impacts. This is particularly critical for the analysis of accidents as the probability, severity, and consequences of an accident depend directly on the chemicals in the crude. They determine, for example, the flammability of the crude and its potential to corrode tank cars, pumps, pipelines, tanks, and other equipment hand store and transport the crude. The Federal Railroad Administration, for example, has observed "an increasing number of incidents involving damage to tank cars in crude oil service in the form of severe corrosion of the internal surface of the tank, manway covers, and valves and fittings," and suggested that this may involve contaminated oil.<sup>5</sup> Further, some types of crudes are more challenging to contain and cleanup in the event of an accidental release.

As the DEIR admits: "the thermal radiation hazards from hydrocarbon pool fires depends on a number of parameters, including the composition of the hydrocarbon mixture..." DEIR, p. 4.7-15. The Project involves a dramatic change in crude slate composition, especially its hydrocarbon composition. The crude slate will change from a relatively inflammable material with high molecular weight hydrocarbons to new crudes ranging from light, highly volatile crudes with low molecular weight hydrocarbons such as propane and butane (Bakken) to heavy, highly corrosive tar sands crudes blended with condensates that can cause different types of accidents. See Comments V and VI.B.

The DEIR asserts that “[r]adiative properties of the fire were based on a detailed analysis of typical crude oil that would be delivered by rail”. DEIR, p. 4.7-16. However, the DEIR does not identify this crude further. Where is the detailed crude analysis that the fire analyses was based on? What specific crude was analyzed, i.e., was it Bakken or tar sands or something else? How representative is it of the range of crudes that would be imported by rail? Where are the assumed properties used to assess flammability and the resulting analysis itself? What is the basis of the burning rate of 0.228 mm/s assumed for “light crude oil”? DEIR, p. 4.7-16.

The hazards section of the DEIR does not acknowledge that a range of crudes will be imported by rail with widely varying properties, or indicate that crude composition was considered in any other aspects of the various hazard analyses except fire hazard. The DEIR, for example, notes that unloaded crude would be sent by pipeline to “be stored in the existing refinery storage tanks. Therefore, crude oil storage would not result in any increase in fire and explosion risk at the refinery”. DEIR, p. 4.7-57. This is wrong because the projected change in crude slate composition will increase the probability of accidental releases from the tank farm and their consequences, as the stored crudes will be either more volatile, flammable, and/or corrosive. The DEIR has failed to analyze these impacts.

#### **B. Risk of Upset Impacts Are Significant**

The DEIR evaluated several crude release accident scenarios: (1) tank farm releases; (2) on-site crude railcar accident pool fires; (3) on-site crude railcar accident BLEVES; (4) crude pipeline accident pool fires; (5) off-site train accidents. DEIR, Appx. H. The DEIR suggests that none of these accident scenarios result in significant impacts. DEIR, Sec. 4.7.4.

However, the DEIR buries the supporting analyses in dense appendices that are not accessible to the typical DEIR reviewer. The DEIR fails to explain how to translate the results of these analyses into impact conclusions that can be understood by non-subject-matter experts, thus preventing meaningful public review of the impacts. The DEIR further incorrectly summarizes the results of these analyses in the text as insignificant, when, in fact, they are highly significant. Finally, the DEIR uses the wrong significance thresholds, fails to evaluate the impact of crude slate changes, and fails to evaluate impacts to on-site workers, the most at risk population.

##### **I. Worker Impacts Excluded**

The DEIR fails to evaluate the impacts to workers, arguing that “OSHA related worker issues are outside the scope of the EIR.” DEIR, p. 4.3-52. The DEIR specifically excludes workers from its risk of upset significance criteria, arguing they do not apply to occupational safety, viz., “Occupational risk, which is governed by state and federal OSHAs is considered to be more voluntary and is generally judged according to more lenient standards of significance than those used for involuntary exposure”. DEIR, p. 4.7-55.

However, neither state nor federal OSHA nor other regulations cover the types of involuntary risks imposed by unit train accidents and exploding pipelines and tanks on workers in the vicinity of these facilities. A death is a death and it should not matter whether it is an on-site worker, off-site worker, or other member of the public. A worker is a member of society at large and is protected by CEQA. None of the federal and state laws reviewed in DEIR Section 4.7.2 include any measures to protect any workers, on-site or off-site, from train, pipeline, and tank farm accidents.

Regardless, CEQA is not a gap-filling regulatory program. CEQA covers all impacts to all media -- the public, air, water, land, biological resources -- regardless of how they may be classified, i.e., on-site workers, off-site workers, residents, threatened and endangered species, etc. These types of catastrophic events are entirely outside of the jurisdiction of OSHA or any other federal or state regulatory program and must be evaluated in the DEIR. The DEIR must be revised to address worker impacts and be recirculated.

2. Tank Farm Accidents Are Significant

The DEIR states that imported crude would be sent through a 3,525-foot long pipeline to existing refinery storage tanks, concluding: "Therefore, crude oil storage would not result in any increase in fire and explosion risk at the refinery." DEIR, p. 4.7-57. The DEIR does not contain any analysis to support this assertion. See, for example, Appendix H, which does not include a storage tank scenario, but rather only rail car and pipeline accident scenarios.

This unsupported assertion is incorrect because it assumes no change in properties of stored crude. The Project would change the composition of the crude slate. If highly flammable Bakken crudes were imported, for example, the risk of fire and explosion would significantly increase at the tank farm, impacting not only workers, but also offsite parties. The flammability classification of Bakken is rated at Level 4, the highest flammability classification, the same as for methane and propane gases.<sup>66</sup> On January 2, 2014, the Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a safety alert addressing the flammability characteristics of crude oil produced from the Bakken Shale formation.<sup>67</sup> Alternatively, if tar sands crudes were imported, corrosion issues could arise at the existing tanks, leading to accidental releases. Neither of these risk scenarios was identified or evaluated in the DEIR.

Rather, the DEIR only contains a description of the existing tank farm. DEIR, Sec. 4.7.1.5, stating: "Thermal radiation impacts from crude oil tank fires could cause injury 220 feet away." DEIR, p. 4.7-37. The DEIR goes on to explain that the closest receptor is further away. Thus, the DEIR asserts: "Given the properties of crude oil, the

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<sup>66</sup> Cenovus MSDS sheet for Bakken Crude.

<sup>67</sup> PHMSA, Safety Alert, January 2, 2014: Preliminary Guidance from Operation Classification.

likelihood of an explosion is virtually non-existent and consequently explosion scenarios are not addressed further in this document.” DEIR, p. 4.7-37.

However, the analyses supporting the claimed 220-foot injury distance is not included in the DEIR and apparently based on the crude slate currently processed at the Santa Maria Refinery. Further, the nature of the “injury” is not disclosed. Regardless, a switch from current crude to Bakken crude would significantly increase the injury distance, likely far in excess of the 425-foot distance to the nearest receptor. Thus, accidental releases from the tank farm were not analyzed in the DEIR and are likely highly significant.

3. Pipeline Accidents Are Significant

The DEIR contains a crude pipeline accident analysis for a pool fire, assuming a spill of 692,000 barrels of crude for wind speeds of 1 meter per second (m/s) (about 2 miles per hour (mi/hr)) and 20 m/s (about 45 mi/hr). DEIR, Appx. H, pp. H-14 to H-17. This analysis is dismissed with the misleading characterization that “[w]orst-case thermal radiation injury levels would extend approximately 800 meters from the pool fire that could result from a catastrophic pipeline failure on the refinery site. Based on this modeling, it was determined that there would not be any potential for offsite injuries associated with worst-case unloading facility crude oil spill and fire.” DEIR, p. 4.7-57.

The supporting analyses are included in Appendix H, in a format that is not accessible to the average reviewer. Thus, they are extracted and summarized in Table 3.

**Table 3**  
**Crude Pipeline Accident Pool Fire**  
 (DEIR, Appx. H)

Heat Flux (kW/m <sup>2</sup> ) = Wind Speed (m/s)	5	10	12.5
	Impact Distance (ft)		
1	1647	889	764
20	2641	1555	1273

The impact metric in these analyses is “heat flux” expressed as kilowatts per square meters (kW/m<sup>2</sup>). Heat flux is thermal radiation intensity, the measure used in the DEIR to determine the resulting injury to exposed parties. DEIR, Table 4.7.2. The DEIR states that it “assumed that all persons exposed to 10 kW/m<sup>2</sup> would suffer serious injuries. Serious injuries would start to be realized at and above 5 kW/m<sup>2</sup>... Exposure to thermal radiation levels in excess of 10 kW/m<sup>2</sup> would likely begin to generate fatalities in less than 1 minute. All persons exposed to thermal radiation within the flame area were assumed to suffer fatalities regardless of exposure duration.” DEIR, p. 4.7-19. See also DEIR Table 4.7-4. The three heat flux criteria reported in Table -- were selected by the DEIR preparers to evaluate the significance of accident scenarios.

Any population located between the accident site up to the reported impact distance, e.g., as far away as 2,641 feet in Table 3, would experience significant impacts. At a heat flux of  $5 \text{ kW/m}^2$ , 10% injury would be experienced in the exposed population up to 2,641 feet from the accident if the wind were blowing at 20 m/s during the accident. Up to 1,555 feet from the accident, 100% of the exposed population would be injured, including second-degree burns in 14 seconds and 10% fatality at 60 seconds. And up to 1,273 feet from the accident, significant fatalities would occur.

A pipeline accident could occur anywhere along the pipeline route, but would most likely occur at the tank farm, where the crude oil is transferred into tankage. Assuming a pipeline accident at the tank farm under calm wind conditions (1 m/s or about 2 mi/hr), significant impacts would occur up to 1,647 feet from the accident site. The impacted area includes an industrial area 425 feet northeast of the tank farm and a residence within the industrial area at 1,200 feet. DEIR, p. 4.7-37. At a wind speed of 20 m/s (about 45 mi/hr), all persons up to 2,641 feet away would be seriously impacted and within a radius of 1,273 feet from the accident site, they would all be killed.

Thus, clearly, a pipeline accident involving the new crude slate has the potential to result in significant off-site (as well as even more significant on-site worker) impacts that were incorrectly described in the DEIR. The actual modeling indicates that off-site parties would be killed. This is a significant impact.

4. On-Site Train Accidents Are Significant

The DEIR also included on-site crude rail car accidents resulting in both pool fires and Boiling Liquid Expanding Vapor Explosions or “BLEVEs” for wind speeds ranging from 1 m/s to 20 m/s. DEIR, Appx. H. The DEIR asserts, based on these analyses buried in Appendix H, that “potential hazards associated with the unloading facility are considered less than significant” and “[h]azards associated with the onsite portion of the Rail Spur Project would be *less than significant (Class IIP)*.” DEIR, pp. 4.7-57/58 (emphasis in original). No significance thresholds are articulated to support these conclusions nor is any explanation provided to explain the basis for the DEIR’s conclusion.

However, independent analyses based on the railcar accident modeling in Appendix H coupled with significance levels scattered about in the DEIR indicates that the risks from train accidents within the Refinery boundary result in significant on-site and off-site impacts for both pool fires and BLEVEs.

a. *Pool Fires*

The DEIR analyzes pool fires resulting from a crude railcar accident in which 54,476 barrels of crude (i.e., the entire contents of a unit train) are released for wind speeds ranging from 1 m/s to 20 m/s (2 mi/hr to 45 mi/hr). DEIR, pp. H-2 to H-9. These analyses report “heat flux” in  $\text{kW/m}^2$  as a function of distance from the release, for distances of 100 to 1,000 meters (328 to 3,281 feet). An accident could occur anywhere



within the Refinery boundary shown on Figure 2-1. The results of the DEIR's railcar pool fire analyses are buried in Appendix H in a format not accessible to the average reviewer. Thus, they are summarized in Table 4.

**Table 4**  
**Summary of Crude Railcar Accident Analysis**  
**of Pool Fires**  
 (DEIR, Appx. H)

Heat Flux (kW/m <sup>2</sup> ) =	5	10	12.5
Wind Speed (m/s)	Impact Distance (ft)		
1	775	407	331
5	876	495	410
10	928	541	446
20	1404	958	810

The interpretation of these data (and other similar data extracted from Appendix H and summarized in these comments) requires a map that shows the location of potentially exposed populations relative to the accident sites (anywhere along the rail line within the Refinery boundary). It is common to include such a map in an EIR to locate the sensitive receptors. However, the DEIR fails to include a sensitive receptor map and is thus deficient. The boundaries of the Refinery are shown in DEIR Fig. 2-1. This figure and Google Earth maps indicate that the northeastern boundary of the Refinery at roughly the elbow of Highway 1, where the Southern Pacific rail line enters the Refinery, abuts industrial and residential property to the east and north and recreational areas in the Coastal Zone to the west. Sensitive receptors are located in these areas, for example, residences along Monadella Street and in areas to the north and south of Highway 1 (Willow Road) and users of the Occano Dunes State Vehicular Recreation Area and Oso Flaco Lake and Dunes to the west.

The results of the railcar accident modeling summarized in Table 4 indicate that both on-site and off-site impacts are significant. When the wind speed is 20 m/s (45 mi/hr), the heat flux is 5 kW/m<sup>2</sup> at up to 1,404 feet from the accident site and 12.5 kW/m<sup>2</sup> up to 810 feet from the accident site. A comparison of Figures 2-1 and 2-4 indicates that if the accident occurred near the junction of Willow Road and U.S. 1, off-site sensitive receptors would be located within 1,404 feet of the accident site. Thus, significant off-site impacts would occur from an accident within the Refinery boundary.

Further, refinery workers would be present throughout the Refinery and at the unloading facility. These workers would be the most highly exposed populations and would experience significant mortality.

Thus, railcar accidents within the Refinery boundary would result in significant impacts to both on-site and off-site populations. These were not disclosed in the DEIR, but rather buried in a maze of tables that are not explained or analyzed.

b. BLEVES

The DEIR also evaluated the radiant heat exposure and explosion over pressures resulting from a railcar accident involving a Boiling Liquid Expanding Vapor Explosion or “BLEVEs.” However, the DEIR fails to discuss the results of this analysis, which is buried in DEIR Appendix H in a format not accessible to the average reviewer. Thus, they are summarized in Table 5.

Heat flux for the BLEVE analysis is reported in the DEIR in units of kilojoules per square meter ( $\text{kJ}/\text{m}^2$ ), which is just another measure of heat density, similar to  $\text{kW}/\text{m}^2$  used to evaluate pool fires, but just expressed in different units. The DEIR explains that at a heat density (or radiation dosage) of  $40 \text{ kJ}/\text{m}^2$ , 10% injury will result, at  $150 \text{ kJ}/\text{m}^2$ , 100% injury will result, and at  $250 \text{ kJ}/\text{m}^2$ , 1% fatalities will occur. DEIR, Table 4.7.4.

**Table 5**  
**Results of Radiation Exposure Analysis**  
**from Railcar Accident BLEVE**  
 (DEIR, p. H-13)

Impact Distance (ft)	Radiant Heat Significance Threshold ( $\text{kJ}/\text{m}^2$ )
1,690	40
1,194	80
1,066	100
859	150
830	160
643	250

Table 5 shows that significant impacts, 20% injury, will occur at up to 1,690 feet from the accident site. As discussed above, if the accident occurs near the vicinity of the intersection of Highway 1 and Willow Road, within the Refinery boundary, significant impacts will result outside of the Refinery, in industrial/residential areas to the east and in the Coastal Zone areas to the west. Further, workers within 1,690 feet of the accident would also experience significant impacts, and those within 643 feet of the accident may die. These are significant impacts that were not disclosed in the DEIR.

5. Offsite Impacts From Train Accidents Are Significant

The DEIR also evaluated train accident impacts outside of the Refinery, within San Luis Obispo County (SLOC). The DEIR asserts this analysis was prepared following guidelines of the American Institute of Chemical Engineers, Center for Chemical Process Safety (CCPS, 1995) and the parameters discussed in DEIR Section 4.7.1.3. DEIR, p. 4.7-61. However, this analysis does not follow the CCPS method; it uses the wrong significance thresholds; it fails to discuss or analyze in any fashion the factors that

actually affect rail accidents; it is totally unsupported; it fails to analyze the most significant impacts, which occur outside of San Luis Obispo County; it is based on outdated information; and it ignores most impacts caused by rail accidents, including the impacts of spilled crude oils to water, land, and biological resources and public health impacts from exposure to toxic fumes and smoke. Each of these issues is discussed below.

*a. Significance Threshold*

The San Luis Obispo County Initial Study Checklist defines significant risk if the project will “result in a risk of explosion or release of hazardous substances,” or “create any other health hazard or potential impact.” Rather than use this definition of significant risk, the DEIR sets it aside and adopts a probability-based risk profile curve approach from Santa Barbara County to evaluate risks associated with crude oil unit train transportation. DEIR, p. 4.7-55, Table 4.7.12, Fig. 4.7-5.

This method minimizes the significance of many potential injuries and deaths by assigning probabilities that a certain number of injuries or deaths will occur, based on statistics that do not capture the proposed increase in rail traffic. Under the San Luis Obispo definition, the mere “risk” of an explosion, a release of crude oil, any health hazard or any potential impact is significant. Thus, as there is ample evidence that spectacular accidents involving crude-carrying unit trains with well documented property damage and death have recently occurred, train accidents are per se significant.

The complex (and unsupported) probability-based risk profile method used in the DEIR seeks to downplay the very well documented significant consequences of accidents involving unit train accidents carrying crude oils. These accidents will happen, they will result in significant impacts, and the DEIR should focus on minimizing their occurrence, rather than burying the fact that they do occur in a maze of unsupported and incoherent probability analysis. Further, the DEIR’s analysis is based on very out of data information that does not consider recent history.

*b. The DEIR Fails To Acknowledge Recent History*

The DEIR’s analysis is based on outdated accident statistics, from CCSP (1995), published long before the recent surge in the transport of crude oil by rail. Recent history indicates that the accidents involving unit trains carrying crude oil have sky-rocketed. They also demonstrate the unique set of challenges posed by highly flammable materials, such as Bakken crudes, transported in unsafe tanker cars configured in unit trains that are “virtual pipelines” of highly flammable material, which now dominate the industry. Risks are compounded when highly flammable material, such as Bakken crudes, are shipped in large amounts.<sup>68</sup>

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<sup>68</sup> National Transportation Safety Board, Safety Recommendation R-14-4 to -6, January 21, 2014, Available at: <http://www.nts.gov/doclib/recletters/2014/R-14-004-006.pdf>.

Historically, most crude oil has been transported in pipelines. However, in places like North Dakota and Canada that have seen huge recent increases in crude oil production, the existing crude oil pipeline network lacks capacity to handle the higher volumes being produced. Pipelines also lack the operational flexibility and geographic reach to serve many potential markets, especially the west coast. Railroads, though, have capacity, flexibility, and reach to fill the gap.

Small amounts of crude oil have long been transported by rail, but since 2009 the increase in rail crude oil movements has been enormous. In the United States, crude oil shipments have increased from 10,800 car loads in 2009 to about 400,000 in 2013. In Canada, shipments of crude oil by rail increased from a mere 500 car loads in 2009 to 160,000 car loads in 2013.<sup>69</sup> Continued large increases are expected in 2014. Crude oil accounted for 0.8 percent of total Class I carload originations for all of 2012, 1.1 percent in the fourth quarter of 2012, and 1.4 percent in the first quarter of 2013. It was just 0.03 percent in 2008.<sup>70</sup>

This recent rise in crude transportation by rail has resulted in soaring numbers of crude oil releases to the environment in the form of both accidents and “non-accident” releases such as leaks. The Pipeline and Hazardous Materials Safety Administration (PHMSA) incident records underscore these growing risks. The number of incidents involving crude oil transportation by rail are as follows:

- 2009: 0
- 2010: 9
- 2011: 34
- 2012: 86
- 2013: 85 (partial)<sup>71</sup>

Similar statistics were published by the Wall Street Journal, based on data generated by the Association of American Railroads (“AAR”):<sup>72</sup>

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<sup>69</sup> TSBC, Rail Safety Recommendations, January 23, 2014, Available at: <http://www.tsb.gc.ca/eng/recommendations-recominendations/rail/2014/rec-r1401-r1403.pdf>.

<sup>70</sup> American Association of Railroads, “Moving Crude Petroleum by Rail,” <https://www.aar.org/keissues/Documents/Background-Papers/Crude-oil-by-rail.pdf>; May 2013, at 3-5.

<sup>71</sup> Data derived from PHMSA incident reports - <http://www.phmsa.dot.gov/hazmat/library/data-stats/incidents>.

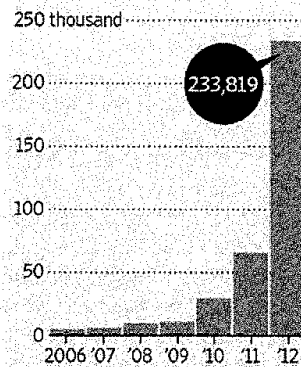
<sup>72</sup> The Wall Street Journal, “Officials Tighten Crude-Shipping Standards,” <http://online.wsj.com/news/articles/SB10001424127887323838204578654463632065372>; August 7, 2013. (Also included as Attachment 3.)

**Figure 6**  
**Industry shipment and incident reports**

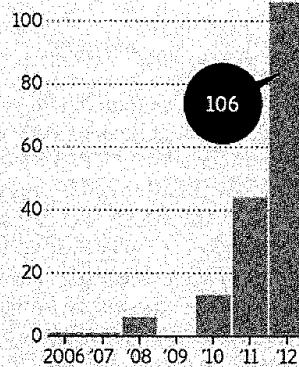
**Sloshing Around**

Crude-oil shipments on railroads are rising in North America, and so are spills, according to rail industry groups.

**Rail carloads of crude oil among major carriers originating in the U.S.**



**Nonaccident releases of crude oil by railcars in the U.S. and Canada\***



\*Unintentional spills or leaks, generally small in nature, that aren't caused by accidents like collisions or derailments.

Source: Association of American Railroads/Bureau of Explosives

The Wall Street Journal

An article in the January 21, 2014 Contra Costa Times, which serves one of the areas through which the Project's unit trains would pass, similarly explains that more crude oil was spilled in U.S. rail accidents in 2013 than in the nearly four decades since the federal government began collecting data on such spills. More than 1.15 million gallons of crude oil was spilled from rail cars in 2013 alone. By comparison, U.S. railroads spilled a combined 800,000 gallons of crude oil between 1975 and 2012.<sup>73</sup> These data do not include Canada, where more than 1.5 million gallons of crude oil were spilled in the Lac-Mégantic, Quebec accident on July 6, 2013, when a runaway train derailed, exploded, and killed 47 people. The cargo was Bakken crude from North Dakota.

The subject unit trains are "virtual pipelines" that pass through heavily populated residential areas. When such large volumes of flammable crude oil are on a single train involved in an accident, as seen in the Lac-Mégantic accident described below, they explode in spectacular fireballs. The resulting accidents can cause major loss of life, property damage, and environmental consequences. The sharp increase in crude oil rail

<sup>73</sup> Curtis Tate, Data: Oil Spills from Rail Cars Massive, Contra Costa Times, January 21, 2014.

shipments has significantly increased safety risks to the public.<sup>74</sup> Crude oil is problematic when released because it is flammable, especially Bakken crude. The risk is compounded because it is commonly shipped in large amounts. These increased risks have not been evaluated in the DEIR.

Unfortunately, the surge of incidents and releases has not been matched by an increase in the resources available to responders and regulators, pointing to the need for mitigation. The DEIR fails to address the lack of adequate resources anywhere along the rail route, even in SLOC, to address the type of catastrophic accident that is likely to occur. Example of some recent accidents follow.

1. Lac-Mégantic

On July 5, 2013, a train hauling 72 DOT-111 tanker cars loaded with 2.0 million gallons of crude from the Bakken shale oil field in North Dakota, one of the crudes proposed to be imported by the Rail Spur Project, slammed into Lac-Mégantic, a town of 6,000 located in Quebec. Owned by an American company – Montreal, Maine and Atlantic Railway – the train had only a single staffer, who abandoned the train in order to sleep in a motel before a replacement crew arrived to complete the train's journey to an oil refinery on Canada's east coast. The brakes on the five-locomotive train malfunctioned, and it began a seven-mile roll toward the small town. Reaching a speed in excess of 60 mi/hr, the train reached a bend in the tracks, derailed and dumping 1.5 million gallons of Bakken crude, which caught fire and incinerated dozens of buildings. Forty-seven people were killed. About 1.6 million gallons of Bakken crude oil were released, covering an area of 77 acres. Oil spilled into the Chaudière River and was transported as far as 74 miles away.<sup>75</sup> While this accident occurred in Canada, the freight railroad operating environment in Canada is similar to that in the United States.

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<sup>74</sup> Association of American Railroads, Bureau of Explosives, Annual Report of Hazardous Materials Transported by Rail, BOE 12-1, 2013.

<sup>75</sup> NTSB, Safety Recommendation In reply refer to: R-14-4 through -6; January 21, 2014. Available at: <http://www.nts.gov/doclib/recletters/2014/R-14-004-006.pdf>.

**Figure 7**  
**Post-Accident Aerial Photo of Lac-Mégantic (Reuters)**



The DOT-111 tanker cars involved in this accident are the same ones that the DEIR suggests will be used to import this very same crude, but notes that “nearly 25 percent of the DOT-111 fleet carrying crude today meets the higher design standards...” DEIR, p. 4.7-15. Will the DEIR's tank car fleet be within the 25% safe or the 75% unsafe DOT-111 fleet?

The DEIR pretends to analyze a similar accident within SLOC, but amazingly, fails to find any significant impacts by using probabilistic methods. However, regardless of the estimated probability, when an accident occurs, the resulting impacts are highly significant. Further information regarding the Lac-Mégantic accident is provided in Attachment 2, “Analysis of the Potential Costs of Accidents/Spills Related to Crude by Rail.”<sup>76</sup> This analysis demonstrates that the costs of crude-by-rail accidents/spills can be very large, and that a major unit train accident/spill could cost \$1 billion or more for a single event. Such accidents are per se significant and must be addressed and mitigated in the DEIR.

As explained in Attachment 2, the Lac-Mégantic rail accident/spill will likely have costs on the order of \$500 million to \$1 billion excluding any civil or criminal damages. Costs/damages for a similar incident could have been substantially higher had it occurred in a more populated area, such as the San Francisco Bay Area or Los Angeles, areas through which the Project's similarly configured and loaded unit trains will pass. Lac-Mégantic is also relevant in that it shows how an accident involving highly flammable light crude (such as the Bakken crude) can have devastating

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<sup>76</sup> This analysis was prepared by The Goodman Group, Ltd, a consulting firm specializing in energy and regulatory economics, on behalf of Oil Change International.



consequences even in a small town in terms of loss of human life and widespread explosion and fire damage to surrounding property. The DEIR failed to recognize this demonstrated significant impact, instead dismissing it with unsupported probability analyses.

2. Marshall, Michigan

Attachment 2 also analyzes the spill of tar sands DilBit from Enbridge's Line 6B in Marshall, Michigan: This rupture in 2010 had costs of about \$1 billion for Enbridge. The spill volumes at Marshall (840,000 gallons) were within the range of the amount of spill possible for this Project (and, in fact, substantially less than the maximum spill) if a crude by rail unit train released much of its cargo. Costs/damages for similar incidents within California could be substantially higher if it occurred in a more populated area, such as the Bay Area or Los Angeles. Marshall is also relevant in showing the high potential cost of dilbit spills into water (and rail lines are often very close to water, e.g., along the Sacramento River and within the Sacramento-San Joaquin Delta, the water supply for most of California's agriculture and drinking water).

3. Alabama

On November 8, 2013, a 90-car unit train carrying 2.7 million gallons of Bakken crude oil in DOT-11 tank cars derailed and exploded in a rural wetland in western Alabama, spilling crude oil into the surrounding wetlands and igniting a fire that burned for several days.<sup>77</sup> No injuries resulted from the accident, but a similar accident in a more populated location would certainly have caused serious risk to public safety.

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<sup>77</sup> Karlamangla, Soumya, "Train in Alabama oil spill was carrying 2.7 million gallons of crude." Los Angeles Times, <http://articles.latimes.com/2013/nov/09/nation/la-na-nn-train-crash-alabama-oil-20131109>, November 9, 2013.

**Figure 8**  
**Aerial photo of Alabama derailment and explosion (Reuters)**



4. Casselton, North Dakota

On December 30, 2013, a similar explosion occurred in Casselton, North Dakota, causing a fiery accident resulting in the town being evacuated. The BNSF train was more than 100 cars, all DOT-111, and about a mile long, of which at least 10 cars were destroyed.<sup>78</sup> Several of the DOT-111 tank cars ruptured and released crude oil that ignited. The post-accident fire destroyed two locomotives and thermally damaged several additional tank cars causing violent, fiery eruptions. Dense, toxic smoke forced a temporary evacuation of the town. Apparently, another train carrying grain derailed first, causing the adjacent Bakken oil filled cars to derail,<sup>79</sup> thus highlighting the hazards associated with multiple trains using the same or adjacent tracks, as proposed by the Rail Spur Project. The coastal line, for example, carries passenger traffic along the Pacific coast. Thus, human life could be put at risk, rather than just a train carrying grain.

5. New Brunswick, Canada

On January 7, 2014, 17 cars in a 122-unit train derailed and exploded near Plaster Rock, New Brunswick. No one was injured, but about 150 people were evacuated. The petroleum products originated in Western Canada and were destined for the Irving Oil Refinery in St. John.<sup>80</sup>

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<sup>78</sup> DOT-111 Tank Car, Wikipedia.

<sup>79</sup> NTSB, Staff Recommendation R-14-01 - 03, January 23, 2014.

<sup>80</sup> DOT-111 Tank Car, Wikipedia.

*c. The DEIR Fails To Evaluate Crude By Rail As A Security Risk*

The explosions in Lac-Mégantic and Alabama were accidents, but they could easily have been created by terrorists. The fact that terrorists haven't yet targeted rail tank cars carrying crude oil doesn't mean it won't occur in the future. The recent Canadian accidents demonstrate the amount of death and destruction that can happen if a rail tank car overturns. Terrorists will have read about these accidents. Without any additional security precautions, crude oil tank cars will be seen as a soft target for an attack, particularly, since they are often manned by small crews and often left unattended.

*d. Off-Site Train Accident Analysis Unsupported*

The results of the off-site train accident analysis appears full blown in Table 4.7-12 for a 72.6 mile segment of rail line from Highway 101 to Nipomo, broken into small segments. This table is apparently the basis of Figure 4.7-5, which presents the frequency of injuries and fatalities as a function of the number of each. Both of these summary results are presented with no supporting analysis, equations, citations, or explanatory material. Table 4.7-12 is also presented in Appendix H at H-19 and H-20, again with no supporting analysis, equation, citations, or explanatory material.

The DEIR asserts this analysis was prepared following guidelines of the American Institute of Chemical Engineers, Center for Chemical Process Safety (CCPS, 1995) and the parameters discussed in DEIR Section 4.7.1.3. DEIR, p. 4.7-61. However, I am very familiar with these guidelines and have used them in many similar analyses. I cannot follow or verify the risk analyses in DEIR Sec. 4.7. The following bulleted items list the columns in Table 4.7.12 and their support or lack thereof based on my review of the DEIR:

- Accident Probability (year): **no support**
- Probability Density: Table 4.7.6 ("default population densities")
- # of Trains per year: DEIR, pp. ES-3, 1-4
- Ignition: All Spill Probability (per year): **no support**
- Ignition: Small Spill Probability (per year): **no support**
- Ignition: Large Spill Probability (per year): **no support**
- No Ignition: All Spill Probability (per year): **no support**
- No Ignition: Small Spill Probability (per year): **no support**
- No Ignition: Large Spill Probability (per year): **no support**

The calculations and inputs to arrive at Table 4.7.12 are many and complex and MUST be included in an appendix to the DEIR, to the same level of detail as Appendix B

for air emission calculations. The methods and inputs include, for example, the following types of standard calculations and inputs, none of which are disclosed in the DEIR:

To evaluate whether a train accident is significant, one must estimate two numbers: 1) the probability that a consequence (e.g., injury or fatality) will occur from the accident and 2) the number of individuals that will be affected.

These two numbers are usually calculated using standard procedures described in the Guidelines for Chemical Transportation Risk Analysis (CCPS, 1995). The first number, the probability that an incident outcome (i.e., a fatality or injury) will occur is given by:

$$F_{g,i,k} = T \cdot A \cdot R_i \cdot L_g \cdot P_{i,k} \quad (1)$$

where:

$F_{g,i,k}$  = frequency of incident outcome  $k$  for release size  $i$  on segment  $g$   
 $T$  = trips per year  
 $A$  = accident rate per mile  
 $R_i$  = release probability for release size  $i$   
 $L_g$  = length of segment  $g$  in miles  
 $P_{i,k}$  = probability of incident outcome  $k$  for release size  $i$   
 $g$  = segment counter  
 $i$  = release size counter  
 $k$  = incident outcome counter

The second number, the associated consequences or number of persons exposed, is given by:

$$N_{g,i,k} = CA_{i,k} \cdot PD_g \cdot PF_{i,k} \quad (2)$$

where:

$N_{g,i,k}$  = number of fatalities (or injuries) for incident outcome  $k$  for release size  $i$  on segment  $g$   
 $CA_{i,k}$  = consequence area associated with incident outcome  $k$  for release size  $i$   
 $PD_g$  = population density for segment  $g$   
 $PF_{i,k}$  = probability of injury/fatality for incident outcome  $k$  for release size  $i$   
 $g$  = segment counter  
 $i$  = release size counter  
 $k$  = incident outcome counter

Without the type of information used in the above equations, the DEIR's train accident analysis is wholly unsupported. The DEIR must be revised to reveal and support all of the input assumptions represented by the variables used in these equations. The revised DEIR must be recirculated.

The unsupported information in Table 4.7.12 was then used to create injury and fatality risk charts that plot the frequency of accidents per year versus the number of injuries and fatalities in Figure 4.7-5. These are compared with Santa Barbara risk thresholds. There is no explanation for how the unsupported probability data from Table 4.7.6 was used to generate these risk curves. A complex series of calculations and various assumptions are typically involved, but none of these were disclosed in the DEIR,

preventing public review. The DEIR must be expanded to support this analysis and recirculated to give the public an opportunity for input.

*e. Entire Route In California Not Analyzed*

The train accident analysis fails to analyze the risk of accident along the entire route within California, but rather stops at the northern San Luis Obispo County border and assumes no trains arrive or depart from the south. The DEIR indicates that unit trains will travel 68 miles<sup>81</sup> one-way within San Luis Obispo County and an additional 390 miles one-way outside of the County. DEIR, p. 4.3-42. Thus, the DEIR only analyzed the risk of train accidents for 17% of the route. This significantly understates the risk and consequences of train accidents as the County is sparsely populated. The projected rail route passes through some of the most densely populated areas with some of the most valuable real estate in the United States.

The DEIR fails to include a map that shows the route(s) that Project trains would follow. However, it does disclose that Union Pacific would be the carrier and includes a map of Union Pacific rail lines in California. DEIR, Fig. 4.12-2. This map indicates that trains may pass through some of the most densely populated areas in the United States, exposing some of the most sensitive and vulnerable public resources to significant adverse impacts.

The DEIR suggests that unit trains would most likely enter the northern part of the state, follow the rail line along the Sacramento River to Roseville, through Sacramento, Oakland, Santa Clara, San Jose, and down the coastal line to the Refinery. DEIR, p. 4.12-7 & Fig. 4.12-2. However, elsewhere, the DEIR indicates that trains could arrive from the north or the south (DEIR, p. 2-21), thus also passing through the densely populated Los Angeles area.

Unit trains approaching from the north would parallel the water supply for most of California, the Sacramento River and the Sacramento-San Joaquin Delta, and pass through some of the most densely populated areas and most valuable real estate in the world in the San Francisco Bay Area and Silicon Valley. An accident on the Mulford line between Santa Clara and Oakland or in San Jose, for example, which the DEIR indicates would be used (DEIR, p. 4.12-7), could have catastrophic effects on infrastructure, workers, and residents. As discussed elsewhere, the DEIR should have considered an alternate route, down the eastern side of the Central Valley, with a new connecting rail spur from Bakersfield to the Refinery, to avoid these significant impacts.

The federal preemption arguments in the DEIR do not prevent the County from requiring mitigation for significant impacts that occur on private land. Further, there is no preemption of the County's authority to refuse to issue a land use permit if Phillips 66 does not mitigate significant impacts that occur anywhere within California.

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<sup>81</sup> Elsewhere, the DEIR reports 72.6 miles within SLOC. DEIR, Table 4.7-12.

*f. Track and Rail Car Condition Not Addressed*

Unit trains loaded with up to 2.2 million gallons of crude oil (DEIR, p. 2-21) will travel one way over about 460 miles of rail line within California nearly every day. DEIR, p. 4.3-42. These trains can weigh up to 15,000 tons and extend for well over a mile. Rail accidents are the result of either an error on the part of the railroad operating personnel or a technical failure in the track, tank car design, and train control equipment. DEIR, p. 4.7-25, CCSP 1995, p. 64. The latter two can be anticipated and mitigated. The primary contributing factors to rail accidents that could have and should have been evaluated in the DEIR are track conditions, train speed, and railcar design.

Derailment rates are high on low class track and reduce rapidly as track quality improves. Broken rail is the factor most likely to pose the greatest risk to train operations as accidents due to broken rails are more frequent and more severe than average. They have been the cause of major derailments involving dangerous goods in both the U.S. and Canada.<sup>82</sup>

The DEIR made no attempt to assess track quality for the mainline route within California that would be used by unit trains. Rather, it dismisses the issue by stating that: “[m]ainline track is generally Class 5 or 6...” DEIR, p. 4.7-25. “Generally”? Is this true, especially along sections currently with light unit train traffic, such as coastal line? The DEIR is silent on track condition, which is a serious oversight. A survey could have and should have been conducted as an input to the risk of upset analysis and to evaluate alternate routes to mitigate impacts.

The severity and consequences of a derailment are related to speed because the energy dissipated during a derailment depends on the kinetic energy of the train, thus its speed and mass. Federal Railroad Administration data for mainline freight trains shows the number of cars derailed, an indicator of accident severity, is highly correlated with speed. Thus, speed reduction has the potential to reduce the severity and consequences of derailments.<sup>83</sup> The DEIR did not consider speed reduction.

Another key factor that affects both the probability and consequences of train accidents is the design and condition of the tank cars. CCSP 1995. The DEIR suggests that DOT-111 rail cars would be used. However, while the DEIR recognizes safety issues with these cars (see, e.g., p. 4.7-17, and 4.7-25) and explicitly recognizes that only about 25% of the current fleet has been upgraded to NTSB standards, it does not consider these flaws in its analyses and does nothing to assure that the Project will use the safest cars available that meet the most current safety standards. DEIR, p. 4.7-25. The DEIR

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<sup>82</sup> Transportation Safety Board of Canada, Rail Recommendations R14-01, R14-02, R14-03, January 23, 2014, Available at: <http://www.tsb.gc.ca/eng/recommendations-recommendations/rail/2014/rec-r1401-r1403.asp#appx-a>.

<sup>83</sup> C.P.L. Barkan, C.T. Dick and R. Anderson, Analysis of Railroad Derailment Factors Affecting Hazardous Materials Transportation Risk, Transportation Research Board Annual Meeting, 2003.

does not require any specific railcars nor safety standards for the rail cars that would be used in Project unit trains.

This is a serious flaw as it is widely acknowledged that the existing fleet of DOT-111 tank cars is unsafe for transporting crude oil or other hazardous materials. There are about 228,000 Class 111 tank cars currently in service in North America. Among many other deficiencies, the head and shells of DOT-111s are paper thin, and they lack many other vital safety features, such as head shields and protection for top fittings. As explained by the Transportation Safety Board of Canada (TSBC): “Many Class 111 tank cars do not have top fitting protection, head shields or thermal protection, and are not jacketed. The sides and heads of these tank cars are typically constructed with 7/16-inch-thick steel plate, which is thinner than some other classes of tank cars. When involved in accidents, these Class 111 tank cars are vulnerable to head and shell damage due to impacts, as well as fitting damage, which can result in the release of product. Furthermore, without thermal protection, additional product can be released through excessive venting of the safety relief device(s), or worse, through a thermal tear, which can result in complete product loss.”<sup>84</sup>

**Figure 9**  
**Class 111 Tank Cars**  
**Assumed in DEIR to Transport Crude (TSBC)**



Rail tank cars should be able to withstand “rollover” accidents. But when pre-2011 DOT-111s are involved in accidents, even at low speeds, almost all of the tank cars rupture and release their contents. This was documented by the National Transportation Safety Board (“NTSB”) in its “Cherry Valley accident report,” cited in the Advanced Notice of Proposed Rulemaking for Hazardous Materials: Rail Petitions and Recommendations to Improve the Safety of Railroad Tank Car Transportation.<sup>85</sup> In that

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<sup>84</sup> Transportation Safety Board of Canada, Rail Recommendation R14-01, R14-02, R14-03, January 23, 2014, Available at: <http://www.tsb.gc.ca/eng/recommandations-recommendations/rail/2014/rec-r1401-r1403.asp>.

<sup>85</sup> PHMSA-2012-0082 (HM-251), 78 FR 54,849 (Sept. 6, 2013).

low-speed accident (36 mph), 13 of 15 tank cars ruptured. The NTSB noted that similar disastrous failure rates had been observed in other accidents (New Brighton, PA – 12 of 23 cars were breached; Arcadia, OH – 28 of 32 were breached).

The Cenovus Material Safety Data Sheet (MSDS) for Bakken crudes rates its flammability at Level 4, which is the highest rating, the same as for methane and propane gases. Under Canadian regulations, propane must be carried in DOT-112 or DOT-114 tank cars, but not in the U.S. Thus, while the use of DOT-111 tank cars would be illegal in Canada, they could be used in the U.S. where Bakken crudes originates<sup>86</sup> and appear to be approved by the DEIR for use on this Project. After the Lac-Mégantic accident in Canada, the Canadian government proposed to reclassify crude oil as a highly hazardous material, upgrading its classification from flammable and non-explosive.<sup>87</sup> The DEIR is seriously deficient for failing to call out this significant risk, the use of unsafe railcars to import highly flammable Bakken crudes through densely populated areas to the Refinery in “virtual pipelines”. This is reckless.

### C. Mitigation Is Inadequate

The DEIR does not impose any mitigation for accidents involving the import and storage of a new crude slate as it alleges there are no significant impacts. (Crossbucks will be installed at all railroad spur crossing with the Refinery. DEIR, p. IST-37.) However, as I demonstrate above, this conclusion is wrong. The import of a new slate of crudes by rail will result in many significant impacts. These must be mitigated. The following sections discuss some of the mitigation measures that I recommend.

Notably, on January 23, 2014, the National Transportation Safety Board (NTSB)<sup>88</sup> issued a series of recommendations to the Department of Transportation to address the safety risk of transporting crude oil by rail.<sup>89</sup> In an unprecedented move, the NTSB issued these recommendations in coordination with the Transportation Safety Board of Canada.<sup>90</sup> These recommendations include tougher standards for all Class-111

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<sup>86</sup> DOT-111 Tank Car, Wikipedia.

<sup>87</sup> Canada Orders Reinforced Fuel Trains After Disaster, January 10, 2014, Available at: <http://crooksandliars.com/2014/01/canada-orders-reinforced-fuel-trains-after>.

<sup>88</sup> NTSB Calls for Tougher Standards on Trains Carrying Crude Oil, January 23, 2014, Available at: <http://www.nts.gov/news/2014/140123.html>; FuelFix, Wreck Investigators Urge Tighter Rules for Oil Trains, January 23, 2014, Available at: <http://fuelfix.com/blog/2014/01/23/rail-wreck-investigators-urge-tighter-rules-for-oil-trains/>; The Globe and Mail, Canadian and U.S. Safety Watchdogs Warn of Oil-by-Rail's Risks in Push for Tighter Rules, January 23, 2014, Available at: <http://www.theglobeandmail.com/news/politics/new-federal-rail-safety-proposal-to-tighten-scrutiny-of-crude-shipments/article16461771/#dashboard/follows/>.

<sup>89</sup> NTSF, Safety Recommendation Letter R-14-001-003, January 23, 2014, Available at: <http://www.nts.gov/doclib/reclatters/2014/R-14-001-003.pdf> and NTSB Safety Recommendation Letter R-14-004-006, January 21, 2014, Available at: <http://www.nts.gov/doclib/reclatters/2014/R-14-004-006.pdf>.

<sup>90</sup> TSB and NTSB Call on Canadian and U.S. Regulators to Improve the Safe Transportation of Crude by Rail, Available at: <http://www.tsb.gc.ca/eng/medias-media/communiqués/rail/2014/r13d0054->



tank cars, not just new ones; strategic route planning; and emergency response assistance plans along routes where large volume of liquid hydrocarbons are shipped. All of these recommendations should be included as mitigation for the Rail Spur Project.

I. Community Emergency Preparedness Response

When a crude oil spill occurs, local response assets are generally the first ones on scene. These assets will include those provided by police departments, fire fighters, and emergency managers. Many times however, these response individuals are unaware of the nature of, and the threat posed by the materials that are being transported through their communities.

The public services and utilities section of the DEIR (Sec. 4.11), does not address how a local train accident would be handled. The DEIR concedes elsewhere that “In the unlikely event of an oil spill along the UPRR mainline tracks, there would likely be no oil spill containment or cleanup equipment available, and it would likely take some time for emergency response teams to mobilize adequate spill response equipment. Depending upon the location of the spill this could allow enough time for the spill to impact sensitive habitat and plants and animal species.” DEIR, p. ES-7. Elsewhere the DEIR admits that “[o]peration of the Rail Spur Project could increase demand for fire protection and emergency response services.” DEIR, pp. ES-9.

The only mitigation proposed for these deficiencies is implementation of a “Fire Protection Plan, Emergency Response Plan, Spill Prevention Control and Countermeasure Plan, training requirement for CALFIRE and the SMR fire brigade” within the Refinery. DEIR, pp. ES-9, IST-33. This is not adequate to address accidents along the 458 miles of track within California as it effectively places the burden of remediating the environmental consequences of an accident on local communities along the route. The DEIR failed to evaluate any alternatives to this do-nothing approach. The applicant could require its carrier to develop a comprehensive plan to ensure the availability of necessary response resources, including identifying and contracting the personnel and equipment necessary to respond to accidents along the route.

Congress, recognizing a gap in communication, mandated in the “9/11 Act”<sup>91</sup> that rail companies transporting security sensitive materials, including toxic-by-inhalation materials, but not including crude oil, improve communication with local officials. Rail carriers are now required to identify a point of contact and to provide information to (1) state and/or regional “Fusion Centers” that have been established to coordinate with state, local and tribal officials on security issues and which are located within the area encompassed by the rail carrier’s rail system; and (2) state, local, and tribal officials in jurisdictions that may be affected by a rail carrier’s routing decisions

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[20140123.asp](http://www.tsb.gc.ca/eng/recommendations-recommendations/rail/2014/rec-r1401-r1403.asp); See also: Rail Recommendations R14-01, R14-02, R14-03 at <http://www.tsb.gc.ca/eng/recommendations-recommendations/rail/2014/rec-r1401-r1403.asp> and Backgrounder at <http://www.tsb.gc.ca/eng/medias-media/fiches-facts/r13d0054/r13d0054-20140123.asp>.

<sup>91</sup> Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. 110-53; 121 Stat. 266.

and who directly contact the railroad to discuss routing decisions.<sup>92</sup> This knowledge enables local communities to have a better understanding of what is being transported near their homes and schools.

According to the mandate of the 9/11 Act, rail carriers transporting security sensitive materials are required to select lower-risk routes, based on an analysis of the safety and security risks presented various routes, railroad storage facilities and proximity of high-consequence targets along the route. The results of this analysis could dictate the rerouting of the security sensitive materials to other locations

Crude oil is not currently defined as “security sensitive” so the additional reporting requirement does not apply to rail carriers transporting crude oil, despite its obvious hazards. However, the DEIR should find the subject crudes as “security sensitive” and implement 9/11 Act requirements.

The lack of regulatory guidance on communication about the movement of crude oil via rail with local officials, neighbors and local businesses is inconsistent with the Administration’s initiatives goal to improve preparedness. President Obama issued a proclamation on August 30, 2013 stating that September 2013 was National Preparedness Month. In this document, the President also stated that Americans should “refocus our efforts on readying ourselves, our families, our neighborhoods, and our Nation for any crisis we may face.” Additionally he directed the Federal Emergency Management Agency to “launch a comprehensive campaign to build and sustain national preparedness with private sector, non-profit, and community leaders and all levels of government.”<sup>93</sup> Private sector and community preparedness can’t occur if the federal government fails to require the disclosure of information that could help communities become more prepared.

The failure to share information also contradicts the mission of the Citizen Corps, a FEMA-managed initiative. Its mission “is to harness the power of every individual through education, training, and volunteer service to make communities safer, stronger, and better prepared to respond to the threats of terrorism, crime, public health issues, and disasters of all kinds.” <http://www.ready.gov/citizen-corps>. Disasters of all kinds include spills created by overturned rail tank cars carrying crude oil.

FEMA released a report on the Citizen Corps in September 2012. In this document entitled “Citizen Corps Councils Registration and Profile Data FY2011 National Report,” FEMA Administrator Fugate stated that the Citizen Corps Councils provide “the table” for collaboration to “(i)ntegrate whole community representatives with emergency managers to ensure disaster preparedness and response planning represents the whole community and integrates nontraditional resources.”<sup>94</sup> Again,

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<sup>92</sup> <http://www.gpo.gov/fdsys/pkg/FR-2008-11-26/html/E8-27826.htm>.

<sup>93</sup> [http://community.fema.gov/gf2.ti/fi/280514/8233733.1/PDF/-/Presidential\\_Proclamation\\_National\\_Preparedness\\_Month\\_2013.pdf](http://community.fema.gov/gf2.ti/fi/280514/8233733.1/PDF/-/Presidential_Proclamation_National_Preparedness_Month_2013.pdf).

<sup>94</sup> FEMA, “Citizen Corps Councils Registration and Profile Data FY2011 National Report.”

without access to accurate information, the whole community is unable to adequately plan and integrate resources for disaster response and preparedness in line with FEMA objectives.

Finally, the failure to share information also contradicts recommendations provided by former Director of EPA's Office of Emergency Management Deborah Dietrich regarding coordination between the Citizen Corps and Local Emergency Planning Committees (LEPCs). Ms. Dietrich sent an August 2009 letter to all State Emergency Response Commission (SERC) Chairs recommending that all LEPCs work more closely with the Citizen Corps regarding the Emergency Planning and Community Right to Know Act of 1986 (EPCRA). She told them to consider "whether working more closely with the Citizen Corps could make your EPCRA and RMP work more effective."<sup>95</sup> Without basic knowledge about crude oil moving through their communities by rail, these planning committees are unable to accomplish their intended goal.

## 2. Rail Car Design

The DEIR suggests that DOT-111 non-pressurized tank cars would be used. DEIR, p. 4.7-25. However, as documented above, based on recent accidents and various proposed rulemakings, these railcars are known to pose significant risks when used to transport crude oil in unit trains.

Railcars are typically (99%) owned by the refiner, a leasing company, or a midstream producer, rather than the railroads.<sup>96</sup> Thus, there is no pre-emption issue and Phillips 66 has control over its railcars. The County can and should establish standards that the Project's railcars must meet. These standards should include the use of DOT-112 or DOT-114 when transporting Level 4 material such as Bakken and otherwise, the use of DOT-111 built to the most current standards, currently as of October 1, 2011, which include increased head and shell thickness; normalized steel; 1/2-inch thick head shield; and top fitting protection. DEIR, p. 4.7-25.

## 3. Train Staffing

A unit train carrying crude oil can weigh up to 15,000 tons and extend for up to a mile in length. Directing such a vehicle from point of origin to its destination is an inordinately demanding task, especially given the enormous risks involved if a mistake is made.

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[https://s3-us-gov-west-1.amazonaws.com/dam-production/uploads/20130726-1854-25045-2121/citizen\\_corps\\_councils\\_final\\_report\\_9\\_27\\_2012.pdf](https://s3-us-gov-west-1.amazonaws.com/dam-production/uploads/20130726-1854-25045-2121/citizen_corps_councils_final_report_9_27_2012.pdf), September 2012.

<sup>95</sup> Dietrich, Deborah, Letter to SERC Chairpersons, <ftp://tbrpc.org/dri/Documents/LEPC/MISCELLANEOUS/EPA's%20EPCRA%20Letter.pdf>, August 20, 2009.

<sup>96</sup> AAR, Moving Crude by Rail, May 2013, p. 9.

The range of tasks and responsibilities imposed on train staff includes powering up, maintaining speed (in compliance with ever-changing speed limits, changing grades, and track conditions), constant visual surveillance of the track and traffic control signals, continuously operating the radio, completing required paperwork, and remaining aware of other rail traffic.

Further, FRA rules require that each car in a hazmat train be inspected visually for defects, signs of tampering, and/or the presence of improvised explosive devices. 49 CFR 174.9(b). This could require over a mile of visual tank car inspections, thus requiring a solo staffer to be away from the locomotive for long periods.

In the event of derailment, collision, mechanical breakdown, etc, a massive piece of equipment such as a unit train cannot be safely operated by one individual. Redundancy in staffing is required to maintain safe operations. This has been recognized by the Federal Aviation Administration, which requires two pilots for all commercial flights. Crude unit trains should be subject to the same requirement.

Thus, the DEIR should include a condition requiring that Phillips 66 negotiate a contract with UPRR that requires at least two operators on each unit train carrying crude oil.

4. Alternate Route Should Be Required

The DEIR should have analyzed the safety and security risks of alternate transportation routes, including consideration of the crude volumes; track type, class, and maintenance schedule; track grade and curvature; environmentally sensitive or significant areas; population density along the routes; emergency response capability along the routes; passenger traffic along the route(s) (i.e., shared track); railway infrastructure (e.g., signaling, track class, crossings, wayside systems, traffic density); geography; and areas of high consequence as defined in 49 CFR 172.820(c). Based on this analysis, the DEIR should have selected the route posing the least overall safety and security risk.

In particular, the DEIR should have selected a route to prevent catastrophic release or explosion in proximity to densely populated areas, including urban areas and events or venues with large numbers of people in attendance, iconic buildings, landmarks, or environmentally sensitive areas.<sup>97</sup> The route selected in the DEIR (without any analysis or justification at all) violates every tenant of safety analysis. The proposed route passes through some of the most densely populated and environmentally sensitive areas in the world.

The coastal route selected in the DEIR overlaps with passenger routes and passes through some of the most densely populated areas in the United States. The Capitol Corridor line travels between San Jose and Sacramento. The Pacific Surfliner travels along the coast between San Luis Obispo and San Diego. The San Joaquin line runs

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<sup>97</sup> 73 FR 20752 (April 16, 2008).

between Bakersfield and the San Francisco Bay Area. The California Zephyr runs between Emeryville and Chicago. The Coast Starlight run between Los Angeles and Chicago. DEIR, Sec. 4.12.

Further, the chosen route passes over 99 bridges and major road crossing in just San Luis Obispo County alone, of which only 33 are grade-separated crossings, where the railroad passes above or below the crossing. DEIR, p. 4.7-28. The DEIR failed to inventory bridges and crossing anywhere else. DEIR, Sec. 4.7 & 4.12. However, there are likely many in densely populated areas that unit trains will pass through. Many of these are likely unseparated and thus would increase the potential for accidents. DEIR, p. 4.7-28. As it could take over an hour for a unit train to pass through any given crossing, massive traffic jams could result in areas like the San Francisco Bay Area, Silicon Valley, and the greater Los Angeles area. The interaction of train traffic and rail traffic was not evaluated in the DEIR. Any increase in congestion due to this Project would be a significant impact that was not analyzed or mitigated.

The 9/11 Act, generally used to argue for safety of existing railroads, was enacted in 2007, when just 5,897 carloads of crude petroleum originated on U.S. Class I railroads. Last year, that number grew to 233,819 carloads – a growth of more than 3865%.<sup>98</sup> In 2013, that number has grown again, totaling 299,052 through the first 3 quarters (averaging about 100,000 per quarter). Assuming volumes will be similar in the fourth quarter, there will be about 400,000 carloads for all of 2013 – a growth of about 6700% relative to carloads in 2007.<sup>99</sup> This exponential growth in unit shipments of crude by rail and associated incidents, as well as the recent Lac-Mégantic disaster, compel the conclusion that unit shipments of crude oil demand enhanced safety standards and should be subjected to the re-routing standards as “security sensitive” materials as set forth in the 9/11 Act.

Finally, hybrid logistics, where crude is offloaded from rail at intermediate terminals, with transport via water and/or pipelines used for final delivery to the Refinery, should have been considered as alternatives to a 100% by rail delivery route. These are clearly on Phillip 66's<sup>100</sup> and other refiner's<sup>101</sup> plates.

##### 5. Mitigation Is Deferred To The Future

The DEIR recommends several mitigation measures that would be developed in the future, outside of the CEQA review process. Thus should be fully developed as part of the DEIR to assure adequate public review.

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<sup>98</sup> AAR May 2013.

<sup>99</sup> AAR, August 29, 2013; AAR November 7, 2013.

<sup>100</sup> Phillips 66, Crude by Rail & Intermodal Supply Chain, Optimization and Opportunities, Refiner-Led Summit 2013, Opening Keynote Panel, August 21, 2013.

<sup>101</sup> Tesoro, Deutsche Bank Energy Conference, January 9, 2014.

First, prior to issuance of construction permits and notice to proceed, various fire protection and emergency response services would be developed including: "Fire Protection Plan, Emergency Response Plan, Spill Prevention Control and Countermeasure Plan, training requirement for CALFIRE and the SMR fire brigade." DEIR, pp. ES-9, IST-33. These updated plans should be included as appendices to the DEIR for public review.

Second, the Applicant also "shall investigate methods for reducing the onsite emissions, both from fugitive components and from locomotives" and "implement a program to limit onsite idling" prior to issuance of the Notice to Proceed, and thus outside of CEQA review. DEIR, p. IST-1.

## VII. ALTERNATIVES

The DEIR considered five major alternatives to the Project: (1) truck transportation; (2) marine transportation; (3) alternative rail unloading sites; (4) loop rail unloading configuration; (5) reduced rail deliveries; (6) no project alternative. DEIR, Sec. 5.1. None of these alternatives significantly reduce impacts. Thus, they are not "alternatives" to the Project under CEQA.

The DEIR failed to evaluate other feasible alternatives that would have lesser impacts and more benefits. These include: (1) use of crude from the Price Canyon Oil Field Project Expansion, which proposes to increase local output,<sup>102</sup> to the extent available, rather than importing by rail; (2) continue production from existing or other nearby oil fields using enhanced oil recovery; (3) use of alternate rail route through the Central Valley with new connector rail line west from Bakersfield; (4) hybrid delivery options (e.g., partial delivery by sea or pipeline); (5) restrict crudes that can be imported.

The DEIR also failed to conduct any analysis at all of the no project alternative, rejecting it out of hand as it would not meet any of the project objectives. DEIR, p. 5-24. What are they? However, economic interests (at the expense of environmental impacts) is not a valid consideration under CEQA. When the no project alternative is the most environmentally superior then the next most environmentally preferred must be selected. DEIR, p. 5-33

The purpose of the Rail Spur Project, evidentially, is to reduce operating cost by importing cheaper oil. However, this should not be allowed at expense of the potentially catastrophic environment consequences, which are externalities that must be weighed, mitigated, or replaced when mitigations are not effective. Local sources of crude can be secured without the Rail Spur Project. New oil fields are currently being developed. The use of locally sourced crudes is the next most environmentally preferred.

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<sup>102</sup> Price Canyon Oilfield Project (Freeport McMoran Oil & Gas), Available at: <http://www.slocounty.ca.gov/planning/environmental/EnvironmentalNotices/PXP.htm>.

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Dr. Fox has over 40 years of experience in the field of environmental engineering, including air pollution control (BACT, BART, MACT, LAER, RACT), cost effectiveness analyses, air quality management, water quality and water supply investigations, hazardous waste investigations, environmental permitting, nuisance investigations (odor, noise), environmental impact reports, CEQA/NEPA documentation, risk assessments, and litigation support.

**EDUCATION**

Ph.D. Environmental/Civil Engineering, University of California, Berkeley, 1980.  
M.S. Environmental/Civil Engineering, University of California, Berkeley, 1975.  
B.S. Physics (with high honors), University of Florida, Gainesville, 1971.

**REGISTRATION**

Registered Professional Engineer: Arizona (2001-present; #36701), California (2002-present; CH 6058), Florida (2001-present; #57886), Georgia (2002-present; #PE027643), Washington (2002-present; #38692), Wisconsin (2005-present; #37595-006)  
Board Certified Environmental Engineer, American Academy of Environmental Engineers,  
Certified in Air Pollution Control (DEE #01-20014), 2002-present  
Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice (QEP #02-010007), 2001-present

**PROFESSIONAL HISTORY**

Environmental Management, Principal, 1981-present  
Lawrence Berkeley National Laboratory, Principal Investigator, 1977-1981  
University of California, Berkeley, Program Manager, 1976-1977  
Bechtel, Inc., Engineer, 1971-1976, 1964-1966

**PROFESSIONAL AFFILIATIONS**

American Chemical Society (1981-2010)  
Phi Beta Kappa (1970-present)  
Sigma Pi Sigma (1970-present)

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**PHYLLIS FOX, PH.D., PAGE 2**

*Who's Who Environmental Registry*, PH Publishing, Fort Collins, CO, 1992.

*Who's Who in the World*, Marquis Who's Who, Inc., Chicago, IL, 11th Ed., p. 371, 1993-present.

*Who's Who of American Women*, Marquis Who's Who, Inc., Chicago, IL, 13th Ed., p. 264, 1984-present.

*Who's Who in Science and Engineering*, Marquis Who's Who, Inc., New Providence, NJ, 5<sup>th</sup> Ed., p. 414, 1999-present.

*Who's Who in America*, Marquis Who's Who, Inc., 59<sup>th</sup> Ed., 2005.

*Guide to Specialists on Toxic Substances*, World Environment Center, New York, NY, p. 80, 1980.

National Research Council Committee on Irrigation-Induced Water Quality Problems (Selenium), Subcommittee on Quality Control/Quality Assurance (1985-1990).

National Research Council Committee on Surface Mining and Reclamation, Subcommittee on Oil Shale (1978-80)

**REPRESENTATIVE EXPERIENCE**

Performed environmental and engineering investigations, as outlined below, for a wide range of industrial and commercial facilities including: petroleum refineries and upgrades thereto; reformulated fuels projects; refinery upgrades to process heavy sour crudes, including tar sands and light sweet crudes from the Eagle Ford and Bakken Formations; petroleum distribution terminals; coal export terminals; LNG export, import, and storage terminals; shale oil plants; coal gasification & liquefaction plants; conventional and thermally enhanced oil production; underground storage tanks; pipelines; gasoline stations; landfills; railyards; hazardous waste treatment facilities; nuclear, hydroelectric, geothermal, wood, biomass, waste, tire-derived fuel, gas, oil, coke and coal-fired power plants; transmission lines; airports; hydrogen plants; petroleum coke calcining plants; coke plants; activated carbon manufacturing facilities; asphalt plants; cement plants; incinerators; flares; manufacturing facilities (e.g., semiconductors, electronic assembly, aerospace components, printed circuit boards, amusement park rides); lanthanide processing plants; ammonia plants; nitric acid plants; urea plants; food processing plants; almond hulling facilities; composting facilities; grain processing facilities; grain elevators; ethanol production facilities; soy bean oil extraction plants; biodiesel plants; paint formulation plants; wastewater treatment plants; marine terminals and ports; gas processing plants; steel mills; iron nugget production facilities; pig iron plant, based on blast furnace technology; direct reduced iron plant; acid regeneration facilities; railcar refinishing facility; battery manufacturing plants; pesticide manufacturing and repackaging facilities; pulp and paper mills; olefin plants; methanol plants; ethylene crackers; selective catalytic reduction (SCR) systems; selective noncatalytic reduction (SNCR) systems; halogen acid furnaces; contaminated property redevelopment projects (e.g., Mission Bay, Southern Pacific Railyards, Moscone Center expansion, San Diego Padres Ballpark); residential developments; commercial office parks,



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**PHYLLIS FOX, PH.D., PAGE 3**

campuses, and shopping centers; server farms; transportation plans; and a wide range of mines including sand and gravel, hard rock, limestone, nacholite, coal, molybdenum, gold, zinc, and oil shale.

*EXPERT WITNESS/LITIGATION SUPPORT*

- For plaintiffs, expert witness in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1997-2000) at the Cemex cement plant in Lyons, Colorado. Reviewed produced documents, prepared expert and rebuttal reports on PSD applicability based on NO<sub>x</sub> emission calculations for a collection of changes considered both individually and collectively. Deposed August 2011. *United States v. Cemex, Inc.*, In U.S. District Court for the District of Colorado (Civil Action No. 09-cv-00019-MSK-MEH). Case settled June 13, 2013.
- For plaintiffs, in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1988 – 2000) at James De Young Units 3, 4, and 5. Reviewed produced documents, analyzed CEMS and EIA data, and prepared netting and BACT analyses for NO<sub>x</sub>, SO<sub>2</sub>, and PM<sub>10</sub>. Expert report February 24, 2010 and affidavit February 20, 2010. *Sierra Club v. City of Holland, et al.*, U.S. District Court, Western District of Michigan.
- For plaintiffs, in civil action alleging failure to obtain MACT permit, expert on potential to emit hydrogen chloride (HCl) from a new coal-fired boiler. Reviewed record, estimated HCl emissions, wrote expert report June 2010 and March 2013 (Cost to Install a Scrubber at the Lamar Repowering Project Pursuant to Case-by-Case MACT), deposed August 2010 and March 2013. *Wildearth Guardian et al. v. Lamar Utilities Board*, Civil Action No. 09-cv-02974, U.S. District Court, District of Colorado. Case settled August 2013.
- For plaintiffs, expert witness on permitting, emission calculations, and wastewater treatment for coal to gasoline plant. Reviewed produced documents. Assisted in preparation of comments on draft minor source permit. Wrote two affidavits on key issues in case. Presented direct and rebuttal testimony 10/27 - 10/28/10 on permit enforceability and failure to properly calculate potential to emit, including underestimate of flaring emissions and omission of VOC and CO emissions from wastewater treatment, cooling tower, tank roof landings, and malfunctions. *Sierra Club, Ohio Valley Environmental Coalition, Coal River Mountain Watch, West Virginia Highlands Conservancy v. John Benedict, Director, Division of Air Quality, West Virginia Department of Environmental Protection and TransGas Development System, LLC*, Appeal No. 10-01-AQB. Virginia Air Quality Board remanded the permit on March 28, 2011 ordering reconsideration of potential to emit calculations, including: (1) support for assumed flare efficiency; (2) inclusion of startup, shutdown and malfunction emissions; and (3) inclusion of wastewater treatment emissions in potential to emit calculations.

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- For plaintiffs, expert on BACT emission limits for gas-fired combined cycle power plant. Prepared declaration in support of CBE's Opposition to the United States' Motion for Entry of Proposed Amended Consent Decree. Assisted in settlement discussions. *U.S. EPA, Plaintiff, Communities for a Better Environment, Intervenor Plaintiff, v. Pacific Gas & Electric Company, et al.*, U.S. District Court, Northern District of California, San Francisco Division, Case No. C-09-4503 SI.
- Technical expert in confidential settlement discussions with large coal-fired utility on BACT control technology and emission limits for NO<sub>x</sub>, SO<sub>2</sub>, PM, PM<sub>2.5</sub>, and CO for new natural gas fired combined cycle and simple cycle turbines with oil backup. (July 2010). Case settled.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1998-99) at Gallagher Units 1 and 3. Reviewed produced documents, prepared expert and rebuttal reports on historic and current-day BACT for SO<sub>2</sub>, control costs, and excess emissions of SO<sub>2</sub>. Deposed 11/18/09. *United States et al. v. Cimergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Settled 12/22/09.
- For plaintiffs, expert witness on MACT, BACT for NO<sub>x</sub>, and enforceability in an administrative appeal of draft state air permit issued for four 300-MW pet-coke-fired CFBs. Reviewed produced documents and prepared prefiled testimony. Deposed 10/8/09 and 11/9/09. Testified 11/10/09. *Application of Las Brisas Energy Center, LLC for State Air Quality Permit*; before the State Office of Administrative Hearings, Texas. Permit remanded 3/29/10 as LBEC failed to meet burden of proof on a number of issues including MACT. Texas Court of Appeals dismissed an appeal to reinstate the permit. The Texas Commission on Environmental Quality and Las Brisas Energy Center, LLC sought to overturn the Court of Appeals decision but moved to have their appeal dismissed in August 2013.
- For defense, expert witness in unlawful detainer case involving a gasoline station, minimart, and residential property with contamination from leaking underground storage tanks. Reviewed agency files and inspected site. Presented expert testimony on July 6, 2009, on causes of, nature and extent of subsurface contamination. *A. Singh v. S. Assaedi*, in Contra Costa County Superior Court, CA. Settled August 2009.
- For plaintiffs, expert witness on netting and enforceability for refinery being upgraded to process tar sands crude. Reviewed produced documents. Prepared expert and rebuttal reports addressing use of emission factors for baseline, omitted sources including coker, flares, tank landings and cleaning, and enforceability. Deposed. *In the Matter of Objection to the Issuance of Significant Source Modification Permit No. 089-25484-00453 to BP Products North America Inc., Whiting Business Unit, Save the Dunes Council, Inc., Sierra*

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*Club, Inc., Hoosier Environmental Council et al., Petitioners, B. P. Products North American, Respondents/Permittee*, before the Indiana Office of Environmental Adjudication.

- For plaintiffs, expert witness on BACT, MACT, and enforceability in appeal of Title V permit issued to 600 MW coal-fired power plant burning Powder River Basin coal. Prepared technical comments on draft air permit. Reviewed record on appeal, drafted BACT, MACT, and enforceability pre-filed testimony. Drafted MACT and enforceability pre-filed rebuttal testimony. Deposed March 24, 2009. Testified June 10, 2009. *In Re: Southwestern Electric Power Company*, Arkansas Pollution Control and Ecology Commission, Consolidated Docket No. 08-006-P. Recommended Decision issued December 9, 2009 upholding issued permit. Commission adopted Recommended Decision January 22, 2010.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1989-1992) at Wabash Units 2, 3 and 5. Reviewed produced documents, prepared expert and rebuttal report on historic and current-day BACT for NO<sub>x</sub> and SO<sub>2</sub>, control costs, and excess emissions of NO<sub>x</sub>, SO<sub>2</sub>, and mercury. Deposed 10/21/08. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Testified 2/3/09. Memorandum Opinion & Order 5-29-09 requiring shutdown of Wabash River Units 2, 3, 5 by September 30, 2009, run at baseline until shutdown, and permanently surrender SO<sub>2</sub> emission allowances.
- For plaintiffs, expert witness in liability phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for three historic modifications (1997-2001) at two portland cement plants involving three cement kilns. Reviewed produced documents, analyzed CEMS data covering subject period, prepared netting analysis for NO<sub>x</sub>, SO<sub>2</sub> and CO, and prepared expert and rebuttal reports. *United States v. Cemex California Cement*, In U.S. District Court for the Central District of California, Eastern Division, Case No. ED CV 07-00223-GW (JCRx), Settled 1/15/09.
- For intervenors Clean Wisconsin and Citizens Utility Board, prepared data requests, reviewed discovery and expert report. Prepared prefiled direct, rebuttal and surrebuttal testimony on cost to extend life of existing Oak Creek Units 5-8 and cost to address future regulatory requirements to determine whether to control or shutdown one or more of the units. Oral testimony 2/5/08. Application for a Certificate of Authority to Install Wet Flue Gas Desulfurization and Selective Catalytic Reduction Facilities and Associated Equipment for Control of Sulfur Dioxide and Nitrogen Oxide Emissions at Oak Creek Power Plant Units 5, 6, 7 and 8, WPSC Docket No. 6630-CE-299.
- For plaintiffs, expert witness on alternatives analysis and BACT for NO<sub>x</sub>, SO<sub>2</sub>, total PM<sub>10</sub>, and sulfuric acid mist in appeal of PSD permit issued to 1200 MW coal fired power plant burning Powder River Basin and/or Central Appalachian coal (Longleaf). Assisted in drafting technical comments on NO<sub>x</sub> on draft permit. Prepared expert disclosure. Presented 8+ days

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of direct and rebuttal expert testimony. Attended all 21 days of evidentiary hearing from 9/5/07 – 10/30/07 assisting in all aspects of hearing. *Friends of the Chatahooche and Sierra Club v. Dr. Carol Couch, Director, Environmental Protection Division of Natural Resources Department, Respondent, and Longleaf Energy Associates, Intervener*. ALJ Final Decision 1/11/08 denying petition. ALJ Order vacated & remanded for further proceedings, Fulton County Superior Court, 6/30/08. Court of Appeals of GA remanded the case with directions that the ALJ's final decision be vacated to consider the evidence under the correct standard of review, July 9, 2009. The ALJ issued an opinion April 2, 2010 in favor of the applicant. Final permit issued April 2010.

- For plaintiffs, expert witness on diesel exhaust in inverse condemnation case in which Port expanded maritime operations into residential neighborhoods, subjecting plaintiffs to noise, light, and diesel fumes. Measured real-time diesel particulate concentrations from marine vessels and tug boats on plaintiffs' property. Reviewed documents, depositions, DVDs, and photographs provided by counsel. Deposed. Testified October 24, 2006. *Ann Chargin, Richard Hackett, Carolyn Hackett, et al. v. Stockton Port District*, Superior Court of California, County of San Joaquin, Stockton Branch, No. CV021015. Judge ruled for plaintiffs.
- For plaintiffs, expert witness on NOx emissions and BACT in case alleging failure to obtain necessary permits and install controls on gas-fired combined-cycle turbines. Prepared and reviewed (applicant analyses) of NOx emissions, BACT analyses (water injection, SCR, ultra low NOx burners), and cost-effectiveness analyses based on site visit, plant operating records, stack tests, CEMS data, and turbine and catalyst vendor design information. Participated in negotiations to scope out consent order. *United States v. Nevada Power*. Case settled June 2007, resulting in installation of dry low NOx burners (5 ppm NOx averaged over 1 hr) on four units and a separate solar array at a local business.
- For plaintiffs, expert witness in appeal of PSD permit issued to 850 MW coal fired boiler burning Powder River Basin coal (Iatan Unit 2) on BACT for particulate matter, sulfuric acid mist and opacity and emission calculations for alleged historic violations of PSD. Assisted in drafting technical comments, petition for review, discovery requests, and responses to discovery requests. Reviewed produced documents. Prepared expert report on BACT for particulate matter. Assisted with expert depositions. Deposed February 7, 8, 27, 28, 2007. *In Re PSD Construction Permit Issued to Great Plains Energy, Kansas City Power & Light – Iatan Generating Station, Sierra Club v. Missouri Department of Natural Resources, Great Plains Energy, and Kansas City Power & Light*. Case settled March 27, 2007, providing offsets for over 6 million ton/yr of CO2 and lower NOx and SO2 emission limits.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications of coal-fired boilers and associated equipment. Reviewed produced documents, prepared expert report on cost to retrofit 24 coal-fired power plants with scrubbers designed to remove 99%

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of the sulfur dioxide from flue gases. Prepared supplemental and expert report on cost estimates and BACT for SO<sub>2</sub> for these 24 complaint units. Deposed 1/30/07 and 3/14/07. *United States and State of New York et al. v. American Electric Power*, In U.S. District Court for the Southern District of Ohio, Eastern Division, Consolidated Civil Action Nos. C2-99-1182 and C2-99-1250. Settlement announced 10/9/07.

- For plaintiffs, expert witness on BACT, enforceability, and alternatives analysis in appeal of PSD permit issued for a 270-MW pulverized coal fired boiler burning Powder River Basin coal (City Utilities Springfield Unit 2). Reviewed permitting file and assisted counsel draft petition and prepare and respond to interrogatories and document requests. Reviewed interrogatory responses and produced documents. Assisted with expert depositions. Deposed August 2005. Evidentiary hearings October 2005. *In the Matter of Linda Chipperfield and Sierra Club v. Missouri Department of Natural Resources*. Missouri Supreme Court denied review of adverse lower court rulings August 2007.
- For plaintiffs, expert witness in civil action relating to plume touchdowns at AEP's Gavin coal-fired power plant. Assisted counsel draft interrogatories and document requests. Reviewed responses to interrogatories and produced documents. Prepared expert report "Releases of Sulfuric Acid Mist from the Gavin Power Station." The report evaluates sulfuric acid mist releases to determine if AEP complied with the requirements of CERCLA Section 103(a) and EPCRA Section 304. This report also discusses the formation, chemistry, release characteristics, and abatement of sulfuric acid mist in support of the claim that these releases present an imminent and substantial endangerment to public health under Section 7002(a)(1)(B) of the Resource Conservation and Recovery Act ("RCRA"). *Citizens Against Pollution v. Ohio Power Company*, In the U.S. District Court for the Southern District of Ohio, Eastern Division, Civil Action No. 2-04-cv-371. Case settled 12-8-06.
- For petitioners, expert witness in contested case hearing on BACT, enforceability, and emission estimates for an air permit issued to a 500-MW supercritical Power River Basin coal-fired boiler (Weston Unit 4). Assisted counsel prepare comments on draft air permit and respond to and draft discovery. Reviewed produced file, deposed (7/05), and prepared expert report on BACT and enforceability. Evidentiary hearings September 2005. *In the Matter of an Air Pollution Control Construction Permit Issued to Wisconsin Public Service Corporation for the Construction and Operation of a 500 MW Pulverized Coal-fired Power Plant Known as Weston Unit 4 in Marathon County, Wisconsin*, Case No. IH-04-21. The Final Order, issued 2/10/06, lowered the NO<sub>x</sub> BACT limit from 0.07 lb/MMBtu to 0.06 lb/MMBtu based on a 30-day average, added a BACT SO<sub>2</sub> control efficiency, and required a 0.0005% high efficiency drift eliminator as BACT for the cooling tower. The modified permit, including these provisions, was issued 3/28/07. Additional appeals in progress.
- For plaintiffs, adviser on technical issues related to Citizen Suit against U.S. EPA regarding failure to update New Source Performance Standards for petroleum refineries, 40 CFR 60,

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Subparts J, VV, and GGG. *Our Children's Earth Foundation and Sierra Club v. U.S. EPA et al.* Case settled July 2005. CD No. C 05-00094 CW, U.S. District Court, Northern District of California – Oakland Division. Proposed revisions to standards of performance for petroleum refineries published 72 FR 27178 (5/14/07).

- For interveners, reviewed proposed Consent Decree settling Clean Air Act violations due to historic modifications of boilers and associated equipment at two coal-fired power plants. In response to stay order, reviewed the record, selected one representative activity at each of seven generating units, and analyzed to identify CAA violations. Identified NSPS and NSR violations for NO<sub>x</sub>, SO<sub>2</sub>, PM/PM<sub>10</sub>, and sulfuric acid mist. Summarized results in an expert report. *United States of America, and Michael A. Cox, Attorney General of the State of Michigan, ex rel. Michigan Department of Environmental Quality, Plaintiffs, and Clean Wisconsin, Sierra Club, and Citizens' Utility Board, Intervenors, v. Wisconsin Electric Power Company, Defendant*, U.S. District Court for the Eastern District of Wisconsin, Civil Action No. 2:03-CV-00371-CNC. Order issued 10-1-07 denying petition.
- For a coalition of Nevada labor organizations (ACE), reviewed preliminary determination to issue a Class I Air Quality Operating Permit to Construct and supporting files for a 250-MW pulverized coal-fired boiler (Newmont). Prepared about 100 pages of technical analyses and comments on BACT, MACT, emission calculations, and enforceability. Assisted counsel draft petition and reply brief appealing PSD permit to U.S. EPA Environmental Appeals Board (EAB). Order denying review issued 12/21/05. *In re Newmont Nevada Energy Investment, LLC, TS Power Plant*, PSD Appeal No. 05-04 (EAB 2005).
- For petitioners and plaintiffs, reviewed and prepared comments on air quality and hazardous waste based on negative declaration for refinery ultra low sulfur diesel project located in SCAQMD. Reviewed responses to comments and prepared responses. Prepared declaration and presented oral testimony before SCAQMD Hearing Board on exempt sources (cooling towers) and calculation of potential to emit under NSR. Petition for writ of mandate filed March 2005. Case remanded by Court of Appeals to trial court to direct SCAQMD to re-evaluate the potential environmental significance of NO<sub>x</sub> emissions resulting from the project in accordance with court's opinion. California Court of Appeals, Second Appellate Division, on December 18, 2007, affirmed in part (as to baseline) and denied in part. *Communities for a Better Environment v. South Coast Air Quality Management District and ConocoPhillips and Carlos Valdez et al v. South Coast Air Quality Management District and ConocoPhillips*. Certified for partial publication 1/16/08. Appellate Court opinion upheld by CA Supreme Court 3/15/10. (2010) 48 Cal.4th 310.
- For amici seeking to amend a proposed Consent Decree to settle alleged NSR violations at Chevron refineries, reviewed proposed settlement, related files, subject modifications, and emission calculations. Prepared declaration on emission reductions, identification of NSR and NSPS violations, and BACT/LAER for FCCUs, heaters and boilers, flares, and sulfur recovery plants. *U.S. et al. v. Chevron U.S.A.*, Northern District of California, Case No. C

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03-04650. Memorandum and Order Entering Consent Decree issued June 2005. Case No. C 03-4650 CRB.

- For petitioners, prepared declaration on enforceability of periodic monitoring requirements, in response to EPA's revised interpretation of 40 CFR 70.6(c)(1). This revision limited additional monitoring required in Title V permits. 69 FR 3203 (Jan. 22, 2004). *Environmental Integrity Project et al. v. EPA* (U.S. Court of Appeals for the District of Columbia). Court ruled the Act requires all Title V permits to contain monitoring requirements to assure compliance. *Sierra Club v. EPA*, 536 F.3d 673 (D.C. Cir. 2008).
- For interveners in application for authority to construct a 500 MW supercritical coal-fired generating unit before the Wisconsin Public Service Commission, prepared pre-filed written direct and rebuttal testimony with oral cross examination and rebuttal on BACT and MACT (Weston 4). Prepared written comments on BACT, MACT, and enforceability on draft air permit for same facility.
- For property owners in Nevada, evaluated the environmental impacts of a 1,450-MW coal-fired power plant proposed in a rural area adjacent to the Black Rock Desert and Granite Range, including emission calculations, air quality modeling, comments on proposed use permit to collect preconstruction monitoring data, and coordination with agencies and other interested parties. Project cancelled.
- For environmental organizations, reviewed draft PSD permit for a 600-MW coal-fired power plant in West Virginia (Longview). Prepared comments on permit enforceability; coal washing; BACT for SO<sub>2</sub> and PM<sub>10</sub>; Hg MACT; and MACT for HCl, HF, non-Hg metallic HAPs, and enforceability. Assist plaintiffs draft petition appealing air permit. Retained as expert to develop testimony on MACT, BACT, offsets, enforceability. Participate in settlement discussions. Case settled July 2004.
- For petitioners, reviewed record produced in discovery and prepared affidavit on emissions of carbon monoxide and volatile organic compounds during startup of GE 7FA combustion turbines to successfully establish plaintiff standing. *Sierra Club et al. v. Georgia Power Company* (Northern District of Georgia).
- For building trades, reviewed air quality permitting action for 1500-MW coal-fired power plant before the Kentucky Department for Environmental Protection (Thoroughbred).
- For petitioners, expert witness in administrative appeal of the PSD/Title V permit issued to a 1500-MW coal-fired power plant. Reviewed over 60,000 pages of produced documents, prepared discovery index, identified and assembled plaintiff exhibits. Deposed. Assisted counsel in drafting discovery requests, with over 30 depositions, witness cross examination, and brief drafting. Presented over 20 days of direct testimony, rebuttal and sur-rebuttal, with cross examination on BACT for NO<sub>x</sub>, SO<sub>2</sub>, and PM/PM<sub>10</sub>; MACT for Hg and non-Hg metallic HAPs; emission estimates for purposes of Class I and II air modeling; risk assessment; and enforceability of permit limits. Evidentiary hearings from November 2003 to

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June 2004. *Sierra Club et al. v. Natural Resources & Environmental Protection Cabinet, Division of Air Quality and Thoroughbred Generating Company et al.* Hearing Officer Decision issued August 9, 2005 finding in favor of plaintiffs on counts as to risk, BACT (IGCC/CFB, NO<sub>x</sub>, SO<sub>2</sub>, Hg, Be), single source, enforceability, and errors and omissions. Assist counsel draft exceptions. Cabinet Secretary issued Order April 11, 2006 denying Hearing Offer's report, except as to NO<sub>x</sub> BACT, Hg, 99% SO<sub>2</sub> control and certain errors and omissions.

- For citizens group in Massachusetts, reviewed, commented on, and participated in permitting of pollution control retrofits of coal-fired power plant (Salem Harbor).
- Assisted citizens group and labor union challenge issuance of conditional use permit for a 317,000 ft<sup>2</sup> discount store in Honolulu without any environmental review. In support of a motion for preliminary injunction, prepared 7-page declaration addressing public health impacts of diesel exhaust from vehicles serving the Project. In preparation for trial, prepared 20-page preliminary expert report summarizing results of diesel exhaust and noise measurements at two big box retail stores in Honolulu, estimated diesel PM10 concentrations for Project using ISCST, prepared a cancer health risk assessment based on these analyses, and evaluated noise impacts.
- Assisted environmental organizations to challenge the DOE Finding of No Significant Impact (FONSI) for the Baja California Power and Sempra Energy Resources Cross-Border Transmissions Lines in the U.S. and four associated power plants located in Mexico (DOE EA-1391). Prepared 20-page declaration in support of motion for summary judgment addressing emissions, including CO<sub>2</sub> and NH<sub>3</sub>, offsets, BACT, cumulative air quality impacts, alternative cooling systems, and water use and water quality impacts. Plaintiff's motion for summary judgment granted in part. U.S. District Court, Southern District decision concluded that the Environmental Assessment and FONSI violated NEPA and the APA due to their inadequate analysis of the potential controversy surrounding the project, water impacts, impacts from NH<sub>3</sub> and CO<sub>2</sub>, alternatives, and cumulative impacts. *Border Power Plant Working Group v. Department of Energy and Bureau of Land Management*, Case No. 02-CV-513-IEG (POR) (May 2, 2003).
- For Sacramento school, reviewed draft air permit issued for diesel generator located across from playfield. Prepared comments on emission estimates, enforceability, BACT, and health impacts of diesel exhaust. Case settled. BUG trap installed on the diesel generator.
- Assisted unions in appeal of Title V permit issued by BAAQMD to carbon plant that manufactured coke. Reviewed District files, identified historic modifications that should have triggered PSD review, and prepared technical comments on Title V permit. Reviewed responses to comments and assisted counsel draft appeal to BAAQMD hearing board, opening brief, motion to strike, and rebuttal brief. Case settled.
- Assisted California Central Coast city obtain controls on a proposed new city that would straddle the Ventura-Los Angeles County boundary. Reviewed several environmental impact reports, prepared an air quality analysis, a diesel exhaust health risk assessment, and



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detailed review comments. Governor intervened and State dedicated the land for conservation purposes April 2004.

- Assisted Central California city to obtain controls on large alluvial sand quarry and asphalt plant proposing a modernization. Prepared comments on Negative Declaration on air quality, public health, noise, and traffic. Evaluated process flow diagrams and engineering reports to determine whether proposed changes increased plant capacity or substantially modified plant operations. Prepared comments on application for categorical exemption from CEQA. Presented testimony to County Board of Supervisors. Developed controls to mitigate impacts. Assisted counsel draft Petition for Writ. Case settled June 2002. Substantial improvements in plant operations were obtained including cap on throughput, dust control measures, asphalt plant loadout enclosure, and restrictions on truck routes.
- Assisted oil companies on the California Central Coast in defending class action citizen's lawsuit alleging health effects due to emissions from gas processing plant and leaking underground storage tanks. Reviewed regulatory and other files and advised counsel on merits of case. Case settled November 2001.
- Assisted oil company on the California Central Coast in defending property damage claims arising out of a historic oil spill. Reviewed site investigation reports, pump tests, leachability studies, and health risk assessments, participated in design of additional site characterization studies to assess health impacts, and advised counsel on merits of case. Prepare health risk assessment.
- Assisted unions in appeal of Initial Study/Negative Declaration ("IS/ND") for an MTBE phaseout project at a Bay Area refinery. Reviewed IS/ND and supporting agency permitting files and prepared technical comments on air quality, groundwater, and public health impacts. Reviewed responses to comments and final IS/ND and ATC permits and assisted counsel to draft petitions and briefs appealing decision to Air District Hearing Board. Presented sworn direct and rebuttal testimony with cross examination on groundwater impacts of ethanol spills on hydrocarbon contamination at refinery. Hearing Board ruled 5 to 0 in favor of appellants, remanding ATC to district to prepare an EIR.
- Assisted Florida cities in challenging the use of diesel and proposed BACT determinations in prevention of significant deterioration (PSD) permits issued to two 510-MW simple cycle peaking electric generating facilities and one 1,080-MW simple cycle/combined cycle facility. Reviewed permit applications, draft permits, and FDEP engineering evaluations, assisted counsel in drafting petitions and responding to discovery. Participated in settlement discussions. Cases settled or applications withdrawn.
- Assisted large California city in federal lawsuit alleging peaker power plant was violating its federal permit. Reviewed permit file and applicant's engineering and cost feasibility study to reduce emissions through retrofit controls. Advised counsel on feasible and cost-effective

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NO<sub>x</sub>, SO<sub>x</sub>, and PM<sub>10</sub> controls for several 1960s diesel-fired Pratt and Whitney peaker turbines. Case settled.

- Assisted coalition of Georgia environmental groups in evaluating BACT determinations and permit conditions in PSD permits issued to several large natural gas-fired simple cycle and combined-cycle power plants. Prepared technical comments on draft PSD permits on BACT, enforceability of limits, and toxic emissions. Reviewed responses to comments, advised counsel on merits of cases, participated in settlement discussions, presented oral and written testimony in adjudicatory hearings, and provided technical assistance as required. Cases settled or won at trial.
- Assisted construction unions in review of air quality permitting actions before the Indiana Department of Environmental Management ("IDEM") for several natural gas-fired simple cycle peaker and combined cycle power plants.
- Assisted coalition of towns and environmental groups in challenging air permits issued to 523 MW dual fuel (natural gas and distillate) combined-cycle power plant in Connecticut. Prepared technical comments on draft permits and 60 pages of written testimony addressing emission estimates, startup/shutdown issues, BACT/LAER analyses, and toxic air emissions. Presented testimony in adjudicatory administrative hearings before the Connecticut Department of Environmental Protection in June 2001 and December 2001.
- Assisted various coalitions of unions, citizens groups, cities, public agencies, and developers in licensing and permitting of over 110 coal, gas, oil, biomass, and pet coke-fired power plants generating over 75,000 MW of electricity. These included base-load, combined cycle, simple cycle, and peaker power plants in Alaska, Arizona, Arkansas, California, Colorado, Georgia, Florida, Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Oregon, Texas, West Virginia, Wisconsin, and elsewhere. Prepared analyses of and comments on applications for certification, preliminary and final staff assessments, and various air, water, wastewater, and solid waste permits issued by local agencies. Presented written and oral testimony before various administrative bodies on hazards of ammonia use and transportation, health effects of air emissions, contaminated property issues, BACT/LAER issues related to SCR and SCONOX, criteria and toxic pollutant emission estimates, MACT analyses, air quality modeling, water supply and water quality issues, and methods to reduce water use, including dry cooling, parallel dry-wet cooling, hybrid cooling, and zero liquid discharge systems.
- Assisted unions, cities, and neighborhood associations in challenging an EIR issued for the proposed expansion of the Oakland Airport. Reviewed two draft EIRs and prepared a health risk assessment and extensive technical comments on air quality and public health impacts. The California Court of Appeals, First Appellate District, ruled in favor of appellants and plaintiffs, concluding that the EIR "2) erred in using outdated information in assessing the emission of toxic air contaminants (TACs) from jet aircraft; 3) failed to support its decision

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not to evaluate the health risks associated with the emission of TACs with meaningful analysis," thus accepting my technical arguments and requiring the Port to prepare a new EIR. See *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598.

- Assisted lessor of former gas station with leaking underground storage tanks and TCE contamination from adjacent property. Lessor held option to purchase, which was forfeited based on misrepresentation by remediation contractor as to nature and extent of contamination. Remediation contractor purchased property. Reviewed regulatory agency files and advised counsel on merits of case. Case not filed.
- Advised counsel on merits of several pending actions, including a Proposition 65 case involving groundwater contamination at an explosives manufacturing firm and two former gas stations with leaking underground storage tanks.
- Assisted defendant foundry in Oakland in a lawsuit brought by neighbors alleging property contamination, nuisance, trespass, smoke, and health effects from foundry operation. Inspected and sampled plaintiff's property. Advised counsel on merits of case. Case settled.
- Assisted business owner facing eminent domain eviction. Prepared technical comments on a negative declaration for soil contamination and public health risks from air emissions from a proposed redevelopment project in San Francisco in support of a CEQA lawsuit. Case settled.
- Assisted neighborhood association representing residents living downwind of a Berkeley asphalt plant in separate nuisance and CEQA lawsuits. Prepared technical comments on air quality, odor, and noise impacts, presented testimony at commission and council meetings, participated in community workshops, and participated in settlement discussions. Cases settled. Asphalt plant was upgraded to include air emission and noise controls, including vapor collection system at truck loading station, enclosures for noisy equipment, and improved housekeeping.
- Assisted a Fortune 500 residential home builder in claims alleging health effects from faulty installation of gas appliances. Conducted indoor air quality study, advised counsel on merits of case, and participated in discussions with plaintiffs. Case settled.
- Assisted property owners in Silicon Valley in lawsuit to recover remediation costs from insurer for large TCE plume originating from a manufacturing facility. Conducted investigations to demonstrate sudden and accidental release of TCE, including groundwater modeling, development of method to date spill, preparation of chemical inventory, investigation of historical waste disposal practices and standards, and on-site sewer and storm drainage inspections and sampling. Prepared declaration in opposition to motion for summary judgment. Case settled.

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- Assisted residents in east Oakland downwind of a former battery plant in class action lawsuit alleging property contamination from lead emissions. Conducted historical research and dry deposition modeling that substantiated claim. Participated in mediation at JAMS. Case settled.
- Assisted property owners in West Oakland who purchased a former gas station that had leaking underground storage tanks and groundwater contamination. Reviewed agency files and advised counsel on merits of case. Prepared declaration in opposition to summary judgment. Prepared cost estimate to remediate site. Participated in settlement discussions. Case settled.
- Consultant to counsel representing plaintiffs in two Clean Water Act lawsuits involving selenium discharges into San Francisco Bay from refineries. Reviewed files and advised counsel on merits of case. Prepared interrogatory and discovery questions, assisted in deposing opposing experts, and reviewed and interpreted treatability and other technical studies. Judge ruled in favor of plaintiffs.
- Assisted oil company in a complaint filed by a resident of a small California beach community alleging that discharges of tank farm rinse water into the sanitary sewer system caused hydrogen sulfide gas to infiltrate residence, sending occupants to hospital. Inspected accident site, interviewed parties to the event, and reviewed extensive agency files related to incident. Used chemical analysis, field simulations, mass balance calculations, sewer hydraulic simulations with SWMM44, atmospheric dispersion modeling with SCREEN3, odor analyses, and risk assessment calculations to demonstrate that the incident was caused by a faulty drain trap and inadequate slope of sewer lateral on resident's property. Prepared a detailed technical report summarizing these studies. Case settled.
- Assisted large West Coast city in suit alleging that leaking underground storage tanks on city property had damaged the waterproofing on downgradient building, causing leaks in an underground parking structure. Reviewed subsurface hydrogeologic investigations and evaluated studies conducted by others documenting leakage from underground diesel and gasoline tanks. Inspected, tested, and evaluated waterproofing on subsurface parking structure. Waterproofing was substandard. Case settled.
- Assisted residents downwind of gravel mine and asphalt plant in Siskiyou County, California, in suit to obtain CEQA review of air permitting action. Prepared two declarations analyzing air quality and public health impacts. Judge ruled in favor of plaintiffs, closing mine and asphalt plant.
- Assisted defendant oil company on the California Central Coast in class action lawsuit alleging property damage and health effects from subsurface petroleum contamination. Reviewed documents, prepared risk calculations, and advised counsel on merits of case. Participated in settlement discussions. Case settled.

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- Assisted defendant oil company in class action lawsuit alleging health impacts from remediation of petroleum contaminated site on California Central Coast. Reviewed documents, designed and conducted monitoring program, and participated in settlement discussions. Case settled.
- Consultant to attorneys representing irrigation districts and municipal water districts to evaluate a potential challenge of USFWS actions under CVPIA section 3406(b)(2). Reviewed agency files and collected and analyzed hydrology, water quality, and fishery data. Advised counsel on merits of case. Case not filed.
- Assisted residents downwind of a Carson refinery in class action lawsuit involving soil and groundwater contamination, nuisance, property damage, and health effects from air emissions. Reviewed files and provided advise on contaminated soil and groundwater, toxic emissions, and health risks. Prepared declaration on refinery fugitive emissions. Prepared deposition questions and reviewed deposition transcripts on air quality, soil contamination, odors, and health impacts. Case settled.
- Assisted residents downwind of a Contra Costa refinery who were affected by an accidental release of naphtha. Characterized spilled naphtha, estimated emissions, and modeled ambient concentrations of hydrocarbons and sulfur compounds. Deposed. Presented testimony in binding arbitration at JAMS. Judge found in favor of plaintiffs.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects from several large accidents as well as routine operations. Reviewed files and prepared analyses of environmental impacts. Prepared declarations, deposed, and presented testimony before jury in one trial and judge in second. Case settled.
- Assisted business owner claiming damages from dust, noise, and vibration during a sewer construction project in San Francisco. Reviewed agency files and PM10 monitoring data and advised counsel on merits of case. Case settled.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects. Prepared declaration in opposition to summary judgment, deposed, and presented expert testimony on accidental releases, odor, and nuisance before jury. Case thrown out by judge, but reversed on appeal and not retried.
- Presented testimony in small claims court on behalf of residents claiming health effects from hydrogen sulfide from flaring emissions triggered by a power outage at a Contra Costa County refinery. Analyzed meteorological and air quality data and evaluated potential health risks of exposure to low concentrations of hydrogen sulfide. Judge awarded damages to plaintiffs.
- Assisted construction unions in challenging PSD permit for an Indiana steel mill. Prepared technical comments on draft PSD permit, drafted 70-page appeal of agency permit action to

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the Environmental Appeals Board challenging permit based on faulty BACT analysis for electric arc furnace and reheat furnace and faulty permit conditions, among others, and drafted briefs responding to four parties. EPA Region V and the EPA General Counsel intervened as amici, supporting petitioners. EAB ruled in favor of petitioners, remanding permit to IDEM on three key issues, including BACT for the reheat furnace and lead emissions from the EAF. Drafted motion to reconsider three issues. Prepared 69 pages of technical comments on revised draft PSD permit. Drafted second EAB appeal addressing lead emissions from the EAF and BACT for reheat furnace based on European experience with SCR/SNCR. Case settled. Permit was substantially improved. See *In re: Steel Dynamics, Inc.*, PSD Appeal Nos. 99-4 & 99-5 (EAB June 22, 2000).

- Assisted defendant urea manufacturer in Alaska in negotiations with USEPA to seek relief from penalties for alleged violations of the Clean Air Act. Reviewed and evaluated regulatory files and monitoring data, prepared technical analysis demonstrating that permit limits were not violated, and participated in negotiations with EPA to dismiss action. Fines were substantially reduced and case closed.
- Assisted construction unions in challenging PSD permitting action for an Indiana grain mill. Prepared technical comments on draft PSD permit and assisted counsel draft appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analyses for heaters and boilers and faulty permit conditions, among others. Case settled.
- As part of a consent decree settling a CEQA lawsuit, assisted neighbors of a large west coast port in negotiations with port authority to secure mitigation for air quality impacts. Prepared technical comments on mobile source air quality impacts and mitigation and negotiated a \$9 million CEQA mitigation package. Represented neighbors on technical advisory committee established by port to implement the air quality mitigation program. Program successfully implemented.
- Assisted construction unions in challenging permitting action for a California hazardous waste incinerator. Prepared technical comments on draft permit, assisted counsel prepare appeal of EPA permit to the Environmental Appeals Board. Participated in settlement discussions on technical issues with applicant and EPA Region 9. Case settled.
- Assisted environmental group in challenging DTSC Negative Declaration on a hazardous waste treatment facility. Prepared technical comments on risk of upset, water, and health risks. Writ of mandamus issued.
- Assisted several neighborhood associations and cities impacted by quarries, asphalt plants, and cement plants in Alameda, Shasta, Sonoma, and Mendocino counties in obtaining mitigations for dust, air quality, public health, traffic, and noise impacts from facility operations and proposed expansions.

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- For over 100 industrial facilities, commercial/campus, and redevelopment projects, developed the record in preparation for CEQA and NEPA lawsuits. Prepared technical comments on hazardous materials, solid wastes, public utilities, noise, worker safety, air quality, public health, water resources, water quality, traffic, and risk of upset sections of EIRs, EISs, FONSI, initial studies, and negative declarations. Assisted counsel in drafting petitions and briefs and prepared declarations.
- For several large commercial development projects and airports, assisted applicant and counsel prepare defensible CEQA documents, respond to comments, and identify and evaluate "all feasible" mitigation to avoid CEQA challenges. This work included developing mitigation programs to reduce traffic-related air quality impacts based on energy conservation programs, solar, low-emission vehicles, alternative fuels, exhaust treatments, and transportation management associations.

*SITE INVESTIGATION/REMEDATION/CLOSURE*

- Technical manager and principal engineer for characterization, remediation, and closure of waste management units at former Colorado oil shale plant. Constituents of concern included BTEX, As, 1,1,1-TCA, and TPH. Completed groundwater monitoring programs, site assessments, work plans, and closure plans for seven process water holding ponds, a refinery sewer system, and processed shale disposal area. Managed design and construction of groundwater treatment system and removal actions and obtained clean closure.
- Principal engineer for characterization, remediation, and closure of process water ponds at a former lanthanide processing plant in Colorado. Designed and implemented groundwater monitoring program and site assessments and prepared closure plan.
- Advised the city of Sacramento on redevelopment of two former railyards. Reviewed work plans, site investigations, risk assessment, RAPS, RI/FSs, and CEQA documents. Participated in the development of mitigation strategies to protect construction and utility workers and the public during remediation, redevelopment, and use of the site, including buffer zones, subslab venting, rail berm containment structure, and an environmental oversight plan.
- Provided technical support for the investigation of a former sanitary landfill that was redeveloped as single family homes. Reviewed and/or prepared portions of numerous documents, including health risk assessments, preliminary endangerment assessments, site investigation reports, work plans, and RI/FSs. Historical research to identify historic waste disposal practices to prepare a preliminary endangerment assessment. Acquired, reviewed, and analyzed the files of 18 federal, state, and local agencies, three sets of construction field notes, analyzed 21 aerial photographs and interviewed 14 individuals associated with operation of former landfill. Assisted counsel in defending lawsuit brought by residents

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alleging health impacts and diminution of property value due to residual contamination. Prepared summary reports.

- Technical oversight of characterization and remediation of a nitrate plume at an explosives manufacturing facility in Lincoln, CA. Provided interface between owners and consultants. Reviewed site assessments, work plans, closure plans, and RI/FSs.
- Consultant to owner of large western molybdenum mine proposed for NPL listing. Participated in negotiations to scope out consent order and develop scope of work. Participated in studies to determine premining groundwater background to evaluate applicability of water quality standards. Served on technical committees to develop alternatives to mitigate impacts and close the facility, including resloping and grading, various thickness and types of covers, and reclamation. This work included developing and evaluating methods to control surface runoff and erosion, mitigate impacts of acid rock drainage on surface and ground waters, and stabilize nine waste rock piles containing 328 million tons of pyrite-rich, mixed volcanic waste rock (andesites, rhyolite, tuff). Evaluated stability of waste rock piles. Represented client in hearings and meetings with state and federal oversight agencies.

*REGULATORY (PARTIAL LIST)*

- In July 2013, prepared technical report on fugitive particulate matter emissions from coal train staging at the proposed Coyote Island Terminal, Oregon, for draft Permit No. 25-0015-ST-01.
- In July 2013, prepared technical comments on air quality impacts of the Finger Lakes LPG Storage Facility as reported in various Environmental Impact Statements.
- In June 2013, prepared technical report on a Mitigated Negative Declaration for a new rail terminal at the Valero Benicia Refinery to import increased amounts of "North American" crudes in. Comments addressed air quality impacts of refining increased amounts of tar sands crudes.
- In May 2013, prepared comments on draft PSD permit for major expansion of midwest refinery to process 100% tar sands crudes, including a complex netting analysis involving debottlenecking and piecemealing and BACT analyses.
- In April 2013, prepared technical report on the Draft Supplemental Environmental Impact Statement (DSEIS) for the Keystone XL Pipeline on air quality impacts from refining increased amount of tar sands crudes at Refineries in PADD 3.
- In October 2012, prepared technical report on the Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow on fugitive particulate matter emissions.



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- Prepared cost analyses and comments on New York's proposed BART determinations for NO<sub>x</sub>, SO<sub>2</sub>, and PM and EPA's proposed approval of BART determinations for Danskammer Generating Station under New York Regional Haze State Implementation Plan and Federal Implementation Plan, 77 FR 51915 (August 28, 2012).
- Prepared cost analyses and comments on NO<sub>x</sub> BART determinations for Regional Haze State Implementation Plan for State of Nevada, 77 FR 23191 (April 18, 2012) and 77 FR 25660 (May 1, 2012).
- Prepared analyses of and comments on New Source Performance Standards for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 FR 22392 (April 13, 2012).
- Prepared comments on CASPR-BART emission equivalency and NO<sub>x</sub> and PM BART determinations in EPA proposed approval of State Implementation Plan for Pennsylvania Regional Haze Implementation Plan, 77 FR 3984 (January 26, 2012).
- Prepared comments and statistical analyses on hazardous air pollutants (HAPs) emission controls, monitoring, compliance methods, and the use of surrogates for acid gases, organic HAPs, and metallic HAPs for proposed National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 76 FR 24976 (May 3, 2011).
- Prepared cost analyses and comments on NO<sub>x</sub> BART determinations and emission reductions for proposed Federal Implementation Plan for Four Corners Power Plant, 75 FR 64221 (October 19, 2010).
- Prepared cost analyses and comments on NO<sub>x</sub> BART determinations for Colstrip Units 1- 4 for Montana State Implementation Plan and Regional Haze Federal Implementation Plan, 77 FR 23988 (April 20, 2010).
- For EPA Region 8, prepared report: Revised BART Cost Effectiveness Analysis for Tail-End Selective Catalytic Reduction at the Basin Electric Power Cooperative Leland Olds Station Unit 2 Final Report, March 2011, in support of 76 FR 58570 (Sept. 21, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station, November 2010, in support of 76 FR 52388 (Aug. 22, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Flue Gas Desulfurization at Coal-Fired Electric Generating Units in Oklahoma: Sooner Units 1 & 2, Muskogee Units 4 & 5, Northeastern Units 3 & 4, October 2010, in support of 76 FR 16168 (March 26, 2011). My work was upheld in: *State of Oklahoma v. EPA*, App. Case 12-9526 (10th Cir. July 19, 2013).

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- Identified errors in N<sub>2</sub>O emission factors in the Mandatory Greenhouse Gas Reporting Rule, 40 CFR 98, and prepared technical analysis to support Petition for Rulemaking to Correct Emissions Factors in the Mandatory Greenhouse Gas Reporting Rule, filed with EPA on 10/28/10.
- Assist interested parties develop input for and prepare comments on the Information Collection Request for Petroleum Refinery Sector NSPS and NESHAP Residual Risk and Technology Review, 75 FR 60107 (9/29/10).
- Technical reviewer of EPA's "Emission Estimation Protocol for Petroleum Refineries," posted for public comments on CHIEF on 12/23/09, prepared in response to the City of Houston's petition under the Data Quality Act (March 2010).
- Prepared comments on SCR cost effectiveness for EPA's Advanced Notice of Proposed Rulemaking, Assessment of Anticipated Visibility Improvements at Surrounding Class I Areas and Cost Effectiveness of Best Available Retrofit Technology for Four Corners Power Plant and Navajo Generating Station, 74 FR 44313 (August 28, 2009).
- Prepared comments on Proposed Rule for Standards of Performance for Coal Preparation and Processing Plants, 74 FR 25304 (May 27, 2009).
- Prepared comments on draft PSD permit for major expansion of midwest refinery to process up to 100% tar sands crudes. Participated in development of monitoring and controls to mitigate impacts and in negotiating a Consent Decree to settle claims in 2008.
- Reviewed and assisted interested parties prepare comments on proposed Kentucky air toxic regulations at 401 KAR 64:005, 64:010, 64:020, and 64:030 (June 2007).
- Prepared comments on proposed Standards of Performance for Electric Utility Steam Generating Units and Small Industrial-Commercial-Industrial Steam Generating Units, 70 FR 9706 (February 28, 2005).
- Prepared comments on Louisville Air Pollution Control District proposed Strategic Toxic Air Reduction regulations.
- Prepared comments and analysis of BAAQMD Regulation, Rule 11, Flare Monitoring at Petroleum Refineries.
- Prepared comments on Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electricity Utility Steam Generating Units (MACT standards for coal-fired power plants).
- Prepared Authority to Construct Permit for remediation of a large petroleum-contaminated site on the California Central Coast. Negotiated conditions with agencies and secured permits.

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- Prepared Authority to Construct Permit for remediation of a former oil field on the California Central Coast. Participated in negotiations with agencies and secured permits.
- Prepared and/or reviewed hundreds of environmental permits, including NPDES, UIC, Stormwater, Authority to Construct, Prevention of Significant Deterioration, Nonattainment New Source Review, Title V, and RCRA, among others.
- Participated in the development of the CARB document, *Guidance for Power Plant Siting and Best Available Control Technology*, including attending public workshops and filing technical comments.
- Performed data analyses in support of adoption of emergency power restoration standards by the California Public Utilities Commission for “major” power outages, where major is an outage that simultaneously affects 10% of the customer base.
- Drafted portions of the Good Neighbor Ordinance to grant Contra Costa County greater authority over safety of local industry, particularly chemical plants and refineries.
- Participated in drafting BAAQMD Regulation 8, Rule 28, Pressure Relief Devices, including participation in public workshops, review of staff reports, draft rules and other technical materials, preparation of technical comments on staff proposals, research on availability and costs of methods to control PRV releases, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and cost of low-leak technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pumps and Compressors, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak and seal-less technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 5, Storage of Organic Liquids, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of controlling tank emissions, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors at Petroleum Refinery Complexes, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.

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- Participated in amending BAAQMD Regulation 8, Rule 22, Valves and Flanges at Chemical Plants, etc, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pump and Compressor Seals, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability of low-leak technology, and presentation of testimony before the Board.
- Participated in the development of the BAAQMD Regulation 2, Rule 5, Toxics, including participation in public workshops, review of staff proposals, and preparation of technical comments.
- Participated in the development of SCAQMD Rule 1402, Control of Toxic Air Contaminants from Existing Sources, and proposed amendments to Rule 1401, New Source Review of Toxic Air Contaminants, in 1993, including review of staff proposals and preparation of technical comments on same.
- Participated in the development of the Sunnyvale Ordinance to Regulate the Storage, Use and Handling of Toxic Gas, which was designed to provide engineering controls for gases that are not otherwise regulated by the Uniform Fire Code.
- Participated in the drafting of the Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries, including participation in workshops, review of draft plans, preparation of technical comments on draft plans, and presentation of testimony before the SWRCB.
- Participated in developing Se permit effluent limitations for the five Bay Area refineries, including review of staff proposals, statistical analyses of Se effluent data, review of literature on aquatic toxicity of Se, preparation of technical comments on several staff proposals, and presentation of testimony before the Bay Area RWQCB.
- Represented the California Department of Water Resources in the 1991 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on a striped bass model developed by the California Department of Fish and Game.
- Represented the State Water Contractors in the 1987 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on natural flows, historical salinity trends in San Francisco Bay, Delta outflow, and hydrodynamics of the South Bay.
- Represented interveners in the licensing of over 20 natural-gas-fired power plants and one coal gasification plant at the California Energy Commission and elsewhere. Reviewed and

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prepared technical comments on applications for certification, preliminary staff assessments, final staff assessments, preliminary determinations of compliance, final determinations of compliance, and prevention of significant deterioration permits in the areas of air quality, water supply, water quality, biology, public health, worker safety, transportation, site contamination, cooling systems, and hazardous materials. Presented written and oral testimony in evidentiary hearings with cross examination and rebuttal. Participated in technical workshops.

- Represented several parties in the proposed merger of San Diego Gas & Electric and Southern California Edison. Prepared independent technical analyses on health risks, air quality, and water quality. Presented written and oral testimony before the Public Utilities Commission administrative law judge with cross examination and rebuttal.
- Represented a PRP in negotiations with local health and other agencies to establish impact of subsurface contamination on overlying residential properties. Reviewed health studies prepared by agency consultants and worked with agencies and their consultants to evaluate health risks.

*WATER QUALITY/RESOURCES*

- Directed and participated in research on environmental impacts of energy development in the Colorado River Basin, including contamination of surface and subsurface waters and modeling of flow and chemical transport through fractured aquifers.
- Played a major role in Northern California water resource planning studies since the early 1970s. Prepared portions of the Basin Plans for the Sacramento, San Joaquin, and Delta basins including sections on water supply, water quality, beneficial uses, waste load allocation, and agricultural drainage. Developed water quality models for the Sacramento and San Joaquin Rivers.
- Conducted hundreds of studies over the past 40 years on Delta water supplies and the impacts of exports from the Delta on water quality and biological resources of the Central Valley, Sacramento-San Joaquin Delta, and San Francisco Bay. Typical examples include:
  1. Evaluate historical trends in salinity, temperature, and flow in San Francisco Bay and upstream rivers to determine impacts of water exports on the estuary;
  2. Evaluate the role of exports and natural factors on the food web by exploring the relationship between salinity and primary productivity in San Francisco Bay, upstream rivers, and ocean;
  3. Evaluate the effects of exports, other in-Delta, and upstream factors on the abundance of salmon and striped bass;
  4. Review and critique agency fishery models that link water exports with the abundance of striped bass and salmon;

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5. Develop a model based on GLMs to estimate the relative impact of exports, water facility operating variables, tidal phase, salinity, temperature, and other variables on the survival of salmon smolts as they migrate through the Delta;
  6. Reconstruct the natural hydrology of the Central Valley using water balances, vegetation mapping, reservoir operation models to simulate flood basins, precipitation records, tree ring research, and historical research;
  7. Evaluate the relationship between biological indicators of estuary health and down-estuary position of a salinity surrogate (X2);
  8. Use real-time fisheries monitoring data to quantify impact of exports on fish migration;
  9. Refine/develop statistical theory of autocorrelation and use to assess strength of relationships between biological and flow variables;
  10. Collect, compile, and analyze water quality and toxicity data for surface waters in the Central Valley to assess the role of water quality in fishery declines;
  11. Assess mitigation measures, including habitat restoration and changes in water project operation, to minimize fishery impacts;
  12. Evaluate the impact of unscreened agricultural water diversions on abundance of larval fish;
  13. Prepare and present testimony on the impacts of water resources development on Bay hydrodynamics, salinity, and temperature in water rights hearings;
  14. Evaluate the impact of boat wakes on shallow water habitat, including interpretation of historical aerial photographs;
  15. Evaluate the hydrodynamic and water quality impacts of converting Delta islands into reservoirs;
  16. Use a hydrodynamic model to simulate the distribution of larval fish in a tidally influenced estuary;
  17. Identify and evaluate non-export factors that may have contributed to fishery declines, including predation, shifts in oceanic conditions, aquatic toxicity from pesticides and mining wastes, salinity intrusion from channel dredging, loss of riparian and marsh habitat, sedimentation from upstream land alternations, and changes in dissolved oxygen, flow, and temperature below dams.
- Developed, directed, and participated in a broad-based research program on environmental issues and control technology for energy industries including petroleum, oil shale, coal

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mining, and coal slurry transport. Research included evaluation of air and water pollution, development of novel, low-cost technology to treat and dispose of wastes, and development and application of geohydrologic models to evaluate subsurface contamination from in-situ retorting. The program consisted of government and industry contracts and employed 45 technical and administrative personnel.

- Coordinated an industry task force established to investigate the occurrence, causes, and solutions for corrosion/erosion and mechanical/engineering failures in the waterside systems (e.g., condensers, steam generation equipment) of power plants. Corrosion/erosion failures caused by water and steam contamination that were investigated included waterside corrosion caused by poor microbiological treatment of cooling water, steam-side corrosion caused by ammonia-oxygen attack of copper alloys, stress-corrosion cracking of copper alloys in the air cooling sections of condensers, tube sheet leaks, oxygen in-leakage through condensers, volatilization of silica in boilers and carry over and deposition on turbine blades, and iron corrosion on boiler tube walls. Mechanical/engineering failures investigated included: steam impingement attack on the steam side of condenser tubes, tube-to-tube-sheet joint leakage, flow-induced vibration, structural design problems, and mechanical failures due to stresses induced by shutdown, startup and cycling duty, among others. Worked with electric utility plant owners/operators, condenser and boiler vendors, and architect/engineers to collect data to document the occurrence of and causes for these problems, prepared reports summarizing the investigations, and presented the results and participated on a committee of industry experts tasked with identifying solutions to prevent condenser failures.
- Evaluated the cost effectiveness and technical feasibility of using dry cooling and parallel dry-wet cooling to reduce water demands of several large natural-gas fired power plants in California and Arizona.
- Designed and prepared cost estimates for several dry cooling systems (e.g., fin fan heat exchangers) used in chemical plants and refineries.
- Designed, evaluated, and costed several zero liquid discharge systems for power plants.
- Evaluated the impact of agricultural and mining practices on surface water quality of Central Valley streams. Represented municipal water agencies on several federal and state advisory committees tasked with gathering and assessing relevant technical information, developing work plans, and providing oversight of technical work to investigate toxicity issues in the watershed.

*AIR QUALITY/PUBLIC HEALTH*

- Prepared or reviewed the air quality and public health sections of hundreds of EIRs and EISs on a wide range of industrial, commercial and residential projects.
- Prepared or reviewed hundreds of NSR and PSD permits for a wide range of industrial facilities.

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- Designed, implemented, and directed a 2-year-long community air quality monitoring program to assure that residents downwind of a petroleum-contaminated site were not impacted during remediation of petroleum-contaminated soils. The program included real-time monitoring of particulates, diesel exhaust, and BTEX and time integrated monitoring for over 100 chemicals.
- Designed, implemented, and directed a 5-year long source, industrial hygiene, and ambient monitoring program to characterize air emissions, employee exposure, and downwind environmental impacts of a first-generation shale oil plant. The program included stack monitoring of heaters, boilers, incinerators, sulfur recovery units, rock crushers, API separator vents, and wastewater pond fugitives for arsenic, cadmium, chlorine, chromium, mercury, 15 organic indicators (e.g., quinoline, pyrrole, benzo(a)pyrene, thiophene, benzene), sulfur gases, hydrogen cyanide, and ammonia. In many cases, new methods had to be developed or existing methods modified to accommodate the complex matrices of shale plant gases.
- Conducted investigations on the impact of diesel exhaust from truck traffic from a wide range of facilities including mines, large retail centers, light industrial uses, and sports facilities. Conducted traffic surveys, continuously monitored diesel exhaust using an aethalometer, and prepared health risk assessments using resulting data.
- Conducted indoor air quality investigations to assess exposure to natural gas leaks, pesticides, molds and fungi, soil gas from subsurface contamination, and outgassing of carpets, drapes, furniture and construction materials. Prepared health risk assessments using collected data.
- Prepared health risk assessments, emission inventories, air quality analyses, and assisted in the permitting of over 70 1 to 2 MW emergency diesel generators.
- Prepare over 100 health risk assessments, endangerment assessments, and other health-based studies for a wide range of industrial facilities.
- Developed methods to monitor trace elements in gas streams, including a continuous real-time monitor based on the Zeeman atomic absorption spectrometer, to continuously measure mercury and other elements.
- Performed nuisance investigations (odor, noise, dust, smoke, indoor air quality, soil contamination) for businesses, industrial facilities, and residences located proximate to and downwind of pollution sources.



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**PUBLICATIONS AND PRESENTATIONS (Partial List - Representative Publications)**

J.P. Fox, T.P. Rose, and T.L. Sawyer, *Isotope Hydrology of a Spring-fed Waterfall in Fractured Volcanic Rock*, 2007.

C.E. Lambert, E.D. Winegar, and Phyllis Fox, *Ambient and Human Sources of Hydrogen Sulfide: An Explosive Topic*, Air & Waste Management Association, June 2000, Salt Lake City, UT.

San Luis Obispo County Air Pollution Control District and San Luis Obispo County Public Health Department, *Community Monitoring Program*, February 8, 1999.

The Bay Institute, *From the Sierra to the Sea. The Ecological History of the San Francisco Bay-Delta Watershed*, 1998.

J. Phyllis Fox, *Well Interference Effects of HDPP's Proposed Wellfield in the Victor Valley Water District*, Prepared for the California Unions for Reliable Energy (CURE), October 12, 1998.

J. Phyllis Fox, *Air Quality Impacts of Using CPVC Pipe in Indoor Residential Potable Water Systems*, Report Prepared for California Pipe Trades Council, California Firefighters Association, and other trade associations, August 29, 1998.

J. Phyllis Fox and others, *Authority to Construct Avila Beach Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, June 1998.

J. Phyllis Fox and others, *Authority to Construct Former Guadalupe Oil Field Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, May 1998.

J. Phyllis Fox and Robert Sears, *Health Risk Assessment for the Metropolitan Oakland International Airport Proposed Airport Development Program*, Prepared for Plumbers & Steamfitters U.A. Local 342, December 15, 1997.

Levine-Fricke-Recon (Phyllis Fox and others), *Preliminary Endangerment Assessment Work Plan for the Study Area Operable Unit, Former Solano County Sanitary Landfill, Benicia, California*, Prepared for Granite Management Co. for submittal to DTSC, September 26, 1997.

Phyllis Fox and Jeff Miller, "Fathead Minnow Mortality in the Sacramento River," *IEP Newsletter*, v. 9, n. 3, 1996.

Jud Monroe, Phyllis Fox, Karen Levy, Robert Nuzum, Randy Bailey, Rod Fujita, and Charles Hanson, *Habitat Restoration in Aquatic Ecosystems. A Review of the Scientific Literature Related to the Principles of Habitat Restoration*, Part Two, Metropolitan Water District of Southern California (MWD) Report, 1996.

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Phyllis Fox and Elaine Archibald, *Aquatic Toxicity and Pesticides in Surface Waters of the Central Valley*, California Urban Water Agencies (CUWA) Report, September 1997.

Phyllis Fox and Alison Britton, *Evaluation of the Relationship Between Biological Indicators and the Position of X2*, CUWA Report, 1994.

Phyllis Fox and Alison Britton, *Predictive Ability of the Striped Bass Model*, WRINT DWR-206, 1992.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the North Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the East Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

Phyllis Fox, *Trip 2 Report, Environmental Monitoring Plan, Parachute Creek Shale Oil Program*, Unocal Report, 1991.

J. P. Fox and others, "Long-Term Annual and Seasonal Trends in Surface Salinity of San Francisco Bay," *Journal of Hydrology*, v. 122, p. 93-117, 1991.

J. P. Fox and others, "Reply to Discussion by D.R. Helsel and E.D. Andrews on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.

J. P. Fox and others, "Reply to Discussion by Philip B. Williams on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.

J. P. Fox and others, "Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 26, no. 1, 1990.

J. P. Fox, "Water Development Increases Freshwater Flow to San Francisco Bay," *SCWC Update*, v. 4, no. 2, 1988.

J. P. Fox, *Freshwater Inflow to San Francisco Bay Under Natural Conditions*, State Water Contracts, Exhibit 262, 58 pp., 1987.

J. P. Fox, "The Distribution of Mercury During Simulated In-Situ Oil Shale Retorting," *Environmental Science and Technology*, v. 19, no. 4, pp. 316-322, 1985.

J. P. Fox, "El Mercurio en el Medio Ambiente: Aspectos Referentes al Peru," (Mercury in the Environment: Factors Relevant to Peru) Proceedings of Simposio Los Pesticidas y el Medio Ambiente," ONERN-CONCYTEC, Lima, Peru, April 25-27, 1984. (Also presented at Instituto Tecnológico Pesquero and Instituto del Mar del Peru.)

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BEFORE THE  
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION  
U.S. DEPARTMENT OF TRANSPORTATION

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Advance Notice of Proposed Rulemaking

Hazardous Materials:  
Rail Petitions and Recommendations To Improve the  
Safety of Railroad Tank Car Transportation

PHMSA-2012-0082 (HM-251)  
Published: 78 Fed. Reg. 54,849 (Sept. 6, 2013)

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Comments of the Natural Resources Defense Council,  
Sierra Club and Oil Change International on behalf of

Earthjustice  
ForestEthics  
Public Citizen  
Friends of the Earth  
Spokane Riverkeeper  
Columbia Riverkeeper  
Puget Soundkeeper Alliance  
Friends of Grays Harbor  
Natural Resources Council of Maine  
Benicia Good Neighbor Steering Committee  
Community In-power and Development Association  
Vermont Chapter of the Sierra Club  
Audubon Society of New Hampshire

Submitted December 5, 2013

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I. INTRODUCTION

These comments are submitted, in response to the above-captioned Advance Notice of Proposed Rulemaking by the Sierra Club, Oil Change International and the Natural Resources Defense Council on behalf of their millions of members and active supporters, and on behalf of Earthjustice, ForestEthics, Public Citizen, Friends of the Earth, Spokane Riverkeeper, Columbia Riverkeeper, Puget Soundkeeper Alliance, Friends of Grays Harbor, Natural Resources Council of Maine, Benicia Good Neighbor Steering Committee, Community In-power and Development

**Analysis of the Potential Costs of Accidents/Spills  
Related to Crude by Rail**

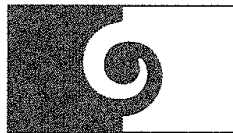
Prepared

by

Ian Goodman  
Brigid Rowan

on behalf of  
Oil Change International

Before the  
Pipeline and Hazardous Materials Safety Administration  
in the Context of  
Hazardous Materials: Rail Petitions and Recommendations to Improve  
the Safety of Railroad Tank Car Transportation  
Docket No. PHMSA-2012-0082 (HM-251)



the goodman group, ltd.

<http://www.thegoodman.com/>

November 8, 2013

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## 1. Introduction

This analysis was prepared by The Goodman Group, Ltd. (TGG), a consulting firm specializing in energy and regulatory economics,<sup>1</sup> on behalf of Oil Change International. Any findings, conclusions or opinions are those of TGG and the authors and do not necessarily reflect those of Oil Change International.

The costs of crude by rail (CBR) accidents/spills can be very large. This analysis demonstrates that a major crude by rail (CBR) unit train accident/spill could cost \$1 billion or more for a single event.

The following examples provide key support for our findings:

1. The explosion, fire and spill of Bakken crude from a train derailment in Lac-Mégantic, QC (2013): The Lac-Mégantic rail accident/spill will likely have costs in the order of \$500 million to \$1 billion. Costs/damages for a similar incident could have been substantially higher had it occurred in a more populated area. Lac-Mégantic is also relevant in that it shows how an accident involving highly flammable light crude (such as the Bakken crude) can have devastating consequences even in a small town in terms of loss of human life and widespread explosion and fire damage to surrounding property.
2. The spill of tar sands dilbit<sup>2</sup> from Enbridge's Line 6B in Marshall, MI (2010): This rupture had costs of about \$1 billion for Enbridge. The spill volumes at Marshall were within the range of the amount of spill possible (and, in fact, substantially less than the maximum spill) if a crude by rail unit train released much of its cargo. Costs/damages for similar incident could have also been substantially higher had it occurred in a more populated area. Marshall is also relevant in

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<sup>1</sup> [www.thegoodman.com](http://www.thegoodman.com) This analysis was co-authored by Ian Goodman and Brigid Rowan.

<sup>2</sup> Diluted bitumen. Raw bitumen (a very heavy asphalt-like crude produced from the Alberta tar sands) is diluted for the purposes of rail and pipeline transport. Bitumen is transported in various forms, including a) SCO (raw bitumen upgraded to light synthetic crude oil), b) raw bitumen mixed with a petroleum-based diluent (such as naphtha or condensate) to make it less viscous, or c) raw bitumen (no diluent). SCO and dilbit (diluted bitumen to pipeline specifications, 25–30% diluent) can be transported in standard (non-coiled and non-insulated) tank cars and pipelines. Railbit (bitumen with 15–20% diluent) and raw bitumen can be transported in coiled and insulated tank cars (which are also sometimes used to transport dilbit). Keystone XL Draft Supplemental EIS, p. 1.4-49. Accessed October 30, 2013. <http://keystonepipeline-xl.state.gov/documents/organization/205654.pdf>

showing the high potential cost of dilbit spills into water (and rail lines are often highly proximate to water).<sup>3</sup>

The AAR petition for rulemaking states:<sup>4</sup>

AAR surveyed its members for information on derailments involving packing group I and II materials from '2004-2008. The derailments resulted in one fatality and eleven injuries, the release of approximately 925,000 gallons of these hazardous materials, and cleanup costs totaling approximately \$63 million.

The Village of Barrington petition for rulemaking responds:<sup>5</sup>

Furthermore, while AAR claims that derailment costs totaled approximately \$64 million over the past five years, including equipment, lading, response and environmental remediation costs," [footnote 17 in original: March 9, 2011 Petition for Rulemaking letter to Dr. Magdy El-Sibae from Michael Rush of the Association of American Railroads at page 2, footnote 7.] Petitioners question the accuracy of industry's cost-benefit claims. In reviewing the derailment cost chart at Attachment B of AAR's petition, PHMSA should note that there is no apparent accounting for costs associated with civil litigation in the wake of derailments. However, in the Cherry Valley/Rockford derailment, CN paid over \$36 million in October of 2011 to settle a lawsuit brought by the family of only one victim. AAR's chart, however, reflects costs of only \$8 million for that incident. [footnote 18 in original: At the very least, Petitioners believe it would make sense for the PHMSA to ascertain the costs stemming from civil litigation for the entire list of derailments incidents that the AAR provided to your office on March 9, 2011. Even if it doesn't yet completely balance the cost-benefit equation in favor of public safety, Petitioners would guess that the plaintiffs' bar would look forward to securing ever higher awards for future victims of derailments based on the public record demonstrating that industry chose to do nothing meaningful in terms of investing in a retrofit program of tank cars that are known to be dangerous and that are increasingly serving as a rolling pipeline for the ethanol and crude oil industries.]

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<sup>3</sup> The discussion of the costs of the Lac-Mégantic disaster and the Marshall, MI pipeline rupture is partly based on excerpts from a TGG report filed as written expert testimony at Canada's National Energy Board:

"The Relative Economic Costs and Benefits of the Line 9B Reversal and Line 9 Capacity Expansion," August 8, 2013, pp. 38-41. Accessed October 23, 2013.

<https://www.neb-one.gc.ca/ll-eng/livelink.exe?func=ll&objId=985663&objAction=Open>

<sup>4</sup> See <http://www.regulations.gov/#!documentDetail;D=PHMSA-2012-0082-0005> p. 2. Accessed October 29, 2013.

<sup>5</sup> See <http://www.regulations.gov/#!documentDetail;D=PHMSA-2012-0082-0006> p. 8. Accessed October 29, 2013.

In fact, even a single accident relating to a crude by rail unit train can have dramatically higher costs than the costs taken into account in the AAR's cost-benefit claims. As further explained in this briefing, this analysis will demonstrate that a major crude by rail unit train accident/spill, involving either dilbit or a very light crude such as Bakken, could cost \$1 billion or more for a single event.

We have limited our cost analysis to environmental and socio-economic impacts that directly affect economic activity and can be somewhat readily (albeit approximately) quantified using market economics. These costs escalate very quickly in more densely populated urban areas. Moreover, as we have witnessed firsthand in Quebec, in summer 2013, unconventional crudes (such as Bakken and dilbit) have hazardous characteristics (notably flammability), such that their unsafe transport can result in the loss of human life. We have not attempted to assign a cost to potential effects on human health and safety or to broader effects on ecosystems (notably residual effects).<sup>6</sup>

As noted above, two relevant examples to support our findings that a single unit-train accident/spill could result in very large costs are the following:

1. the explosion, fire and spill of Bakken crude from a train derailment in Lac-Mégantic, QC (2013).
2. the spill of tar sands dilbit from Enbridge's Line 6B in Marshall, MI (2010).

For each example, TGG will provide:

1. description of the disaster;
2. the cost and sources of the cost data;
3. the relevance of the example to estimating the potential costs of CBR accidents/spills.

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<sup>6</sup> Residual effects are those effects remaining after implementation of mitigation measures, such as emergency response and decontamination efforts.



## 2. Estimated Costs of the Crude by Rail Disaster at Lac-Mégantic

### 2.1. Description of Disaster

According to the Transportation Safety Board of Canada (TSB), “[o]n July 6 2013, a unit train carrying petroleum crude oil operated by Montreal, Maine & Atlantic Railway (MMA) derailed numerous cars in Lac-Mégantic, Quebec, and a fire and explosions ensued.”<sup>7</sup>

The train with five locomotives was pulling 72 DOT-111 tanker cars full of light crude oil from the Bakken shale play in North Dakota to the Irving Oil refinery in Saint John, New Brunswick. The train was operated by Montreal Maine & Atlantic Railway. The train broke away and derailed, unleashing an explosive ball of burning Bakken crude, which incinerated the downtown core of this small Quebec town.<sup>8</sup>

Quebec’s Department of Sustainable Development, Environment and Parks reports that this rail accident released 6.0 million litres<sup>9</sup> of crude oil into the environment (affecting soil, water and air).<sup>10</sup> Among its other findings (as of October 28, 2013):

A total of 7.7 million litres<sup>11</sup> of crude oil were on the runaway MMA train

from a total of 72 tankers, 63 spilled and 9 avoided spilling during the accident

43 million litres of oily water have been recovered from Lac-Mégantic’s city centre (sewer system, lake, and grounds)

52,000 litres of oily water removed from the nearby Chaudière River

<sup>7</sup> See TSB website, Railway investigation R13D0054. Accessed October 29, 2013.

<http://www.bst-tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/R13D0054.asp>

<sup>8</sup> “Lac-Mégantic: What we know, what we don’t,” Montreal Gazette, July 22, 2013. Accessed August 2, 2013.

<http://www.montrealgazette.com/news/M%C3%A9gantic+What+know+what+know/8626661/story.html>

<sup>9</sup> Equivalent to 1.6 million gallons.

<sup>10</sup> See Quebec Department of Sustainable Development, Environment and Parks website, Train Accident in Lac-Mégantic (content in French: *Ministère du Développement durable, de l’Environnement, de la Faune et des Parcs (MDDEFP), Accident ferroviaire à Lac-Mégantic*), Accessed November 8, 2013 <http://www.mddep.gouv.qc.ca/lac-megantic/index.htm>; and specifically

Summary Table on quantities of oil estimated as of October 28, 2013 (*Tableau-Synthèse: Estimation au 28 octobre 2013 des quantités de pétrole brut léger impliquées dans l’accident à Lac-Mégantic*)

<http://www.mddefp.gouv.qc.ca/lac-megantic/20131028-tableau-synthese-petrole.pdf>

<sup>11</sup> Equivalent to 2.0 million gallons.

the oily water recovered has concentrations of oil ranging from 2% to 50%, and it is not possible to determine the exact amount of oil actually recovered.

“The catastrophe killed 47 residents and levelled more than 40 buildings.”<sup>12</sup>

According to a September 11, 2013 TSB news release, “TSB test results indicate that the level of hazard posed by the petroleum crude oil transported in the tank cars on the accident train was not accurately documented.” The crude was “offered for transport, packaged, and transported as a Class 3, PG III product, which represented it as a lower hazard, less volatile flammable liquid.”<sup>13</sup>

## 2.2. Costs and Sources of Cost Data

The TSB investigation into the accident is still ongoing.<sup>14</sup> It is still too early to know the final costs for this disaster (including decontamination, town reconstruction, economic recovery, and compensation for victims’ families); but **TGG estimates these costs to be in the hundreds of millions (in the order of \$500 million to \$1 billion).**

Preliminary clean-up bills for damage to the town doubled in the weeks following the accident from \$4 million to almost \$8 million. The MM&A Railway stated at the end of July that it was unable to pay clean-up costs because it was not getting funds from its insurers. At the time, MM&A had outstanding bills for \$7.8 million. MM&A also publicly raised the concern that it could go bankrupt.<sup>15</sup> In response, the Quebec government ordered World Fuel Services Corp. to assist with the clean-up. World Fuel “purchased the oil from producers in North Dakota’s Bakken region, then leased and loaded rail

<sup>12</sup> McNish, Jackie and Justin Giovanetti, “Oil Company Disputes Lac-Mégantic Cleanup Order,” Globe and Mail. Accessed August 4.

<http://www.theglobeandmail.com/news/national/oil-company-disputes-lac-megantic-cleanup-order/article13518237/>

<sup>13</sup> “TSB calls on Canadian and U.S. regulators to ensure properties of dangerous goods are accurately determined and documented for safe transportation,” TSB News release, September 11, 2013. Accessed October 29, 2013.

<http://www.bst-tsb.gc.ca/eng/medias-media/communiqués/rail/2013/r13d0054-20130911.asp>

The news release further explains that this misclassification may partly explain why the crude ignited so quickly following the rupture.

<sup>14</sup> See the TSB active investigation page for Lac-Mégantic:

<http://www.bst-tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/R13D0054.asp>

<sup>15</sup> Blatchford, Andy, “Railway says it can’t pay for Lac-Mégantic disaster cleanup”

<http://www.theglobeandmail.com/news/national/mma-lays-off-nearly-one-third-of-quebec-workforce-union/article13496970/#dashboard/follows/>

cars and arranged for their transport to an Irving Oil refinery in New Brunswick.”<sup>16</sup> World Fuel is disputing the cleanup order.

“In the end, says one expert in civil responsibility, taxpayers could be stuck with a bill in the hundreds of millions of dollars.

Quebec law professor Daniel Gardner says he highly doubts MM&A has enough coverage to absorb the massive, combined financial liabilities of damages like environmental cleanup, emergency-crew salaries and lawsuits.

In fact, he believes the Lac-Mégantic derailment could have more financial consequences than any other land disaster in North American history.

“The whole cost of this will be far closer to \$1 billion than to \$500 million.” said the Université Laval academic, adding he would be surprised if the railway had a total of \$500 million in coverage.

“What will probably happen? ...The company will go bankrupt, insurance coverage won’t be enough.”

Gardner expects governments will wind up covering the difference.<sup>17</sup>

On August 7, 2013, MM&A filed for bankruptcy in both Canada (Quebec) and the US (Maine).<sup>18</sup>

“It has become apparent that the obligations of both companies now exceed the value of their assets, including prospective insurance recoveries,” MM&A chairman Edward Burkhardt said in a statement Wednesday.

Filing for bankruptcy is “the best way to ensure fairness of treatment to all in these tragic circumstances,” he said.

The decision means the company will start a judge-supervised process to determine how much money will be paid to its various creditors. The process, which allows the company to tackle its unmanageable debt load and remain viable, can be lengthy and typically places secured creditors ahead of those seeking compensation through a lawsuit.

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<sup>16</sup> See footnote 12.

<sup>17</sup> See footnote 15.

<sup>18</sup> Mackrael, Kim and Tu Thanh Ha, “MM&A files for creditor protection after Lac-Mégantic rail disaster” Globe and Mail. Accessed August 7.  
<http://www.theglobeandmail.com/news/national/rail-company-involved-in-megantic-disaster-files-for-bankruptcy/article13644535/#/dashboard/follows/>

MM&A's insurance provider, XL Group, has so far declined to cover the cleanup bills, leaving the province to step in and pay more than \$8-million to ensure the work continues.

The court documents indicate that XL has no plans to contribute to continuing environmental recovery costs because it has decided to prioritize claims from victims affected by the disaster. MM&A's insurance policy with XL covers the company for up to \$25-million, according to the court documents.

Because of the number of claims and the amounts being claimed, the insurer "cannot provide for payment of covered environmental cleanup costs to the detriment of the third-party claimants, especially where the amounts of the claims exceed the limit of the coverage," the documents state.

Based on the information provided above, the now bankrupt MM&A has liabilities in excess of assets, minimal insurance coverage (\$25 million); and the insurer has so far refused to pay environmental cleanup costs.

Ongoing squabbling has recently intensified between Quebec and the Canadian federal government over who should pay for the clean-up, economic recovery and town reconstruction. Quebec is insisting that the federal government pitch in more than the \$60M they have committed to. In the October 2013 Throne Speech, the federal government promised to help more with decontamination and reconstruction but have yet to commit to an exact amount.

The Quebec government has still not supplied the federal government with a cost estimate for the cleanup and reconstruction. Federal officials refuse to commit to a fixed amount without a final bill.<sup>19</sup>

While MM&A is bankrupt, some **\$25 million** in derailment insurance policy is earmarked by the US bankruptcy trustee for the victim's families. There is a possibility that additional compensation could be obtained for the families from a second insurance policy or from the sale of the company's assets, but these amounts are uncertain.<sup>20</sup>

<sup>19</sup> The Globe and Mail, "Throne Speech to promise help with Lac-Mégantic cleanup, but not a 'blank cheque,' insiders say," October 15, 2013.  
<http://www.theglobeandmail.com/news/politics/throne-speech-to-promise-help-with-lac-megantic-cleanup-but-not-a-blank-cheque-insiders-say/article14883079/#dashboard/follows/>

<sup>20</sup> Montreal Gazette, "Quebec rail victims could begin to see compensation in mid-2014: U.S. trustee," October 22, 2013.  
<http://www.montrealgazette.com/business/Quebec+rail+viclms+could+begin+compensation+mid2014/9066861/story.html>

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Certainly, even individual victims of derailment have recently received compensation greater than \$25 million,<sup>21</sup> therefore higher compensation, if available, would be justifiable.

On the **decontamination costs alone** there are a series of estimates:

- In late July 2013, a Quebec-based Ecotoxicologist, Emilien Pelletier, estimates that the bill just for decontamination would be **\$500 million** and that doesn't include town reconstruction.<sup>22</sup>
- In early August 2013, MM&A was reported to have estimated the decontamination costs at **\$200 million** in court documents.<sup>23</sup>
- In an October 2013 article, the Quebec government recently estimated the **soil decontamination costs alone at \$150 million.**<sup>24</sup>

**Overall costs estimates** vary from several hundred million dollars to \$1 billion:

- As indicated above, Quebec law professor, Daniel Gardner, estimated in August that the costs would far closer to **\$1 billion than \$500 million.**<sup>25</sup>
- In September 2013, the Toronto Star reported that cleanup costs are pegged as high as **\$500 million by some estimates.**<sup>26</sup>
- On October 15, 2013, the Globe and Mail (Canada's National paper), indicated that "[e]xperts and government officials expect that **the bill will easily reach \$200-million, and could even end up in the vicinity of \$1-billion.**"<sup>27</sup>

In light of the above, it would appear that the minimum decontamination costs would be \$200 million and the minimum total costs (decontamination, town reconstruction and

<sup>21</sup> See footnote 5.

<sup>22</sup> See <http://www.ledevoir.com/environnement/actualites-sur-l-environnement/383941/blanchet>

<sup>23</sup> See <http://www.theglobeandmail.com/news/national/quebec-could-still-be-on-hook-for-cleanup-bill/article13680378/#dashboard/follows/> and

[http://www.thestar.com/news/canada/2013/08/09/lac\\_megantic\\_cleanup\\_to\\_stretch\\_into\\_next\\_year.html](http://www.thestar.com/news/canada/2013/08/09/lac_megantic_cleanup_to_stretch_into_next_year.html)

<sup>24</sup> See

[http://www.thestar.com/news/canada/2013/10/03/lacmegantic\\_ottawa\\_to\\_pitch\\_in\\_more\\_money\\_for\\_cleanup\\_of\\_train\\_derailment.html](http://www.thestar.com/news/canada/2013/10/03/lacmegantic_ottawa_to_pitch_in_more_money_for_cleanup_of_train_derailment.html)

<sup>25</sup> See footnote 15.

<sup>26</sup> See

[http://www.thestar.com/news/canada/2013/09/24/lac\\_megantic\\_cleanup\\_quebec\\_asks\\_federal\\_government\\_to\\_share\\_bill.html#](http://www.thestar.com/news/canada/2013/09/24/lac_megantic_cleanup_quebec_asks_federal_government_to_share_bill.html#)

<sup>27</sup> See footnote 19.

economic recovery, and compensation for victims' families) would be approximately \$500 million. The total bill could escalate to \$1 billion and beyond. The updated information is consistent with TGG's August 2013 estimate from the NEB expert report:

**"It is far too early to know the final costs for this disaster but they are estimated to be in the hundreds of millions, and possibly exceed \$1 billion."**<sup>28</sup>

### 2.3. Relevance of Lac-Mégantic to Estimating the Costs of CBR Accidents/Spills

The Lac-Mégantic tragedy is directly relevant to an estimation of the costs of a major CBR accident/spill for the following reasons:

1. It demonstrates the consequences of a CBR accident in a small town by a lake, thus proximate to people, water and economic activity.
2. The Lac-Mégantic tragedy demonstrates the effect of a rupture of 63 tank cars on a unit train with a total of 72 tankers, all carrying Bakken crude.
3. Bakken crude, which caused the explosion, is very light, and has hazardous characteristics (notably flammability).
4. Rail is now transporting over 600,000 barrels per day (and over 60% of the total) from Bakken production.<sup>29</sup>
5. More generally, the rapid expansion of CBR results from the rapid expansion in production and transport of unconventional crudes (Bakken and other light crudes from shale/tight oil plays and dilbit and other heavy crudes from Canadian tar sands).<sup>30</sup>

<sup>28</sup> See footnote 3, p. 39.

<sup>29</sup> See North Dakota Pipeline Authority website. Accessed October 30, 2013.  
<http://northdakotapipelines.com/directors-cut/>.

Monthly Updates for April 2013-October 2013 (February 2013-August 2013 data), reporting transport by rail ranging from 600,000 to 700,000 barrel per day, comprising 61-75% of total Bakken production.

<sup>30</sup> To date, a sizable proportion of overall recent CBR activity relates to Bakken production. The Keystone XL Draft Supplemental EIS (KXL DSEIS) assumes that CBR could be rapidly expanded to transport expanded Canadian tar sands production of dilbit and other heavy crudes, so as to provide a viable alternative to expanded pipeline capacity. The KXL DSEIS analysis of tar sands CBR is flawed and potentially misleading because it assumes that CBR can be quickly and vastly scaled up, with no significant operating, logistical, economic or regulatory constraints. Nonetheless, some Western Canadian production is already being transported by rail into the US (including dilbit, railbit, and raw bitumen, from both tar sands and non-tar sands), and there is a potential for further expansion of CBR transport of unconventional Canadian crudes.

See footnote 29; Titterton, Paul, Tank Car Update: Presentation to SWARS, February 28, 2013. Accessed October 30, 2013.

[http://www.swrailshippers.com/swars\\_pdfs/2013\\_gatx\\_presentation.pdf](http://www.swrailshippers.com/swars_pdfs/2013_gatx_presentation.pdf);  
(footnote continued on next page)

6. In addition to the devastation of the Lac-Mégantic town center, there has been significant release of crude oil (6.0 million liters or 1.6 million gallons) into the environment (affecting soil, water and air).<sup>31</sup>
7. There are very serious concerns about who will bear the financial responsibility for the disaster.

Although the Lac-Mégantic accident/spill was devastating and will likely have costs in the order of \$500 million to \$1 billion, it is nowhere near a worst-case scenario for a CBR accident.

Costs/damages for a similar incident could have been substantially higher had it occurred in a more populated area. Lac-Mégantic demonstrates how an accident involving highly flammable light crude (such as the Bakken crude) can have devastating consequences even in a small town in terms of loss of human life and widespread explosion and fire damage to surrounding property. In an urban area, the effects of such an accident could be catastrophic and costs could easily escalate to the multi-billion dollar range.<sup>32</sup>

(footnote continued from previous page)

Keystone XL Draft Supplemental EIS, pp. 1.4-33 – 1.4-60. Accessed October 30, 2013.

<http://keystonepipeline-xl.state.gov/documents/organization/205654.pdf>;

Goodman, Ian and Brigid Rowan, Report evaluating the adequacy of the Keystone XL (KXL) Draft Supplemental Environmental Impact Statement (DSEIS) Market Analysis, April 22, 2013, pp. 33-50, Adobe pp. 267-284

<http://switchboard.nrdc.org/blogs/aswift/Comments%20of%20Sierra%20Club%2C%20et.%20ai.%2C%20on%20the%20Keystone%20XL%20DSEIS.4.22.13.pdf>

<sup>31</sup> There have been concerns that the spill affected water quality and drinking water in Lac-Mégantic and nearby towns. Authorities continue to monitor water quality.

"Government Examining Lac-Mégantic Health Risks," The Record, July 31, 2013. Accessed August 2, 2013.

<http://www.sherbrookerecord.com/content/gov%E2%80%99t-examining-lac-megantic-health-risks>;  
see also footnote 10.

<sup>32</sup> In the context of the PHMSA rulemaking and elsewhere, some may submit that the Lac-Mégantic accident is an exceptional and possibly worst-case scenario that is unlikely to be repeated. And this particular accident certainly has some attributes that may be atypical or even unique. That said, this accident also occurred in a relatively small town. A similar explosion and fire in a more dense urban area could have had even worse consequences and higher costs. In an urban area, the particular factors in Lac-Mégantic (unattended train rolling down steep grades to crash at high speeds) may be far less likely to occur. On the other hand, in an urban area, there are other risk factors, such as increased danger of collisions with other trains (or other vehicles), as well as proximity to large populations and other infrastructure.

It may also be pointed out that the Lac-Mégantic accident occurred in Canada and that the estimated costs are in Canadian dollars. But in fact, the Lac-Mégantic accident is very relevant for the US. First, US and Canadian dollars now have similar value, so the cost estimates for Lac-Mégantic accident would be similar if presented in US dollars. Second, the accident occurred very close to the US border, on a train that had originated in the US (North Dakota), traveled through numerous US states and cities, and would have again passed through the US (Maine) on its intended routing between Quebec and New Brunswick.

### 3. Estimated Costs of Enbridge's Line 6B Spill in Marshall, MI

#### 3.1. Description of Disaster

According to the NTSB, following its investigation of the Enbridge Line 6B Spill (emphasis added):<sup>33</sup>

On Sunday, July 25, 2010, at about 5:58 p.m., a 30 inch-diameter pipeline (Line 6B) owned and operated by Enbridge Incorporated ruptured and spilled crude oil into an ecologically sensitive area near the Kalamazoo River in Marshall, Mich., for 17 hours until a local utility worker discovered the oil and contacted Enbridge to report the rupture.

The NTSB found that the material failure of the pipeline was the result of multiple small corrosion-fatigue cracks that over time grew in size and linked together, creating a gaping breach in the pipe measuring over 80 inches long.

"This investigation identified a complete breakdown of safety at Enbridge. Their employees performed like Keystone Kops and failed to recognize their pipeline had ruptured and continued to pump crude into the environment," said NTSB Chairman Deborah A.P. Hersman. "Despite multiple alarms and a loss of pressure in the pipeline, for more than 17 hours and through three shifts they failed to follow their own shutdown procedures."

[...]

Over 840,000 gallons of crude oil - enough to fill 120 tanker trucks - spilled into hundreds of acres of Michigan wetlands, fouling a creek and a river. A Michigan Department of Community Health study concluded that over 300 individuals suffered adverse health effects related to benzene exposure, a toxic component of crude oil.

Line 6B had been scheduled for a routine shutdown at the time of the rupture to accommodate changing delivery schedules. Following the shutdown, operators in the Enbridge control room in Edmonton, Alberta, received multiple alarms indicating a problem with low pressure in the pipeline, which were dismissed as

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<sup>33</sup> NTSB Press Release, "Pipeline Rupture and Oil Spill Accident Caused by Organizational Failures and Weak Regulations," July 10, 2012. Accessed August 3, 2012.  
<http://www.nts.gov/news/2012/120710.html>



being caused by factors other than a rupture. "Inadequate training of control center personnel" was cited as contributing to the accident.

The investigation found that Enbridge failed to accurately assess the structural integrity of the pipeline, including correctly analyzing cracks that required repair. The NTSB characterized Enbridge's control room operations, leak detection, and environmental response as deficient, and described the event as an "organizational accident."

Following the first alarm, Enbridge controllers restarted Line 6B twice, pumping an additional 683,000 gallons of crude oil, or 81 percent of the total amount spilled, through the ruptured pipeline. The NTSB determined that if Enbridge's own procedures had been followed during the initial phases of the accident, the magnitude of the spill would have been significantly reduced. Further, the NTSB attributed systemic flaws in operational decision-making to a "culture of deviance," which concluded that personnel had a developed an operating culture in which not adhering to approved procedures and protocols was normalized.

The NTSB also cited the Pipeline and Hazardous Materials Safety Administration's weak regulations regarding pipeline assessment and repair criteria as well as a cursory review of Enbridge's oil spill response plan as contributing to the magnitude of the accident.

The investigation revealed that the cracks in Line 6B that ultimately ruptured were detected by Enbridge in 2005 but were not repaired. A further examination of records revealed that Enbridge's crack assessment process was inadequate, increasing the risk of a rupture.

"This accident is a wake-up call to the industry, the regulator, and the public. Enbridge knew for years that this section of the pipeline was vulnerable yet they didn't act on that information," said Chairman Hersman. "Likewise, for the regulator to delegate too much authority to the regulated to assess their own system risks and correct them is tantamount to the fox guarding the hen house. Regulators need regulations and practices with teeth, and the resources to enable them to take corrective action before a spill. Not just after."

As a result of the investigation, the NTSB reiterated one recommendation to PHMSA and issued 19 new safety recommendations to the Department of the Transportation, PHMSA, Enbridge Incorporated, the American Petroleum Institute, the International Association of Fire Chiefs, and the National Emergency Number Association.

### 3.2. Costs and Sources of Cost Data

As of March 31, 2013, Enbridge indicated in its First Quarter Interim Report to Shareholders that the total clean-up for the spill is now estimated to cost approximately \$1 billion. Enbridge's civil penalty for the spill was only \$3.7 million.<sup>34</sup> Enbridge also points out that there is a possibility that the clean-up bill will continue to increase as the clean-up is still ongoing.

No lives were lost, but as the NTSB citation above indicates: "over 300 individuals suffered adverse health effects related to benzene exposure, a toxic component of crude oil." Furthermore, "[o]ver 840,000 gallons of crude oil - enough to fill 120 tanker trucks - spilled into hundreds of acres of Michigan wetlands, fouling a creek and a river."

### 3.3. Relevance of Marshall, MI to Estimating the Costs of CBR Accidents/Spills

The Marshall, MI pipeline disaster is also highly relevant to an estimation of the costs of a major CBR accident/spill for the following reasons:

1. It demonstrates the costs of a dilbit spill in an environmentally sensitive area (with wetlands and proximity to waterways and human population) in a non-urban area.<sup>35</sup> Marshall, MI is not dissimilar to the many areas through which trains are also routed (along waterways in order to minimize elevation and through population centers throughout the US).
2. The spill volumes at Marshall were within the range of the amount of spill possible (and, in fact, substantially less than the maximum spill) if a crude by rail unit train released much of its cargo. 840,000 gallons (or 3.3 million liters) were spilled at Marshall, the equivalent of the full cargo release of 27 tank cars (carrying 31,000 gallons) or 34 tank cars (carrying 25,000 gallons).<sup>36</sup> With

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<sup>34</sup> Enbridge First Quarter Interim Report to Shareholders for the Three Months Ended March 31, 2013, Section 11 Contingencies, Adobe p. 67. Accessed August 3, 2013. See <http://www.enbridge.com/InvestorRelations/FinancialInformation/InvestorDocumentsandFilings.aspx> and then click on FIRST QUARTER REPORT under 2013.

<sup>35</sup> The population of Marshall is approximately 7,000.

<sup>36</sup> Maximum capacity per tank car typically varies between 25,000 and 31,800 gallons of crude, based on factors including maximum weight limits, tank car design, and type of crude. Capacity will generally be lower for heavy crudes (such as the dilbit spilled at Marshall), which weigh more per gallon than light crudes (such as the Bakken crude spilled at Lac-Mégantic). Likewise, capacity will be lower for tank cars (footnote continued on next page)

transport by unit trains on the rise, and unit trains carrying up to 100+ tank cars, it would be possible for a unit train to spill significantly higher volumes than the 840,000 gallons (or 3.3 million liters) released at Marshall. The 6.0 million liters released at Lac-Mégantic (almost twice the amount released at Marshall) provide support for this finding.

3. In light of recent findings regarding the Line 6B spill, the EPA has recently expressed concerns regarding the additional impacts of tar sands crude spills (versus conventional oil), with a particular concern about spills on waterways.<sup>37</sup>

Regarding the need for improved safety regulation for CBR, there are a number of regulatory lessons from the Marshall, MI rupture that should be considered:

1. The NTSB investigation also clearly indicates that in the case of Enbridge, and with respect to the regulation of pipeline operators, “trust us” isn’t good enough. Chair Hersman has insightfully pointed out that “for the regulator to delegate too much authority to the regulated to assess their own system risks and correct them is tantamount to the fox guarding the hen house.”<sup>38</sup> Chair Hersman’s words are even more relevant for the regulation of transport of hazardous materials by rail, which is in many ways both weaker and more fragmented than the regulation of liquid pipelines.<sup>39</sup>
2. The NTSB investigation pointed out that the Marshall rupture was “a wake-up call” to industry, the regulator, and the public.” Enbridge knew for years that the

(footnote continued from previous page)

which have higher tare (unloaded) weights (such as those with heater coils and insulation, which are also sometimes used to transport dilbit).

<sup>37</sup> Comments of EPA on the Department of State’s Keystone XL Draft Supplement Environmental Impact Statement (DSEIS). Accessed October 30, 2013.

<http://epa.gov/compliance/nepa/keystone-xl-project-epa-comment-letter-20130056.pdf>

<sup>38</sup> See footnote 33.

<sup>39</sup> As described in various other documents in the current proceeding, there is a long history of problems in regard to transport of hazardous materials (notably flammable liquids) by rail, with only a very slow and partial response to tighten standards to insure public safety. See Village of Barrington, Illinois and The Regional Answer to Canadian National (TRAC) - Petition for Rulemaking (P-1587); National Transportation Safety Board - Accident Report - Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire Cherry Valley, Illinois June 19, 2009; and National Transportation Safety Board - Safety Recommendation - R-12-5 through -8, R-07-4 (Reiteration)

In the case of liquid pipelines, the pipeline owner/operator is typically responsible for construction and operation of all facilities within its transport system that are handling hazardous materials (notably flammable liquids), including pipes, valves, and pumping stations. By contrast, in the case of rail, the railroads provide motive power and crews to move hazardous materials (notably flammable liquids) in tank cars which are typically owned, loaded, and unloaded by shippers and other entities besides the railroads.

pipeline was vulnerable; much as the rail industry knows that another CBR spill is only a matter of time.

Although the Line 6B rupture caused widespread devastation to the Kalamazoo and surrounding wetlands and, at \$1 billion in clean-up costs, holds the record for the single most expensive onshore spill in US history,<sup>40</sup> it is nowhere near the worst-case scenario for a CBR disaster. Similar to the Lac-Mégantic tragedy involving a CBR release of Bakken, the costs/damages for a CBR dilbit spill could be substantially higher in a more populated area, and costs could easily escalate to the multi-billion dollar range. The clean-up of dilbit, especially in waterways is particularly problematic and expensive. Moreover, the condensate can be highly flammable when spilled and this flammability could have catastrophic consequences in a more densely populated area.

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<sup>40</sup> See footnote 33.

#### 4. Conclusion

As the examples of the Lac-Mégantic CBR tragedy and the Marshall, MI pipeline rupture have demonstrated, a major CBR unit train accidents/spill could cost \$1 billion or more for a single event.

Unit trains now transport unconventional crude, including both dilbit and Bakken, through densely populated urban areas, and this form of transport is rapidly growing. An accident/spill in an urban area could damage and disrupt major infrastructure, result in serious and widespread water and soil contamination, and possibly cause loss of life. The costs of a major unit train derailment in an urban centre could easily escalate into the multi-billion dollar range.

1/27/2014

Officials Tighten Crude-Shipping Standards - WSJ.com

Attachment 3

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CANADA NEWS

## Officials Tighten Crude-Shipping Standards

By BETSY MORRIS and RUSSELL GOLD

Updated Aug. 7, 2013 10:09 p.m. ET

The Federal Railroad Administration plans to start asking shipping companies to supply testing data they use to classify their crude-oil shipments, saying it is concerned that some shipments are being transported in tank cars that aren't safe enough.

In a letter to American Petroleum Institute CEO Jack Gerard last week, the FRA said it is investigating whether some crude shipments contain chemicals—possibly from the hydraulic-fracturing process used to extract it—that make them more hazardous than their classification indicates.



Oil containers sit at a train depot outside Williston, N.D., last month. Oil producers and refiners are increasingly using rail in North Dakota and Texas, where there aren't enough pipelines. *Getty Images*

The agency told the API it also suspects that mixes of crude and other chemicals might be the cause of an increase in damage to tank cars caused by "severe corrosion." If shippers can't supply their testing data, the FRA said in the letter, it will work with the Pipeline and Hazardous Materials Safety Administration to test the shipments independently.

Companies routinely add highly corrosive hydrochloric acid to fracking fluid to break down rock formations. They also add certain chemicals to kill microorganisms and reduce friction in oil. Frack fluids are exempt from federal disclosure laws, but some companies voluntarily provide details, and some states require a thorough ingredient list.

The action is the latest by the agency to toughen regulation of the transport by rail of crude oil after a runaway train hauling 72 tank cars with crude oil derailed and exploded last month, killing 47 people and ravaging the Quebec town of Lac-Mégantic.

The latest FRA action "looks like a shot over the bow," said Grady Cothen, a former FRA safety official who is now a transportation-policy consultant. "They seem to be saying, 'Get your house in order or we'll do it for you.'"

The Quebec disaster follows a number of serious accidents involving hazardous materials and tank cars in recent years that have raised federal regulators' concern. More than 34 million barrels of crude were delivered to U.S. refineries by train in 2012, a fivefold increase compared with a year earlier, according to the Energy Information Administration, the statistical arm of the U.S. Energy Department. The volume is

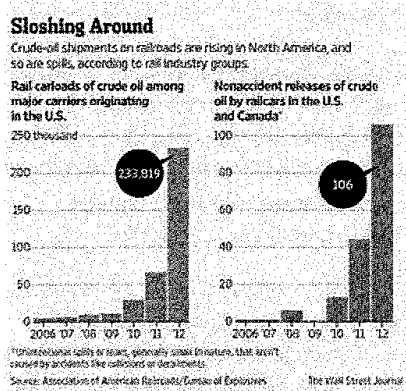
expected to increase again in 2013.

The Canadian Transportation Safety Board said it would analyze and compare numerous fluid samples taken from the Lac-Mégantic accident "to verify the properties of the petroleum product in these tank cars" and to help figure out "why the oil created such a fierce fire that night." It is also analyzing metallurgical samples, damage records and photographs to determine how well the tank cars involved in the derailment were prepared to withstand a crash.

The company that operated that train, Montreal, Maine & Atlantic Railway Ltd., filed for bankruptcy protection Wednesday in U.S. Bankruptcy Court in Bangor, Maine. Its Canadian counterpart filed for protection from creditors.

The FRA moves will likely pose difficulties for some shippers. Oil producers and refiners are increasingly using rail in Texas and North Dakota, where there aren't enough pipelines to get the crude to markets that will command the highest price.

Prentiss Searles, marketing-issues manager for the American Petroleum Institute, said the institute was reviewing the letter to see what, if anything, needed to be done to respond to the FRA's concerns. "Ultimately, we're going to follow the rules and requirements that currently exist. If somebody made a mistake and put the wrong type of crude in the wrong type of tank care, that should not happen," he said.



EOG Resources Inc., a Houston-based energy producer that ships crude from rail yards in Texas and North Dakota, said it was "in close communication with our railroad carriers and is currently reviewing the topics raised by the Federal Railroad Administration." Jeff Hume of Continental Resources Inc., an Oklahoma City-based crude producer, said: "We meet all [Department of Transportation] specifications. If the DOT deems it necessary to change those specifications, we will support what safety experts recommend."

In the detailed letter to the Petroleum Institute, Thomas J. Herrmann, acting director of FRA's office of safety assurance and compliance, spelled out numerous reasons for the agency's concern. In one example, the FRA said a company was shipping crude that should have been classified as flammable in a tank car that hadn't been designed for that material. The agency could "only speculate as to the number of potential crude-oil shipments that are being made in violation of Hazardous Material Regulations," he wrote.

Shippers need to know the chemical makeup of substances they are shipping, the letter said. But FRA said its audits indicate the oil is often classified based on outdated testing and testing that doesn't reflect all the batches of oil from different sources and wells that are being mixed. Crude is frequently shipped in unit trains made up of scores of tank cars, containing oil from different shippers and many wells, some of which has been blended together.

The FRA also noted recurring problems with what it said appeared to be overloaded tank cars. Proper tank-car loading is based on a calculation that involves relative temperatures and gravity to determine the quantity to load without overloading that will result in leaks.

## APPENDIX G1: RESPONSE TO COMMENTS

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1/27/2014

Officials Tighten Crude-Shipping Standards - WSJ.com

Attachment 3

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George King, an engineer and technology consultant for Apache Corp., said hydrochloric acid used in fracking typically doesn't return to the surface. "I have never seen anything stronger than a very, very weak vinegar come back in terms of acid," he said.

However, Mr. King said the acid won't mix with crude oil and if stored in a tanker, will settle to the bottom. "Could it be corrosive on steel? Yes," he said.

—Daniel Gilbert contributed to this article.

Write to Betsy Morris at [betsy.morris@wsj.com](mailto:betsy.morris@wsj.com)

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**EXHIBIT G**



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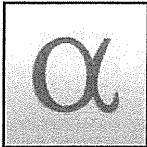
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## Tesoro Logistics LP Management Discusses Q4 2013 Results - Earnings Call Transcript

Feb. 6, 2014 3:40 PM ET | About: [Tesoro Logistics LP \(TLLP\)](#)by: SA Transcripts

### Executives

Christopher Castro

Phillip M. Anderson - President of Tesoro Logistics GP

Gregory J. Goff - Chairman of Tesoro Logistics GP LLC and Chief Executive Officer of Tesoro Logistics GP LLC

### Analysts

Brian J. Zarahn - Barclays Capital, Research Division

TJ Schultz - RBC Capital Markets, LLC, Research Division

Sharon Lui - Wells Fargo Securities, LLC, Research Division

Jeremy B. Tonet - JP Morgan Chase & Co, Research Division

Richard Roberts - Howard Weil Incorporated, Research Division

Tesoro Logistics LP ([TLLP](#)) Q4 2013 Earnings Call February 6, 2014 12:00 PM ET

### Operator

Good day, ladies and gentlemen, and welcome to the Fourth Quarter 2013 Tesoro Logistics LP Earnings Conference Call. My name is Ketina, and I'll be your coordinator for today. [Operator Instructions] As a reminder, this conference is being recorded for replay purposes.

I would now like to turn the presentation over to your host for today's call, Mr. Chris Castro, Investor Relations Manager. Please proceed.

### Christopher Castro

Good morning, everyone, and welcome to today's conference call to discuss our fourth quarter 2013 earnings. Joining me today are Greg Goff, Chairman and CEO; Phil Anderson, President; and Scott Spendlove, Vice President and CFO.

Yesterday we issued a press release announcing our full quarterly results. That release along with additional financial and operational information and reconciliations for non-GAAP financial measures is available on our website at [tesorologistics.com](http://tesorologistics.com). Please refer to the forward-looking statements in the

<http://seekingalpha.com/article/2001121-tesoro-logistics-lp-management-discusses-q4-2013-results-earnings-call...> 6/2/2014

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earnings press release, which says statements made during this call that refer to management's expectations and/or future predictions are forward-looking statements intended to be covered by the Safe Harbor provisions of the Securities Act, as there are many factors which could cause results to differ from our expectations. Please keep in mind that our reported fourth quarter financials include historical results of the Los Angeles Logistics assets that were acquired during the quarter, including periods in which we didn't own the asset.

We have provided additional information in our release that is comparable on a period-to-period basis, focusing on the results of operations of TLLP assets following their acquisition. For purposes of this call, we'll focus on results that include only TLLP's ownership of the assets and exclude predecessor results. Additionally, on a go-forward basis and within the fourth quarter results, we have consolidated the terminalling and storage revenues into the reporting of the terminalling business within the Terminalling and Transportation segment. We have updated prior period results within the supplemental data files located on the Tesoro Logistics website to reflect accordingly.

With that, I'll turn the call over to Phil.

#### Phillip M. Anderson

Thanks, Chris. Good morning, and thank you for joining us on the call today. You have our earnings release. I'll go over the details of the results, and forward view the business, and Greg will conclude with a strategic update.

On January 22, we announced a cash distribution for the fourth quarter of \$0.565 per limited partner unit, or \$2.26 per unit on an annualized basis. This represents a 4% increase over the quarterly distribution paid in November of 2013, and a 20% increase over the last 4 quarters. As Chris said in his introduction, in order to satisfy GAAP requirements, TLLP's accounting statements include the period that Tesoro owned the assets that we acquired during the fourth quarter. The results of the period that TLLP owned the assets is broken out further in the release, and there are additional schedules on our website that breakout the predecessor from the partnership. The distribution is based on -- and the results we will discuss today are only those of the partnership.

Today -- I'm sorry, yesterday we reported distributable cash flow of \$35.4 million for the fourth quarter, which was up 5% from the prior quarter, and adjusted EBITDA of \$52.9 million. Adjusted EBITDA excludes \$3.1 million of Northwest Products pipeline inspection and maintenance costs that were included in expenses, but paid with cash we retained from the purchase price reduction on those assets. Included within the adjusted EBITDA was approximately \$2 million of transaction costs primarily related to the Los Angeles logistics assets acquisition and debt exchange costs.

Looking back at some of our quarterly accomplishments, on December 6, 2013, we closed the acquisition of the Los Angeles logistics assets from Tesoro for total consideration of \$650 million. Included within the suite of assets that we acquired, were 2 marine terminals with expected throughput of approximately 285,000 barrels per day, over 100 miles of active crude oil and refined product pipelines with expected throughput of 550,000 barrels per day. Storage and refined product terminals with over 2 million barrels of storage capacity, and a coke handling and storage facility.

The acquisition price of \$650 million included cash of \$585 million and TLLP equity valued at approximately \$65 million. The cash consideration was financed with cash on hand, borrowings of \$250 million from the revolving credit facility, and net proceeds of approximately \$310 million from the equity offering that we closed on November 22. That offering of 6.3 million common units represented limited partner interest at \$51.05 per common unit.

On December 17, 2013, TLLP completed an offering of \$250 million of notes that were an add-on to the 5 7/8% senior notes due 2020 that we issued on September of 2012. The proceeds from that offering were primarily used to repay amounts outstanding under the credit facility for the acquisition of the Los Angeles logistics assets. Our current level of debt puts us slightly above our conservative leverage target of 3x to 4x EBITDA, but we expect that ratio to decline over the next few quarters, as we see EBITDA growth from our organic projects.

Next, I'd like to provide a brief update on the Tioga, North Dakota crude oil pipeline release that occurred in September. The impacted segment of pipeline was repaired and placed into service on November 1. The site has been fully stabilized for winter, and we're currently working to establish a comprehensive remediation plan that we expect to review with regulators and the landowner during this quarter. In the fourth quarter, results included a combined impact of \$1.7 million from lost revenue due to downtime on that segment, and additional costs for mine integrity testing.

Additionally, we were able to reverse \$3 million of accrued site remediation expenses during the fourth quarter, with the expectation that our pollution liability insurance policy will cover the remediation costs in excess of the \$1 million policy deductible, based on insurance recoveries of \$1.5 million that we've received to date. The final remediation plans are still under development, but we expect the cost to be within our insurance policy limit.

Total capital expenditures in the quarter were \$22.1 million. This includes \$17.8 million of expansion capital and \$4.3 million of maintenance capital. Approximately \$600,000 of the maintenance capital was reimbursed by Tesoro.

For the first quarter, we expect capital spending, net of reimbursements, of approximately \$20 million to \$25 million, including expected maintenance capital of approximately \$6 million. For the full year, we expect total capital spending of approximately \$125 million, net of expected reimbursements. Of that total, our organic growth program for the year is expected to be approximately \$100 million, which is consistent with our previously announced projects, primarily focused on growing our Crude Oil Gathering business and the Southern California Terminalling and Transportation business.

Turning to our operations. In our Crude Oil Gathering segment, we delivered about 88,000 barrels per day on our High Plains Pipeline during the fourth quarter. The quarter-over-quarter decrease in pipeline throughput is a direct result of the downtime on the segment of pipeline where the crude oil release occurred. Our goal to transport over 100,000 barrels per day on the pipeline looks to be within reach here in the first quarter, following the needed focus during the fourth quarter on the Tioga release. We've added new pumping capacity that is expected to come online in February, and that should allow us to sustain our goal of over 100,000 barrels per day on the system. Although, total trucking volumes were down, we had a record contribution from the trucking business as we captured efficiencies, and substantially reduced delivery costs within our expanded proprietary trucking fleet.

As we look beyond the first quarter, we expect to see significant upside in our Crude Oil Gathering business, as we progress on our High Plains Pipeline reversal project and the further development of our Bakken area storage hub. Upon completion of the reversal project, we expect to have the ability to grow pipeline volumes by 50,000 to 75,000 barrels per day, with direct access to our Bakken area storage hub location, where we have the potential to add up to 2.5 million barrels of commercial storage capacity. We've completed the first 120,000 barrel tank in December, and another 360,000 barrels of committed capacity is currently under construction and expected to be placed in service in the spring.

Moving to the Terminalling and Transportation segment. Within Terminalling, we reported volume of approximately 637,000 barrels per day. The increase was primarily due to the contribution from the Los Angeles logistics assets, acquired in the fourth quarter. Overall, volumes at our base terminals were lower quarter-over-quarter as extended refinery maintenance on the West Coast and regulatory maintenance downtime at our Long Beach terminal adversely impacted our throughputs. Thus far, January volumes are in line with our expectations.

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For the first quarter, we expect total terminalling volumes of 850,000 to 875,000 barrels per day. Our incremental throughput in the first quarter primarily reflects a full quarter's contribution from the LA terminals we acquired in December. Those are expected to have an average revenue of approximately \$0.65 per barrel.

In conjunction with Tesoro, we've already begun the process of optimizing our Southern California product terminals as Tesoro moves its legacy volumes into our system. That process should continue over the course of this year, as we complete expansions and interconnections at a few of our terminals. Longer-term, we continue to see substantial opportunities to organically grow EBITDA contributions from our Southern California distribution system, as we invest to open it up to third-party business.

Additionally, we are seeing other significant opportunities for organic growth in that market that support improving the efficiency of crude oil deliveries, and improving the product value capture for refined products around Tesoro's Los Angeles refinery. Within pipeline transportation, we moved about 325,000 barrels per day in our systems in the quarter. The volume growth over the prior quarter was consistent with our expectations, and includes contributions from the Southern California pipelines that were acquired during the quarter.

For the first quarter, we expect to have pipeline throughput of 725,000 to 750,000 barrels per day, as a result of a full quarter's operation of the newly acquired Southern California pipelines. We expect revenue per barrel on that system of approximately \$0.23 per barrel this quarter.

With that, I'll turn the call over to Greg to discuss our strategic outlook.

**Gregory J. Goff**

Thank you, Phil. At Tesoro's annual analyst and investor presentation, held in early December of 2013, we discussed Tesoro's strategic objective to grow the logistics business with TLLP, and how it plays a significant role in realizing Tesoro's value around our embedded logistics and enabling the ability to invest in new logistics capabilities to drive advantaged crude oil supply into Tesoro's refineries.

In conjunction with Tesoro, we've led industry efforts to gather and transport advantaged Bakken crude oil to the West Coast and see significant opportunities to capture additional value with the expansion of our high plains crude oil gathering business coupled with Tesoro's development of the Vancouver, Washington rails and marine terminals.

In addition to the Vancouver terminal, Tesoro identified 2 pipeline projects that are in development as potential future acquisitions by Tesoro Logistics. Those developments, which would safely and efficiently transport Uintah crude oil in Utah, and Cook Inlet crude oil in Alaska are currently in the engineering and design phase. Including these future developments and the right-of-first-offer assets that were initially identified as drop down candidates at IPO, Tesoro believes that there is at least \$1.5 billion worth of potential logistics assets to be offered to TLLP over the next few years.

Let me point out that of the original 10 assets identified on the right-of-first-refusal offer list at IPO, only 2 assets, the Martinez and Long Beach marine terminals, have been acquired in the course of TLLP's 6 acquisitions. The remaining acquisitions have been new assets developed by Tesoro in the case of the Anacortes Rail Facility, transactions where we strategically partnered with Tesoro to acquire assets as we did in the Southern California transactions are direct third-party opportunities with the acquisition of the Northwest Product System.

As we turn the page on another year, we continue to have high expectations for our future growth prospects, and we'll remain focused on driving EBITDA growth and unitholder value through the delivery of our strategic initiatives.

That concludes my comments, and with that I'll turn the call back over to the operator for questions.

#### Question-and-Answer Session

##### Operator

[Operator Instructions] Your first question comes from the line of Brian Zarahn representing Barclays.

**Brian J. Zarahn - Barclays Capital, Research Division**

I appreciate the color on the first quarter, and also on the drop in inventory, I guess trimming [ph] the drop downs, even though -- heavy activity in 2013 on acquisitions, would it be less likely to see a drop down in 2014?

**Phillip M. Anderson**

I don't think so. That's a process that we'll continue to work through probably fairly methodically.

**Brian J. Zarahn - Barclays Capital, Research Division**

And then, I guess, maybe can you provide a range for -- Greg mentioned the -- expect the assets to be dropped down over time, is there -- is this more of 3- or 5-year timeframe that would be considered?

**Phillip M. Anderson**

I think, 3 to 5 years is the right time to think about around the portfolio that Greg mentioned.

**Brian J. Zarahn - Barclays Capital, Research Division**

Okay. And turning to the High Plains expansion, can you provide a potential cost estimate for the project and would returns be expected at a similar multiple on previous organic projects?

**Phillip M. Anderson**

Absolutely, Brian. We've previously disclosed that the reversal project is about \$35 million in total. The bulk of that spending will take place in 2014. And the return on that project, or the EBITDA estimate was \$10 million to \$15 million. So the other projects we have going on up there with the build-out of the BASH storage facility and a couple other gathering projects would be at similar returns.

## APPENDIX G1: RESPONSE TO COMMENTS

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**Brian J. Zarahn - Barclays Capital, Research Division**

In terms of the -- I was more referencing the open season you have, is there a potential cost estimate for that project?

**Phillip M. Anderson**

So in the open season, there's a reference to a Phase I and Phase II. Phase I is consistent with the reversal project. Phase II would be incremental to the reversal project, and based on the demand we get from the open season process we'll develop a final engineering estimate to complete that. But at this point, we don't have a firm estimate of what that would look like or the EBITDA necessarily.

**Brian J. Zarahn - Barclays Capital, Research Division**

Okay. And then, last question for me. Can you comment on how the integration of the Carson assets is progressing? You seem to have a variety of optimization opportunities. Is there anything particular that stands out that you see good growth potential for TLLP?

**Phillip M. Anderson**

I think, our integration process has gone consistently with what we hope to achieve. Operationally, we have integrated the assets very well into our overall systems, and as I said in the prepared remarks, the process of moving Tesoro's volumes in that market into our system continues at a pace that we really expected there.

**Operator**

Your next question comes from the line of TJ Schultz representing RBC Capital Markets.

**TJ Schultz - RBC Capital Markets, LLC, Research Division**

I guess, just on the Southern California assets to clarify. When you closed the second tranche, you identified, I think, up to \$15 million of additional EBITDA beyond the first full year from some of the synergies. So just to clarify, is there some amount of CapEx that you're allocating now. It looks like in 2014, and if could you just give kind of an estimate of cost it will take to realize those synergies? And if that is still kind of the EBITDA estimate that you expect there?

**Phillip M. Anderson**

Sure, TJ. So the big upside that we've got on the second tranche of assets is really pipeline throughput through our pipeline system, as Tesoro integrates the 2 refining sites. That throughput is the primary source of that incremental, approximately \$10 million of EBITDA. The CapEx for that, while we will show with -- in terms of gross CapEx spending, because the cost estimates were not complete on those projects, Tesoro agreed to reimburse us to complete those connections. So our net cash out the door to complete that is expected to be very minimal. And that was essentially baked into the price of the deal.

**TJ Schultz - RBC Capital Markets, LLC, Research Division**

Okay, understood. High Plains, just near-term, before the reversal of project as you kind of ramp up to that 100,000 barrels a day. If you can just kind of clarify what you need to get done. It sounds like there is something in February that will get you kind of pump and throughput on that system?

**Phillip M. Anderson**

That's right, TJ. We needed more pumping capacity at a major origination point on the pipeline and that's Johnson's Corner, which is where we interface with Crestwood and Targa's systems in that area. That pump is required to get the volumes to where we need to go, the volumes are there, and the customers are ready to ship, as soon as we open that system up for nomination.

**TJ Schultz - RBC Capital Markets, LLC, Research Division**

Got it. And I guess, lastly, what was leverage during the quarter, and if you could give any expectation on kind of where you see leverage by mid-'14 and then by year-end?

**Phillip M. Anderson**

Our leverage, based on fourth quarter results, when you reflect a full quarter's operation of the acquired assets, I believe, was about 4.1x EBITDA. Our expectation is that will decline into the mid-3s later this year as the organic growth EBITDA comes online.

**Operator**

[Operator Instructions] Your next question comes from the line of Sharon Lui representing Wells Fargo.

**Sharon Lui - Wells Fargo Securities, LLC, Research Division**

Just wondering if you could give, I guess, a little bit more color on your growth CapEx budget of \$100 million for '14 and '15. What projects are included in those numbers? Does it include, I guess, the Phase II of the open season and the additional storage project?

**Phillip M. Anderson**

Sure, Sharon. For this year, the \$100 million of growth CapEx that we expect to spend net of reimbursements, primarily reflects the projects in the High Plains, and that's -- the reversal project and about 1 million barrels of incremental capacity at the Bakken Area Storage Hub. We've got a couple of modest gathering projects in some smaller expansions on the system that are included on that. The remainder of the organic growth is focused primarily in our Southern California assets, where we're expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. At this point, we do not have an estimate on Phase II of the open season, pending receipt of the volume expectations from potential shippers. Once we have that, we'll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate. But that is more of a 2015 type spend at this point. And it would be this year. Our preliminary estimate, as we said at Tesoro's Analyst Day, is to spend about \$100 million organically per year on this suite of assets that are in TLLP right now. And that Phase II would be part of our expected spend in 2015.

## APPENDIX G1: RESPONSE TO COMMENTS

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**Sharon Lui - Wells Fargo Securities, LLC, Research Division**

Okay, that's helpful. And could you quantify, I guess, what's the spending associated with the storage hub project?

**Phillip M. Anderson**

We have not broken that out. It will depend ultimately on how customers elect to go in terms of co-mingled versus segregated storage. And so, we've got an estimate included in our number for this year, but we'll finalize that again as we get that firm demand.

**Sharon Lui - Wells Fargo Securities, LLC, Research Division**

Okay. And then, I guess, in terms of the contribution in the fourth quarter from the drop-down, what was the EBITDA and was it -- has it been performing, I guess, in line with the acquisition economics?

**Phillip M. Anderson**

For the -- we have not broken it out, but the EBITDA contribution from the tranche 2 assets for the 26 days we owned it was almost exactly what we expected based on the guidance that we gave. And our expectation is the same for 1Q as well.

**Sharon Lui - Wells Fargo Securities, LLC, Research Division**

Okay. And I guess, the last question. Any impact, I guess, in the Bakken from weather-related disruptions in Q1?

**Phillip M. Anderson**

It really sort of started back in December. And I think, other folks have referenced it on their call, where sort of the early onset and sort of extreme weather that they've had up there this year did increase the complexity of some of the things we're doing. But we continue to deal with that. And our current plans are based on a typical North Dakota winter at this point.

**Operator**

Your next question comes from the line of Jeremy Tonet representing JPMorgan.

**Jeremy B. Tonet - JP Morgan Chase & Co, Research Division**

Sorry if I missed it, if you covered this earlier in the call, but I was just wondering if you could talk a bit about within the Terminalling and Transportation, some of the drivers for the EBITDA quarter-over-quarter, 3Q versus 4Q, what were some of the drivers there as far as the change in EBITDA?

**Phillip M. Anderson**

Sure. The key things for us around our base assets was there was a fair bit of downtime in the LA refining basin that impacted our throughputs through our product terminals and our marine terminals. Additionally, we had some regulatory downtime at our Long Beach terminal to do some required seismic work that caused us to miss out on nearly a month's worth of throughput through that facility. So far, as we've progressed into the first quarter, things are running as we would expect, and we don't see any continuation of those events.

**Jeremy B. Tonet - JP Morgan Chase & Co, Research Division**

Okay, that's very helpful. Could you give us any thoughts as what you think might be more of a normalized EBITDA run rate for the segment without some of that noise?

**Phillip M. Anderson**

As we look forward -- and we'll have a lot of things going on this year. So it's tough to say exactly what any one quarter is going to be, but when we look at that segment, I would say, \$55 million to \$65 million, depending on the vagaries of demand and organic growth timing.

**Operator**

Your next question comes from the line of Richard Roberts representing Howard Weil.

**Richard Roberts - Howard Weil Incorporated, Research Division**

Just a couple of quick ones for me. For one, at the Analyst Day, back in December you talked about 2014 CapEx of around \$160 million, and if I heard correctly, earlier you said about \$125 million now for '14. So is there any shift in spending plans there? Or maybe is that just a higher level of reimbursements sort of driving the difference? And then secondly, just wanted to follow-up if you're still on track for 150,000 barrels a day on the High Plains System by 2014 with just a little bit of shift in timing on volumes here.

**Phillip M. Anderson**

Sure. So on the first one, on the capital, what you saw at Tesoro's Analyst Day was a gross number. And our net number is -- we reported on this call today is net of expected reimbursements from Tesoro. And the bulk of that difference, that's maybe a little different this year than past years, relates to those pipeline connections in LA that Tesoro will reimburse us for making during the course of the year. With regard to our targets on the High Plains System for this year, we do feel like we are on track with our target to increase throughputs on that system by 50,000 to 75,000 barrels per day by the end of the year. The reversal project is the key driver of that in the open season process that's underway now will help us get that demand firmly committed to that expansion.

**Operator**

With no further questions at this time. We've now approached the end of our question-and-answer session. Ladies and gentlemen, thank you for your participation in today's conference. This concludes the presentation. You may now disconnect. Good day.

## APPENDIX G1: RESPONSE TO COMMENTS

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#### Executives

Christopher Castro

Phillip M. Anderson - President of Tesoro Logistics GP

Gregory J. Goff - Chairman of Tesoro Logistics GP LLC and Chief Executive Officer of Tesoro Logistics GP LLC

#### Analysts

Brian J. Zarahn - Barclays Capital, Research Division

TJ Schultz - RBC Capital Markets, LLC, Research Division

Sharon Lui - Wells Fargo Securities, LLC, Research Division

Jeremy B. Tonet - JP Morgan Chase & Co, Research Division

Richard Roberts - Howard Weil Incorporated, Research Division

Tesoro Logistics LP (TLLP) Q4 2013 Earnings Call February 6, 2014 12:00 PM ET

#### Operator

Good day, ladies and gentlemen, and welcome to the Fourth Quarter 2013 Tesoro Logistics LP Earnings Conference Call. My name is Ketina, and I'll be your coordinator for today. [Operator Instructions] As a reminder, this conference is being recorded for replay purposes.

I would now like to turn the presentation over to your host for today's call, Mr. Chris Castro, Investor Relations Manager. Please proceed.

#### Christopher Castro

Good morning, everyone, and welcome to today's conference call to discuss our fourth quarter 2013 earnings. Joining me today are Greg Goff, Chairman and CEO, Phil Anderson, President, and Scott Spendlove, Vice President and CFO.

Yesterday we issued a press release announcing our full quarterly results. That release along with additional financial and operational information and reconciliations for non-GAAP financial measures is available on our website at [tesorologistics.com](http://tesorologistics.com). Please refer to the forward-looking statements in the earnings press release, which says statements made during this call that refer to management's expectations and/or future predictions are forward-looking statements intended to be covered by the Safe Harbor provisions of the Securities Act, as there are many factors which could cause results to differ from our expectations. Please keep in mind that our reported fourth quarter financials include historical results of the Los Angeles Logistics assets that were acquired during the quarter, including periods in which we didn't own the asset.

We have provided additional information in our release that is comparable on a period-to-period basis, focusing on the results of operations of TLLP assets following their acquisition. For purposes of this call, we'll focus on results that include only TLLP's ownership of the assets and exclude predecessor results. Additionally, on a go-forward basis and within the fourth quarter results, we have consolidated the terminalling and storage revenues into the reporting of the terminalling business within the Terminalling and Transportation segment. We have updated prior period results within the supplemental data files located on the Tesoro Logistics website to reflect accordingly.

With that, I'll turn the call over to Phil.

#### Phillip M. Anderson - President of Tesoro Logistics GP

Thanks, Chris. Good morning, and thank you for joining us on the call today. You have our earnings release. I'll go over the details of the results, and forward view the business, and Greg will conclude with a strategic update.

On January 22, we announced a cash distribution for the fourth quarter of \$0.565 per limited partner unit, or \$2.26 per unit on an annualized basis. This represents a 4% increase over the quarterly distribution paid in November of 2013, and a 20% increase over the last 4 quarters. As Chris said in his introduction, in order to satisfy GAAP requirements, TLLP's accounting statements include the period that Tesoro owned the assets that we acquired during the fourth quarter. The results of the period that TLLP owned the assets is broken out further in the release, and there are additional schedules on our website that breakout the predecessor from the partnership. The distribution is based on -- and the results we will discuss today are only those of the partnership.

Today -- I'm sorry, yesterday we reported distributable cash flow of \$35.4 million for the fourth quarter, which was up 5% from the prior quarter, and adjusted EBITDA of \$52.9 million. Adjusted EBITDA excludes \$3.1 million of Northwest Products pipeline inspection and maintenance costs that were included in expenses, but paid with cash we retained from the purchase price reduction on those assets. Included within the adjusted EBITDA was approximately \$2 million of transaction costs primarily related to the Los Angeles logistics assets acquisition and debt exchange costs.

<http://seekingalpha.com/article/2001121-tesoro-logistics-lp-management-discusses-q4-2013-results-earnings-call...> 6/2/2014



## APPENDIX G1: RESPONSE TO COMMENTS

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### Tesoro Logistics LP Management Discusses Q4 2013 Results - Earnings Call Transcript | Seeking Alpha

Looking back at some of our quarterly accomplishments, on December 6, 2013, we closed the acquisition of the Los Angeles logistics assets from Tesoro for total consideration of \$650 million. Included within the suite of assets that we acquired, were 2 marine terminals with expected throughput of approximately 285,000 barrels per day, over 100 miles of active crude oil and refined product pipelines with expected throughput of 550,000 barrels per day. Storage and refined product terminals with over 2 million barrels of storage capacity; and a coke handling and storage facility.

The acquisition price of \$650 million included cash of \$585 million and TLLP equity valued at approximately \$65 million. The cash consideration was financed with cash on hand, borrowings of \$250 million from the revolving credit facility, and net proceeds of approximately \$310 million from the equity offering that we closed on November 22. That offering of 6.3 million common units represented limited partner interest at \$51.05 per common unit.

On December 17, 2013, TLLP completed an offering of \$250 million of notes that were an add-on to the 5 7/8% senior notes due 2020 that we issued on September of 2012. The proceeds from that offering were primarily used to repay amounts outstanding under the credit facility for the acquisition of the Los Angeles logistics assets. Our current level of debt puts us slightly above our conservative leverage target of 3x to 4x EBITDA, but we expect that ratio to decline over the next few quarters, as we see EBITDA growth from our organic projects.

Next, I'd like to provide a brief update on the Tioga, North Dakota crude oil pipeline release that occurred in September. The impacted segment of pipeline was repaired and placed into service on November 1. The site has been fully stabilized for winter, and we're currently working to establish a comprehensive remediation plan that we expect to review with regulators and the landowner during this quarter. In the fourth quarter, results included a combined impact of \$1.7 million from lost revenue due to downtime on that segment, and additional costs for mine integrity testing.

Additionally, we were able to reverse \$3 million of accrued site remediation expenses during the fourth quarter, with the expectation that our pollution liability insurance policy will cover the remediation costs in excess of the \$1 million policy deductible, based on insurance recoveries of \$1.5 million that we've received to date. The final remediation plans are still under development, but we expect the cost to be within our insurance policy limit.

Total capital expenditures in the quarter were \$22.1 million. This includes \$17.8 million of expansion capital and \$4.3 million of maintenance capital. Approximately \$600,000 of the maintenance capital was reimbursed by Tesoro.

For the first quarter, we expect capital spending, net of reimbursements, of approximately \$20 million to \$25 million, including expected maintenance capital of approximately \$6 million. For the full year, we expect total capital spending of approximately \$125 million, net of expected reimbursements. Of that total, our organic growth program for the year is expected to be approximately \$100 million, which is consistent with our previously announced projects, primarily focused on growing our Crude Oil Gathering business and the Southern California Terminalling and Transportation business.

Turning to our operations. In our Crude Oil Gathering segment, we delivered about 88,000 barrels per day on our High Plains Pipeline during the fourth quarter. The quarter-over-quarter decrease in pipeline throughput is a direct result of the downtime on the segment of pipeline where the crude oil release occurred. Our goal to transport over 100,000 barrels per day on the pipeline looks to be within reach here in the first quarter, following the needed focus during the fourth quarter on the Tioga release. We've added new pumping capacity that is expected to come online in February, and that should allow us to sustain our goal of over 100,000 barrels per day on the system. Although, total trucking volumes were down, we had a record contribution from the trucking business as we captured efficiencies, and substantially reduced delivery costs within our expanded proprietary trucking fleet.

As we look beyond the first quarter, we expect to see significant upside in our Crude Oil Gathering business, as we progress on our High Plains Pipeline reversal project and the further development of our Bakken area storage hub. Upon completion of the reversal project, we expect to have the ability to grow pipeline volumes by 50,000 to 75,000 barrels per day, with direct access to our Bakken area storage hub location, where we have the potential to add up to 2.5 million barrels of commercial storage capacity. We've completed the first 120,000 barrel tank in December, and another 360,000 barrels of committed capacity is currently under construction and expected to be placed in service in the spring.

Moving to the Terminalling and Transportation segment. Within Terminalling, we reported volume of approximately 637,000 barrels per day. The increase was primarily due to the contribution from the Los Angeles logistics assets, acquired in the fourth quarter. Overall, volumes at our base terminals were lower quarter-over-quarter as extended refinery maintenance on the West Coast and regulatory maintenance down time at our Long Beach terminal adversely impacted our throughputs. Thus far, January volumes are in line with our expectations.

For the first quarter, we expect total terminalling volumes of 850,000 to 875,000 barrels per day. Our incremental throughput in the first quarter primarily reflects a full quarter's contribution from the LA terminals we acquired in December. Those are expected to have an average revenue of approximately \$0.65 per barrel.

In conjunction with Tesoro, we've already begun the process of optimizing our Southern California product terminals as Tesoro moves its legacy volumes into our system. That process should continue over the course of this year, as we complete expansions and interconnections at a few of our terminals. Longer-term, we continue to see substantial opportunities to organically grow EBITDA contributions from our Southern California distribution system, as we invest to open it up to third-party business.

Additionally, we are seeing other significant opportunities for organic growth in that market that support improving the efficiency of crude oil deliveries, and improving the product value capture for refined products around Tesoro's Los Angeles refinery. Within pipeline transportation, we moved about 325,000 barrels per day in our systems in the quarter. The volume growth over the prior quarter was consistent with our expectations, and includes contributions from the Southern California pipelines that were acquired during the quarter.

For the first quarter, we expect to have pipeline throughput of 725,000 to 750,000 barrels per day, as a result of a full quarter's operation of the newly acquired Southern California pipelines. We expect revenue per barrel on that system of approximately \$0.23 per barrel this quarter.

With that, I'll turn the call over to Greg to discuss our strategic outlook.

**Gregory J. Goff** - Chairman of Tesoro Logistics GP LLC and Chief Executive Officer of Tesoro Logistics GP LLC

Thank you, Phil. At Tesoro's annual analyst and investor presentation, held in early December of 2013, we discussed Tesoro's strategic objective to grow the logistics business with TLLP, and how it plays a significant role in realizing Tesoro's value around our embedded logistics and enabling the ability to invest in new logistics capabilities to drive advantaged crude oil supply into Tesoro's refineries.

In conjunction with Tesoro, we've led industry efforts to gather and transport advantaged Bakken crude oil to the West Coast and see significant opportunities to capture additional value with the expansion of our high plains crude oil gathering business coupled with Tesoro's development of the Vancouver, Washington rails and marine terminals.

## APPENDIX G1: RESPONSE TO COMMENTS

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### Tesoro Logistics LP Management Discusses Q4 2013 Results - Earnings Call Transcript | Seeking Alpha

In addition to the Vancouver terminal, Tesoro identified 2 pipeline projects that are in development as potential future acquisitions by Tesoro Logistics. Those developments, which would safely and efficiently transport Uintah crude oil in Utah, and Cook Inlet crude oil in Alaska are currently in the engineering and design phase. Including these future developments and the right-of-first-offer assets that were initially identified as drop down candidates at IPO, Tesoro believes that there is at least \$1.5 billion worth of potential logistics assets to be offered to TLLP over the next few years.

Let me point out that of the original 10 assets identified on the right-of-first-refusal offer list at IPO, only 2 assets, the Martinez and Long Beach marine terminals, have been acquired in the course of TLLP's 6 acquisitions. The remaining acquisitions have been new assets developed by Tesoro in the case of the Anacortes Rail Facility, transactions where we strategically partnered with Tesoro to acquire assets as we did in the Southern California transactions are direct third-party opportunities with the acquisition of the Northwest Product System.

As we turn the page on another year, we continue to have high expectations for our future growth prospects, and we'll remain focused on driving EBITDA growth and unitholder value through the delivery of our strategic initiatives.

That concludes my comments, and with that I'll turn the call back over to the operator for questions.

#### Question-and-Answer Session

##### Operator

[Operator Instructions] Your first question comes from the line of Brian Zarahn representing Barclays.

**Brian J. Zarahn** - Barclays Capital, Research Division

I appreciate the color on the first quarter, and also on the drop in inventory, I guess trimming [ph] the drop downs, even though -- heavy activity in 2013 on acquisitions, would it be less likely to see a drop down in 2014?

**Phillip M. Anderson** - President of Tesoro Logistics GP

I don't think so. That's a process that we'll continue to work through probably fairly methodically.

**Brian J. Zarahn** - Barclays Capital, Research Division

And then, I guess, maybe can you provide a range for -- Greg mentioned the -- expect the assets to be dropped down over time, is there -- is this more of 3- or 5-year timeframe that would be considered?

**Phillip M. Anderson** - President of Tesoro Logistics GP

I think, 3 to 5 years is the right time to think about around the portfolio that Greg mentioned.

**Brian J. Zarahn** - Barclays Capital, Research Division

Okay. And turning to the High Plains expansion, can you provide a potential cost estimate for the project and would returns be expected at a similar multiple on previous organic projects?

**Phillip M. Anderson** - President of Tesoro Logistics GP

Absolutely, Brian. We've previously disclosed that the reversal project is about \$35 million in total. The bulk of that spending will take place in 2014. And the return on that project, or the EBITDA estimate was \$10 million to \$15 million. So the other projects we have going on up there with the build-out of the BASH storage facility and a couple other gathering projects would be at similar returns.

**Brian J. Zarahn** - Barclays Capital, Research Division

In terms of the -- I was more referencing the open season you have, is there a potential cost estimate for that project?

**Phillip M. Anderson** - President of Tesoro Logistics GP

So in the open season, there's a reference to a Phase I and Phase II. Phase I is consistent with the reversal project. Phase II would be incremental to the reversal project, and based on the demand we get from the open season process we'll develop a final engineering estimate to complete that. But at this point, we don't have a firm estimate of what that would look like or the EBITDA necessarily.

**Brian J. Zarahn** - Barclays Capital, Research Division

Okay. And then, last question for me. Can you comment on how the integration of the Carson assets is progressing? You seem to have a variety of optimization opportunities. Is there anything particular that stands out that you see good growth potential for TLLP?

**Phillip M. Anderson** - President of Tesoro Logistics GP

I think, our integration process has gone consistently with what we hope to achieve. Operationally, we have integrated the assets very well into our overall systems, and as I said in the prepared remarks, the process of moving Tesoro's volumes in that market into our system continues at a pace that we really expected there.

##### Operator

Your next question comes from the line of TJ Schultz representing RBC Capital Markets.

**TJ Schultz** - RBC Capital Markets, LLC, Research Division

## APPENDIX G1: RESPONSE TO COMMENTS

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### Tesoro Logistics LP Management Discusses Q4 2013 Results - Earnings Call Transcript | Seeking Alpha

I guess, just on the Southern California assets to clarify. When you closed the second tranche, you identified, I think, up to \$15 million of additional EBITDA beyond the first full year from some of the synergies. So just to clarify, is there some amount of CapEx that you're allocating now. It looks like in 2014, and if could you just give kind of an estimate of cost it will take to realize those synergies? And if that is still kind of the EBITDA estimate that you expect there?

**Phillip M. Anderson** - President of Tesoro Logistics GP

Sure, TJ. So the big upside that we've got on the second tranche of assets is really pipeline throughput through our pipeline system, as Tesoro integrates the 2 refining sites. That throughput is the primary source of that incremental, approximately \$10 million of EBITDA. The CapEx for that, while we will show with -- in terms of gross CapEx spending, because the cost estimates were not complete on those projects, Tesoro agreed to reimburse us to complete those connections. So our net cash out the door to complete that is expected to be very minimal. And that was essentially baked into to the price of the deal.

**TJ Schultz** - RBC Capital Markets, LLC, Research Division

Okay, understood. High Plains, just near-term, before the reversal of project as you kind of ramp up to that 100,000 barrels a day. If you can just kind of clarify what you need to get done. It sounds like there is something in February that will get you kind of pump and throughput on that system?

**Phillip M. Anderson** - President of Tesoro Logistics GP

That's right, TJ. We needed more pumping capacity at a major origination point on the pipeline and that's Johnson's Corner, which is where we interface with Crestwood and Targa's systems in that area. That pump is required to get the volumes to where we need to go, the volumes are there, and the customers are ready to ship, as soon as we open that system up for nomination.

**TJ Schultz** - RBC Capital Markets, LLC, Research Division

Got it. And I guess, lastly, what was leverage during the quarter, and if you could give any expectation on kind of where you see leverage by mid-'14 and then by year-end?

**Phillip M. Anderson** - President of Tesoro Logistics GP

Our leverage, based on fourth quarter results, when you reflect a full quarter's operation of the acquired assets, I believe, was about 4.1x EBITDA. Our expectation is that will decline into the mid-3s later this year as the organic growth EBITDA comes online.

**Operator**

[Operator Instructions] Your next question comes from the line of Sharon Lui representing Wells Fargo.

**Sharon Lui** - Wells Fargo Securities, LLC, Research Division

Just wondering if you could give, I guess, a little bit more color on your growth CapEx budget of \$100 million for '14 and '15. What projects are included in those numbers? Does it include, I guess, the Phase II of the open season and the additional storage project?

**Phillip M. Anderson** - President of Tesoro Logistics GP

Sure, Sharon. For this year, the \$100 million of growth CapEx that we expect to spend net of reimbursements, primarily reflects the projects in the High Plains, and that's -- the reversal project and about 1 million barrels of incremental capacity at the Bakken Area Storage Hub. We've got a couple of modest gathering projects in some smaller expansions on the system that are included on that. The remainder of the organic growth is focused primarily in our Southern California assets, where we're expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. At this point, we do not have an estimate on Phase II of the open season, pending receipt of the volume expectations from potential shippers. Once we have that, we'll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate. But that is more of a 2015 type spend at this point. And it would be this year. Our preliminary estimate, as we said at Tesoro's Analyst Day, is to spend about \$100 million organically per year on this suite of assets that are in TLLP right now. And that Phase II would be part of our expected spend in 2015.

**Sharon Lui** - Wells Fargo Securities, LLC, Research Division

Okay, that's helpful. And could you quantify, I guess, what's the spending associated with the storage hub project?

**Phillip M. Anderson** - President of Tesoro Logistics GP

We have not broken that out. It will depend ultimately on how customers elect to go in terms of co-mingled versus segregated storage. And so, we've got an estimate included in our number for this year, but we'll finalize that again as we get that firm demand.

**Sharon Lui** - Wells Fargo Securities, LLC, Research Division

Okay. And then, I guess, in terms of the contribution in the fourth quarter from the drop-down, what was the EBITDA and was it -- has it been performing, I guess, in line with the acquisition economics?

**Phillip M. Anderson** - President of Tesoro Logistics GP

For the -- we have not broken it out, but the EBITDA contribution from the tranche 2 assets for the 26 days we owned it was almost exactly what we expected based on the guidance that we gave. And our expectation is the same for 1Q as well.

**Sharon Lui** - Wells Fargo Securities, LLC, Research Division

Okay. And I guess, the last question. Any impact, I guess, in the Bakken from weather-related disruptions in Q1?

**Phillip M. Anderson** - President of Tesoro Logistics GP

## APPENDIX G1: RESPONSE TO COMMENTS

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### Tesoro Logistics LP Management Discusses Q4 2013 Results - Earnings Call Transcript | Seeking Alpha

It really sort of started back in December. And I think, other folks have referenced it on their call, where sort of the early onset and sort of extreme weather that they've had up there this year did increase the complexity of some of the things we're doing. But we continue to deal with that. And our current plans are based on a typical North Dakota winter at this point.

#### Operator

Your next question comes from the line of Jeremy Tonet representing JPMorgan.

**Jeremy B. Tonet** - JP Morgan Chase & Co, Research Division

Sorry if I missed it, if you covered this earlier in the call, but I was just wondering if you could talk a bit about within the Terminalling and Transportation, some of the drivers for the EBITDA quarter-over-quarter, 3Q versus 4Q, what were some of the drivers there as far as the change in EBITDA?

**Phillip M. Anderson** - President of Tesoro Logistics GP

Sure. The key things for us around our base assets was there was a fair bit of downtime in the LA refining basin that impacted our throughputs through our product terminals and our marine terminals. Additionally, we had some regulatory downtime at our Long Beach terminal to do some required seismic work that caused us to miss out on nearly a month's worth of throughput through that facility. So far, as we've progressed into the first quarter, things are running as we would expect, and we don't see any continuation of those events.

**Jeremy B. Tonet** - JP Morgan Chase & Co, Research Division

Okay, that's very helpful. Could you give us any thoughts as what you think might be more of a normalized EBITDA run rate for the segment without some of that noise?

**Phillip M. Anderson** - President of Tesoro Logistics GP

As we look forward -- and we'll have a lot of things going on this year. So it's tough to say exactly what any one quarter is going to be, but when we look at that segment, I would say, \$55 million to \$65 million, depending on the vagaries of demand and organic growth timing.

#### Operator

Your next question comes from the line of Richard Roberts representing Howard Weil.

**Richard Roberts** - Howard Weil Incorporated, Research Division

Just a couple of quick ones for me. For one, at the Analyst Day, back in December you talked about 2014 CapEx of around \$160 million, and if I heard correctly, earlier you said about \$125 million now for '14. So is there any shift in spending plans there? Or maybe is that just a higher level of reimbursements sort of driving the difference? And then secondly, just wanted to follow-up if you're still on track for 150,000 barrels a day on the High Plains System by 2014 with just a little bit of shift in timing on volumes here.

**Phillip M. Anderson** - President of Tesoro Logistics GP

Sure. So on the first one, on the capital, what you saw at Tesoro's Analyst Day was a gross number. And our net number is -- we reported on this call today is net of expected reimbursements from Tesoro. And the bulk of that difference, that's maybe a little different this year than past years, relates to those pipeline connections in LA that Tesoro will reimburse us for making during the course of the year. With regard to our targets on the High Plains System for this year, we do feel like we are on track with our target to increase throughputs on that system by 50,000 to 75,000 barrels per day by the end of the year. The reversal project is the key driver of that in the open season process that's underway now will help us get that demand firmly committed to that expansion.

#### Operator

With no further questions at this time. We've now approached the end of our question-and-answer session. Ladies and gentlemen, thank you for your participation in today's conference. This concludes the presentation. You may now disconnect. Good day.

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## **Attachment 2**

**KAMALA D. HARRIS**  
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January 15, 2013

**Via U.S. and Electronic Mail**

Kristin V. Pollot  
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**RE: Recirculated Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project (SCH # 2011072053)**

Dear Ms. Pollot:

Attorney General Kamala D. Harris submits the following comments on the Recirculated Draft Environmental Impact Report (RDEIR) for the WesPac Pittsburg Energy Infrastructure Project (Project).<sup>1</sup> WesPac's proposed \$200 million, 134-acre Project will transform a long-inactive facility into a significant center for the storage, transfer, and transportation of crude oil by rail, pipeline, ship and barge and will bring new sources of crude to the Bay Area for refining. The Project's capacity is massive, with a maximum annual throughput of almost one-fifth of all oil currently processed each year in California.

As set forth below, our review of the RDEIR has revealed some significant legal problems under the California Environmental Quality Act (CEQA). As a threshold matter, the document fails to disclose the sources and analyze the environmental impacts of the new crude. There are a wide range of crudes with different chemical compositions currently available in commerce, and an increasing number of unconventional crudes, such as crudes produced from bitumen sands (so-called "oil sands" or "tar sands"). Different types of crude can have very

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<sup>1</sup> The Attorney General submits these comments pursuant to her independent power and duty to protect the environment and natural resources of the State. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600-12612; *D'Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14-15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the RDEIR's compliance with the California Environmental Quality Act.

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different types of impacts on such things as local air quality, greenhouse gas emissions, and the risks associated with accidental releases.

This fundamental defect affects the adequacy of the entire document. Because of this and other errors, the RDEIR fails to:

- Adequately disclose and analyze local air quality impacts to the already impacted community of Pittsburg;
- Consider the effects to other Bay Area communities of refining the new crudes;
- Propose and analyze feasible mitigation that could reduce local air quality impacts;
- Adequately disclose and address the risk of accidents that could result from transportation and storage of the new crudes;
- Fully disclose and consider mitigation for the Project's climate change-related impacts; and
- Consider a reasonable range of feasible alternatives that could reduce the Project's significant impacts.

We urge the City of Pittsburg to correct these deficiencies before certifying the RDEIR and approving the Project.

#### Summary of the Project

WesPac proposes to transform an existing oil storage and transfer facility that has been dormant for 15 years into a major facility with the capacity to receive, store, and transfer almost 20 percent of California's crude oil supply. The proposed Project is next to residential neighborhoods in the City of Pittsburg with no buffer zone and is located within a quarter-mile of a number of sensitive receptors including schools, an extended care facility, a head-start program, three parks, and several churches. The Office of Environmental Health Hazard Assessment has ranked central Pittsburg, the Project area, in the top ten percent of California communities that are already burdened by multiple sources of pollution and experiencing adverse public health effects.<sup>2</sup>

The Project will bring in large volumes of crude oil and partially refined crude oil<sup>3</sup> from unidentified "distant sources"<sup>4</sup> delivered daily by train (100-plus cars long), ocean-going ships, barges, and pipelines. The facility will store the crude in tanks and then transfer it by pipeline to nearby Bay Area facilities (and possibly elsewhere) for refining. Refineries that may receive the

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<sup>2</sup> See <http://oehha.ca.gov/ej/ces11.html> (zip code 94565).

<sup>3</sup> The total annual average throughput for the Project will be approximately 88.3 million barrels per year, with a maximum throughput of over 136 million barrels per year. To put these numbers in context, all the refineries in California currently process well over 700 million barrels of oil annually, with Bay Area refineries processing 276 million barrels annually. <http://energyalmanac.ca.gov/petroleum/refineries.html>.

<sup>4</sup> RDEIR at p. 1.0-9

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crude include the Shell Martinez Refinery in Martinez; the Tesoro Golden Eagle Refinery in Martinez; the Conoco Phillips Refinery in Rodeo; and the Valero Benicia Refinery in Benicia.<sup>5</sup> The Project will operate twenty-four hours per day, seven days per week.

#### Comments on RDEIR

##### **The RDEIR fails to disclose and analyze the local air quality impacts to the already impacted community of Pittsburg.**

CEQA mandates that an EIR identify and analyze all potentially significant adverse effects of a project, including, both direct and indirect impacts, short-term and long-term impacts, and growth-inducing impacts. (Pub. Resources Code, § 21100; Cal. Code Regs., tit. 14, §§ 15126, 15126.2.) The RDEIR's discussion of local air quality impacts is deficient in several respects, as set forth below.

##### **The RDEIR understates local air quality impacts.**

The Project's many ships, barges, tugboats, locomotives, process equipment and storage tanks will significantly increase the pollution in the surrounding community. According to the RDEIR, even after implementing the proposed mitigation measures, WesPac will exceed the Bay Area Air Quality Management District's (Air District's) recommended significance thresholds for nitrogen oxide (NO<sub>x</sub>) and organic compounds that contribute to smog and can exacerbate respiratory problems. The Project will also emit particulate matter, a pollutant that already accounts for more than 90 percent of premature mortality related to air pollution in the Bay Area.<sup>6</sup> Because the Project's estimated particulate emissions are under the Air District's recommended thresholds, the RDEIR concludes that the impacts are less than significant and proposes no mitigation. Further, the RDEIR concludes that Project's incremental cancer risk from localized pollution is 9.5 – meaning that the Project is expected to cause 9.5 excess cases of cancer per one million people exposed in a lifetime due to the operation of the Project. This is just under the Air District's recommended threshold of ten excess cancers. No mitigation is proposed.

The RDEIR's disclosure and analysis of localized air impacts is deficient in at least two important respects. First, there is no discussion of the types of crude that will be transported to and distributed from the facility.<sup>7</sup> Information on crude type, however, is critical to a full and fair analysis of potential impacts to local air quality. The amount and toxicity of air emissions and

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<sup>5</sup> RDEIR at p. 2.0-43, Table 2-6. It is not clear whether Chevron's Richmond refinery will receive oil from the Project.

<sup>6</sup> <http://www.baaqmd.gov/Divisions/Planning-and-Research/Particulate-Matter.aspx>.

<sup>7</sup> The rail and marine component of the Project will allow delivery of crude from almost anywhere in the world, including the oil sands of Alberta, Canada. See, e.g., BNSF, Crude-by-Rail presentation (Sept. 2013) at p. 10, available at <http://www.fra.dot.gov/Elib/Document/3436>.



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potential releases associated with transporting and storing crude<sup>8</sup> will vary based on the crude's chemical composition, including the contaminants it contains, its sulfur content, and whether it is blended with other chemicals such as diluent (used to make thick crudes like oil sands less viscous and easier to transport).<sup>9</sup> The failure to base local air impacts analysis on the Project's projected crude types causes the RDEIR to "fail[ ] as an informational document[.]" (See *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 89 [holding EIR deficient where the "project description is inconsistent and obscure as to whether the Project enables the Refinery to process heavier crude."])

Second, the RDEIR's emissions estimates for localized air pollutants do not appear to include all aspects of the Project. The RDEIR fails to include all "fugitive" emissions (for example, from leaks in pressurized equipment, pipelines, seals, and valves) and all aspects of transportation that affect local air quality.<sup>10</sup> Third, the RDEIR's pollution projections are based on hypothetical ship, barge, and rail fleets made up of new and efficient models, rather than real-world fleets made up in part of older, less efficient and higher polluting vehicles and vessels.<sup>11</sup> The RDEIR's reliance on hypothetical, cleaner fleets causes it to underestimate the Project's actual emissions.

Underestimating the Project's localized pollution emissions in this case is prejudicial, working against CEQA's informed decision making and public disclosure purposes. For example, even with the identified deficiencies, the RDEIR's estimated cancer risk is very close to the threshold of significance.<sup>12</sup> A relatively small increase in the estimated emissions may well place the Project over the threshold for cancer risk, requiring the City to consider mitigation for this impact, which it has not done in the RDEIR. Before approving the Project, the City must ensure that the environmental document accounts for crude types and includes all sources in estimating the Project's potential impacts to local air quality.

The RDEIR fails to analyze the significance of local air quality impacts on the already overburdened residents of Pittsburg.

In addition, the RDEIR fails to consider whether the Project's contribution to local air pollution is significant given central Pittsburg's existing pollution burdens. The significance of the Project's localized air emissions must be evaluated in context. (Cal. Code Regs., tit. 14, § 15064, subd. (b).) The context of an action or a specific impact may include the sensitivity of

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<sup>8</sup> E.g., releases and spills, fugitive emissions (discussed below), evaporative emissions, and emissions from storage tanks and thermal oxidizers. See Air District comment letter at p. 2.

<sup>9</sup> See, e.g., Crude Oil Material Data Safety Sheets, Keystone XL Pipeline, available at <http://keystonepipeline-xl.state.gov/documents/organization/205570.pdf>. See also comment letter from Natural Resources Defense Council, September 13, 2013, at pp. 8-21.

<sup>10</sup> The Air District noted that it was "unable to verify the potential health risks" from the Project because of defects in quantifying and modeling the Project's emissions. Air District comment letter at pp. 2-3.

<sup>11</sup> See Air District Letter at p. 3.

<sup>12</sup> RDEIR, 4.0-57, Table 4-21.

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the environment or of the persons affected; some affected persons may be more vulnerable than the general population (such as children, the elderly, or persons whose health already is compromised). In addition, some of those affected may already be subject to higher pollution burdens and thus more sensitive to even seemingly small incremental increases in that burden. (See *Kings County Farm Bur. v. City of Hanford* (1990) 221 Cal.App.3d 692, 718.) Given that the residents of Pittsburg are already facing some of the highest pollution burdens in California, and, for example, are in the 98<sup>th</sup> percentile for emergency room visits for asthma,<sup>13</sup> the environmental document for this Project must analyze whether adding additional pollution that can contribute to the community's existing public health problems is significant.

**The RDEIR fails to consider the effects to other Bay Area communities of refining the new crudes.**

One of the stated, central purposes of the Project is to replace California and Alaska crude stocks, whose volumes are declining, with new sources of crude oil. (RDEIR at pp. 1.0-2, 1.0-6, 1.0-9.) The RDEIR fails, however, to consider any impacts that may be experienced in the communities receiving and refining the new, high-volume deliveries of unidentified crude.

To comply with CEQA, the environmental document for this Project must evaluate whether there is the potential for new or increased impacts to the communities where the crude oil will be refined due to changes in delivered volume or in the composition of the crude. If, for example, the incoming crude oil requires more energy to refine it, or contains different or higher levels of contaminants than the current mix, there may be higher levels of emissions around the receiving refineries. Such impacts would constitute a "reasonably foreseeable indirect physical change in the environment which may be caused by the project. (See Cal. Code Regs., tit. 14, § 15064; *Muzzy Ranch Co. v. Solano County Airport Land Use Com.* (2007) 41 Cal. 4<sup>th</sup> 372, 387.) The fact that these indirect impacts will be experienced some distance from the Project's footprint is irrelevant. Indeed, "the purpose of CEQA would be undermined if the appropriate governmental agencies went forward without an awareness of the effects a project will have on areas outside of the boundaries of the project area." (*Napa Citizens for Honest Government v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4<sup>th</sup> 342, 369.)

**The RDEIR fails to analyze feasible mitigation that could reduce local air quality impacts.**

Under CEQA, "public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects...." (Pub. Resources Code, § 21002; *Mountain Lion Foundation v. Fish and Game Com.* (1997) 16 Cal.4<sup>th</sup> 105, 134.) By the RDEIR's own estimates,<sup>14</sup> localized air emissions from both construction and direct operations will exceed the Air District's significance thresholds for nitrogen oxides and organic compounds that result in smog. But the RDEIR's proposed mitigation measures fall far short.

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<sup>13</sup> See CalEnviroScreen, <http://oehha.ca.gov/ej/ces11.html>.

<sup>14</sup> As noted above, the RDEIR may substantially underestimate local air emissions.

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The RDEIR proposes to “offset” certain aspects of the Project’s local air pollution by buying or using credits previously earned for reducing emissions elsewhere (emissions reduction credits) rather than implementing on-site mitigation measures. While offsets might reduce air pollution in California or the general region (depending on where actual reductions take place), they will not reduce the localized air pollution impacts in the community where the Project is located. Stated simply, the mitigation does not match the impact. To address the specific local impacts identified, CEQA requires that the RDEIR analyze – and the Project should be required to achieve – all feasible emission reductions of localized air pollutant on-site first.

For instance, on-site mitigation could include requiring dock electrification (which can reduce emissions from marine vessels running their auxiliary engines), minimizing the idling time of diesel-powered construction equipment, prohibiting diesel generators where access to the electrical grid is available, and requiring all equipment meet at least the Tier II engine standard or be fitted with diesel particulate filters if Tier II engines are not available. Additional components of the Project, including the rail elements, could be electrified, and there may be additional process efficiencies that should be considered. The City should also consider whether creating a buffer around the Project, planting vegetation or creating other physical screens, or subsidizing the installation of air filters in the community could reduce air impacts. Further, the City should develop its suite of feasible mitigation measures in a process that is accessible to the public and the affected community. “Fundamentally, the development of mitigation measures, as envisioned by CEQA, is not meant to be a bilateral negotiation between a project proponent and the lead agency after project approval; but rather, an open process that also involves other interested agencies and the public.” (*Communities for a Better Environment, supra*, 184 Cal.App.4th at p. 93.)

**The RDEIR fails to adequately disclose and address the risk of accidents that could result from transportation, storage, and refining of the new crudes.**

The RDEIR states that the Project’s potential to “[c]reate a hazard to the public or environment through reasonably foreseeable upset or accident conditions involving the release of a hazardous material to the environment” is “[s]ignificant and unavoidable.”<sup>15</sup> This conclusion requires that the City discuss the risk in order to fashion appropriate mitigation measures to reduce the likelihood of accident in all phases of the operation, and increase the probability of an effective response should an accident occur. The RDEIR fails on both counts.

Because the RDEIR fails to identify the types of crude oil that will be handled at the facility, it necessarily also fails to identify the varied risks associated with transporting, storing, and refining these crudes. For instance, higher acid and/or sulfur content in a crude may increase the risk of corrosion to refinery equipment and pipes, which in turn can lead to leaks, explosion or fire.<sup>16</sup> Further, crudes and crude mixtures with a lower flash point present a greater risk of

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<sup>15</sup> RDEIR 10.0-31.

<sup>16</sup> Pipe corrosion contributed to the August 6, 2012 explosion and fire at Chevron’s Richmond refinery. See <http://www.dir.ca.gov/DIRNews/2013/IR2013-06.html>. Further, the Federal Railroad Administration has expressed concern about an increasing number of severe corrosion incidents and has noted that “[a] possible cause is contamination of the crude oil by materials

(continued...)

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explosion and fire<sup>17</sup> And certain types of crudes can be more challenging to contain and clean up in the event of an accidental release.<sup>18</sup> The National Oceanographic and Atmospheric Administration notes that “knowledge about the chemical properties and behavior of tar sands products during a marine spill is limited” and that “[t]hese gaps in information make effective spill planning and response more difficult ....”<sup>19</sup>

To ensure that the Project’s risks are adequately disclosed and that there is sufficient information to design tailored mitigation and accident response plans, the EIR for this Project must provide additional, detailed information about the new sources of crude, their chemical compositions, and the risks associated with their transportation, storage, and refining.

In addition, as of the date of the RDEIR, it appears that the City had failed to engage key agencies that will have essential roles in the event of an accident or threat of release. For example, the RDEIR states that the facility will not require any extra fire services and that the Contra Costa County Fire Protection District (“Fire District”) is fully capable of providing any required emergency services.<sup>20</sup> The Fire District, however, submitted a comment letter stating that it does not have an adequate number of personnel to properly respond to a fire incident at this facility or the necessary equipment/material such as industrial foam firefighting apparatus to handle a large-scale fire.<sup>21</sup> Moreover, there is nothing in the RDEIR demonstrating that the Project applicant or the City has actively engaged the California Department of Fish and Wildlife’s Office of Spill Prevention and Response (OSPR), the State’s lead agency for marine and off-highway oil spill prevention, response, and natural resource restoration, to ensure that OSPR has all the information it requires and is prepared and able to respond in case of a spill related to the Project.

Before this Project is approved, to ensure a full disclosure of the Project’s risks and an adequate analysis of specific, enforceable mitigation, the City and WesPac must work with all

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*(... continued)*

used in the fracturing process that are corrosive to the [rail] tank car tank and service equipment.” See <http://www.fra.dot.gov/eLib/details/L04717>.

<sup>17</sup> See <http://www.tsb.gc.ca/eng/medias-media/communiques/rail/2013/r13d0054-20130911.asp> (Canadian Transportation Board analysis of July 6, 2013 derailment and explosion in Lac-Mégantic, Quebec).

<sup>18</sup> A 2010 pipeline leak near Marshall, Michigan released an estimated at 843,000 gallons of tar sands oil. Substantial amounts of the oil remain on the river bottom to this day, and cleanup continues. See <http://www.epa.gov/enbridgespill/>.

<sup>19</sup> <http://response.restoration.noaa.gov/about/media/what-are-increased-risks-transporting-tar-sands-oil.html>.

<sup>20</sup> RDEIR at pp. 10.0-62-63.

<sup>21</sup> Troublingly, it appears that the RDEIR does not examine the adequacy of response to certain large-scale incidents that, while they may have a low probability, could have catastrophic consequences. For example, it does not consider the possibility of a major release with fire, a complete tank failure, or a rail spill that involves more than one rail car. RDEIR at pp. 10.0-41-42; 10.0-55-56; 10.0-61. Without explanation, it also fails to consider the possibility of derailment outside of Contra Costa County. RDEIR at p. 10.0-56.

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relevant response agencies, including those listed above, to develop a detailed, enforceable, and fully funded response plan for its facility and other areas where crude could be released.

**The RDEIR fails to fully disclose and consider mitigation for the Project's climate change-related impacts.**

The RDEIR calculates the Project's greenhouse gas emissions at over 35,000 metric tons per year, concludes that the Project's climate change impacts are significant, and summarily asserts that *no* mitigation measures are available to reduce the GHG emissions from the Project. The RDEIR does not explain why no mitigation measures are available or even what mitigation measures were considered and rejected. There are a number of problems with the RDEIR's analysis.

The Project may substantially underestimate greenhouse gas emissions by not, for example, basing calculations on the expected crude mix<sup>22</sup> and on the current and projected fleets for barges, ships, ground equipment and rail. In addition, it is unclear why the RDEIR considers greenhouse gas emissions for rail operations only within Contra Costa County, and considers only those emissions from marine tankers that occur within 54 nautical miles of the Project.<sup>23</sup> Unlike localized air emissions, greenhouse gases are global pollutants that have effects worldwide and in California regardless of where the emissions occur. If the Project is causing new rail and vessel traffic resulting in additional greenhouse gas emissions, this would appear to be a growth-inducing aspect of the Project that should at the very least be disclosed in the document.

The RDEIR also errs in jumping to the conclusion that the Project's impacts related to climate change are significant and unavoidable, without conducting the analysis of *why* this is the case. (*Keep Berkeley Jets Over the Bay Com. v. Board of Port Comrs.* (2001) 91 Cal.App.4th 1344, 1371 [holding that "simply labeling the impact 'significant' without accompanying analysis" violates "the environmental assessment requirements of CEQA."]) For this particular long-term infrastructure investment Project, the question of the Project's significance may turn less on the precise volume of greenhouse gases that will be emitted, and more on how the Project is or is not consistent with the State's energy and climate objectives.

The RDEIR states that the Project is needed to ensure reliable sources of transportation fuels for California, citing the California Energy Commission's 2009 Integrated Energy Policy Report, and asserts that demands for crude oil in California are increasing as a result of increasing vehicle miles traveled. (RDEIR at pp. 1.0-3, 1.0-6.) But the 2009 report, based on 2008 data, is significantly outdated. The California Energy Commission published a superseding 2011 Energy Policy Report and a 2012 update, and recently issued its final 2013 Integrated Energy Policy Report. These more recent documents show that conditions relating to traditional vehicle fuels have changed substantially in recent years, due in part to policies and laws designed

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<sup>22</sup> See Congressional Reporting Service, Canadian Oil Sands: Life-Cycle Assessments of Greenhouse Gas Emissions, Richard K. Lattanzio (March 15, 2013), Summary, available at [www.fas.org/sgp/crs/misc/R42537.pdf](http://www.fas.org/sgp/crs/misc/R42537.pdf).

<sup>23</sup> RDEIR at pp. 5.0-10; 4.0-36.

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to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and GHG emissions from the transportation sector, and reduce vehicle miles traveled.<sup>24</sup>

The RDEIR also fails to note and address the numerous state laws and policies specifically designed to reduce the need for conventional, high-carbon transportation fuels. These include California's Low Carbon Fuel Standard Program, its Zero Emission Vehicle Program, and the Sustainable Communities Strategies Act (SB 375), whose purpose is to reduce vehicle miles traveled. It is the State's goal to "transform[ ] personal transportation so that virtually all vehicles in the state are zero-emission by 2050, and ultimately reducing transportation sector greenhouse gas emissions by 80 percent below 1990 levels."<sup>25</sup> The revised EIR should include evidence and analysis addressing whether and how this Project meets any interim need as the State transitions to low- and zero-carbon transportation fuels and to renewable energy sources – changes that are essential to meeting of the State's objective to reduce California's greenhouse gas emissions to 80% below their 1990 levels by 2050 in order to reduce the risk of dangerous climate change.<sup>26</sup>

In addition, it is simply not plausible that there are *no* feasible mitigation measures that could reduce the Project's greenhouse gas emissions. The CEQA Guidelines set out examples of potential measures, including off-site mitigation<sup>27</sup> and energy conservation. (Cal. Code Regs., tit. 14, § 15126.4, subd. (c); see also Appendix F to the CEQA Guidelines, addressing energy conservation.) In addition, the document should discuss the possibility of requiring minimum standards for the marine vessels and rail engines servicing the Project, dock electrification, and potential electrification of other aspects of the Project that could reduce the use of fuels with higher carbon intensities. The Final EIR must consider these and any other feasible mitigation measures that could apply to this Project.

**The RDEIR fails to consider a reasonable range of feasible alternatives that could reduce the Project's significant impacts.**

One of the "core" requirements of an EIR is an adequate consideration of alternatives. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564.) Under CEQA, an EIR must "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." (Cal. Code Regs., tit. 14, § 15126.6, subd. (a).)

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<sup>24</sup> 2013 Integrated Energy Policy Report - Final Lead Commissioner Report, available at [http://www.energy.ca.gov/2013\\_energypolicy/](http://www.energy.ca.gov/2013_energypolicy/). See, e.g., *id.* at pp. 192 and 229.

<sup>25</sup> California Energy Commission, Integrated Energy Policy Report, 2012 Update, at p. 61, available at [http://www.energy.ca.gov/2012\\_energypolicy/index.html](http://www.energy.ca.gov/2012_energypolicy/index.html).

<sup>26</sup> This deficiency is also present in the RDEIR's statement of "Purpose and Need" beginning at p. 1.0-6.

<sup>27</sup> Off-site mitigation for greenhouse gas emissions may be appropriate where reductions outside the facility can reduce climate change impacts as effectively as on-site mitigation.

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The RDEIR is fundamentally defective because it considered only *one* action alternative: a version of the Project that reduces storage capacity by 18%. (The reduced capacity alternative would create a slight buffer zone between single family residences adjacent to some of the storage tanks but is otherwise very similar to the proposed Project.) There are other feasible alternatives that the City could have considered. For example, the City summarily rejected an alternative that would utilize docks and storage tanks at existing refineries. It cited the 2009 California Energy Commission report, which the City believes supports its view that existing “facilities are currently at or near capacity, resulting in a need for additional marine terminal and storage capacity infrastructure.”<sup>28</sup> Based on current trends, however, it is possible that there is sufficient infrastructure to meet the State’s need for imported oil; if this is the case, then smaller, dispersed upgrades to existing facilities in the Bay Area and elsewhere could in fact be sufficient. Another alternative might be to remove the Project’s rail terminal component (which was only recently added) and rely on an electrified marine terminal and pipelines. In a revised document, the City must consider a full range of alternatives that could meet most of the Project’s objectives.

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<sup>28</sup> RDEIR at 2.0-138.

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**Conclusion**

We urge the City of Pittsburg to substantially revise the environmental document for this Project so that it will fully inform the public and the City Council of the impacts of this Project to the residents of Pittsburg, to the other Bay Area communities that will refine the incoming crude, and to the State as we transition to a low-carbon economy and make long-term infrastructure investments.

We appreciate your consideration and would be happy to answer any question you might have about our comments.

Sincerely,

/s/

JANILL L. RICHARDS  
Supervising Deputy Attorney General  
ROSE B. FUA  
Deputy Attorney General

For KAMALA D. HARRIS  
Attorney General

cc: Ken Alex, Director, Governor's Office of Planning and Research  
Thomas Gibson, General Counsel, Department of Fish and Wildlife  
Michael Levy, Chief Council, California Energy Commission



## **Attachment 3**



EDMUND G. BROWN JR.  
GOVERNOR

STATE OF CALIFORNIA  
GOVERNOR'S OFFICE OF PLANNING AND RESEARCH



KEN ALEX  
DIRECTOR

December 3, 2013

Kristin Pollot, Associate Planner  
City of Pittsburg, Planning Department  
65 Civic Avenue  
Pittsburg, CA 94565  
[kpollot@ci.pittsburg.ca.us](mailto:kpollot@ci.pittsburg.ca.us)

Re: WesPac Pittsburg Energy Infrastructure Project, Tar Sands

Dear Ms. Pollot:

The public comment period for the Recirculated Draft Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project closed on September 13, 2013. We apologize for missing that deadline, but ask that this letter be included in the record before the City Council at the time the WesPac project comes before the Council.

The Governor's Office of Planning and Research (OPR) is California's comprehensive state planning agency and serves the Governor and his Cabinet as staff for long-range planning and research. The RDEIR includes the following information:

1. WesPac proposes to modernize and reactivate the existing oil storage and transfer facilities located at the NRG Energy, Inc. Pittsburg Generating Station. The proposed Terminal "would be designed to receive crude oil and partially refined crude oil from trains, marine vessels, and pipelines, store oil in existing or new storage tanks, and then transfer oil to nearby refineries."
2. The total annual throughput for the Terminal would be approximately 88.3 million barrels of crude oil or partially refined crude oil per year.

The WesPac project may impact planning for greenhouse gas emission reduction and infrastructure and is therefore of interest to OPR. As a result, we pose three straight-forward questions that we believe should be answered in the course of review of the project:

1. Can the WesPac project receive, store, or transfer crude oil or partially refined crude oil from tar sands?
2. What are the anticipated sources of crude oil or partially refined crude oil that WesPac will receive, store, or transfer?
3. If the anticipated sources of crude change, who makes that decision, and if the crude mix change results in increased environmental impacts, how will those impacts be addressed?

**APPENDIX G1: RESPONSE TO COMMENTS**

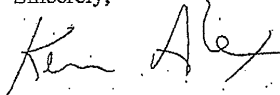
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Kristin Pollot, Associate Planner

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Many thanks for your consideration of these issues.

Sincerely,



Ken Alex  
Director

Cc Members of the Pittsburg City Council

## ATTACHMENT B

**Comments**  
**on the**  
**Draft Environmental Impact Report (DEIR)**  
**for the**  
**Tesoro Los Angeles Refinery**  
**Integration and Compliance Project**  
**Los Angeles, California**

June 10, 2016

Phyllis Fox, Ph.D., PE  
745 White Pine Ave.  
Rockledge, FL32955  
phyllisfox@gmail.com  
321-626-6885

I. INTRODUCTION, SUMMARY AND CONCLUSIONS

I have reviewed the Draft Environmental Impact Report (DEIR) for the Tesoro Los Angeles Refinery Integration and Compliance Project (Project).<sup>1</sup> This Project will allow Tesoro to integrate the operation of two adjacent refineries, the Carson Operations and the Wilmington Operations, into a single refinery, the Los Angeles Refinery.

Based on my review, I conclude this DEIR is fundamentally defective in that it omits crucial information required to understand the Project's significant impacts, omits many significant impacts, and underestimates impacts that were included, as follows:

- The DEIR fails to analyze the air quality and other impacts from refining a different crude slate than in the baseline;
- The Project is piecemealed;
- The DEIR reports the capacity of the Los Angeles Refinery as 363,000 bbl/day, but fails to disclose baseline throughput. Tesoro's most recent SEC 10K filing indicates that the Refinery achieved 363,000 bbl/day in 2015 and that the design capacity of the refinery is 380,000 bbl/day. Thus, the Project could increase throughput by up to 17,000 bbl/day or double the amount claimed in the DEIR;
- The DEIR fails to acknowledge the increase in marine vessel emissions, which are significant;
- The DEIR incorrectly calculated the increase in heater emissions from increased firing rates, resulting in a significant underestimate of toxic air pollutants and criteria pollutants. When these errors are corrected, the increase in NOx emissions from increases in heater firing rates results in a significant and unmitigated NOx impact.
- Emission reductions from the shutdown of the Wilmington FCCU are unsupported and improperly calculated.

G1-78.92

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<sup>1</sup> Environmental Audit, Inc., Tesoro Los Angeles Refinery Integration and Compliance Project, Draft Environmental Impact Report, Submitted to: South Coast Air Quality Management District, SCH No. 2014091020, March 2016; Available at: <http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects>. The Tesoro Los Angeles Refinery Integration and Compliance Project is sometimes referred to as the LARIC Project, notably in DEIR, p. 2-20 and Appendix. F.

- Greenhouse gas emissions from crude and LPG transport to/from the refinery as well as from advantaged crude production were omitted from the emission inventory, would increase, and are significant;
- Flaring emissions were omitted and, combined with other omitted emission sources, are significant;
- Operational VOC emissions from fired sources are underestimated and are significant;
- Cancer risks are significant at the MEIR, MEIW, and sensitive receptor when revised to use the crude oil benzene concentration disclosed in the new tank applications;
- Storage tank VOC emissions are underestimated and are significant;
- Impacts from accidents were underestimated and are significant;
- All feasible mitigation was not required for identified significant accident impacts;
- Construction emissions are significant and all feasible mitigation was not required; and
- Health effects of construction were not evaluated.

Specifically, the DEIR does not disclose the Project's baseline and post-project crude slate, relies on flawed analyses in addressing whether the Project would enable refining of substantial quantities of Bakken crudes and tar sands, relies on unsupported assumptions as to the Project's light crude composition, and underestimates the Project's operational emissions of volatile organic compounds (VOCs), nitrogen oxides (NOx), and toxic air contaminants (TACs). When these underestimates are corrected, the Project results in significant air quality and public health impacts. The emission increase calculations are unsupported, because Tesoro has claimed key emission input data as confidential business information. The District must correct these defects and recirculate the DEIR, so that the public and decision-makers can be fully informed of the Project's air quality, public health, and safety impacts.

My resume is included in Exhibit 1 to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas (GHG) emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports, including CEQA/NEPA documentation; risk assessments; and litigation support.

G1-78.92  
cont'd.

G1-78.93

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical) in California and a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 CEQA documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries; crude oil rail terminals in California, Louisiana, Oregon, New York, Texas, and Washington; and various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, New York, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York. I worked on environmental issues at the Wilmington Refinery for a previous owner of the refinery.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310.

My comments on the FEIR were prepared with assistance from Ian Goodman on crude supply for the Tesoro Los Angeles Refinery.<sup>2</sup>

## II. THE DEIR FAILS TO ANALYZE THE AIR QUALITY AND OTHER IMPACTS FROM REFINING DIFFERENT TYPES OF CRUDE

The DEIR has failed to disclose any information about the crudes that were refined in the baseline and crudes that will be refined after the Project is operational. The source of, and chemical and physical composition of, the individual crude oils that have been and will be refined are essential to determine numerous impacts, including air quality, public health, odor, and consequences of accidents. The DEIR, for example, explains that the "hazards [from accidents] that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions."<sup>3</sup> In spite of this clear recognition of the importance of the physical and

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<sup>2</sup> Ian Goodman testimony regarding the Vancouver Energy Terminal (VET), a major source of future crude supply for the Tesoro Los Angeles Refinery: Ian Goodman Direct Testimony, Washington Energy Facility Siting Evaluation Council, Case No. 15-001, May 12, 2016, Exhibit 27. Ian Goodman Resume, Exhibit 27, pdf 65-93, also available at <http://www.thegoodman.com/pdf/TGG20160122IanGoodmanCV.pdf>.

<sup>3</sup> DEIR, p. 1-27.

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G1-78.94



chemical properties of the materials being handled (e.g., crude oil and intermediate refining streams), the DEIR asserts that all of this information is confidential business information (CBI).

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In the baseline, 2012 and 2013, crude oil from California, the Alaska North Slope, and foreign imports were refined. The Project would displace some of these imports with Bakken, other light crudes, and tar sands crudes, imported from proposed terminals and/or existing terminals.

G1-78.95

Tesoro, in a joint venture with Savage Companies, is proposing a new 360,000 bbl/day rail-to-marine terminal at the Port of Vancouver in Washington (Vancouver Energy Terminal or VET). The VET would receive Bakken and tar sands crudes<sup>4</sup> by rail and then transport the crudes by marine vessel to Tesoro's California refineries and other west coast refineries. The VET DEIS, for example, in the accidents and oil spills analyses, assumes Bakken crude oil and diluted bitumen (DilBit), a Canadian tar sands crude, would be handled.<sup>5</sup> While other crudes could be handled by the VET, these are the most likely, given Tesoro's public statements and filings in many fora, reviewed below and proximity of the sources to the VET.

G1-78.96

Bakken is the largest and most likely source of light sweet crude as the rail haul distance between Bakken and the VET is shorter, faster, and lower cost than to other actual and potential markets for Bakken. Further, the VET DEIS assumes both Bakken and DilBit can and will be handled by the VET and analyzes impacts of both spills and accidents for both crude types.<sup>6</sup> Finally, Tesoro is heavily invested in Bakken.<sup>7</sup>

G1-78.97

<sup>4</sup> Energy Facility Site Evaluation Council (EFSEC), Tesoro Savage Vancouver Energy Project, Draft Environmental Impact Statement (VET DEIS), January 22, 2016, pp. 2-65, 2-73, 4-29/31, 5-51, Appendix B, p. 1 ("The Facility would be designed and constructed to unload Bakken crude oil, and possibly other heavier grades such as diluted bitumen crude oil, from railcars in Terminal 5."), Appendix E, p. 39, Appendix J; Available at <http://www.efsec.wa.gov/Tesoro%20Savage/SEPA%20-%20DEIS/DEIS%20PAGE.shtml>.

<sup>5</sup> VET DEIS, Tables 4-6 and 4-7 and pp. 4-33/34 (explaining that DilBit or diluted bitumen is a Canadian tar sands crude).

<sup>6</sup> VET DEIS pp. 4-29 through 31, 4-26, 5-51, 2-65, 2-73; Appendix E, p. 39; Appendix J.

<sup>7</sup> 12/9/14 Tesoro and Tesoro Logistics Analyst and Investor Day Transcript, p. 17, Exhibit 15 ("Obviously, our Bakken business, which has been the center of a lot of our growth, it's where we really work on acquisition of crude oil. We pick it up in trucks; we have gathering pipelines; we have our mainlines. We store crude; we deliver it to rail facilities and we deliver it to Tesoro's refinery...We've obviously been investing quite a lot around our Bakken system; we're investing in our West Coast system to grow our capabilities there, matched to the things Tesoro is trying to do.")

These new crudes differ chemically and physically from the current crude slate. These differences will cause environmental impacts that were not considered in the DEIR. As explained by Tesoro in its VET DEIS<sup>8</sup>:

Different crude oils exhibit a wide range of properties based on the proportions of these chemicals within them. Crude oil chemical composition influences fate and transport in the environment as well as potential toxicity to human and other biologic receptors. Important physicochemical properties of crude oil include:

- API gravity (a measure of how dense an oil is compared to water);
- Vapor pressure, which indicates how quickly the crude oil will evaporate;
- Flash point, which is the lowest temperature at which the crude oil will vaporize and ignite in air;
- Viscosity, which determines how readily the crude oil would flow when released;
- Solubility, which represents the propensity of crude oil to dissolve in water; and
- Chemical constituents present in the oil (proportion and volume).

These characteristics influence the level of evaporation or volatilization of the released liquid in the environment, its persistence in the environment, and the amount of potentially toxic material that could dissolve or disperse into the aquatic environment. For instance, if a crude oil has an API gravity greater than 10, it indicates that the oil is lighter than water and will float; conversely, a crude oil with an API gravity less than 10 will sink in water.

Instead of disclosing baseline and post-Project crude quality information and basing analyses on these changes, Tesoro asserts that there will be no change in the crude slate or crude quality. This assertion is contrary to information that Tesoro has disclosed in various presentations, earnings calls, and SEC filings. These sources, as demonstrated below, indicate that Tesoro is planning to change its crude slate, including importing significant amounts of Bakken and tar sands crudes to its Los Angeles Refinery. These crude slate changes are facilitated by the Project.

My review of the DEIR and other publicly available Tesoro information indicates that the Project is designed to achieve maximum flexibility in crude slate to reduce operating costs and maximize profits by refining the cheapest available crude. Precedent (piecemealed) projects coupled with the Integration Project allow the Refinery to process a range of crudes, from a significant amount of Bakken and other similar light crudes, to a significant amount of tar sands and other heavy crudes. The DEIR should have acknowledged this and evaluated the maximum impacts from the reasonably foreseeable slate changes, which would be encompassed by a largely Bakken slate and a largely tar sands slate.

Further, the Tesoro Los Angeles Refinery did not refine Bakken crude in the baseline and refined only very small amounts of tar sands crude in the baseline. The information reviewed below indicates that Tesoro plans to significantly increase the

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<sup>8</sup> VET DEIS, pp. 4-32/33.

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amount of Bakken and tar sands crudes that will be refined as a result of the Project. Thus, the DEIR must evaluate the environmental impacts of a crude slate change.

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cont'd.

**A. The DEIR Must Evaluate the Impacts of the Full Range of Crude Oil Types That Could Be Refined**

The DEIR fails to disclose specific crude oil sources (which determine emissions from transport) and chemical and physical composition data for materials that were refined in the baseline and that would be refined in the future by the Project.<sup>9</sup> The DEIR only reports operating ranges for sulfur and API gravity.<sup>10</sup> The full physical and chemical composition of the individual crudes that make up a crude slate and the final crude slate itself determine many environmental impacts, including air quality, public health, odor, water quality impact in the event of spills, and consequences of accidents, among others.

G1-78.100

The reported API gravity and total sulfur content of the current crude slate are just lumped parameters that are not useful for evaluating environmental impacts. The specific chemicals in the crude and their concentrations are required to evaluate impacts. This type of information is reported in a crude assay or "fingerprint" of the oil, which are available to Tesoro, and in fact, are routinely collected to evaluate any crude under consideration. Yet, this information was excluded from the DEIR, foreclosing any meaningful public review of environmental impacts.

G1-78.101

Rather, the DEIR asserts that there would be no changes because all crudes will be blended to the same API gravity and sulfur content operating range. The only mention in the DEIR of alternate crudes is a response to comment on the Storage Tank Replacement and Modification project. In response to this comment, the DEIR asserts that "[t]he Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oil, and no modifications are being proposed in the Tesoro Refinery Integration and Compliance Project that would increase the ability of the Refinery to process Bakken crude oil."<sup>11</sup> This is incorrect. The Los Angeles Refinery has processed Bakken crude oil and concluded that it is "ideal" for the refinery as it increases yields of gasoline and distillate. Further, numerous disclosures by Tesoro in other fora indicate that it plans to import both Bakken and tar sands crudes to the integrated Los Angeles Refinery.

G1-78.102

<sup>9</sup> DEIR, Appx. F, p. F-7 ("...detailed information concerning the quality and potential sources of crude oil both processed in the past and contemplated to be processed in the future at Tesoro's Los Angeles Refinery are business confidential information and therefore are not included in the EIR or this report.")

<sup>10</sup> DEIR, p. 2-16. (Acceptable ranges "for Carson Operations is an API gravity range of 28 degrees to 35 degrees and sulfur content of 0.6 to 3.5 weight percent sulfur. The basic crude oil operating envelope for the Wilmington Operations Crude Unit is an API gravity range of 19 degrees to 37 degrees and sulfur content of 0.0 to 2.5 weight percent sulfur.")

<sup>11</sup> DEIR, Appx. A, p. 4-5/6.

1. DEIR Appendix F Claims Are Incorrect

Instead of disclosing this critical information, essential to evaluate Project impacts, the District retained a “refinery expert” to buttress the claim that there would be no changes in the crude slate.<sup>12</sup> However, a “refinery expert” does not have the required expertise to opine on the relationship between crude quality and public health, air quality, risk of upset, and other environmental impacts. The information in Appendix F is irrelevant, misleading, and inconsistent with CEQA as it fails to recognize that impacts under CEQA must be determined relative to the baseline. These erroneous Appendix F arguments are carried over into the DEIR to justify not evaluating impacts due to changes in the crude slate, even though Tesoro has admitted that changes in crude slate affect environmental impacts in other fora<sup>13</sup> and has publicly disclosed its intention to change the Los Angeles Refinery crude slate.

G1-78.103

*First*, Dr. McGovern argues “the LARIC project will not change the modes by which Tesoro receives crude oil into the refinery complex. As such, the LARIC project will not allow Tesoro to access crudes that are not currently available to the refinery.”<sup>14</sup> I agree that the “modes” of crude receipt, pipeline and marine vessel, will not change. However, this is not the relevant factor under CEQA. The “availability” by mode is not the relevant factor under CEQA, but rather, the actual amount of each crude that arrived in the baseline compared to future projections. It is immaterial if it was “available” but not actually used. As demonstrated below, no Bakken and very little tar sands was refined in the baseline, 2012-2013.

G1-78.104

The Project facilitates a change in the relative amounts of crude that can be received by marine vessel compared to pipeline by significantly increasing marine terminal storage tank capacity and marine vessel unloading speed. The maximum potential increase in marine deliveries in barrels per day (and corresponding decrease in pipeline deliveries), relative to baseline deliveries, is the metric relevant for CEQA impact analyses. As demonstrated below, the Project will result in an increase in both marine vessel emissions and storage tank emissions, relative to the baseline, due to Project changes in crude slate.

*Second*, Dr. McGovern argues that “processing configurations” limit the instantaneous quality of the crude mix that can be processed.<sup>15</sup> However, blending is used at refineries to reduce concentrations of substances that cause refining issues, but

G1-78.105

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<sup>12</sup> DEIR, p. 2-20 and Appx. F.

<sup>13</sup> VET DEIS, pp. 4-32/33.

<sup>14</sup> DEIR, p. 2-20 and Appx. F, p. F-6.

<sup>15</sup> DEIR, p. 2-20 and Appx. F, p. F-6.



not environmental impacts. Further, many of the impacts of concern occur in the storage tanks and from fugitive components before the crude is blended into a “slate” in the charging tanks and reach processing units, where processing constraints come into play.

Refineries have two types of tanks: (1) storage tanks, which receive crude oil and are generally limited to a single type of crude oil and (2) charging tanks, which feed crude oil into the distillation units. Storage tanks typically hold the crude for about 24 hours to allow any water to separate. The oil is then pumped to charging tanks, where different crudes are mixed to achieve an optimal mix for the distillation tower.<sup>16</sup> The objectionable refining parameters, such as too much sulfur, are blended out in these charging tanks, but not the parameters responsible for environmental impacts. Tesoro has already installed a blending system at Carson to mitigate refining problems caused by a change in crude slate. This is one of several piecemealed projects, as discussed elsewhere in these comments.

G1-78.105  
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*Third*, the constituents in crudes that may result in environmental impacts (e.g., benzene) do not cause processing constraints and are very different from those that do cause processing problems (e.g., sulfur, waxes, naphthenic acids).

*Fourth*, Dr. McGovern asserts the crude slate (characterized by API gravity and sulfur content) will not change and thus operating emissions, criteria air pollutants, TACs, or greenhouse gas emissions, would not change.<sup>17</sup> However, there are many physical and chemical properties of the crude that are not related to API gravity and sulfur content that vary independent of these crude slate variables and can result in significant environmental impacts, but not affect refining characteristics.

G1-78.106

*Fifth*, Dr. McGovern asserts that “changes being made as a result of this project will not allow the refinery to process a different slate of crude oil.”<sup>18</sup> This is inconsistent with public statements made by Tesoro and is inconsistent with the Project description, which includes many modifications that will allow a change in crude slate, including:

(1) 3.66 million barrels of additional marine terminal storage capacity with a Reid Vapor Pressure of 10.5 psi, which is much higher than crudes received at the terminals in the baseline;

G1-78.107

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<sup>16</sup> John Kemp, Operational Constraints Limit Crude Storage at U.S. Refineries, Reuters, September 14, 2015; Available at: <http://www.reuters.com/article/us-usa-refineries-oilstorage-kemp-idUSKCN0RE17620150914>.

<sup>17</sup> DEIR, p. 2-20 and Appx. F, p. F-6.

<sup>18</sup> DEIR, p. 2-20 and Appx. F, pp. 6/7.

- (2) shutdown of the Wilmington FCCU;
- (3) recovery of propane;
- (4) a new wet jet treater to remove mercaptans and reduce total acid number;
- (5) increase in capacity of units that process light process streams including the No. 51 Vacuum Unit and HTU-1, -2, and -4; and
- (6) increased firing rates of various heaters, among others.

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These changes will allow the integrated refinery to import and process significant amounts of very light crude oils, such as Bakken crudes, as well as Canadian tar sands crudes and blends of these two. These crudes have chemical characteristics that set them apart from the crude slate currently refined, even though they may be blended to the same general range of sulfur and API gravity in the crude slates charged to the distillation units.

## 2. API Gravity And Sulfur Content Do Not Determine Environmental Impacts

The DEIR asserts that the Refinery is not making any equipment modifications that would allow it to receive crude oils that cannot be blended to the same API gravity and sulfur content parameters than it currently receives.<sup>19</sup> The DEIR further asserts that the crude "slate" will not change, where "slate" is defined as "a list of potential crude oils that the refinery can choose to purchase and be delivered as input to the refinery or it can refer to the blend of crude oils actually purchased and processed in a refinery."<sup>20</sup>

These assertions are incorrect and side step the issue of the impact of individual crudes in the slate on environmental impacts both before they are blended (e.g., from tanks and fugitive components) and after they are blended, during refining. These impacts are discussed below for the two most likely imports, Bakken and other light domestic crudes (Comment II.B) and tar sands crudes (Comment II.C). This section discusses why changes to crude slate that do not alter the API gravity and sulfur content of crude oil can still result in crude-related environmental impacts.

G1-78.108

There are important differences between crudes that are not related to the API gravity and total sulfur content that are not considered in blending crudes and that can result in adverse environmental impacts. Even if the weight and sulfur content of a

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<sup>19</sup> DEIR, p. 4-6; Appx. F.

<sup>20</sup> DEIR, Appx. F, p. F-5.

particular crude blend fall within the range specified in the DEIR, or don't change at all, other components in the crude, such as toxic air contaminants, like benzene, or highly malodorous (and toxic) compounds such as mercaptans, may be present at much higher concentrations than in the crudes they replace with identical sulfur and API gravity. Further, blending does not eliminate these issues.

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*a. Blending Does Not Address Impacts that Occur Prior to Blending*

The individual crudes that make up a "slate" are typically transported and stored as single components before blending occurs.<sup>21</sup> The "storage tanks," for example, typically contain only one type of crude. The unloading, transport, and storage of individual crudes emit VOCs and TACs at unloading racks, tanks, and from fugitive components, such as pumps, compressors, and valves before any blending occurs. Blending does not eliminate these impacts. Thus, while the blended crude slate or the "average" crude may remain within baseline sulfur and API gravity bounds, the individual crudes in the blend arrive and are stored separately and thus may have different environmental impacts. Impacts that occur before blending obviously would not be eliminated by blending.

G1-78.109

*b. Blending Does Not Address Environmentally Important Chemicals*

The environmental impacts of a crude slate depend upon the specific chemicals in the slate and their concentrations, not gross lumpsum parameters such as total sulfur and API gravity. The specific chemicals in a slate are not a function of the API gravity or the sulfur content, but rather depend upon chemical and physical characteristics of the individual crudes in the blend. The chemical and physical characteristics that are relevant for environmental impacts – VOC, TACs, sulfur species, volatility, flammability – are not related to total sulfur and API gravity. Total sulfur, one of the two metrics relied on by Dr. McGovern, is a good example.

G1-78.110

*c. Total Sulfur Does Not Address Impacts of Individual Sulfur Compounds*

Sulfur is not simply sulfur, but is made up of a complex collection of individual chemical compounds such as hydrogen sulfide, mercaptans, thiophene, benzothiophene, methyl sulfonic acid, dimethyl sulfone, thiacyclohexane, etc. Each crude has a different suite of individual sulfur compounds. And each sulfur compound results in different environmental impacts at different concentrations.

G1-78.111

<sup>21</sup> Some blending could occur at the VET, which is equipped to blend crudes before they are transferred to marine vessels.

The impacts of "sulfur" depend upon the specific sulfur chemicals and their relative concentrations, not on the range of the "gross" amount of total sulfur expressed as weight percent sulfur, as argued in DEIR Appendix F. The fact that the range in the total sulfur content of crude that would be refined by the Project and the current crude slate may be the same<sup>22</sup> is irrelevant.

The role of the specific sulfur compounds, for example, was clearly and tragically demonstrated in the August 2012 catastrophic accident at the Chevron Richmond Refinery. This accident was caused by the erroneous assumption that sulfur is sulfur, which led to significant corrosion. Similarly, while the lighter sulfur compounds such as mercaptans and disulfides found in light sweet crudes may not significantly increase the overall weight percent sulfur in the crude slate, they do lead to impacts, such as aggressive sulfidation corrosion, which can lead to accidental releases. These compounds concentrate in the lower boiling naphtha fraction and contribute to aggressive sulfidation corrosion in the convection section of naphtha hydrotreating furnaces.<sup>23</sup> The DEIR did not evaluate these impacts.

G1-78.111  
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Odor impacts are another example of the importance of considering the specific sulfur compounds. Sulfur compounds, such as mercaptans and sulfides, are highly odiferous. Different crudes have different mixtures of sulfur compounds. The NOP/IS concluded odor impacts were less than significant because the Project would not modify units handling hydrogen sulfide.<sup>24</sup> Thus, the DEIR did not even consider odor impacts.

However, odor impacts originate from a complex mixture of sulfur compounds in the crude oil, which vary from crude to crude. These compounds are emitted from storage tanks and fugitive components, which will be modified by the Project. Thus, a change in crude slate, which is facilitated by the Project (by expanding crude storage at the terminals and other Project changes), will alter the suite of sulfur compounds present in emissions from tanks, fugitive components and vents throughout the refinery, even if they are not physically modified by the Project. This could result in significant odor and/or health impacts at sensitive receptors near the storage tanks.

G1-78.112

Sulfur compounds also include many that are toxic. However, the health risk assessment only evaluated hydrogen sulfide and omitted many other highly toxic sulfur compounds, such as the mercaptans. Mercaptans, which are both toxic and highly

G1-78.113

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<sup>22</sup> The DEIR has not demonstrated that the sulfur content of crudes imported to support the Project will be the same as the current crude slate at Carson and Wilmington Operations.

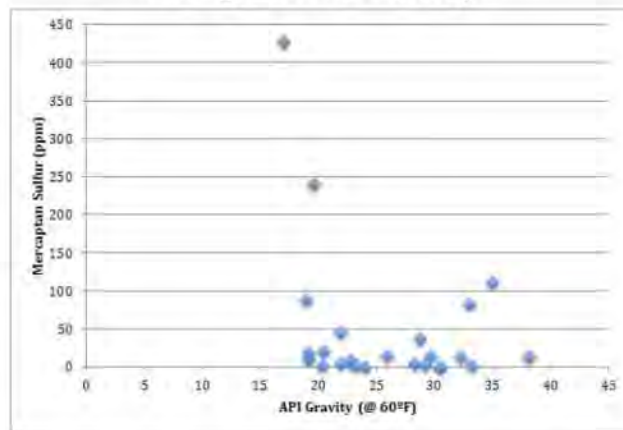
<sup>23</sup> See, for example, Jim McLaughlin, Changing Your Crude Slate, Becht News, May 24, 2013, Available at <http://becht.com/news/becht-news/>.

<sup>24</sup> DEIR, Appx. A, p. A-128.



odiferous, is a good example of why total sulfur cannot be relied on to assure a crude switch will not result in environmental impacts. Figures 1 and 2, using mercaptan data from Tesoro Logistic's Marine Terminal Agreement,<sup>25</sup> show that there is no relationship between API gravity or sulfur content and the concentration of mercaptans.

Figure 1.  
Mercaptans vs. API Gravity<sup>26</sup>



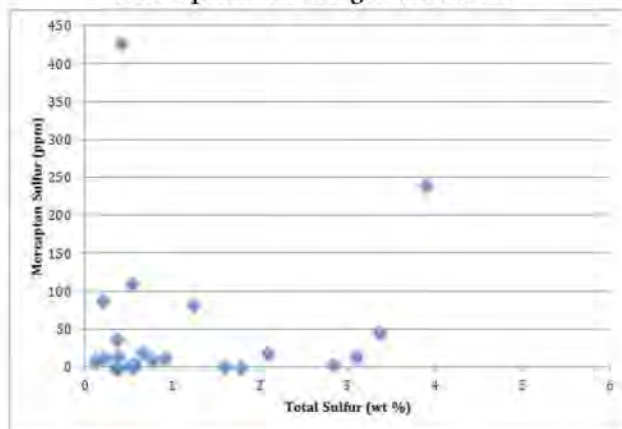
G1-78.113  
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<sup>25</sup> Long Beach Berth Access, Use and Throughput Agreement (Marine Terminal Agreement), Annex D; Available at: <http://www.sec.gov/Archives/edgar/data/1507615/000119312512392849/d412286dex105.htm>.

<sup>26</sup> Marine Terminal Agreement, Annex D.

Figure 2.  
Mercaptans vs. Weight % Sulfur<sup>27</sup>



G1-78.113  
cont'd.

*d. API Gravity and Sulfur Do Not Address the Impacts Due to Vapor Pressure Changes*

Vapor pressure is important because it determines the amount of VOC and TAC emissions from sources such as marine terminal unloading, tanks, and fugitive components, e.g., pumps, valves, flanges. However, as discussed below, it is not related to either API gravity or sulfur content of the crude.

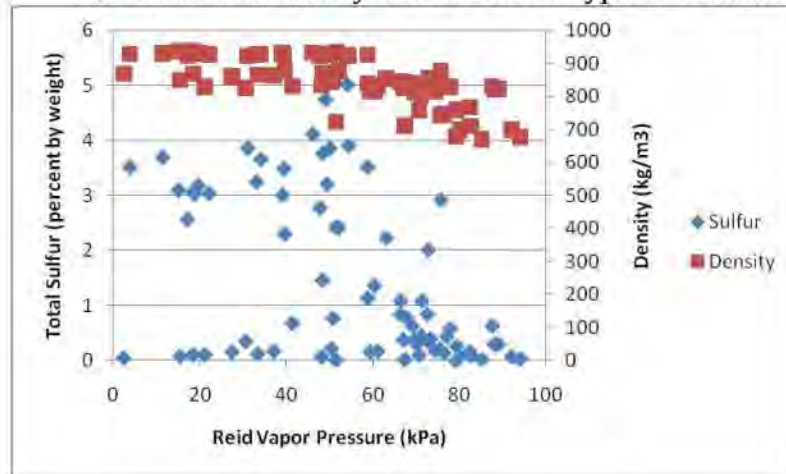
G1-78.114

The DEIR's consultant, Dr. McGovern, demonstrated there is no relationship between vapor pressure (expressed as RVP) and crude gravity (expressed as API Gravity).<sup>28</sup> This is further substantiated by my analysis of data published by Enbridge, summarized here in Figure 3. The Enbridge data covering 76 different types of crude oil show that crude oil attributes of sulfur content and density are completely independent of vapor pressure (and thus VOC and TACs).

<sup>27</sup> *Ibid.*

<sup>28</sup> DEIR, Appendix F, Figure 7.

Figure 3. Reid Vapor Pressure Compared to Total Sulfur and Density for 76 Different Types of Crude Oil<sup>29</sup>



G1-78.114  
cont'd.

However, in spite of the lack of a relationship, Dr. McGovern concludes that “there is no valid reason to believe that the crudes that arrive after the LARIC project will be higher volatility than those currently processed.”<sup>30</sup> This is wrong. The vapor pressure used to estimate VOC emissions from the tanks are much higher than the tanks they will replace or supplement. As demonstrated in Comment II.A.2.d, the Project will increase the throughput of 11 psi crude by a factor of 8 at Wilmington and by a factor of 7 at Carson. Further, the Marine Terminal Agreement, Annex D, indicates that the new tank vapor pressure limits are substantially higher than any crude oil imported at the terminal in the baseline.

The admitted absence of any relationship between vapor pressure and API gravity is substantial evidence that running a crude slate with an API gravity and sulfur content that falls within the historic ranges will not prevent environmental impacts from a crude slate change due to higher crude vapor pressure.

G1-78.115

The vapor pressure of crude determines to a large extent the amount of VOC and TAC emissions that are emitted when it is transported, stored, and refined. Thus, a crude slate may have identical sulfur content and API gravity, but would result in dramatically different VOC and TAC emissions if vapor pressures differed. The high vapor pressure limit for the proposed new storage tanks, which is much higher than crudes that were unloaded and stored in the baseline, presages a change in crude slate

G1-78.116

<sup>29</sup> Enbridge Pipelines Inc., 2013 Crude Characteristics, Available at: <http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf>.

<sup>30</sup> DEIR, Appendix F, p. F-25.



that will include more light volatile crudes than in the baseline, thus increasing VOC and TAC emissions.

G1-78.116  
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Vapor pressure is measured in pounds per square inch (psi) and is typically reported as either True Vapor Pressure (TVP) or Reid Vapor Pressure (RVP).<sup>31</sup> The TVP is usually higher than RVP for light gassy shale crudes. Vapor pressure is an indirect measure of the evaporation rate of volatile compounds in the crude oil, with higher vapor pressures indicating greater losses of VOC and TACs from evaporation. The DEIR neglected to disclose the well-known relationship between the vapor pressure of a crude oil and the amount of emissions released from equipment containing the crude.<sup>32</sup>

G1-78.117

The volatility and chemical speciation information for individual crudes, required to evaluate a crude switch, from ANS, foreign imports and California crudes to a Bakken/tar sands or other blend, is completely absent from the DEIR. Vapor pressure and crude TAC speciation information are not confidential and are routinely included in public documents to support tank and fugitive emission calculations. Further, crude assay data is widely reported.<sup>33</sup> See, for example, the Tesoro VET Application<sup>34</sup> and VET DEIS.<sup>35</sup>

G1-78.118

*e. API Gravity and Sulfur Do Not Address Thermal Radiation Hazards*

The thermal radiation hazards from hydrocarbon pool and other types of fires, which were evaluated in the DEIR, depend on a number of parameters not related to API gravity and sulfur, including the composition of the hydrocarbon mixture. The DEIR did not disclose any of its assumptions as to the composition of materials involved in accidents,<sup>36</sup> preventing any meaningful review.

G1-78.119

<sup>31</sup> Measured by American Society for Testing and Materials Method ASTM D323-08, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method) is used to determine the vapor pressure at 100 F with initial boiling point above 32 F.

<sup>32</sup> See AP-42, Section 7.1: Organic Liquid Storage Tanks.

<sup>33</sup> Jeff Thompson, Public Crude Assay Websites, February 24, 2011. [http://www.coqa-inc.org/docs/default-source/meeting-presentations/20110224\\_Thompson\\_Jeff.pdf](http://www.coqa-inc.org/docs/default-source/meeting-presentations/20110224_Thompson_Jeff.pdf).

<sup>34</sup> Tesoro Savage, Application for Site Certification Agreement (VET Application), vol. 1, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf> and vol. 2, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf>.

<sup>35</sup> VET DEIS, Appendix J.

<sup>36</sup> DEIR, Appendix C.

*f. API Gravity and Sulfur Do Not Address Parameter Creep*

The rationale that sulfur levels and API gravity of the crude slate would stay within a narrow range ignores the possibility of gradual creep within that range that could still be significant. This recently occurred at the Chevron Richmond Refinery. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit.<sup>37</sup> This change increased corrosion rates in the 4-sidecut line, which led to a catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This accident sent 15,000 people from the surrounding area for medical treatment due to the release and resulting fire that created huge black clouds of pollution over the surrounding community.<sup>38</sup>

G1-78.120

These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Los Angeles Refinery crude slate, even if the range of sulfur and gravity of the crudes remain the same. These crudes have a significant concentrations of sulfur in the heavy components of the crude coupled with high total acid number (TAN) and high solids, which aggravate corrosion. Avoiding these impacts would require significant upgrades in metallurgy, which are not proposed. The gas oil and vacuum resid piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from tar sands crudes, leading to catastrophic releases.<sup>39</sup> Catastrophic releases of air pollution from these types of accidents were not considered in the DEIR.<sup>40</sup>

*g. API Gravity and Sulfur Do Not Address Chemical Composition Of Individual Crudes*

Bakken and tar sands crudes, the most likely crude slate additions (Comments II.B, II.C), have unique chemical and physical characteristics that distinguish them from currently refined crudes. These unique chemical and physical characteristics are not related to API gravity and sulfur. Thus, blending these crudes to the same API gravity and sulfur range will not guarantee that no environmental impacts will occur.

G1-78.121

<sup>37</sup> US Chemical Safety and Hazard Investigation Board, Chevron Richmond Refinery Pipe Rupture and Fire, August 6, 2012, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

<sup>38</sup> U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013, Available at: <http://www.csb.gov/chevron-refinery-fire/>.

<sup>39</sup> See, for example, K. Turini, J. Turner, A. Chu, and S. Vaidyanathan, Processing Heavy Crudes in Existing Refineries. In: Proceedings of the AIChE Spring Meeting, Chicago, IL, American Institute of Chemical Engineers, New York, NY, Available at <http://www.aiche-fpd.org/listing/112.pdf>.

<sup>40</sup> DEIR, Appx. C.

Difference in the chemical and physical properties of individual crudes in the future slate may result in significant environmental impacts not identified in the DEIR, including significant risk of upset, air quality, odor, and public health impacts.

G1-78.121  
cont'd.

Before discussing these differences in crude slate composition, I will review the information supporting a crude switch. As discussed below, the foreseeable switch from ANS and other current components of Tesoro's crude slate to a Bakken crude, a tar sands crude, or a Bakken-tar sands-other crude mix, is a feedstock change that should have been explicitly identified and evaluated in the DEIR. These new crudes are chemically and physically different from the current crude slate in ways that are not captured by exclusive consideration of crude slate sulfur content, API gravity, and other refinery blending parameters. These differences can result in significant environmental impacts that were not evaluated or disclosed in the DEIR.

These differences – in both chemical and physical characteristics other than API gravity and sulfur content – fluctuate independent of sulfur content and API gravity and will result in significant impacts that have not been considered in the DEIR. These impacts include, for example,

- significant increases in VOC emissions, contributing to existing violations of ozone ambient air quality standards;
- significant increases in TAC emissions, resulting in significant health impacts; significant increases in malodorous sulfur compounds, resulting in significant odor impacts;
- significant increases in combustion emissions, contributing to existing violations of ambient air quality standards;
- significant increases in corrosive sulfur compounds, leading to increased risk of accident; and significant increases in flammability and thus the potential for more dangerous accidents involving the 52% increase in terminal storage tank capacity and unloading operations.

G1-78.122

The DEIR fails to consider these significant impacts by raising irrelevant issues.

Thus, regardless of what crude might be imported, there are potentially significant environmental impacts that are due to characteristics of the new crude oil that are not captured by total sulfur and API gravity. These impacts have not been analyzed by the DEIR, which thus fails as an informational document.



**B. The Project Will Facilitate The Import Of Bakken Crude Oils**

The Project is designed to facilitate a crude switch. The precise nature of the switch and the resulting increase in emissions cannot be determined without access to information omitted from the DEIR and claimed as CBI -- baseline storage tank contents, throughputs, and vapor pressure data.<sup>41</sup> This information was redacted from emission reports for all tanks at Carson, Wilmington, and the marine terminals.<sup>42</sup> Baseline storage tank contents, throughput, and vapor pressure data are required to estimate emissions of VOCs from storage tanks in the baseline. In my experience, these data are routinely supplied to support emission calculations. In the absence of this data, I develop an alternate method to demonstrate that the Project will facilitate a crude switch by relying on permitted tank contents and vapor pressure limits.

G1-78.123

Substantial evidence indicates that the Project involves a crude switch, including: (1) the vapor pressure of the proposed new storage tanks supports Bakken crude oil or another similar light crude oil; (2) the Material Safety Data Sheet (MSDS) for "crude oil, light sweet" submitted with the initial tank applications is consistent with Bakken crude oil; (3) Tesoro has significant holdings in the Bakken formation, which makes these crudes economically attractive; (4) Tesoro and Savage are building the VET rail-to-marine terminal to export Bakken and other crudes to Tesoro's California refineries; and (5) Tesoro itself has repeatedly stated in many fora that it intends to change its crude slate and import Bakken crude oil to its Los Angeles Refinery. As Bakken was not refined in the baseline (Comment II.D.1), this is a per se switch in crude slate. Each of these factors is discussed below.

1. Tank Vapor Pressure Used in VOC Calculations Are Consistent with Bakken

The Project description is silent on the vapor pressure that was used to estimate VOC emissions and that would thus be permitted for all new and modified crude oil storage tanks that will service the marine terminal.<sup>43</sup> This information has to be dredged out of complex appendices to the main text, which effectively prevents non-expert members of the public from understanding this Project. This key information is buried in DEIR Appendix B-3, Air Emission Calculations and Health Risk Assessment,

G1-78.124

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<sup>41</sup> Letter from Lisa Ramos, SCAQMD, to Rachael Koss, ABJC, Ref.: Control No. 86120, June 3, 2016, Attaching: Declaration Against Furnishing Document and/or Data, Prepared by June Christman, Tesoro, and Addendum to Declaration: Itemization of Documents/Portions Thereof Claimed Exempt from Production, June 2, 2016.

<sup>42</sup> Letter from Lisa Ramos, Public Records Coordinator, SCAQMD, to Rachael Koss, Adams Broadwell Joseph and Cardozo, Ref.: Control No. 86120, Completion Letter, June 3, 2016 and attached files.

<sup>43</sup> New and modified tanks listed in DEIR, Appendix B, Tables 1 and 2, pp. B-3-7 and B-3-8.

Attachment B, Storage Tank Emission Calculations.<sup>44</sup> The TANKS 4.09.9d output in Attachment B, which only a subject matter expert can interpret, indicates that the VOC emissions from all new and modified tanks were estimated assuming a Reid Vapor Pressure (RVP) of 10.5 psi.<sup>45</sup>

G1-78.124  
cont'd.

It is well known in the industry that RVP underestimates the true vapor pressure of light gassy shale crude oils such as Bakken and other North American light shale crudes. The standard method used to measure RVP, ASTM D323 (Reid Vapor Pressure), results in large vapor losses if the sample is supersaturated, resulting in a much lower value for vapor pressure than the true value. The VOC emissions should have been calculated and the vapor pressure limit should be set on true vapor pressure, measured using ASTM D6377, at 100 F and a vapor-liquid ratio of 4:1. This method uses a pressurized cylinder for crudes that contain volatile light ends and avoids exposing the sample to the atmosphere.<sup>46</sup> The RVP method typically underestimates true vapor pressure by about 1 psi. Thus, actual vapor pressure of material that Tesoro plans to store in these tanks is likely closer to 11.5 psi, which is consistent with Bakken crude oil.<sup>47</sup>

G1-78.125

In comparison, there are very few existing tanks at either Wilmington or Carson that are permitted to store crude oil with a vapor pressure of 11 psi. Most existing crude oil "storage" (as opposed to "charging") tanks have vapor pressure limits that are lower than 11 psi,<sup>48</sup> indicating that Tesoro anticipates importing more volatile crude oils than were refined in the baseline. My calculations below indicate that the new tanks will increase 11 psi crude storage by a factor of 8 at Wilmington and by a factor of 7 at Carson, facilitating the import of Bakken and other similar light crude oils.

G1-78.126

The DEIR asserts that the "tank replacement and modification project" is a separate project from the "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."<sup>49</sup> However,

G1-78.127

<sup>44</sup> DEIR, Appendix B, Attachment B-3, pdf 1110.

<sup>45</sup> DEIR, pdf 1113 (Carson CCT #1 to #6), 1174 (Tanks 300035, 300036), 1188 (Tank 80060), 1196 (Tank 80067), 1204 (Tank 80079).

<sup>46</sup> Nia William, Reuters, Exclusive: TransCanada Toughens Pipeline Pressure Limits for Gassy Crude, Reuters, January 31, 2014; Available at: <http://www.reuters.com/article/us-transcanada-pipeline-vapor-pressure-idUSBREA0U0UW20140131>. See also: John R. Auers and others, North Dakota Petroleum Council, The North Dakota Petroleum Council Study on Bakken Crude Properties, August 4, 2014, p. 16.

<sup>47</sup> The tanks would likely be permitted at a TVP of 11 psia as federal and SCAQMD regulations limit tank vapor pressure to 11 psia without special controls. However, as the vapor pressure limits in Tesoro's Title V permits are not enforceable, any vapor pressure limit is meaningless.

<sup>48</sup> Carson Title V Permit, January 21, 2016; Wilmington Title V Permit, July 7, 2015.

<sup>49</sup> DEIR, p. 1-5, pdf 24.



the facts indicate otherwise. The goal of the Project is to increase the amount of gasoline or distillate that can be produced by 30,000 to 40,000 bbl/day. As explained in Comment II.B.3, this requires a lighter crude slate that yields more gasoline and distillate. As explained in Comment II.B.3, many Project components require an increase in lighter crude, including the shutdown of the Wilmington FCCU. At Wilmington, there are only three existing “storage” tanks<sup>50</sup> with vapor pressure limits of 11 psi<sup>51</sup> that could hold crude oil: tanks 13506, 13509, and 13512.<sup>52</sup> The total monthly permitted throughput of these three tanks is 376,248 bbl/mo.<sup>53</sup> The Project would add two 300,000 bbl tanks with vapor pressure limits of 11 psi that were assumed to have 60 turnovers per year in the TANKS 4.0.9d VOC analyses.<sup>54</sup> Thus, the Project would increase the amount of 11 psi crude oil throughput at Wilmington by a factor of 8.<sup>55</sup>

G1-78.127  
cont’d.

At Carson, there are only three “storage” tanks with vapor pressure limits of 11 psi<sup>56</sup> that could hold crude oil: tanks 6, 8, and 191.<sup>57</sup> The permitted total annual throughput of these three tanks is 20,650,000 bbl/yr. The Project would add five 500,000 bbl tanks with vapor pressure limits of 11 psi that were assumed to have 50.1 turnovers per year in the TANKS 4.0.9d VOC analyses.<sup>58</sup> Thus, the Project would increase the amount of 11 psi crude oil throughput at Carson by a factor of 7.<sup>59</sup>

G1-78.128

<sup>50</sup> Other tanks permitted to store 11 psi vapor pressure material are not relevant. Tank 96059 is equipped with mixers and thus is likely a “charging” tank. Tank 125004 is permitted to only store naphtha.

<sup>51</sup> Wilmington Title V Permit, Tanks subject to condition B22.8 (TVP = 11 psi) at pdf 212.

<sup>52</sup> Wilmington Title V Permit, Tanks 13505 (pdf 85), 13509 (pdf 85), and 13512 (pdf 86).

<sup>53</sup> Wilmington Title V Permit, Tank 13506, Condition C1.26 (72,083 bbl/mo); Tank 13509, Condition C1.8 (152,083 bbl/mo); Tank 13512, Condition C1.8 (152,083 bbl/mo).

<sup>54</sup> DEIR, Attachment B, Appendix B-3, p. B-3-182, pdf 1173.

<sup>55</sup> Total annual existing potential 11 psi crude oil storage tank throughput at Wilmington =  $(72,083 + 152,083 + 152,082 \text{ bbl/mo}) \times 12 = 4,514,988 \text{ bbl/yr}$ . Total annual 11 psi crude oil storage tank throughput added by the Project =  $2 \text{ tanks} \times 300,000 \text{ bbl/tank} \times 60 \text{ turnovers/tank-yr} = 36,000,000 \text{ bbl/yr}$ . Increase in 11 psi storage tank throughput =  $(36,000,000 \text{ bbl/yr}) / (4,514,988 \text{ bbl/yr}) = 7.97$ . New Wilmington tanks 300035 and 300036 turnovers from DEIR, pdf 1173.

<sup>56</sup> Carson Title V Permit, Tanks 6 (pdf 190), 8 (pdf 19), and 191 (pdf 180).

<sup>57</sup> Carson Title V Permit, Tank 6, Condition C1.31, pdf 418 (1.825E+7 bbl/yr); Tank 8, Condition C1.31, pdf 418 (1.825E+7 bbl/yr); and Tank 191, Condition C1.69, pdf 440 (200,000 bbl/mo).

<sup>58</sup> DEIR, Attachment B, Appendix B-3, p. Bp3-121, pdf 1112.

<sup>59</sup> Total annual existing potential 11 psi crude oil storage tank throughput at Carson =  $2 \times 1.825E+7 \text{ bbl/yr} + 12 \times 200,000 \text{ bbl/mo} = 20,650,000 \text{ bbl/yr}$ . Total annual 11 psia crude oil storage tank throughput added by the project =  $6 \text{ tanks} \times 500,000 \text{ bbl/tank} \times 51.10 \text{ turnovers/tank-yr} = 153,300,000 \text{ bbl/yr}$ . Increase in 11 psi storage tank throughput =  $(153,300,000 \text{ bbl/yr}) / (20,650,000 \text{ bbl/yr}) = 7.4$ . New Carson (DEFR) tank turnovers from DEIR, pdf 1112.

The three existing tanks at Wilmington (80060, 80067, 80079)<sup>60</sup> that would be modified by the Project to increase throughput all have internal heating coils, which means they stored low vapor pressure materials in the baseline.<sup>61</sup> As tank 80067 has a vapor pressure limit of 0.5 psi,<sup>62</sup> the Project would effectively increase the volatility of the material stored in this tank by a factor of 22 (11/0.5=22). Similar increases are expected for the other two replaced tanks due to the presence of heating coils.

G1-78.129

These changes in the amount of crude oil that can be stored at a vapor pressure of 11 psi suggest a crude switch from heavy crudes to lighter crudes such as Bakken. This significant change in the vapor pressure of crude to be stored in these new and modified tanks is also much higher than any crude allowed to be imported by the Marine Terminal Agreement, Annex D. These two facts are compelling evidence that the Project will facilitate a crude switch as the new storage tanks are part of the Project.<sup>63</sup> The future crude will most likely be Bakken, which is supported by several lines of evidence.

G1-78.130

Bakken crude oils are the only crude oils that I am aware in the market today that have a true vapor pressure 11+ psi. The Wall Street Journal, for example, analyzed data collected by Capline Pipeline, which tested crudes from 86 locations world-wide for vapor pressure. The Journal reported:<sup>64</sup>

“[L]ight, sweet oil from the Bakken Shale had a far higher vapor pressure – making it much more likely to throw off combustible gases – than crude from dozens of other locations...According to the data, oil from North Dakota and the Eagle Ford Shale in Texas had vapor-pressure readings of over 8 pounds per square inch, although Bakken readings reached as high as 9.7 PSI. U.S. refinery Tesoro Corp. TSO +1.01 %, a major transporter of Bakken crude to the West Coast, said it regularly has received oil from North Dakota with even more volatile pressure readings – up to 12 PSI. By comparison, Louisiana Light Sweet from the Gulf of Mexico, had vapor pressure of 3.33 PSI, according to the Capline data.”

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<sup>60</sup> DEIR, Attachment B, Appendix B-3, Table 1, p. B-3-8.

<sup>61</sup> Wilmington Title V Permit, July 7, 2015, pdf 90, 91, 115.

<sup>62</sup> Wilmington Title V Permit, July 7, 2015, pdf 91, Condition B22.1 at pdf 211 (“The operator shall not use this equipment with materials having a(n) true vapor pressure of 0.5 psia or greater under actual operating conditions.”).

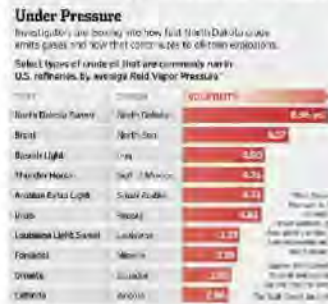
<sup>63</sup> The DEIR argues that the storage tanks are not part of the project. However, without the ability to import significant amounts of light crude, facilitated by the new tanks, the Wilmington FCCU could not be shutdown, propane recovery would not be feasible, and other Project components would not be required.

<sup>64</sup> Russell Gold, Analysis of Crude From North Dakota Raises Further Questions About Rail Transportation, Wall Street Journal, February 23, 2014.

This data, as summarized by the Wall Street Journal, is shown in Figure 4. This figure shows that all crude oils that are designated as “light” do not have the same vapor pressure and thus, the same environmental impacts when stored and transported. See also additional discussion of Bakken vapor pressure in Comment II.E.2.

The more volatile the crude, the higher the VOC, TACs, and GHG emissions, the higher the flammability, and the greater the consequences in the event of an accident. The only “light”<sup>65</sup> crude oil that Tesoro has admitted to refining at its California refineries in its filings with the U.S. Security and Exchange Commission is Basrah, an imported Iraqi light crude oil with a vapor pressure that is half that of Bakken. Thus, any claim that the Project will not facilitate a crude switch is clearly invalid. The vapor pressure of the crude oils stored in the new and modified tanks, 11+ psi, is clear and unrefutable evidence that the Project is designed to import a lighter crude than currently refined.

**Figure 4.**  
**Volatility (psi) of**  
**Some Commonly Refined Crude Oils<sup>66</sup>**



The vapor pressure (RVP) used to calculate VOC emissions from new and modified storage tanks (RVP=10 psi, TVP=11+ psi) is a design parameter that is consistent with Tesoro’s widely reported plans to reduce operating costs at its Los Angeles Refinery by replacing a portion of its crude slate with certain cost-advantaged

<sup>65</sup> Bashrah has an API gravity of 29.7 and thus, while very light, falls just below the “light” threshold of 32 used in the industry to classify crudes. Therefore, it is a very light “medium” crude under the usual classification scheme. However, Tesoro itself classifies it as “light” in its SEC filings (SEC 10-Q, Quarter Ending March 31, 2014).

<sup>66</sup> Wall Street Journal, February 23, 2014.

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G1-78.132

North American crudes, labeled "WTI," which includes all grades of North American crude other than those identified in Figure 5.



G1-78.132  
cont'd.

As illustrated in Figure 5, cost-advantaged North American crudes, such as Bakken and tar sands (WTI in Figure 5), would increase from 15% in 2013 to 38% in 2015, replacing Alaska North Slope, foreign imports, and California supplies.<sup>68</sup> The President and CEO of Tesoro, Greg Goff, stated in the first quarter 2014 earnings call in responses to questions:<sup>69</sup>

**“Paul Y. Cheng - Barclays Capital - Analyst**

Okay. In Carson, I think before being acquired by you guys, that they were running largely you said<sup>70</sup> ANS, maybe 100,000 barrel per day. And then maybe another 100,000 of the Iraqi Basra<sup>71</sup>. Is the crude slate changed now? Or that is essentially secured by the same crude slate as in the past?

G1-78.133

**Gregory J. Goff - Tesoro Corporation - President & CEO**

Basically the same. We are running some different crudes there, but not material differences at this point in time. It is in our plans to do that. Basically what you

<sup>67</sup> Tesoro, Transformation through Distinctive Performance, Simmons Energy Conference, February 27, 2014 (2/27/14 Tesoro Presentation), p. 18, Exhibit 2.

<sup>68</sup> 2/27/14 Tesoro Presentation, p. 18, Exhibit 2.

<sup>69</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014 (Q1 2014 Tesoro Earnings Call), Barclay Capital questions at pp. 12-13, Exhibit 4b. There are some discrepancies between the Thomson Reuters transcript and the original webcast. The recording of the original webcast is attached in Exhibit 4a.

<sup>70</sup> “you said” mistranscribed as “essential”.

<sup>71</sup> “Basra” mistranscribed as “basket”.

described, is the bulk of the crude supply the two sources what is happens in the Los Angeles refinery today.

**Paul Y. Cheng - Barclays Capital - Analyst**

Right. Greg, how quickly that you think you may start to be able to change the crude slate to do that?<sup>72</sup>

**Gregory J. Goff - Tesoro Corporation - President & CEO**

The first thing, our intention at the Port of Vancouver to be able to do that.

**Paul Y. Cheng - Barclays Capital - Analyst**

You have to wait until the Savage terminal's<sup>73</sup> up and running before you can actually do that?

**Gregory J. Goff - Tesoro Corporation - President & CEO**

That would allow us to move the most significant volume right now if we do that. We are looking at other things on an ongoing basis to be able to move crudes there. But we have a number of things that we're looking at, but that is the primary way that we want to be able to improve crude supply cost at the Los Angeles facility.

**Paul Y. Cheng - Barclays Capital - Analyst**

When the Savage that if we assume that you will get the permit and it's actually become a reality sometime in 2015. Given you have said in your system, if you run smoothly you can process up to 200,000 barrels per day of the light oil, is there any reason that you will not take 100% of the Savage crude --<sup>74</sup> into your own system?

Seems like even after you expand into 280,000 barrel per day, including heavy oil and light oil, you will have more than sufficient capacity, refining capacity, to absorb it. Is there any kind of arrangement with your partner that will stop you in<sup>75</sup> taking the entire shipment for yourself?

**Gregory J. Goff - Tesoro Corporation - President & CEO**

There is no restrictions on how much we choose to move to Vancouver, Washington and then supply our West Coast system. We will balance it with the financial commitments and our overall supply strategy with continued sources of crudes of how much we ultimately decide to take.

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<sup>72</sup> "slate to do that" mistranscribed as "slated to buy it?"

<sup>73</sup> "Savage terminal" mistranscribed as "terminal".

<sup>74</sup> Mistranscribed as "Savage water"; recording unclear, but meaning in context is "Savagecrude".

<sup>75</sup> "you in" mistranscribed as "unions".



We have said so far we have committed to take the first 50,000 barrels a day. And the partnerships work through the rest of the supply for that facility, we will be engaged in doing that.

But I think at the same time, Paul, we need to look at the dynamics of the pricing of other types of crude, as we do that. I think goes back to Jeff's question earlier, that there may be some other impacts on crude. But we'll see how that impacts and determine how much crude we take out to our West Coast system."

In its most recent earning conference call, Tesoro reiterated its plans to import crudes from the VET to the Los Angeles Refinery in response to a question on the connection between the integrated Los Angeles Refinery and the VET:

**Gregory J. Goff - Tesoro Corporation - President & CEO**

"We have said that once Vancouver Energy is up and operating, we'll use crude oil into the facility to supply our west coast operations but there's no connection to the permits."<sup>76</sup>

2. Bakken Material Safety Data Sheets (MSDSs) Were Submitted with the Tank Applications

The MSDS for "light sweet crude oil" submitted with the initial permit applications for the new Wilmington tanks<sup>77</sup> is identical to the MSDS submitted by Tesoro in support of its proposed Vancouver Export Terminal, which proposes to import Bakken crude oil from its substantial holdings. Based on public statements by Tesoro, some of this crude oil, at least 50,000 bbl/day, would be shipped to the Los Angeles Refinery.<sup>78</sup> This demonstrates that Bakken will be transported to marine terminals that service the Los Angeles Refinery.

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<sup>76</sup> Tesoro, 2016 Tesoro Corporation Earnings Conference Call Recording, May 5, 2016, 41:39 - 41:50 minutes, Exhibit 5a; Available at <http://edge.media-server.com/m/p/56vao56c>; Thomson Reuters Streetevents Edited Transcript, TSO - Q1 2016 Tesoro Corporation Earnings Conference Call, May 5, 2016, Exhibit 5b, p. 14.

<sup>77</sup> SCAQMD Application 545745, November 30, 2012, pdf 77, Material Safety Data Sheet, Crude Oil, Light Sweet; See also revised Application 545745, March 7, 2013, pdf 96 and Application 556835, October 3, 2013, pdf 12.

<sup>78</sup> While Tesoro has included a MSDS for "Bakken Crude Oil" from Enbridge Pipelines Inc. in some filings, this MSDS is not representative of the Bakken crude oils that would be imported by Tesoro at the VET. The light ends are stripped from crude oil shipped by pipeline, reducing the crude vapor pressure and concentration of volatile organic compounds such as benzene. See, e.g., Reuters, Exclusive: TransCanada Toughens Pipeline Pressure Limits for Gassy Crude, January 31, 2014 (Crude vapor pressure on pipelines lowered to 69 kPa-a or 10 psia); Available at <http://www.reuters.com/article/us-transcanada-pipeline-vapor-pressure-idUSBREA0U0UW20140131>.

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3. The Project Is Designed to Import Bakken Crudes

The DEIR asserts that “[t]he Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and no modifications are being proposed in the Tesoro Refinery Integration and Compliance Project that would increase the ability of the Refinery to process Bakken crude oil.”<sup>79</sup> However, this directly contradicts the opinion of Tesoro’s CEO who has characterized Bakken as “the right supply source” for the Los Angeles Refinery.<sup>80</sup>

G1-78.135

First, numerous Tesoro presentations and quarterly earnings calls document Tesoro’s plans to import Bakken crude oil to the Los Angeles Refinery from the VET as preliminary investigations demonstrated that it increases yields of valuable gasoline and diesel products. Tesoro stated in its December 10, 2013 Analyst and Investor Presentation: “Los Angeles, which is the largest of our West Coast facilities, will potentially see an increase of 125,000 to 130,000 barrels a day of advantaged crude.”<sup>81</sup>

Bakken blends could replace California crudes, foreign imports and ANS, as shown in Figures 6 and 7. Bakken is attractive as an alternative to ANS and California crudes as it yields more gasoline and distillate.<sup>82</sup> Figure 6, for example, shows that a barrel of Bakken crude yields 34% gasoline when refined, while the same barrel of ANS yields only 27% gasoline. Similarly, a barrel of Bakken yields 34% distillate while a barrel of ANS yields only 26% distillate. Gasoline, jet fuel, and diesel are the more valuable products from refining crude. Thus, Bakken and similar light crudes are the most likely crudes to be imported and stored in the new tanks,<sup>83,84</sup> explaining the need for a high vapor pressure limit for the new tanks. See Comment II.A.2.d.

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<sup>79</sup> DEIR, p. 4-6.

<sup>80</sup> Q1 2014 Earnings Call Transcript, Exhibit 4b, p. 18.

<sup>81</sup> Thomson Reuters Streetevents Edited Transcript, TSO – Tesoro Analyst and Investor Presentation, December 10, 2013 (12/10/13 Analyst and Investor Presentation), p. 11, Exhibit 6.

<sup>82</sup> Tesoro, Deutsche Bank Energy Conference, January 9, 2014 (1/19/14 Tesoro Presentation), p. 16, Exhibit 16 (“Bakken crude oil yields 14% to 16% more gasoline and distillate than ANS”).

<sup>83</sup> Thomson Reuters Streetevents Edited Transcript, TSO – Tesoro Corporation 2015 Analyst and Investor Day, December 9, 2015 (Tesoro 12/9/15 Analyst and Investor Day Transcript), Exhibit 7b, p. 26 (“From Bakken to the west coast, there’s a couple things that have -- there’s one thing that hasn’t changed. And the yield advantage that we get off of Bakken in our west coast system has stayed the same. So we still get that \$3 to \$5, as [Danny] said, we’ve talked about now since we started moving Bakken to the west coast. That is still there.”) and p. 42 (“it’s the crude supply and the advantage, the real advantage of being able to get Bakken crude there is in the yield.”) See also Webcast in Exhibit 7a.

<sup>84</sup> See also Thomson Reuters Streetevents Edited Transcript, TSO – Q3 2015 Tesoro Corp Earnings Call, October 29, 2015 (Tesoro Q3 2015 Earnings Call Transcript), Exhibit 8, p. 8 (“However, as we look out over time, even in a lower price environment, we still see economic value to be able to move Bakken to the West Coast and achieve the benefits that we have always stated, which primarily are driven by the

Figure 6.  
Bakken Crude Yields More Gasoline and Distillate and Provides Higher Margins<sup>85</sup>

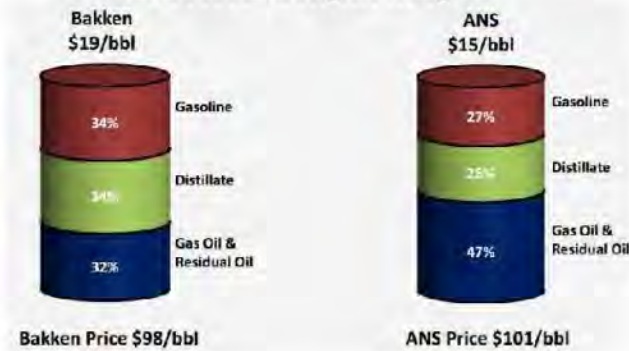


Figure 7.  
Improved Refinery Yields vs. Other Benchmarks<sup>86</sup>



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cont'd.

yield improvements in the refineries, as long as you can competitively price the crude in there.”)

<sup>85</sup> Tesoro, Driven to Create Value, Analyst and Investor Day, December 9, 2014, Exhibit 9, p. 30.

<sup>86</sup> CLR Implementation: The Bakken, Slides, p. 48, October 7, 2012, Exhibit 10. CLR (Continental Resources) is one of the largest Bakken crude producers. Kern County is in California’s San Joaquin Valley. The Kern County crudes shown in this figure is a San Joaquin Valley crude, included in the general classification of San Joaquin Valley or California crudes discussed elsewhere in these comments.



In the second quarter 2014 earnings call, for example, the CEO of Tesoro explained:<sup>87</sup>

“During maintenance activity at the Anacortes refinery in the quarter, we were able to move some barrels of Bakken down to our Los Angeles refinery and realized refinery values relative to ANS<sup>88</sup> similar to those that we experienced at Anacortes.

We are integrating the refined products logistics between the two refineries, and are now moving finished barrels from Wilmington into the new Carson logistics system.”

In its December 2015 Analyst and Investor Day earnings call, Tesoro remained optimistic about supplying Bakken crude to its California refineries:<sup>89</sup>

“When you think about formalizing competitive advantage and fully integrating our value chain, that is really what the Los Angeles Integration and Compliance Project is about. And when we think about creating value, we are not just thinking about advantaged crude oils in front of our refineries, but we're thinking about how that supply to the west coast of advantaged crude oils can change the shape of the crude oil supply/demand dynamics for the west coast. And that's what we are trying to accomplish through Vancouver Energy.”

The DEIR, on the other hand, incorrectly asserts that the “Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and no modifications are being proposed...that would increase the ability of the Refinery to process Bakken crude oil.”<sup>90</sup> This is wrong. The Refinery currently does not have sufficient tankage to store large quantities of these light crudes during unloading as much heavier crudes were imported in the baseline.<sup>91</sup> In fact, the Project is designed to facilitate unloading, storing, and refining much lighter crudes than processed in the baseline due to their yield advantage and cost advantage.

*Second*, many of the Project changes are designed to facilitate a shift to Bakken crude, from the 3.66 million barrels of 10.5 psi storage capacity to the shutdown of the Wilmington FCCU. The heart of the Integration Project is the shutdown of the

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<sup>87</sup> Q2 2014 Earnings Call Transcript, July 31, 2014, p. 5, Exhibit 11.

<sup>88</sup> “ANS” mistranscribed as “A&S”.

<sup>89</sup> Tesoro 12/9/15 Analyst and Investor Day Transcript, p. 10, Exhibit 7b.

<sup>90</sup> DEIR, p. 4-5; DEIR Section 2.5.4.1; DEIR, Appx. F.

<sup>91</sup> Marine Terminal Agreement, Annex D, RVP column.

Wilmington FCCU. Fluid catalytic cracking is typically done to reduce the molecular weight of the heavy fractions of crude oil to lighter fractions. The FCCU converts heavy gas oil from crude distillation and other heavy streams to light gases, petrochemical feedstocks, gasoline blendstocks, and diesel blendstocks.<sup>92</sup> The FCCU was required to process the heavy feedstock in the baseline years. However, shifting from the heavy crudes refined at Wilmington (and Carson) in the baseline, to a Bakken blend, eliminates the need for the Wilmington FCCU because distillation of Bakken and other light crudes at the front end of a refinery yields much greater amounts of these lighter blendstocks and much smaller amounts of heavy feedstocks that require cracking.

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cont'd.

Further, the increased yields of lighter fractions from refining Bakken and possibly other light crudes requires increases in the throughput of downstream units that process lighter fractions from distillation, including the reformer, isomerization, and hydrotreating units.<sup>93</sup> The Project includes increases in the throughput of these units. The CRU-3 fractionation section will be modified to enable recovery of propane from the refinery fuel gas.<sup>94</sup> The naphtha isomerization unit will be modified to recover propane and heavier material from the off-gas, enabling additional product sales.<sup>95</sup> The increased amounts of propane that will be recovered originate from lighter crudes that are rich in propane. Dr. McGovern suggests that more naphtha cannot be refined due to limited lifting capability of the crude unit.<sup>96</sup> However, the Project increases the firing rate of the No. 51 Vacuum Unit at Carson from 300 to 360 MMBtu/hr, which would increase the lifting capability in this unit. Further, hydrotreating Units 1, 2, and 4 will be modified to handle increased yields of lighter products, consistent with refining a lighter crude slate.<sup>97</sup> Similar modifications are proposed at Tesoro's Anacortes Refinery to accommodate Bakken crude oil.<sup>98</sup>

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<sup>92</sup> See, e.g., DEIR, Figure 2-8.

<sup>93</sup> See, e.g., K.J. Bryden and others, Processing Shale Oils in FCC: Challenges and Opportunities, Hydrocarbon Processing, September 1, 2013; Available at: <http://www.hydrocarbonprocessing.com/Article/3250397/Processing-shale-oils-in-FCC-Challenges-and-opportunities.html>.

<sup>94</sup> DEIR, p. 1-12.

<sup>95</sup> DEIR, p. 1-16.

<sup>96</sup> DEIR, p. F-11/12.

<sup>97</sup> DEIR, pp. 2-37/38.

<sup>98</sup> Anacortes Upgrade, Clean Products Upgrade Project Fact Sheet, Available at: <http://anacortesupgradeproject.com/docs/anacortes-upgrades-fact-sheet.pdf>.

4. Bakken Crude Can Be Imported By Marine Vessel Even if the VET Is Not Built

There are currently several existing and proposed rail-to-marine terminals in the Pacific Northwest that could supply small amounts of Bakken to the Los Angeles Refinery. However, the most likely source, given the volumes contemplated, is the proposed VET. This Terminal would transport Bakken and tar sands crudes to the VET and then by marine vessel to Tesoro refineries on the west coast. Most of the imported crude would likely be Bakken as Tesoro has substantial holdings in the Bakken reserves (the High Plains System, Great Northern Midstream, and related trucking operations in the Bakken Shale/Williston Basin area of North Dakota and Montana).<sup>99</sup> These imports would replace crude currently delivered by pipeline from California sources and by marine vessel from the Alaska North Slope and various foreign sources. The VET is assumed to export 80% Bakken crude and 20% other crudes, including Canadian tar sands.<sup>100,101</sup>

The Bakken and tar sands crudes have unique chemical and physical properties, compared to crudes refined in the baseline. Further, the portion of these imports that would replace pipeline deliveries would result in an increase in marine vessel emissions, which were not estimated in the DEIR.

While Tesoro is optimistic that the VET will be permitted,<sup>102</sup> should the VET not be permitted, there are other currently operating or soon to operate terminals that could supply some of the Bakken crudes.<sup>103</sup> These other crude-by-rail-to-marine transload terminals include 178,000 bbl/day of existing capacity and 71,000 bbl/day of proposed capacity.<sup>104</sup>

<sup>99</sup> See, for example, Tesoro 12/9/15 Analyst and Investor Day Transcript, Exhibit 7b, pp. 14, 15, 23 and U.S. Securities and Exchange Commission, Form 10-K, Tesoro Corporation, Fiscal Year Ended December 31, 2013, p. 12.

<sup>100</sup> Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf>.

<sup>101</sup> 2/27/14 Tesoro Presentation, pp. 13-18, Exhibit 2; Kristen Hays and Erwin Seba, Update 1 - Tesoro Delivering First Bakken Crude Unit Train to California, Reuters, September 11, 2013, Available at: <http://www.reuters.com/article/2013/09/11/tesoro-rail-crude-idUSL2N0H70U420130911>.

<sup>102</sup> Q1 2016 Tesoro Earnings Call, May 5, 2016, Recording (Exhibit 5a) and Transcript, pp. 5, 7 (Exhibit 5b).

<sup>103</sup> Q1 2015 Tesoro Earnings Call Transcript, May 8, 2015, p. 16, Exhibit 17 (Goff: "Yes, I think there are some alternatives. ..So the other opportunities that we're also looking at and we've always looked at are much smaller in scale.").

<sup>104</sup> The capacities listed for each terminal are intended to be representative and are sometimes approximated. Various sources sometimes report higher or lower capacities for terminals. See sources below and those provided in footnotes for each of the five specific terminals.

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Targa (Tacoma, WA; existing/operating):	40,000 bbl/day <sup>105</sup>
Arc Logistics (Portland, OR; existing/operating):	18,000 bbl/day <sup>106</sup>
Global (Clatskanie, OR; existing/repurposing):	120,000 bbl/day <sup>107</sup>
Westway (Grays Harbor, WA; in permitting):	49,000 bbl/day <sup>108</sup>
NuStar (Vancouver, WA; in permitting):	22,000 bbl/day <sup>109</sup>

G1-78.139  
cont'd.

WA State, Department of Ecology, Washington 2014 Marine and Rail Oil Transportation Study, March 1, 2015, Available at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1508010.html>; Eric de Place, The Northwest's Pipeline on Rails, Sightline Institute, Updated July 2015, Available at: <http://www.sightline.org/download/48374/>.

<sup>105</sup> City of Tacoma Planning and Development Services Department, "Notice of Land Use Decision", December 5, 2013, Available at: <http://tacomapermits.org/wp-content/uploads/2013/06/40000203722D.pdf>.

<sup>106</sup> Arc Logistics (website), Operations, Portland Terminal; Available at: <http://arclxp.com/terminal/portland-terminal/>; U.S. Securities and Exchange Commission, Form 10-K, Arc Logistics Partners LP, Fiscal Year Ended December 31, 2015, pp. 10, 81, Available at: <http://investors.arclxp.com/secfiling.cfm?filingID=1564590-16-14592&CIK=1583744>.

<sup>107</sup> The Clatskanie terminal is permitted to transload both crude and ethanol, and it had been shipping Bakken crude to refineries in both California and Washington. The market for crude by rail is now contracting, and this terminal has recently stopped handling crude. Tanks are being cleaned, and port facilities upgraded to handle Panamax tankers. The Clatskanie terminal will then reopen to handle only ethanol. But the Clatskanie terminal can be shifted back to crude service as market conditions warrant.

Rory Carroll, Oregon approves permit for Global Partners crude oil railport, August 20, 2014, Reuters, Available at: <http://www.reuters.com/article/global-partners-crude-railway-idUSL2N0QQ2S120140820>; U.S. Securities and Exchange Commission, Form 10-K, Global Partners LP, Fiscal Year Ended December 31, 2014, pp. 50, F-69; Available at: <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NTczNjk5fENoaWxkSUQ9Mjc2MTYyfFR5cGU9MQ==&t=1>; WA State, Department of Ecology (2014), pp. 46, 94; Rory Carroll, California getting more Bakken crude by barge than rail, October 23, 2014, Reuters, Available at: <http://www.reuters.com/article/us-california-bakken-berge-idUSKCN0IC17I20141023>; Q4 2015 Global Partners Earnings Call Transcript, February 29, 2016; Available at: <http://seekingalpha.com/article/3941066-global-partners-glp-ceo-eric-slifka-q4-2015-results-earnings-call-transcript?part=single>.

<sup>108</sup> City of Hoquiam and Washington State Department of Ecology, Westway Expansion Project Draft Environmental Impact Statement, August 2015, especially pp. 2-8, 6-14; Available at: [http://www.ecy.wa.gov/geographic/graysharbor/docs/wwVol1\\_Chapters\\_PublicDEIS\\_complete\\_web.pdf](http://www.ecy.wa.gov/geographic/graysharbor/docs/wwVol1_Chapters_PublicDEIS_complete_web.pdf).

<sup>109</sup> Southwest Clean Air Agency, "Air Discharge Permit ADP07-2710R3," April 21, 2014, p. 17; Available at: <http://www.swcleanair.org/permits/Final/07-2710R3TSD.PDF>; Stephanie Rice, "Vancouver council will not make NuStar decision," The Columbian, January 12, 2015, Available at: <http://www.columbian.com/news/2015/jan/12/vancouver-council-will-not-make-nustar-decision>; Hearing Examiner Decision on SEPA Appeal, October 5, 2015, pp. 10, 13; Available at: [http://www.cityofvancouver.us/sites/default/files/fileattachments/community\\_and\\_economic\\_development/page/12901/prj-145874\\_nustar\\_appeal\\_decision.pdf](http://www.cityofvancouver.us/sites/default/files/fileattachments/community_and_economic_development/page/12901/prj-145874_nustar_appeal_decision.pdf).

In addition to the terminals listed above, various other crude-by-rail-to-marine transload terminals have been proposed in the Pacific Northwest. Currently, these other projects are on hold, notably due to current lack of market demand. But if there is a future market for additional transload terminals in the Pacific Northwest, notably if VET is not permitted, existing and proposed terminals may operate to provide Bakken and other North American crudes to California and specifically to the Tesoro Los Angeles refinery.

G1-78.140

Bakken and tar sands crudes also can be supplied to California via terminals at Washington refineries. Tesoro can and has sent Bakken crude to its Los Angeles refinery via its Anacortes (Washington) refinery crude-by-rail and marine terminals<sup>110</sup> as well as the Plains crude-by-rail terminal in Bakersfield.

The DEIR asserts that the VET is an independent project undergoing separate environmental review in the state of Washington that has not been and may not be approved. Tesoro, however, is more optimistic, stating "...we're very confident that the movement of Bakken crude oil to the West Coast will continue to make sense overtime. So we don't see any change there, and our commitment to Vancouver Energy hasn't wavered from the very first day."<sup>111</sup>

The DEIR asserts that the VET and the Los Angeles Refinery Integration Project are independent as neither relies on the other. The DEIR further asserts that the new crude oil tanks will be installed regardless of the fate of the VET.<sup>112</sup> However, they are clearly related.

G1-78.141

*First*, the majority of the exports from the VET are headed to Los Angeles to replace more expensive and/or declining supplies from the Alaska North Slope, California,<sup>113</sup> and foreign exports. Tesoro has publicly stated in many fora that it plans to import Bakken crudes from the VET to its Los Angeles refinery, inextricably linking

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<sup>110</sup> The Anacortes refinery has a 50,000 bbl/day crude-by-rail unit train unloading terminal, as well as a marine terminal that can load crude onto marine vessels. Thus, crude by rail into Anacortes can be shipped out by marine vessel, notably when the refinery there does not need all of the crude that can be supplied by rail. As discussed above, during maintenance at the Anacortes refinery in early 2014, Tesoro sent Bakken crude to its Los Angeles refinery. Tesoro Q2 2014 Earnings Call Transcript; Tesoro, "Tesoro Corporation Closes the Sale of the Anacortes Rail Unloading Facility to Tesoro Logistics," November 15, 2012; Available at <http://phx.corporate-ir.net/phoenix.zhtml?c=242247&p=irol-newsArticle&ID=1759179>.

<sup>111</sup> Tesoro Q2 2015 Earnings Call August 6, 2015 Transcript, p. 22, Exhibit 18.

<sup>112</sup> DEIR, pp. 4-5/6.

<sup>113</sup> See VET DEIS, p. 2-73 ("Crude oil handled by the proposed Facility [VET] would be loaded onto marine vessels for transfer to terminals and refineries in California...to replace declining crude oil supplies from California and Alaska.").



them. The CEO of Tesoro, Greg Goff, has indicated that the Los Angeles Refinery can take the entire shipment from the VET. There are “no restrictions on how much we ... take.”<sup>114</sup> The DEIR even admits that ANS is no “readily” longer available so blending will be used to create a crude with similar properties.<sup>115</sup> The VET proposal is designed to supply these blendstocks and will primarily handle Bakken and tar sands crudes.

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*Second*, the Project is designed to allow an increase in gasoline and diesel production, consistent with refining Bakken crudes. Tesoro variously indicates the Project provides 30 to 40 thousand barrels per day of product flexibility<sup>116</sup> and offers several benefits including “yield flexibility of between 30 to 40 thousand barrels per day of gasoline and distillate.”<sup>117</sup> The Project includes modifications that accommodate an increase in the production of gasoline and diesel, including modifications to the Wilmington HCU (15% increase in heater fired duty), Wilmington Hydrotreater Units 1 and 2 (7,000 bbl/day increase in FCCU gasoline); and Carson No. 51 Vacuum unit (increases distillate yields and 20% increase in diesel heater firing duty); and Carson hydrocracker (10% increase in distillate yield), among others.<sup>118</sup>

In fact, increasing gasoline and diesel production appear to be a primary (and hidden) goal of the Project. The DEIR frames these changes as allowing more flexible operation. However, they would also allow an increase in production of gasoline and diesel by refining Bakken crude oils. The DEIR admits the Project would allow an increase in the production of Tier 3 gasoline, but never states that production of non-Tier 3 gasoline that is currently shipped out of state would be curtailed as a result of the Project. Thus, it is reasonable to assume that total refinery gasoline and diesel production will increase, while heavier refined products would decrease, which can be accomplished by replacing ANS, foreign exports, and California crude oil with Bakken crude oil or a blend of Bakken crude oil and tar sands.

G1-78.142

The DEIR must be modified to include material mass balances for the baseline and post Project periods that identify all refinery inputs and outputs to properly estimate and disclose changes in crude oil throughput as a result of the Project. The DEIR claims that the only effect of the Project is a 6,000 bbl/day increase in crude oil throughput. This is questionable given the nature of the proposed modifications and

<sup>114</sup> Q1 2014 Tesoro Earnings Call Transcript, Gregory Goff (Tesoro) response to Paul Cheng (Barclays Capital) questions, Exhibit 4b, p. 13.

<sup>115</sup> DEIR, p. 2-16.

<sup>116</sup> Tesoro, 2014 Analyst and Investor Day Presentation, December 10, 2013, Exhibit 13, p. 38 (“Provides 30-40 MBD product flexibility”).

<sup>117</sup> Q1 2016 Tesoro Earnings Call, May 5, 2016, Recording (15:16 minutes, Exhibit 5a) and Transcript (p. 5, Exhibit 5b).

<sup>118</sup> DEIR, pdf 29, 30, 31, 33, 34.

various reports that the throughput of the combined facility is 380,000 bbl/day,<sup>119</sup> rather than the 363,000 bbl/day reported in the DEIR. According to Tesoro's Form 10K, the refinery achieved the 363,000 bbl/day target in 2015, BEFORE implementation of the Integration Project.

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*Third*, Tesoro Logistics has announced it plans to expand the capacity of its marine terminals,<sup>120</sup> which would be facilitated by the proposed new tanks and pipelines described in the DEIR, but erroneously asserted not to be part of the Project.<sup>121</sup> In its May 1, 2014 earnings call, Philip Anderson, President of Tesoro Logistics LP stated:

"We have two of our terminals are (sic) being expanded to handle additional capacity, and those expansions will come online this summer. And that will allow us to bump up volumes either very late in the second quarter or early in the third quarter."<sup>122</sup>

Elsewhere in the same conference call, Mr. Anderson responded to a question from RBC Capital Markets further identifying which terminals would be expanded and by how much:

G1-78.143

"Our marine facility down there [referring to Tesoro terminals in Long Beach], 121, which is the large T-Berth<sup>123</sup> in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, T-2 in Long Beach. And between T-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity."<sup>124</sup>

In the baseline, Terminal 121 supplied Carson. Further, the 100,000 bbl/day of unused throughput capacity is consistent with similar estimates published elsewhere. This other analysis reported Berths 76-78 [Tesoro legacy Marine Terminal] had 43,000 bbl/day and Berths 84-87 [newly acquired T-2] had 59,000 bbl/day of unused capacity,

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<sup>119</sup> U.S. Securities and Exchange Commission, Form 10K, Tesoro Corporation, For the Fiscal Year Ended December 31, 2015 (2015 Tesoro Form 10K), p. 5; Available at <http://services.corporate-ir.net/SEC.Enhanced/SecCapsule.aspx?c=79122&fid=14232456>.

<sup>120</sup> Tesoro Logistics, 2012 Citi MLP/Midstream Infrastructure Conference, August 2012 (August 2012 Tesoro Logistics Presentation), pp. 12-13, Exhibit 24; 1/9/14 Tesoro Presentation, p. 24, Exhibit 16.

<sup>121</sup> DEIR, pp. 4-5/6.

<sup>122</sup> Thomson Reuters Streetevents Edited Transcript, TLLP - Q1 2014 Tesoro Logistics LP Earnings Conference Call, May 1, 2014 (5/1/14 Q1 2014 Tesoro Logistics Earnings Call Transcript), p. 6, Exhibit 25.

<sup>123</sup> "T-Berth" mistranscribed as "de-berth".

<sup>124</sup> 5/1/14 Q1 2014 Tesoro Logistics Earnings Call Transcript, p. 7, Exhibit 25.

for a total of 102,000 bbl/day.<sup>125</sup> Thus, with no physical modifications to the marine terminals, the Project, by removing storage and unloading constraints, would allow an increase in the currently unused throughput. Increased marine imports, for example, could replace California crudes currently imported by pipeline. The DEIR failed to include emission increases from increases in marine imports.

More modifications are planned to capture additional throughput increases, allowed by the Project's increase in tank and pipeline throughput. In a recent earning call, the President of Tesoro Logistics, Phillip Anderson, stated: "The remainder of the organic growth is focused primarily in our Southern California assets, where we're expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. Once we have that, we'll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate."<sup>126</sup> A project is currently pending at the POLB, the Berths 84-87 Tesoro Facility Improvements project.<sup>127</sup> The "Berths 84-87 Tesoro Facility Improvements, Phase 2 is shown as on hold with a completion date of May 12, 2017,<sup>128</sup> in lock step with the Project. The SCAQMD should address whether these modifications are related to the Project.

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The relationship between the Applicant's Los Angeles Refinery and the VET is graphically illustrated in Figure 8 from a Tesoro presentation. This figure shows crude moving from the Bakken region by rail to the VET and then by ship to the Los Angeles Refinery. The Project is an initial phase of the Applicant's larger plan to import significant amounts of Bakken crude to the Los Angeles Refinery via Tesoro's VET to terminals in the POLB. However, a switch to other cost-advantaged crudes cannot be ruled out, as discussed elsewhere in these Comments.

G1-78.145

Finally, the DEIR asserts that the Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and that no modifications are being proposed in the Project that would increase the ability of the Refinery to process Bakken crude oil.<sup>129</sup> These assertions are either contrary to information disclosed by

<sup>125</sup> Pacific L.A. Marine Terminal SEIR/DSEIR, Appx. D1, pp. D1-20/21; Available at [https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix\\_D1\\_Throughput\\_Projection\\_Vessel\\_Mix\\_Methodology.pdf](https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix_D1_Throughput_Projection_Vessel_Mix_Methodology.pdf); see also LARIC DEIR, pp. 2-25/26/27 for description of marine terminals associated with the Tesoro Los Angeles Refinery.

<sup>126</sup> Tesoro Logistics Earnings Call Transcript, February 6, 2014, Exhibit 3.

<sup>127</sup> G.J. Cardamonte, Port of Long Beach 2012 Capital Program Update, September 2012, pdf 37 ("Berths 84-87 Tesoro Facility Improvements"), Available at: [http://www.cmaasc.org/pdfs/092012\\_portoflb.pdf](http://www.cmaasc.org/pdfs/092012_portoflb.pdf). See also: <http://www.polb.com/civica/filebank/blobload.asp?BlobID=11974>.

<sup>128</sup> Port of Long Beach, Master Schedule Construction Only, May 11, 2016, p. 2; Available at <http://www.polb.com/civica/filebank/blobload.asp?BlobID=13008>.

<sup>129</sup> DEIR, Section 2.5.4.1 and Appx. F.



Tesoro in other fora or they are demonstrably false. As documented elsewhere in these comments, the Refinery has already run some Bakken crude, which demonstrated that it is ideal for the refinery, increasing yields of gasoline and distillate. Further, the Project includes modifications to increase yields of gasoline and distillate, consistent with refining Bakken crude oils.

Figure 8.  
Cost-Advantaged Crude Transportation Options  
1/9/14 Tesoro Presentation, p. 19<sup>130</sup>  
(Legend)<sup>131</sup>



G1-78.145  
cont'd.

Thus, the 11 psi TVP vapor pressure limit for new tanks, coupled with identical crude composition data reported in MSDSs for the SCAQMD permit tank applications and the VET Application establish that the Project is designed to facilitate the crude switch that is widely reported by Tesoro and Tesoro Logistics.

<sup>130</sup> 1/9/14 Tesoro Presentation, p. 19, Exhibit 16.

<sup>131</sup> 12/10/13 Tesoro Analyst and Investor Presentation Transcript, p. 13, Exhibit 6: "The blue arrows represent Tesoro's ability to move advantaged North American crude from the production fields to the Port of Vancouver...and then through the entire West Coast system. The red arrows represent our waterborne domestic and foreign capabilities."

C. The Project Will Facilitate the Import of Tar Sands Crudes

The publicly available information, including the assumed vapor pressure for the new tanks (RVP = 10.5 psi; TVP=11+ psi), propane recovery, shutdown of the Wilmington FCCU, and other processing changes suggest that large amounts of Bakken or other light crude oils will be incorporated into the crude slate. However, the Project description and prior, piecemealed projects, suggest the Project is also building in maximum flexibility to allow other cost-advantaged crudes such as tar sands, given the Los Angeles Refinery’s configuration, the Project design, the VET product mix and public statements by Tesoro.

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*First*, the VET, which will supply the majority of the new crudes, is designed to heat 25% to 33% of crude unloaded from trains. Only the heavier Canadian tar sands crudes could require heating.<sup>132</sup> Assuming an average maximum VET throughput of 300,000 bbl/day, that would imply the ability to deliver up to 75,000 to 100,000 bbl/day of heavier tar sands crudes requiring heating. The lower end might actually not be that low (or rarely would) as it is based on limitations of steam supply to 1 to 1.5 unit train per day of out of 4. Some of this tar sands could end up at the Los Angeles Refinery, as it is somewhat similar to California heavy crudes currently refined there. The heavy VET tar sands crudes that could require heating are unlikely to go to Tesoro’s Anacortes or Kenai refineries as they do not have a coker.<sup>133</sup>

*Second*, the Marine Terminal Agreement, Annex D, lists crudes that could be accepted at the Marine Terminal in the baseline. These included two Canadian tar sands crudes, Cold Lake and Wabasca.<sup>134</sup>

G1-78.147

*Third*, some of the Applicant’s recently completed and planned projects to integrate the Carson and Wilmington Operations are required to facilitate the refining of increased amounts of heavy sour crudes, such as tar sands, at the Wilmington Operations. In fact, these already completed projects suggest that the Integration Project is piecemealed. Tesoro has been making modifications at both Wilmington and Carson that were completed prior to the release of the Integration DEIR, but which are required to implement the Integration Project.

G1-78.148

<sup>132</sup> Some other crudes being handled by the VET, such as Uinta Basin waxy crude, could require heating, but heavier tar sands crudes would be the predominant type of crudes that could require heating at the VET. But even for heavier tar sands crudes, heating requirements might be limited (especially in summer, when ambient temperatures are higher at the VET and along the rail routings from tar sands to the VET). Thus, heavier tar sands crudes comprise more than 33% of the crudes handled by the VET, especially in summer.

<sup>133</sup> Further, Tesoro Anacortes already has access to heavy tar sands crude via pipeline, as well as an onsite refinery unit train unloading terminal. Thus, Tesoro Anacortes is unlikely to receive substantial amounts of heavier tar sands crude via the VET.

<sup>134</sup> Marine Terminal Agreement, Annex D.

A new vacuum distillation unit started up at Wilmington in 2012, which will help maximize gasoline, diesel and jet fuel production by increasing the amount of vacuum gas oil.<sup>135</sup> This will require increased coking, perhaps explaining the need for a 10% increase in the maximum fired duty of the coker heater (H-100).<sup>136</sup>

The hydrogen plant at Wilmington was recommissioned to produce an additional 15 MMSCF/day of hydrogen. This removed constraints for the hydrocracker and hydrotreaters at both facilities, allowing them to refine increased amounts of heavy crudes, such as tar sands.<sup>137</sup>

The Wilmington sulfur recovery unit was “debottlenecked,” increasing its capacity by 10 ton/day.<sup>138</sup> This increased capacity would be required to run significant amounts of high sulfur tar sands crudes.

A blending system was also installed at Carson to mix light and heavy crudes to eliminate metallurgy (e.g., corrosion due to high TAN tar sands crudes) or yield constraints (e.g., reductions in yield due to system design).<sup>139</sup> This increased throughput volumes<sup>140</sup> and facilitated the processing of a range of tar sands crudes.

G1-78.148  
cont'd.

<sup>135</sup> Aaron Clark and Dan Murtaugh, Tesoro Wilmington Refinery Begins Operating New Vacuum Tower, Bloomberg, November 26, 2012; Available at: <http://www.bloomberg.com/news/articles/2012-11-26/tesoro-wilmington-refinery-begins-operating-new-vacuum-tower>.

<sup>136</sup> DEIR, pp. 1-11/12 (heater H-100 duty increased from 252 to 302.4 MMBtu/hr).

<sup>137</sup> 12/10/13 Tesoro Analyst and Investor Presentation Transcript, Exhibit 6, p. 10 (“The processing projects focus on removing feedstock constraints; fully utilizing the assets; improving our conversion capabilities, and subsequently, our yield. You know a great example of this that we’ve already achieved is the recommissioning of the hydrogen plant at Wilmington, which now is producing 15 million standard cubic feet per day of hydrogen, which then removes the constraints for the hydrocrackers and the hydrotreaters at both the facilities. It took us about \$4 million to bring that system back online.”)

<sup>138</sup> Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff remarks on California synergies at 9:27 to 10:13 minutes, attached as Exhibit 4a (“We were able to debottleneck the sulfur recovery unit and increase production capacity by 10 tons per day.”); Q1 2014 Tesoro Corporation Earnings Conference Call Transcript, May 1, 2014, p. 4, Exhibit 4b (Mistranscribed as: “We were able fleet stock that disposal recovery unit and increase production capacity by 10 tons per day. This modification allows us to increase crude flexibility and refining and capture further energy.”)

<sup>139</sup> 12/10/13 Tesoro Analyst and Investor Presentation Transcript, Exhibit 6, pp. 10, 28, 29, and May 1, 2014, Q1 2014 Tesoro Earnings Conference Call, Goff remarks on California synergies (Webcast, Exhibit 4a, at 9:27 to 10:13 minutes; Transcript, Exhibit 4b, p. 4).

<sup>140</sup> U.S. Securities and Exchange Commission, Form 10-K, Tesoro Corporation, Fiscal Year Ended December 31, 2015; Available at: <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NjMwOTIwfENoaWxkSUQ9MzMIMjk3fFR5cGU9MQ==&t=1>; (2015 Tesoro Form 10-K), p. 30 (“...Los Angeles improvements including...Crude blending capabilities at the Carson crude terminal that resulted in higher throughput volume.”).

All of these projects at the Los Angeles Refinery, and especially the Wilmington Operations, allow the Refinery to process increased amounts of tar sands crudes compared to the baseline, when very little tar sands was refined. Thus, these precedent projects in conjunction with the Integration Projects would allow an increase in the amount of tar sands that could be refined.

G1-78.148  
cont'

*Fourth*, the Refinery started receiving tar sands crudes via the Plains Bakersfield crude-by-rail terminal in December 2014. In a December 2015 presentation, Tesoro announced its intention to import 25,000 bbl/day of heavy tar sands crude to its California refineries:<sup>141</sup>

**"CJ Warner - Tesoro Corp. - EVP for Strategy & Business Development**  
One is bring a 25,000 barrels a day more heavy crude oil to California refineries. This is a rail opportunity. We are in the process of realizing it, and we're actually already producing or processing 9,000 barrels a day through this route in our LA refineries."

In Feb 2015, Greg Goff, CEO and Chairman of Tesoro, explained in response to a question from Citigroup<sup>142</sup>:

**"Faisal Khan - Citigroup - Analyst**

Okay, understood. And then on WCS and Bakken and moving those volumes into the West Coast, understanding that at the Vancouver facility that process is still ongoing, is there a desire to increase the amount of WCS you're reeling in right now to California? I know you're maxed out at roughly 20,000 a day, but is there ability for you to expand the facilities that Plains has at Bakersfield and move more WCS into Central California?

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**Greg Goff - Tesoro Corporation - Chairman & CEO**

The movement just started in December of the Canadian heavy that we're moving into Bakersfield, as you said. And then that will ramp up as the facility comes up. So we'll take our full share that we've contractually committed to, to moving the Canadian crude into our refineries.

**Faisal Khan - Citigroup - Analyst**

And is that still economic in the current environment to do that?

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<sup>141</sup> Tesoro, Driven to Create Value, Analyst and Investor Day Slides, December 9, 2014, p. 32, Exhibit 9 ("Provide reliable and cost advantaged access to feedstocks - 25 MBD heavy crude oil to California refineries...") and Thomson Reuters Streetevents Edited Transcript, TSO - Tesoro Corporation and Tesoro Logistics LP Analyst and Investor Day Transcript, December 9, 2014, p. 13, Exhibit 15.

<sup>142</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Q4 2014 Tesoro Corp. Earnings Call, February 12, 2015 (Q4 2015 Earnings Call), pp. 22-23, Exhibit 19.



**Greg Goff - Tesoro Corporation - Chairman & CEO**

You know, I haven't looked at it. I haven't looked at in the last a little bit. Those things bounce around a lot. You just have to look and see where they are over time. I don't know, Faisal, at this current time right now."

G1-78.149  
cont'd.

Thus, starting in Dec 2014, Tesoro was apparently moving some Western Canadian Select (WCS) into Bakersfield and on to its refineries, including Los Angeles.

Finally, tar sands crudes could be blended with Bakken to create an ANS look-alike crude using 55% Bakken and 45% Western Canadian Select at a cost potentially less than the ANS market price. The resulting mix has the same API gravity and slightly higher sulfur than ANS, and virtually identical distillation yields.<sup>143</sup> However, some refineries do not have sufficient storage or blending capacity.<sup>144</sup> The significant increase in storage tank capacity and the installation of blending facilities at the Carson terminal suggest that blending is an undisclosed part of the Project. Thus, the DEIR must disclose the assumed crude slate and evaluate the impacts of importing and processing both a lighter crude oil, such as Bakken and tar sands crudes, which span the range of likely impacts.

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Tar sands crudes would face stronger opposition in California than Bakken due to the well-known environmental impacts from producing and refining them.<sup>145</sup> Thus, they are frequently disguised in project proposals by referring only to broad general classes of crudes, e.g., light and heavy or "North American sourced crudes."

Tar sands crudes cannot be eliminated based on the record. Their refining is facilitated by the Project, and public statements made by Tesoro confirm its intent to import increased amounts of tar sands crudes to its Los Angeles Refinery. Thus, the DEIR should have identified them and disclosed the environmental impacts that would

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<sup>143</sup> John R. Auers and John Mayes, North American Production Boom Pushes Crude Blending, Oil & Gas Journal, May 6, 2013, Exhibit 32. See also DEIR, Appx. F, p. F-23 and VET DEIS, p. 5-51 ("For example, blending Canadian derived dilbit crude oil with the Bakken crude oil would create a feed blend for refining that would be similar to Alaskan North Slope crude oils that have generally been used in PADD 5 refineries.").

<sup>144</sup> Auers and Mayes 2013 ("While this type of blending can be successfully conducted within a refinery, some refineries do not have sufficient storage or blending capacity.")

<sup>145</sup> EIP, Tar Sands: Feeding U.S. Refinery Expansions with Dirty Fuel, June 2008, Available at: [http://environmentalintegrity.org/pdf/publications/Tar\\_Sand\\_Report.pdf](http://environmentalintegrity.org/pdf/publications/Tar_Sand_Report.pdf). See also: Jan Austen, Pollution from Canadian Oil Sands Vapor Is Substantial, Study Finds, May 25, 2016, New York Times; Available at: <http://www.nytimes.com/2016/05/26/business/energy-environment/pollution-from-canadian-oil-sands-vapor-is-substantial-study-finds.html?ref=business&r=0> and J. Liggio and others, Oil Sands Operations as a Large Source of Secondary Organic Aerosols, Nature, 2016; Available at: <http://www.nytimes.com/2016/05/26/business/energy-environment/pollution-from-canadian-oil-sands-vapor-is-substantial-study-finds.html?ref=business&r=0>.

be associated with refining them. While a small amount of these crudes were run in the baseline, the Project would allow a substantial increase in these crudes from the VET and were the VET not permitted, from other rail-to-marine terminals or the Plains Bakersfield Terminal.

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#### D. The Los Angeles Refinery Did Not Refine Significant Amounts of Bakken And Tar Sands Crude Oil In The Baseline

Publicly available information indicates that neither Wilmington nor Carson processed significant amounts of Bakken and other North American cost-advantaged crude oils in the baseline. As documented elsewhere in these comments, the Project will facilitate the import of these crudes, and Tesoro has publicly stated in many fora that it plans to import them. The Project includes modifications specifically designed to accommodate a crude switch. Thus, the DEIR must evaluate the impacts associated with substituting Bakken and/or tar sands for California, ANS and foreign-imported crudes refined in the baseline, because this change is facilitated by the Project's modifications to storage tanks and refinery processing equipment.

##### I. Baseline Amounts of Bakken Crudes

In its 10-Q reports to the U.S. Securities & Exchange Commission, Tesoro reported that only its Alaska, North Dakota, and Washington refineries were running Bakken crude:

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- For the quarter ended September 30, 2012: "We supply our North Dakota refinery exclusively with Bakken crude oil and our Washington refinery with Canadian Light Sweet crude oil."
- For the quarter ending March 31, 2013: "We supply our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Canadian Light Sweet and Bakken crude oil and our Utah refinery with light sweet crude oil from Wyoming and Montana as well as Uinta Basin waxy crude oil... **Our California refineries run a significant amount of South American heavy crude oil and San Joaquin Valley Heavy ("SJVH"), which continued to be priced at a discount to Brent during the first quarter of 2013.** During the first quarter of 2013, we supplied our Alaska refinery primarily with Alaska North Slope crude oil ("ANS")."<sup>146</sup>

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<sup>146</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2013, p. 33. Available at <https://www.sec.gov/Archives/edgar/data/50104/000005010413000029/a2013331-tsox10q.htm>, emphasis added.



- For the quarter ending March 31, 2014: “We supplied our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Bakken and Canadian Light Sweet crude oil and our Utah refinery with light sweet crude oil from Wyoming and Colorado as well as Uinta Basin waxy crude oil... **Our California refineries run a significant amount of South American heavy crude oil (“Oriente”) and San Joaquin Valley Heavy () and light crude oil from Iran (“Basrah”).**<sup>147</sup>
- For the quarter ending March 31, 2015: “We supply our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Bakken and Canadian Light Sweet crude oil and our Utah refinery with light sweet crude oil from Wyoming and Colorado as well as Uinta Basin waxy crude oil... **Our California refineries run a significant amount of South American heavy (“Oriente”) and San Joaquin Valley Heavy (SJVH) crude oil and light crude oil from Iraq (“Basrah”).**<sup>148</sup>

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cont’d.

Thus, the 10-Q reports indicate that Tesoro was not refining Bakken at its California refineries in 2012 and 2013 and that Tesoro is not currently refining significant amounts of Bakken at its California refineries.

The CEO of Tesoro, Greg Goff, stated that Tesoro shipped 5,000 to 7,000 bbl/day of Bakken into California in the first quarter of 2014 and the Bakken supply is limited to 10,000 bbl/day due to logistic constraints.<sup>149</sup> These numbers are consistent with known rail imports of Bakken to Tesoro’s Martinez refinery,<sup>150</sup> and further indicate the Los Angeles Refinery is not currently, nor has it historically refined Bakken crudes.

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<sup>147</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2014, p. 28. Available at: <https://www.sec.gov/Archives/edgar/data/50104/000005010414000024/tso10q-20140331.htm>, emphasis added.

<sup>148</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2015, p. 35. Available at: <http://www.sec.gov/Archives/edgar/data/50104/000005010415000019/a2015331-tsox10q.htm>, emphasis added.

<sup>149</sup> May 1, 2014 Q1 2014 Tesoro Earnings Call Webcast, Exhibit 4a, Goff (Tesoro) response to Cheng (Barclays) questions at 28:10 - 28:47 min; Transcript, Exhibit 4b, p. 12.

<sup>150</sup> Q3 2013 Tesoro Earnings Conference Call, November 7, 2013 Transcript, Exhibit 20, Greg Goff statements at p. 4 (“We also started taking up to 3 unit trains a month of Bakken crude oil into our Martinez refinery... we have the capacity to deliver nearly 350,000 barrels per month of Bakken crude oil into our Martinez, California refinery.”) and at p. 12 (“...we can deliver three unit trains per month into the Martinez or Golden Eagle refinery as well as some additional manifest cars that we do, which allows us to maximize the use of the facilities. As a result of that, it’s 350,000 barrels per month at the present time.”).

Tesoro's own statements in its earnings calls indicate that Bakken was not being refined at Los Angeles in the baseline. In the first quarter 2014 earnings call Mr. Goff stated that the crude slate of the Los Angeles Refinery has not changed materially since the acquisition of Carson (in 2013) and is largely ANS and Basrah. He confirmed that the crude slate will change in the future and the VET is the "primary way that we want to be able to improve crude supply cost at the Los Angeles facility."<sup>151</sup>

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cont'd.

The Marine Terminal Agreement, Annex D, lists crudes that could be accepted at the Wilmington Marine Terminal (Berths 84-86) in the baseline, prior to 2013. These do not include Bakken crude or any crude with a vapor pressure as high as Bakken.<sup>152</sup> The RVPs of crudes that could be accepted range from 1.0 to 6.3 psi and include tar sands crudes (Cold Lake, Wabasca). In fact, this Agreement stipulates a Reid Vapor Pressure limit of 6 psi or less for crudes imported at the Marine Terminal, which excludes the much higher RVP Bakken crudes. This Agreement was amended in December 2013 to eliminate all restrictions,<sup>153</sup> presaging plans to start importing Bakken and other light crudes.

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One of the characteristics of Bakken crudes, as discussed elsewhere in these Comments is a very high vapor pressure, similar to gasoline.<sup>154</sup> The only non-Bakken light crude identified as a feedstock to Tesoro's California refineries reported in its Form 10-Q reports is Basrah, which has a RVP of 3 to 6 psi. While it is possible that small amounts of Bakken (and tar sands) has been imported to Wilmington via Anacortes<sup>155</sup> or by manifest rail car to third party terminals, a method admitted to have been used for a cost-advantaged, tight shale, mid-continent Permian crude<sup>156</sup> and tar sands crude, this is unlikely to have occurred in large amounts. Further, it is unlikely

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<sup>151</sup> Q1 2014 Tesoro Corporation Earnings Conference Call Webcast, May 1, 2014, Tesoro (Goff) response to Cheng (Barclays) questions at 28:54 – 30:19 min, Exhibit 4a; Transcript in Exhibit 4b, p. 12.

<sup>152</sup> Marine Terminal Agreement, Sec. 7.0 and Annex D.

<sup>153</sup> Amended and Restated Long Beach Berth Access, Use and Throughput Agreement, December 6, 2013, Available at:

<http://www.sec.gov/Archives/edgar/data/50104/000119312513465459/d638208dex109.htm>.

<sup>154</sup> Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: <http://www.tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/1ab/20140306/LP1482013.asp>

Enbridge Pipelines Inc., 2013 Crude Characteristics (U.S. High Sweet – Clearbrook and Lewiston are Bakken crudes), Available at: <http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf>.

<sup>155</sup> Kristen Hays, UPDATE 2 – Tesoro Lifts Volumes of Bakken Rail Project, August 2, 2012, Reuters (CEO Goff of Tesoro is quoted as saying: Tesoro "may consider moving crude oil to California" once the Anacortes rail operation is running smoothly at 50,000 bpd.) Available at: <http://www.reuters.com/article/2012/08/02/tesoro-bakken-idUSL2E8I276M20120802>.

<sup>156</sup> Q1 2014 Tesoro Corporation Earnings Conference Call Webcast, May 1, 2014, Exhibit 4a, Tesoro (Goff) response to Cheng (Barclays) questions from at 27:26 to 27:48 min and Transcript in Exhibit 4b, p. 11.



that these crudes would have been imported in significant amounts prior to 2012 as transportation out of their area of origin was constrained due to lack of pipeline and rail terminals.

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cont'd.

2. Baseline Amounts of Tar Sands Crudes

In 2012, the Wilmington Refinery reportedly ran 1,000 bbl of tar sands crude, less than 2% of its throughput.<sup>157</sup> The U.S. Energy Information and Administration (US EIA) data on foreign crude imports indicates that both the Wilmington and Carson Operations have imported small amounts of tar sands crudes.<sup>158</sup> See Table 1. Additional amounts may have been imported via third-party terminals, such as the Plains Bakersfield Terminal, which might not be reported by EIA as being delivered to Carson or Wilmington. However, EIA data indicates very little Canadian crudes going to third-party terminals in California, Oregon, and Washington.

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Table 1.  
Canadian Crude Imports<sup>159</sup>

Year	Imports (bbl/day)	
	Wilmington	Carson
2012	1,000	1,000
2013	0	900
2014	700	0
2015	0	0

E. **Bakken Crudes Have Unique Environmental Impacts that Must be Disclosed and Analyzed in the DEIR**

Bakken crude is a “light” (i.e., very volatile) crude with a high API gravity (>40°) and very low sulfur content that is not similar to the current crude feedstock consisting of heavy California crudes, ANS, and imported foreign crudes. When refined, it yields very little residuum (coker feed) and large amounts of gasoline. Figures 6 and 7. The current Tesoro Los Angeles crude slate, which is similar to the ANS and Kern County

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<sup>157</sup> Oil Change International, Refinery Report, Available at: <http://refineryreport.org/refineries-list.php>.

<sup>158</sup> U.S., EIA Data, Tesoro Corp. Crude Oil Imports, Port City: Los Angeles, CA, Port Code 2704. Available at: <http://www.eia.gov/petroleum/imports/companylevel/>.

<sup>159</sup> The imports to Wilmington were all heavy sour. The imports to Carson were all heavy sour in 2013 and heavy sour, medium, and light sour in 2012. See Exhibit 21.

crude<sup>160</sup> shown in Figure 7, consists of heavier, higher sulfur crude. When refined, it yields large amounts of residuum, which must be processed in the cokers and FCCUs to extract lighter products amenable to conversion into gasoline, diesel, jet fuel, and distillates, the high value refinery products.

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cont'd.

These unique characteristics of Bakken crudes, for example, include high volatility, high flammability,<sup>161</sup> and elevated concentrations of TACs and VOC. These unique characteristics vary independently of API gravity and sulfur content. Thus, blending crude slates to satisfy refining goals would not assure that environmental impacts not related to blending metrics would not occur. The unique chemical and physical characteristics of each crude, as it relates to potential environmental impacts, but be separately evaluated.

1. Elevated Toxic Air Contaminants

Various publicly available information indicates that the chemical composition of Bakken and other light crudes is highly variable, from well to well. The health risk assessment should have evaluated an upper bound, but rather assumed a conventional crude with low concentrations of TACs.

The MSDSs for light sweet crude oil included with the application for the new storage tanks<sup>162</sup> reported much higher TACs than included in the health risk assessment,<sup>163</sup> as follows:

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- Benzene: MSDS: 5% - 7% HRA: **0.2%**
- Ethylbenzene: MSDS: 5% - 7% HRA: **0.13%**
- Toluene: MSDS: 5% - 7% HRA: **0.38%**
- Xylenes: MSDS: 5% - 7% HRA **0.13%**.

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<sup>160</sup> Kern County is in California's San Joaquin Valley. Kern County crude oil is a San Joaquin Valley crude, similar to other heavy California crudes refined in the baseline.

<sup>161</sup> Flammable crude oils will ignite when they are mixed with air in certain concentration ranges. The lowest temperature at which they produce sufficient vapor to support combustion is called the "flash point".

<sup>162</sup> Tank Application, October 3, 2013, pdf 13.

<sup>163</sup> The concentration of these chemicals in the crude oil included in the HRA are reported in DEIR Appendix B-3, Table A-19, p. B-3-11, pdf 1102.

Thus, these HAPs were underestimated by factors of 11 (xylene) to 54 (ethylbenzene), which thus underestimated chronic, acute, and cancer (benzene) health impacts by significant amounts. The precise amount cannot be determined as the DEIR failed to disclose the contribution to risk by chemical, as is customary in health risk assessment. My revision to the cancer risk assessment, to take into consideration the higher concentration of benzene in imported crude oils indicates that cancer risks are significant all three evaluated receptors.

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cont'd.

The Tank Applications reported benzene concentrations of 5% to 7% for light sweet crude oil, presumably Bakken crude oil.<sup>164</sup> The DEIR's analysis of health impacts, on the other hand, assumed a very low benzene concentration (0.2 wt.%) in crude oil,<sup>165</sup> consistent with default assumptions in the TANKS program, which are not relevant. Benzene is a potent carcinogen that contributes most of the Project's cancer risk from storage tanks. The major source of benzene emissions is the new tanks and associated fugitive components. Thus, the DEIR underestimated health impacts due to its failure to consider the specific impacts of a change in crude slate.

The DEIR's reported cancer risk ranges from 2.1 cases in a million at the nearest sensitive receptor up to 9.2 in a million at the nearest off-site worker.<sup>166</sup> The cancer significance threshold is 10 in one million. The DEIR failed to disclose the contribution to cancer risk for any carcinogen except diesel particulate matter (DPM). Rather, it lumps everything but DPM into a category called "other TACs," which includes benzene.<sup>167</sup>

Health risk assessments typically summarize TAPs and their corresponding contribution to health risks (cancer, chronic, acute) by pollutant. This facilitates confirming and understanding the source and accuracy of the resulting risk calculations and informs the public of what they are exposed to and its consequences. This information is missing from the DEIR. Rather, it is buried in complex HARP modelling files and a dense collection of emission spreadsheets (which are not listed individually in the table of contents or summarized in one place by pollutant and source) to understand the risk calculations.

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The HARP files do not disclose the source (e.g., tanks, heaters) of the emissions, i.e., pounds per year of pollutant by source. This critical information is buried in a maze of separate tables in DEIR Appendix B-3, with no overall emission summary table or table of contents. Reviewing the jumbled TAP emissions and HARP modeling files is

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<sup>164</sup> Tank Application, October 3, 2013, pdf 13.

<sup>165</sup> DEIR, pdf 1102, Table A-19, Column RS197, crude oil.

<sup>166</sup> DEIR, Appx. B-4, Table 10, pdf 1619.

<sup>167</sup> DEIR, Appx. B-4, Table 12, pdf 1624.

beyond the skill level of the majority of affected members of the public and requires highly specialized expertise and more time than allotted for the review of the DEIR. The absence of health risk (cancer, acute, and chronic) information by pollutant significantly hinders the ability to review the reasonableness of the health risk assessment. Thus, the DEIR fails as an informational document.

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The DEIR's summary table shows that the majority of the cancer risk at the nearest residential receptor (MEIR) and nearest sensitive receptor is primarily due to "other TACs", which contribute 97% of the risk at each. The HARP modeling files indicate that benzene contributes 33% of the cancer risk at the MEIR and 42% as the MEIW. Table 2.

Table 2. Contribution of Benzene to Cancer Risk.<sup>168</sup>

Receptor	UTM Easting	UTM Northing	Receptor #	Project Cancer Risk (per million)	Project Benzene Cancer Risk (per million)	Benzene % of Total Impacts
MEIR	383700	3741400	2978	3.64	1.22	33.41
MEIW	386006	3742921	5659	9.19	0.03	0.37
Sensitive	386721	3739987	7	2.09	0.88	42.25

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The benzene emission calculations in Appendix B-3 indicate that over 98% of the benzene emissions are from the tanks and fugitives sources that handle crude oil. Thus, if the risk due to just benzene, as summarized in Table 2, is adjusted to use the upper bound benzene concentration in Bakken crude (7%), rather than the assumed value of 0.2%, the benzene cancer risk would increase to 43 in a million for the MEIR,<sup>169</sup> to 1.05 in a million for the MEIW,<sup>170</sup> and to 31 in a million for the sensitive receptor.<sup>171</sup> Table 3 indicates that the total cancer risk at these three receptors would increase to 45 in one

<sup>168</sup> The benzene cancer risk is calculated from the provided HARP files by subtracting the baseline results from post-project results for each receptor, using the following files: **MEIR:** PostResCancer30YrCancerRisk.csv and BaseResCancer30YrCancerRisk.csv, **MEIW:** PostWorkerCancer25YrCancerRisk.csv, and BaseWorkerCancer25YrCancerRisk.csv, and **Sensitive:** PostSensCancer30YrCancerRisk.csv and BaseSensCancer30YrCancerRisk.csv.

<sup>169</sup> Cancer risk due to benzene at MEIR = (1.22)/(7/0.2) = 42.7 in one million.

<sup>170</sup> Cancer risk due to benzene at MEIW = (0.03)/(7/0.2) = 1.05 in one million.

<sup>171</sup> Cancer risk due to benzene at sensitive receptor (0.88)/(7/0.2) = 30.8 in one million.

million at the MEIR,<sup>172</sup> to 10.2 in one million at the MEIW,<sup>173</sup> and to 32 in one million at the sensitive receptor.<sup>174</sup>

**Table 3: Revised Cancer Risk  
(Increased Cases in One Million)**

	DEIR Cancer Risk	Revised Benzene Risk	Revised Cancer Risk	Significant?
MEIR	3.64	43	45	Yes
MEIW	9.19	1.05	10.2	Yes
Sensitive	2.09	31	32	Yes

G1-78.159  
cont'd.

Thus, if the upper bound benzene concentration for Bakken crude oil (or the light crude oil listed in the MSDS submitted with the tank application) had been used in the health risk assessment, the cancer risk at all three receptors would be significant. The cancer risk at the MEIR and the sensitive receptor are significantly higher than the significance threshold of 10 in one million. Thus, the DEIR has failed to identify a significant health impact by failing to take into consideration crude quality.

The DEIR should be revised to include similar calculations for other crude oil TACs that were underestimated and the revised document recirculated for public review to fully disclose impacts to the surrounding community.

2. Elevated Vapor Pressure

The amount of TACs and VOC released from storage tanks and fugitive components and the probability and consequences of accidents further depend upon the vapor pressure of the crude oil. Bakken crude oils are more volatile than crudes refined in the baseline.<sup>175</sup> See discussion of vapor pressure in Comments II.B.1 and II.E.2.

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<sup>172</sup> Total cancer risk at MEIR = 3.64 - 1.22 + 42.7 = 45 in one million.

<sup>173</sup> Total cancer risk at MEIW = 9.19 - 0.03 + 1.05 = 10.2 in one million.

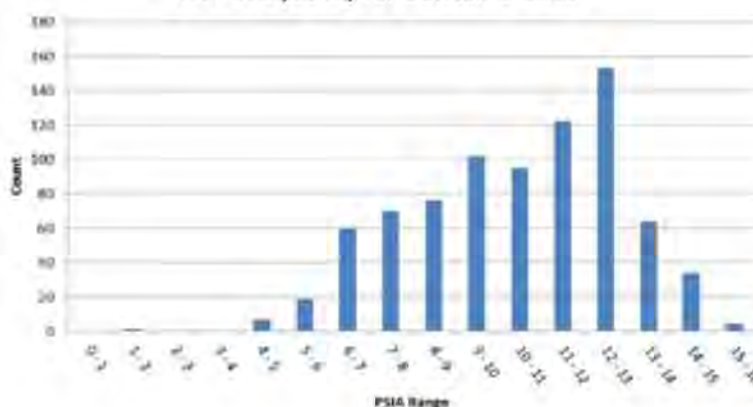
<sup>174</sup> Total cancer risk at sensitive receptor = 2.09 - 0.88 + 30.8 = 32 in one million.

<sup>175</sup> See Terminal Agreement, Annex D and crude oil tank vapor pressure limits in Title V permits.

This data, summarized in Figure 9, shows that Bakken crude oils vary substantially in vapor pressure and thus would have a wide range of environmental impacts when stored and transported. The more volatile the crude, the higher the VOC, TACs, and methane (a potent greenhouse gas) emissions, the higher the flammability, and the greater the potential consequences in the event of an accident.

Other data<sup>176</sup> indicate that the RVP of Bakken crude oil can be substantially higher than the value reported in Capline Pipeline data. In fact, this data shows that a significant portion of the tested Bakken crude had a RVP greater than 13. Further, a study of Bakken crudes involved in the Lac-Mégantic accident by the Transportation Safety Board of Canada (TSBC)<sup>177</sup> concluded that the volatility and flammability of Bakken crudes were more similar to gasoline than to crude oil, distinguishing Bakken crudes from other light crudes currently refined at the Los Angeles Refinery, e.g., Bashrah.

Figure 9.<sup>178</sup>  
**RVP Frequency for Bakken Crudes**



G1-78.160  
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Bakken and other light crude oils taken straight from the well typically contain large amounts of natural gas liquids (NGLs), known as light ends or condensate.<sup>179</sup> These include C2 to C5 hydrocarbons: methane, propane, butane, ethane, and pentane.

<sup>176</sup> A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, submitted by the American Fuel & Petrochemical Manufacturers, May 2014, p. 5; Exhibit 33.

<sup>177</sup> Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: <http://www.bst-tsb.gc.ca/eng/lab/rail/2013/lp1482013/LP1482013.asp>.

<sup>178</sup> Exhibit 33, p. 19.

<sup>179</sup> Dangerous Goods Transport Consulting, Inc., 2014.



These are the components most likely to volatilize, burn, or explode in an accident. These light ends have the effect of increasing a crude's vapor pressure, lowering its flash point and lowering its initial boiling point, all of which result in increased environmental risks. These direct-well crudes are called "live" crude oils. The high concentration of light ends makes them highly flammable, more likely to form fire balls and boiling liquid expanding vapor explosions (BLEVES) in accidents. The failure to recognize this resulted in a significant underestimate of VOC and TAC emissions and hazards in the DEIR.

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In most petroleum-producing regions, light ends are removed before they are shipped using a stabilizer — a tall, cylindrical tower that uses heat to separate the light ends, which are then condensed and sent to a fractionator for processing. Crude stabilizers and NGL pipelines to send the recovered NGLs to market are ubiquitous in oil fields that produce light crude oils as crude pipeline specifications set pressure limits that force stripping of the NGLs. However, in the Bakken fields, this infrastructure is rare and most Bakken crude that is shipped by rail is shipped live. This distinguishes it from other light crudes, which are shipped dry, e.g., Eagle Ford crudes in Texas, where oil field infrastructure exists to process it and most of it is shipped by pipeline, which requires that NGLs be stripped.<sup>180</sup> While North Dakota has implemented regulations to control this issue, they have not been effective as they are not enforceable. As Tesoro has stated in other fora:

"Oil producers at the wellhead must condition the crude oil, not Shippers. The intent of the Order was to "improve the marketability and safe transportation of the crude oil" through wellhead conditioning of the crude oil to remove more light ends and essentially put a cap on vapor pressure (not volatility, per se). Then rail facilities are required to notify NDIC when discovering that any crude oil tendered for shipment violates federal safety standards – the rail facilities are not required to (and it is not feasible to) test all crude oil coming into or out of the facility for light end content, vapor pressure, or volatility."<sup>181</sup>

G1-78.161

Other crudes that Bakken would replace, such as ANS and California crudes, are hard to ignite because they do not have as much combustible light ends. Most light crudes, including the imported foreign crudes currently processed, are stabilized. These stabilized crudes will not actively boil at ambient temperature and can be more safely shipped, stored, and refined.

<sup>180</sup> 'Degassing' North Dakota Crude Oil Before Shipping Among Safety Ideas, Insurance Journal, May 14, 2014, Available at: <http://www.insurancejournal.com/news/national/2014/05/14/329095.htm>.

<sup>181</sup> Tesoro Savage Vancouver Energy Distribution Terminal Facility Draft Environmental Impact Statement, November 2015, T-S Comments on the DEIS, January 22, 2016, p. 4-12, pdf 188, Exhibit 22a.

Thus, while “light” (domestic) crude may replace other types of “light” (foreign imported) crude, there are major differences in composition that affect environmental impacts. Neither the DEIR, nor the VET (the most likely source of cost-advantaged crudes) imposes any condition(s) that require that NGLs be removed from received crudes to mitigate these impacts. Thus, the EIR’s analyses must assume that they will be present in the crude supply for the Project. Otherwise, the EIR must impose enforceable conditions that prohibit receipt of live crude oils at the marine terminals that support the Project.

G1-78.161  
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3. Emissions from Operating Problems

In addition, Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in refinery operating issues, which require adjustments to operating procedures and result in increased emissions. These include higher paraffinic content that can result in waxy coatings on storage tanks, increasing tank cleaning emissions; greater development of sludges and solids when combining Bakken with non-Bakken crude oils, increasing tank cleaning emissions; elevated H<sub>2</sub>S, requiring operational changes to avoid potential increases in corrosion; fouling of the cold preheat train; desalter upsets; and fouling of hot preheater exchangers and furnaces; as well as corrosion.<sup>182</sup> These operating problems increase emissions. These operating problems and attendant emission increases were not disclosed in the DEIR.

G1-78.162

4. Increased Risk of Accidents

The very high vapor pressure of some Bakken crudes, noted by Tesoro and others, can lead to serious problems in storage tanks. Large amount of light ends, all components lighter than pentane, can spontaneously start to boil and split the storage tank, sink the roof, and emit a flammable gas cloud.<sup>183</sup>

G1-78.163

<sup>182</sup> Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>; Gordon Schremp, Trends in Sources of Crude Oil, 2014 IEPR Workshop, California Petroleum Overview & Background, June 25, 2014, p. 47; Available at: [http://www.energy.ca.gov/2014\\_energypolicy/documents/2014-06-25\\_workshop/presentations/01\\_Schremp\\_Final\\_2014-06-25.pdf](http://www.energy.ca.gov/2014_energypolicy/documents/2014-06-25_workshop/presentations/01_Schremp_Final_2014-06-25.pdf).

<sup>183</sup> David Murray, Canadian Crude Oil Quality. Handle with Care!, Presented to the Canadian Heavy Oil Association, Edmonton Chapter, January 27, 2014; Available at: <http://www.ccqta.com/files/CHOA%20Presentation%20Jan%2027%202014%20V4%20r2.pdf>.



F. Tar Sands Crudes Have Unique Environmental Impacts That Must Be Disclosed in the DEIR

1. Impacts of Diluent

The majority of the tar sands crudes imported to Los Angeles will likely be DilBits, a blend of bitumen and diluent. The diluent is typically natural gas condensate, pentanes, or naphtha.<sup>184</sup> Tar sands crudes must be diluted or thinned with a lighter hydrocarbon stream to reduce viscosity and density to be transported.

Pure undiluted tar sands bitumen is unlikely as the Project description does not disclose any equipment or process modifications that would be necessary to handle pure bitumen, e.g., heated storage tanks. Undiluted bitumen would eliminate the diluent impacts discussed in this section, but would significantly increase the impacts from refining the heavy ends from increased use of utilities that increase combustion emissions. Setting aside undiluted bitumen, this leaves the question of the amount and type of diluent that would be mixed with the crude, which ultimately determines impacts.

G1-78.164

The potential import of DilBits cannot be eliminated and is likely given the MSDSs submitted with the tank application.<sup>185</sup> The failure to disclose the potential import of tar sands crudes, which are chemically distinct from the current crude slate, is a significant omission as the emissions from handling and refining this material are different from the baseline crude slate. The emissions of some pollutants, VOCs and TAPs, for example, are large and will result in significant air quality, odor, and worker and public health impacts. The MSDS for sweet heavy crude oil, submitted with the Wilmington tank application, shows elevated concentrations of benzene (0.1% to 3%) compared to an assumed benzene concentration of 0.2 wt.% in crude oil<sup>186</sup> in the health risk assessment.<sup>187</sup> Thus, the HRA underestimated health risks from benzene in imported tar sands crudes.

Heavy crude transported by rail from Canada to the VET will most likely be conventional pipeline-quality DilBits with 20% to 30% diluent as the VET is designed for pipeline grade crude oil. The mixture of diluent and bitumen does not behave the same as a conventional heavy crude, such as present in the current crude slate, because

G1-78.165

<sup>184</sup> Gary R. Brierley, Visnja A. Gembicki, and Tim M. Cowan, Changing Refinery Configurations for Heavy and Synthetic Crude Processing, 2006 (Brierley et al 2006); Available at: <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showFoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138>.

<sup>185</sup> Wilmington Tank Application 556835, December 11, 2012, pdf 88, MSDS for Sweet Heavy Crude Oil.

<sup>186</sup> DEIR, pdf 1102, Table A-19. Column RS197, crude oil.

<sup>187</sup> Tank Application, October 3, 2013.

the distribution of hydrocarbons is very different. The blended lighter diluent generally evaporates readily when exposed to ambient conditions, leaving behind the heavy ends, the vacuum gas oil (VGO) and residuum.<sup>188</sup> Thus, when a DilBit is released accidentally, it will generally create a difficult to cleanup spill as the heavier bitumen will be left behind.<sup>189</sup> Further, in a storage tank, the diluent also can be rapidly evaporated and be emitted through tank openings, releasing high amounts of VOCs and TACs.

These conventional DilBits, which are the most likely tar sands crudes to be imported from the VET to Los Angeles over the long term, given the current economic outlook, are sometimes referred to as “dumbbell” or “barbell” crudes as the majority of the diluent is C<sub>5</sub> to C<sub>12</sub> and the majority of the bitumen is C<sub>30+</sub> boiling range material, with very little in between.<sup>190</sup> This means these crudes have a lot of material boiling at each end of the boiling point curve, but little in the middle. Thus, they yield very little middle distillate fuels, such as diesel, heating oil, kerosene, and jet fuel and more coke, than other heavy crudes. A typical DilBit, for example, will have 15% to 20% by weight light material, basically the added diluent, 10% to 15% middle distillate, and the balance, >75% is heavy residual material (vacuum gas oil and residue) exiting the distillation column. These characteristics distinguish DilBits from crudes currently refined at Carson and Wilmington. Thus, they could generate more coke than the current crude slate, which was not disclosed in the DEIR.

G1-78.165  
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The large amount of light material that distills below 149 C is very volatile and can be emitted to the atmosphere from storage tanks and equipment leaks of fugitive components (pumps, compressors, valves, fittings) in much larger amounts than other heavy crudes that it would replace. A portion of this material will likely be recovered as propane by the Project.

The DEIR does not indicate whether other heavy crudes processed at the Refinery currently arrive with diluent. The EIA data summarized in Table 1 suggest very little tar sands DilBit has been refined at Los Angeles. Thus, the presence of diluent in marine-imported crudes is likely an important difference between the current heavy crude slates processed at the Refinery and the tar sands crudes that could replace them. This diluent will have impacts during marine vessel unloading as well from storage and charging tanks and at the refining units.

G1-78.166

<sup>188</sup> The residuum is the residue obtained from the oil after nondestructive distillation has removed all of the volatile materials. Residua are black, viscous materials. They may be liquid at room temperature (from the atmospheric distillation tower) or almost solid (generally vacuum residua), depending upon the nature of the crude oil.

<sup>189</sup> A Dilbit Primer: How It's Different from Conventional Oil, Inside Climate News. Available at <http://insidetheclimate.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar-sands-Alberta-Kalamazoo-Keystone-XL-Enbridge?page=show>.

<sup>190</sup> Brierley et al. 2006.



The diluent is a low molecular weight organic material with a high vapor pressure that contains high levels of VOCs, sulfur compounds, and TACs. These would be emitted during unloading, storage, and transport and would be present in emissions from the crude tank(s) and fugitive components from their entry into the Refinery with the crude until it is refined. The presence of diluent would increase the vapor pressure of the crude, substantially increasing VOC and TAC emissions from tanks and fugitive component leaks compared to those from displaced heavy crudes not blended with diluent.

G1-78.166  
cont'd.

The composition of some typical diluents/condensates is reported on the website, [www.crudemonitor.ca](http://www.crudemonitor.ca).<sup>191</sup> The specific diluents that would be present in imported crudes is unknown. However, the CrudeMonitor information indicates that diluents contain very high concentrations of the TACs benzene, toluene, ethyl benzene, and xylenes, much higher than included in the health risk assessment. The sum of these four compounds is known as "BTEX" or benzene-toluene-ethylbenzene-xylene. The DEIR does not disclose the BTEX concentrations in the baseline crude slate nor the BTEX concentrations in the range of crudes that could be imported. Rather, it contains only a single mass fraction crude vapor speciation profile that is used only to estimate TAC emissions from tanks and fugitive components.

The CrudeMonitor information also indicates that these diluents contain elevated concentrations of volatile mercaptans (9.9 to 103.5 ppm), which are highly odiferous and toxic compounds that will create odor and nuisance problems at the Refinery in the vicinity of the unloading area, crude storage tanks and supporting fugitive components. Mercaptans can be detected at concentrations substantially lower than will be present in emissions from the crude tanks and fugitive emissions from pumps, valves, flanges, and connectors in the baseline.<sup>192</sup> In fact, mercaptans are added to natural gas in very tiny amounts so that the gas can be smelled to facilitate detecting leaks.

G1-78.167

Thus, unloading, storing, handling and refining bitumens mixed with diluent would emit VOCs, TACs, and malodorous sulfur compounds, not found in comparable levels in the existing slate of heavy high sulfur local and imported ANS and foreign crudes. There are no restrictions on the crudes, diluent source, or their compositions nor any requirements to monitor emissions from tanks and leaking equipment where DilBit-blended and other light crudes would be handled.

<sup>191</sup> Condensate Blend (CRW) - <http://www.crudemonitor.ca/condensate.php?acr=CRW>; Fort Saskatchewan Condensate (CFT) - <http://www.crudemonitor.ca/condensate.php?acr=CFT>; Peace Condensate (CPR) - <http://www.crudemonitor.ca/condensate.php?acr=CPR>; Pembina Condensate (CPM) - <http://www.crudemonitor.ca/condensate.php?acr=CPM>; Rangeland Condensate (CRL) - <http://www.crudemonitor.ca/condensate.php?acr=CRL>; Southern Lights Diluent (SLD) - <http://www.crudemonitor.ca/condensate.php?acr=SLD>.

<sup>192</sup> American Industrial Hygiene Association, Odor Thresholds for Chemicals with Established Occupational Health Standards, 1989; American Petroleum Institute, Manual on Disposal of Refinery Wastes, Volume on Atmospheric Emissions, Chapter 16 - Odors, May 1976, Table 16-1.

2. Increased Combustion Emissions From Tar Sands Bitumen Not Evaluated

The composition of tar sands crudes is chemically different from other heavy crudes currently processed at the Refinery for two major reasons: (1) presence of large quantities of volatile diluent with high levels of VOCs and toxic chemicals as discussed above and (2) unique chemical composition of the bitumen, the heavy fraction. The previous comment discussed diluent. This comment discusses the unique composition of tar sands bitumens that require more intense processing and thus result in higher emissions not disclosed in the DEIR.

G1-78.168

Tar sands bitumens are composed of higher molecular weight chemicals and are deficient in hydrogen compared to conventional heavy crudes. This means more energy will be required to convert them into the same slate of refined products. Thus, most fired sources at the Refinery – heaters, boilers, etc. – will have to work harder to generate the same quantity and quality of refined products. This will increase all utilities required to run the refinery - electricity, natural gas, hydrogen, water, and steam. These increases in emissions were not disclosed in the DEIR. This section discusses these bitumens and their impact on refining emissions.

Refining converts crude oils into transportation fuels. This is done by removing contaminants (sulfur, nitrogen, metals) and breaking down and reassembling chemicals present in the crude oil charge by adding hydrogen, removing carbon as coke, and applying heat, pressure, and steam in the presence of various catalysts. More intensive refining is required to convert tar sands crudes into useful products than other heavy crudes, regardless of the API gravity and sulfur content of the final blend. This means a greater amount of energy must be expended to yield the same product slate. Thus, all of the combustion sources in a refinery, such as heaters and boilers, must work harder and thus emit more pollutants, than when refining conventional heavy and other crudes. The DEIR fails completely to analyze the impact of crude composition on the resulting emissions from generating increased amount of these utilities.

G1-78.169

Canadian tar sands bitumen is distinguished from conventional petroleum by the small concentration of low molecular weight hydrocarbons and the abundance of high molecular weight polymeric material.<sup>193</sup> Crudes derived from Canadian tar sands bitumen – DilBits and SynBits – are heavier, i.e., have larger, more complex molecules such as asphaltenes,<sup>194</sup> some with molecular weights above 15,000.<sup>195</sup> They generally

<sup>193</sup> O.P. Strausz, *The Chemistry of the Alberta Oil Sand Bitumen*, Available at: [http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22\\_3\\_MONTREAL\\_06-77\\_0171.pdf](http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf)

<sup>194</sup> Asphaltenes are nonvolatile fractions of petroleum that contain the highest proportions of heteroatoms, i.e., sulfur, nitrogen, oxygen. The asphaltene fraction is that portion of material that is precipitated when a large excess of a low-boiling liquid hydrocarbon such as pentane is added. They are dark brown to black amorphous solids that do not melt prior to decomposition and are soluble in



have higher amounts of coke-forming precursors; larger amounts of contaminants (sulfur, nitrogen nickel, vanadium) that require more intense processing to remove; and are deficient in hydrogen, compared to other heavy crudes. These differences lead to many refining challenges -- naphthenic acid corrosion, subtle TAN changes, desalter upsets, preheat train fouling<sup>196</sup> – that can increase emissions.

Thus, to convert tar sands crudes into the same refined products requires more utilities -- electricity, water, heat, and hydrogen. This requires that more fuel be burned in most every fired source at a refinery and that more water be circulated in heat exchangers and cooling towers. Further, this requires more fuel to be burned in any supporting off-site facilities. Under CEQA, these indirect increases in emissions caused by a project must be included in the impact analysis. These increases in fuel consumption release increased amounts of NO<sub>x</sub>, SO<sub>x</sub>, VOCs, CO, PM10, PM2.5, and TACs as well as greenhouse gas emissions (GHG). Some of the principal differences are identified below, followed by a discussion of the impacts these differences have on emissions.

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### 3. Higher Concentrations of Asphaltenes and Resins

The severity (e.g., temperature, amount of catalyst, hydrogen) of hydrotreating depends on the type of compound a contaminant is bound up in. Lower molecular weight compounds are easier to remove. The difficulty of removal increases in this order: paraffins, naphthenes, and aromatics.<sup>197</sup> Most of the contaminants of concern in tar sands crudes are bound up in high molecular weight aromatic compounds such as asphaltenes that are difficult to remove, meaning more heat, hydrogen, and catalyst are required to convert them to lower molecular weight blend stocks. Some tar sands-derived vacuum gas oils (VGOs), for example, contain no paraffins of any kind. All of the molecules are aromatics, naphthenes, or sulfur species that require large amounts of hydrogen to hydrotreat, compared to other heavy crudes.<sup>198</sup>

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benzene and aromatic naphthas.

<sup>196</sup> O.P. Strausz, *The Chemistry of the Alberta Oil Sand Bitumen*, Available at: [http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22\\_3\\_MONTREAL\\_06-77\\_0171.pdf](http://web.anl.gov/PCS/acsfuel/preprint%20archive/Files/22_3_MONTREAL_06-77_0171.pdf).

<sup>196</sup> Eric Veters, *Challenges of Processing Canadian Crudes: Low Cost Reliable Operation in a Competitive Business Environment*, June 20, 2012, Joint CCQTA/COQA Meeting; Available at: <http://www.ccqta.com/files/Challenges%20of%20Processing%20Canadian%20Crudes%20June%202012%20v2a.pdf> and Walter Giesbrecht, *Challenges of Processing Heavy Canadian Crudes*, June 20, 2012, Joint CCQTA/COQA Meeting; Available at: June 20, 2012, Joint CCQTA/COQA Meeting; Available at: <http://www.ccqta.com/files/FHR%20CCQTA%20Presentation%202012.pdf>.

<sup>197</sup> Gary et al., 2007, p. 200.

<sup>198</sup> See, for example, the discussion of hydrotreating and hydrocracking of Athabasca tar sands cuts in Brierley et al. 2006, pp. 11-17.

Asphaltenes and resins generally occur in tar sands bitumens in much higher amounts than in other heavy crudes. They are the nonvolatile fractions of petroleum and contain the highest proportions of sulfur, nitrogen, and oxygen.<sup>199</sup> They have a marked effect on refining and result in the deposition of high amounts of coke during thermal processing in the coker. They also form layers of coke in hydrotreating reactors, requiring increased heat input, leading to localized or even general overheating and thus even more coke deposition. This seriously affects catalyst activity resulting in a marked decrease in the rate of desulfurization. They also require more intense processing in the coker to break them down into lighter products. These factors require increases in steam and heat input, both of which generate combustion emissions – NO<sub>x</sub>, SO<sub>x</sub>, CO, VOCs, PM10, and PM2.5.

Further, if the crude includes a synthetic crude, SCO, for example, the material has been previously hydrotreated. Thus, the remaining contaminants (e.g., sulfur, nitrogen), while present in small amounts, are much more difficult to remove (due to their chemical form, buried in complex aromatics), requiring higher temperatures, more catalyst, and more hydrogen.<sup>200</sup>

The higher amounts of asphaltenes and resins generate more heavy feedstocks that require more severe processing than lighter feedstocks. The coker, for example, makes more coker distillate and gas oil, that would contribute to the propane would be recovered, compared to conventional heavy crudes. Similarly, the Crude Unit makes more atmospheric and vacuum gas oils,<sup>201</sup> increasing emissions there, including fugitive VOC emissions from equipment leaks and combustion emissions from burning more fuel.

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<sup>199</sup> James G. Speight, The Desulfurization of Heavy Oils and Residua, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Tables A.2, A.3, and A.4.

<sup>200</sup> See, for example, Brierley et al. 2006, p. 8 ("The sulfur and nitrogen species left in the kerosene and diesel cuts are the most refractory, difficult-to-treat species that could not be removed in the upgrader's relatively high-pressure hydrotreaters."); Turini et al. 2011, p. 4.

<sup>201</sup> See, for example, Turini et al. 2011, p. 9.

4. Hydrogen Deficiency

Tar sands crudes are hydrogen-deficient compared to heavy and conventional crude oils and thus require substantial hydrogen addition during refining, beyond that required to remove contaminants (sulfur, nitrogen, metals) from non-tar-sands crudes. This again means more combustion emissions from burning more fuel.

G1-78.171

5. Higher Concentrations of Catalyst Contaminants

Tar sands bitumens contain about 1.5 times more sulfur, nitrogen, oxygen, nickel and vanadium than typical heavy crudes.<sup>202</sup> Thus, much more hydrogen per barrel of feed and higher temperatures would be required to remove the larger amounts of these poisons from semi-refined products. These impurities are removed by reacting hydrogen with the crude fractions over a fixed catalyst bed at elevated temperature. The oil feed is mixed with substantial quantities of hydrogen either before or after it is preheated, generally to 500 F to 800 F. The amount of hydrogen required for a particular application depends on the hydrogen content of the feed and products and the amount of the contaminants to be removed. Hydrogen consumption is typically about 70 standard cubic foot per barrel (scf/bbl) of feed per percent sulfur, about 320 scf/bbl feed per percent nitrogen, and 180 scf/bbl per percent oxygen removed.<sup>203</sup>

G1-78.172

Canadian tar sands crudes generally have higher nitrogen content, 3,000 to >6,000 ppm<sup>204</sup> and specifically higher organic nitrogen content, particularly in the naphtha range, than other heavy crudes.<sup>205</sup> This nitrogen is mostly bound up in complex aromatic compounds that require a lot of hydrogen to remove. This would increase emissions.

First, additional hydrotreating is required to remove them, which increases hydrogen and energy input. Second, they deactivate the cracking catalysts, which requires more energy and hence more emissions to achieve the same end result. Third, they increase the nitrogen content of the fuel gas fired in combustion sources, which increases NO<sub>x</sub> emissions from all fired sources that use refinery fuel gas. Fourth, nitrogen in tar sands crudes is present in higher molecular weight compounds than in

<sup>202</sup> See, for example, USGS, 2007, Table 1.

<sup>203</sup> James H. Gary, Glenn E. Handwerk, and Mark J. Kaiser, Petroleum Refining: Technology and Economics, 5th Ed., CRC Press, 2007, p. 200 and A.M. Aitani, Processes to Enhance Refinery-Hydrogen Production, Int. J. Hydrogen Energy, v. 21, no. 4, pp. 267-271, 1996.

<sup>204</sup> Murray R. Gray, Tutorial on Upgrading of Oil Sands Bitumen, University of Alberta, Available at: <http://www.ualberta.ca/~gray/Links%20&%20Docs/Web%20Upgrading%20Tutorial.pdf>.

<sup>205</sup> See, for example, James G. Speight, Synthetic Fuels Handbook: Properties, Process, and Performance, McGraw-Hill, 2008, Appendix A.



other heavy crudes and thus requires more hydrogen and energy to remove. Fifth, some of this nitrogen will be converted to ammonia and other chemically bound nitrogen compounds, such as pyridines and pyrroles. These become part of the fuel gas and could increase NO<sub>x</sub> from fired sources. They further may be routed to the flares, where they would increase NO<sub>x</sub>.

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These types of chemical differences between the current crude slate and the new crude slate facilitated by the Project were not addressed at all in the DEIR. The potential increases due to these factors must be estimated relative to the CEQA baseline.

6. Higher Concentrations of Metals

The baseline slate includes very little tar sands crudes. Table 1. The Project could increase the import of tar sands crudes. These crudes have higher metal content than the baseline crude slate.<sup>206</sup> These metals, for example, would be partitioned into the coke. The impacts from increases in metal content were not evaluated in the DEIR.

The U.S. Geological Survey (USGS) reported that "natural bitumen," the source of all Canadian tar sands-derived oils, contains 102 times more copper, 21 times more vanadium, 11 times more sulfur, six times more nitrogen, 11 times more nickel, and 5 times more lead than conventional heavy crude oil, such as those currently refined from local sources.<sup>207</sup>

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The environmental damage caused by these metal pollutants includes bioaccumulation of toxic chemicals up the food chain and a direct health hazard from air emissions. These metals, for example, mostly end up in the coke and would be present coke dust emissions and coke pile runoff.

Further, larger amounts of coke may be produced by tar sands crudes by than the current crude slate. The metal content of fugitive dust from coke piles could increase to dangerous levels. The California Air Resources Board, for example, has classified lead as a pollutant with no safe threshold level of exposure below which there

<sup>206</sup> Straatiev and other, 2010, Table 1; Brian Hitchon and R.H. Filby, *Geochemical Studies - 1 Trace Elements in Alberta Crude Oils*, [http://www.ags.gov.ab.ca/publications/OFR/PDF/OFR\\_1983\\_02.PDF](http://www.ags.gov.ab.ca/publications/OFR/PDF/OFR_1983_02.PDF); F.S. Jacobs and R.H. Filby, *Trace Element Composition of Athabasca Tar Sands and Extracted Bitumens, Atomic and Nuclear Methods in Fossil Energy Research*, 1982, pp 49-59; James G. Speight, *The Desulfurization of Heavy Oils and Residua*, Marcel Dekker, Inc., 1981, Tables 1-1, 2-2, 2-3, 2-4 and p. 13 and James G. Speight, *Synthetic Fuels Handbook: Properties, Process, and Performance*, McGraw-Hill, 2008, Tables A.2, A.3, and A.4; Pat Swafford, *Evaluating Canadian Crudes in US Gulf Coast Refineries*, Crude Oil Quality Association Meeting, February 11, 2010, Exhibit 34.

<sup>207</sup> R.F. Meyer, E.D. Attanasi, and P.A. Freeman, *Heavy Oil and Natural Bitumen Resources in Geological Basins of the World*, U.S. Geological Survey Open-File Report 2007-1084, 2007, p. 14, Table 1, Available at <http://pubs.usgs.gov/of/2007/1084/OF2007-1084v1.pdf>.

are no adverse health effects. Thus, just the increase in lead from switching up to tar sands crude is a potentially significant impact that was not disclosed in the DEIR. Accordingly, crude quality is critical for a thorough evaluation of the impacts of a crude switch, such as facilitated by the Project and widely broadcast by Tesoro.

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7. Higher Total Acid Number (TAN)

Both DilBit and SynBit crudes, which are cost-advantaged North American crudes that could be imported from the VET, have high TAN, which indicates high organic acid content, typically naphthenic acids. These acids are known to cause corrosion at high temperatures, such as occur in many refining units, e.g., in the feed to cokers. As a rule-of-thumb, crude oils with a TAN number greater than 0.5 mgKOH/g<sup>208</sup> are considered to be potentially corrosive and indicates a level of concern. A TAN number greater than 1.0 mgKOH/g is considered to be very high. Canadian tar sands crudes are high TAN crudes. The DilBits, for example, range from 0.98 to 2.42 mgKOH/g.<sup>209</sup>

Sulfidation corrosion from elevated concentrations of sulfur compounds in some of the heavier distillation cuts is also a major concern, especially in the vacuum distillation column, coker, and hydrotreater units. The specific suite of sulfur compounds may lead to increased corrosion. The DEIR does not disclose either the specific suite of sulfur compounds or the TAN for the proposed crude imports.

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A crude slate change could result in corrosion from, for example, the particular suite of sulfur compounds or naphthenic acid content. The composition difference could cause significant accidental releases, even if the crude slate is within the current design slate basis. As discussed in Comments II.A.2.c and II.A.2.f, this recently occurred at the Chevron Richmond Refinery in the San Francisco Bay.

These types of accidents can be reasonably expected to result from incorporating tar sands crudes into crude oils processed at the Los Angeles Refinery. Even if the range of sulfur and gravity of the crudes remains the same, unless significant upgrades in metallurgy occur, as these crudes have a significant concentration of sulfur in the heavy components of the crude coupled with high TAN and high solids, which aggravate corrosion. The gas oil and vacuum residue piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from tar sands crudes,

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<sup>208</sup> The Total Acid Number measures the composition of acids in a crude. The TAN value is measured as the number of milligrams (mg) of potassium hydroxide (KOH) needed to neutralize the acids in one gram of oil.

<sup>209</sup> [www.crudemonitor.ca](http://www.crudemonitor.ca).



leading to catastrophic releases.<sup>210</sup> Catastrophic releases of air pollution from these types of accidents were not considered in the DEIR.

Refinery emissions released in upsets and malfunctions can, in some cases, be greater than total operational emissions recorded in formal inventories. For example, a recent investigation of 18 Texas oil refineries between 2003 and 2008 found that “upset events” were frequent, with some single upset events producing more toxic air pollution than what was reported to the federal Toxics Release Inventory database for the entire year.<sup>211</sup>

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### III. THE DEIR’S SHIP EMISSION CALCULATIONS ARE FATALLY FLAWED

The Project includes modifications to tanks and pipelines that serve the marine terminals and supply crude oil to the Carson and Wilmington Operations. The Project will replace two 80,000 barrel tanks with two 300,000 barrel tanks at the Wilmington Operations and will add six 500,000 barrel tanks at the Carson Crude Terminal for a total increase in storage capacity of 3,440,000 barrels.<sup>212</sup> Tesoro Logistics, who operates the marine terminals, reports it currently has 97 crude oil, feedstock, and refined product storage tanks with a combined capacity of 6.6 million barrels.<sup>213</sup> Thus, the Project is doubling storage capacity.<sup>214</sup> The increase in crude oil storage capacity at the Carson Terminal alone will increase from a total of 2,028,000 barrels (5 tanks) to a total capacity of 5,028,000 (11 tanks) or by a factor of 2.5. These increases will provide the Los Angeles Refinery with greater flexibility for purchase and blending of crude oils. It may also allow storage and blending of off-specification crude oil.<sup>215</sup>

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The DEIR fails to present any baseline and post-Project throughput and capacity information for the marine terminals that serve the Project<sup>216</sup> even though the Project significantly increases the unloading rate at these terminals and doubles their storage capacity. Tesoro has claimed all of the information required to estimate baseline

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<sup>210</sup> See, for example, Turini and others, 2011.

<sup>211</sup> J. Ozymy and M.L. Jarrell, *Upset over Air Pollution: Analyzing Upset Event Emissions at Petroleum Refineries*, *Review of Policy Research*, v. 28, no. 4, 2011.

<sup>212</sup> Increase in tank storage capacity =  $6(500,000) + 2(300,000 - 80,000) = 3,440,000$  bbl. The Carson Crude Terminal is south of Sepulveda Boulevard, adjacent to Carson Operations (which is north of Sepulveda Boulevard; see DEIR, p. 2-7.

<sup>213</sup> U.S. Securities and Exchange Commission, Form 10-K, Tesoro Logistics LP, Fiscal Year Ended December 31, 2015 (2015 Tesoro Logistics Form 10-K), p. 8; Available at <http://services.corporate-ir.net/SEC.Enhanced/SecCapsule.aspx?c=242247&fid=14232449>.

<sup>214</sup> Increase in storage tank capacity relative to baseline =  $(6.6+3.44)/6.6 = 1.52$

<sup>215</sup> SCAQMD Application 567649, pdf 938.

<sup>216</sup> DEIR, Section 2.6.5.

terminal throughput as CBI, thus preventing an estimate of the increase in emissions from increase marine vessel traffic in the usual manner.

The Carson and Wilmington Operations received crude oil in the baseline by ship at three marine terminals operated by Tesoro Logistics Operations, LLC (Tesoro Logistics) in the Port of Long Beach and a marine storage facility that support Tesoro's Los Angeles refinery: (1) Long Beach Terminal Berths B84 and 87 (Wilmington); (2) Marine Terminal 1, Berth 121 (Carson), which is capable of handling a two million barrel capacity crude carrier; (3) Marine Terminal 2 Berths B76-78 (Carson), which is comprised of a two-vessel berth dock; and (4) the Terminal 3 (Carson) storage facility.<sup>217</sup> Tesoro integrated the delivery systems in 2014 for these facilities so that Wilmington currently can access the Carson delivery network.<sup>218</sup> Presumably, after the Project is implemented, these terminals will supply the integrated Los Angeles Refinery.

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The information reviewed below, summarized in Figure 10, suggests that the Project is part of Tesoro Logistics' plans to expand its terminals.<sup>219</sup>

Figure 10.

Long Beach Terminal and Los Angeles Pipelines Drop Down Assets



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<sup>217</sup> DEIR, pp. 2-23/27 and Fig. 2-9; 2015 Tesoro Logistics Form 10-K, p. 8.

<sup>218</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Q3 2014 Tesoro Corporation Earnings Conference Call, October 31, 2014 (10/31/14 Q3 2014 Tesoro Earnings Call Transcript), p. 4, Exhibit 14.

<sup>219</sup> Terminal Agreement, Schedule A, Pipelines.



The DEIR asserts that the proposed modifications will increase the unloading rate, reducing the time that ships remain at the terminal (hoteling), thus reducing marine vessel emissions. At Wilmington, the DEIR assumed there would be no increase in VOC emissions because Wilmington currently receives crude oil in only two vessel sizes – Panamax and Aframax -- and will continue to receive crude oil in the same size vessels, even though the crude oil unloading rate is proposed to increase from 5,000 bbl/hr to 15,000 bbl and the storage capacity will increase by 440,000 barrels.<sup>220</sup> There are four major problems with these assumptions.

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*First*, the marine traffic at many of the berths in the baseline did not include any of the larger Aframax vessels. Exhibit 31.

*Second*, these refineries were originally designed to process San Joaquin Valley and other local California crudes,<sup>221</sup> which remains a major supply for Wilmington. Carson was later expanded to also refine Alaska North Slope, which remains a major supply for Carson.<sup>222</sup> However, it is well known that the production of these local California crudes has been declining, as has supply from Alaska. The Senior Director, Market Analysis, and Senior Economist for Tesoro, recently testified:

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“During my approximately 10 years tenure at Tesoro, the combined production of California and Alaska has declined approximately 350 MPD which is the supply to 3 average West Coast refineries... Thus, this decline in production is expected to continue. If the decline continues at historical rates, over the next 10 years an additional decline of ~300 BPD of production from Alaska and California will occur which is near the design capacity of the [VET] Project.”<sup>223</sup>

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<sup>220</sup> DEIR, pp. 4-26.

<sup>221</sup> DEIR, Appx. F, p. 22.

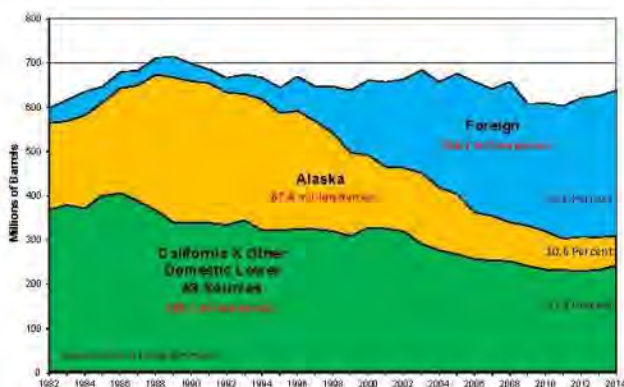
<sup>222</sup> DEIR, Appx. F, p. F-13/24. Carson was formerly owned by BP, a large Alaska North Slope crude producer.

<sup>223</sup> Sworn Pre-Filed Testimony of Brad Roach, In the Matter of Application No. 2013-01, Tesoro Savage, LLC Tesoro Savage Distribution Terminal, Before the State of Washington Energy Facility Site Evaluation Council, Case No. 15-001, May 13, 2015, attached as Exhibit 23, pp. 15-16. Regarding decline in California and Alaska crude, see also Figure 11 in this Comment; DEIR, Appx. F, p. F-17 and Figure 5; California Energy Commission (CEC), Margaret Sheridan, California Crude Oil Production and Imports, April 2006, Available at: <http://www.energy.ca.gov/2006publications/CEC-600-2006-006/CEC-600-2006-006.PDF>; and Gordon Schremp, California Energy Commission (CEC), Crude Oil Overview & Changing Trends, Presentation at IEPR Commissioner Workshop – Trends in Crude Oil Market and Transportation, July 20, 2015, pp. 7-10, 16-17; Available at [http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-13/TN205401\\_20150720T084540\\_Crued\\_Oil\\_Overview\\_Changing\\_Trends.pptx](http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-13/TN205401_20150720T084540_Crued_Oil_Overview_Changing_Trends.pptx).

Further, these crudes are more expensive than cost-advantaged crudes from the mid-continent, such as tar sands crudes and Bakken and other North American light crudes. Thus, there is an economic incentive to replace pipeline imports.

As shown in Figure 11, the decline in supply from California (and Alaska) crudes has been replaced by increases in marine imports from foreign sources.

Figure 11. Crude Oil Sources for CA<sup>224</sup>



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*Third*, the marine deliveries at both terminals could routinely include crude oils that have much higher vapor pressures than those delivered in the baseline, thus increasing tank VOC emissions relative to the baseline. All of the new crude storage tanks were assumed to have a RVP of 10.5 psi,<sup>225</sup> corresponding to a true vapor pressure of 11+ psi. This is higher than the permitted vapor pressure of the majority of the existing crude storage tanks at Carson and Wilmington<sup>226</sup> and is consistent with the vapor pressure of light shale crudes such as Bakken. These lighter crudes have not been refined in significant quantities at the Wilmington or Carson Operations.

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*Fourth*, increased ship unloading efficiency does not exclude the possibility of unloading a greater proportion of bigger ships, as compared to baseline operations, or even unloading ships on more days. Simply put, if ships can be unloaded faster, more and/or larger ships can be unloaded, increasing ship emissions.

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<sup>224</sup> Schremp CEC, 2015, p. 10.

<sup>225</sup> DEIR, Appx. B-3, Attachment B, p. B-3-128 (6 new 500,000 bbl Carson tanks) and p. B-3-189 (3 new Wilmington tanks).

<sup>226</sup> Title V Permits for Wilmington (Facility ID 800436) and Carson (Facility ID 174655).

Emissions would increase if the number of ship calls increased relative to the baseline or if the mix of Aframax/Panamax changed to favor larger ships. These scenarios were not discussed in the DEIR nor does the DEIR include enforceable conditions that would prevent these outcomes. Instead, the DEIR presents emissions per thousand barrels delivered for Wilmington, assuming the same type of ship and same number of ships in both the baseline and post Project. However, the change in marine vessel emissions due to the Project should be estimated as the difference between pre-project (baseline) and post-project (future) emissions, as follows:

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cont'd.

$$\text{Increase in Ship Emissions} = \text{Post-Project Emissions} - \text{Pre-Project Emissions} (1)$$

This calculation requires information on the number and type of marine vessels calling in the baseline (2012-2013) and the number and type calling after the Project is fully operational. The DEIR does not contain this information, does not make this calculation. Thus, the DEIR fails as an informational document.

It is entirely possible, especially in the absence of any enforceable conditions of approval on marine deliveries, that the Project would increase marine deliveries, increasing emissions of VOC, NO<sub>x</sub>, CO, PM<sub>10</sub>, and PM<sub>2.5</sub>. The DEIR must be modified to include clearly stated and enforceable provisions to prevent any increase in marine emissions from increases in the amount of crude oil delivered to the Carson and Wilmington marine terminals or the types of ship used to make the deliveries. These conditions should include:

- a clearly stated and enforceable import cap on marine deliveries of crude oil;
- requirements to test, record, and report to the SCAQMD the RVP and vapor molecular weight of all crude oil delivered by ship, rail, and pipeline;
- source testing of representative ship emissions; and
- publicly available reporting of daily deliveries.

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Absent such conditions to assure no increase in marine emissions, the DEIR must estimate the potential increase in emissions from increased marine deliveries to supply the Los Angeles Refinery and mitigate the significant impacts.

Further, as discussed in Comments II.B.4 and III.A, Tesoro Logistics is planning to expand the capacity of its terminals to accommodate other customers. This expansion, facilitated by the Project, should be evaluated as part of the Project and/or as a cumulative project. To the extent that the expansion relies on tanks and other facilities installed under the Integration Project, the increase in emissions from this

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expansion should be included in the Project’s emission increases. Mitigation must be specified to reduce these emissions to the extent feasible.<sup>227</sup>

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cont’d.

**A. Increase in Marine Vessel Emissions at Wilmington Are Significant**

The DEIR estimated the change in marine vessel emissions at only Wilmington using a calculation that compares pre- and post-project emissions for two cases: (1) a single Panamax vessel calling in both the baseline and post-project periods with different unloading rates and (2) a single Aframax vessel calling in both the baseline and post-project with different unloading rates. In other words, the DEIR assumes the same number of and size of vessels in both the baseline and post-Project conditions for the same number of vessel calls -- only one. Thus, the DEIR only evaluates the impact of a change in the unloading rate on emissions, ignoring the fact that the Project debottlenecks terminal throughput. This results in a decrease in emissions because the Project will increase the unloading rate by increasing connecting pipeline diameters and increasing storage. However, this is wrong for five reasons.

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*First*, it fails to account for the actual number of marine vessel calls in the baseline compared to the post-project period. As shown in Exhibit 31, no Aframax vessels called at many of the berths in the baseline.

*Second*, it fails to account for the mix of Aframax, Panamax, and possibly other sized vessels calling in the baseline compared to the post-project period. The DEIR asserts that the largest vessel that can call at its terminals is an Aframax (720,000 bbl).<sup>228</sup>

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*Third*, it fails to account for the fact that more much larger marine vessels may call, which would have higher emissions. The Tesoro Logistics Form 10-K indicates that one of the marine terminals that services the Los Angeles Refinery is capable of handling a two million barrel capacity very large crude carrier.<sup>229</sup>

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*Fourth*, it fails to account for the increase in marine vessel calls required to replace any decline in pipeline imports (supply from California crudes).

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<sup>227</sup> As discussed elsewhere, Tesoro Logistics will provide logistics to third parties (other refineries), not just for Tesoro. So marine unloading, crude transfers, and perhaps also storage could increase for multiple reasons, with associated increases in emissions. This could be due to the Tesoro Los Angeles Refinery running more crude and/or shifting to crude by marine vessel vs. pipeline. But there could also be an increase in emissions as more crude is supplied other refineries, using the infrastructure installed as part of the Integration Project, e.g., the significant increase in storage.

<sup>228</sup> DEIR, p. 4-26.

<sup>229</sup> DEIR, pp. 2-23/27 and Fig. 2-9; 2015 Tesoro Logistics Form 10-K, p. 8-9.

*Fifth*, it fails to account for emissions from the marine vessels themselves, to the extent that there is an increase in marine traffic.

The DEIR calculated the change in marine vessel emissions at Wilmington assuming the Project would: (1) decrease emissions from the increased offloading rate and (2) increase emissions from a 6,000 bbl/day increase in crude throughput.<sup>230</sup> The net effect of these two factors according to the DEIR is a reduction in marine vessel emissions.<sup>231</sup>

The emissions from marine vessel unloading are presented in pounds per year per 1,000 barrels of crude oil unloaded (lb/yr/1,000 bbl unloaded) in DEIR Table 4.2-11 for two types of vessels: (1) Panamax with a capacity of 400,000 bbl and (2) Aframax with a capacity of 720,000 bbl.<sup>232</sup> These calculations suggest that increasing the unloading rate by a factor of three results in significant reductions in all criteria pollutants, when expressed in units of pounds per year per 1,000 barrels unloaded. See DEIR Table 4.2-11.

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However, the net change in emissions when expressed in units of pounds per day, the metric of the significance criteria, depends on the total amount of crude oil received by marine vessel in the baseline compared to post Project. The DEIR did not present this calculation, but rather only assumed a modest 6,000 bbl/day increase, which is the estimated increase in design capacity of the Los Angeles Refinery after the Integration Project is completed. However, as discussed in Comment V.C, this assumed increase in crude throughput is inconsistent with information reported by Tesoro to the U.S. SEC in its most recent 10K report, which indicates the increase could be up to 17,000 bbl/day.

The DEIR's marine vessel analysis is very misleading. It fails to acknowledge that the Project facilitates an increase in marine deliveries of far more than the 6,000 bbl/day increase in design throughput due to modifications of refining processes at the combined facility pursuant to the Tesoro Integration Project. It also fails to calculate the change in emissions relative to the baseline, by erroneously assuming the same size ship before and after the Project. The California State Lands Commission (CSLC) data in Exhibit 31 shows that this is clear error.

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The Wilmington and Carson Operations have historically received crude oil by pipeline from the San Joaquin Valley and Los Angeles Basin and by ship from the

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<sup>230</sup> DEIR, pp. 4-26 to 4-29.

<sup>231</sup> DEIR, Tables 4.2-9 and 4.2-11.

<sup>232</sup> DEIR, pp. 4-26, 4-27, Table 4.2-9.

Alaska North Slope and foreign sources.<sup>233</sup> In the baseline, Carson, formerly owned by BP (which is a large Alaska North Slope crude producer), refined crude oil from the Alaska North Slope and foreign sources.<sup>234</sup> Similarly, in the baseline, Wilmington refined crude oil received by pipeline from the San Joaquin Valley and Los Angeles Basin as well as by ship from various unidentified sources. If the pipeline deliveries, which are declining and generally more expensive than other sources, were replaced by marine deliveries (notably from Tesoro's VET), marine emissions would increase compared to the DEIR's estimate.

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The DEIR fails to disclose the relative amounts of each crude oil received by pipeline and marine vessel in the baseline and post-Project. The DEIR also fails to disclose that these historically refined crudes are in decline and will be replaced over the lifetime of the Project.<sup>235</sup> The modifications at the Wilmington Marine Terminal not only speeds up unloading. They also facilitate unloading more ships than called at the Terminal in the baseline, thus allowing the integrated refinery to increase its marine imports.

As explained previously (Comment II.B.4) an increase in Marine Terminal throughput is consistent with public announcements by Tesoro Logistics, the terminal operator. Tesoro Logistics has announced it plans to expand the capacity of its marine terminals.<sup>236</sup> In its May 1, 2014 earnings call, Philip Anderson, President of Tesoro Logistics LP stated:

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"We have two of our terminals are being expanded (sic) to handle additional capacity, and those expansions will come online this summer. And that will allow us to bump up volumes either very late in the second quarter or early in the third quarter."<sup>237</sup>

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<sup>233</sup> Tesoro, Los Angeles Refinery; Available at: <http://tsocorp.com/refining/los-angelescalif/>.

<sup>234</sup> BP, BP Completes Sale of Carson Refinery and Southwest US Retail Assets to Tesoro, June 2013; Available at: <http://www.bp.com/en/global/corporate/press/press-releases/bp-completes-sale-of-carson-refinery-and-southwest-u-s-retail-a.html>.

<sup>235</sup> Pacific L.A. Marine Terminal SEIR/DSEIR, Appendix D3: Southern California Petroleum Market Assessment, May 2008; Available at: [https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix\\_D3\\_Southern\\_CA\\_Petroleum\\_Market\\_Assessment.pdf](https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix_D3_Southern_CA_Petroleum_Market_Assessment.pdf).

<sup>236</sup> August 2012 Tesoro Logistics Presentation, pp. 12-13, Exhibit 24; 1/9/14 Tesoro Presentation, p. 24, Exhibit 16.

<sup>237</sup> 5/1/14 Q1 2014 Tesoro Logistics Earnings Call Transcript, p. 6, Exhibit 25.



Elsewhere in the same conference call, Mr. Anderson responded to a question from RBC Capital Markets further identifying which terminals would be expanded and by how much:

“Our marine facility down there [referring to Tesoro terminals in Long Beach], 121, which is the large T-Berth<sup>238</sup> in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, T-2 in Long Beach. And between T-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity.”<sup>239</sup>

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The 100,000 bbl/day of unused throughput capacity is consistent with similar estimates published elsewhere. This other analysis reported Berths 76-78 [Tesoro legacy Marine Terminal] had 43,000 bbl/day and Berths 84-87 [newly acquired T-2] had 59,000 bbl/day of unused capacity, for a total of 102,000 bbl/day.<sup>240</sup> Thus, with no physical modifications to the Marine Terminals themselves, the Project, by removing a vapor recovery capacity constraint, increasing the diameter of the connecting pipeline, and increasing storage capacity, would allow an increase in currently unused throughput of about 102,000 bbl/day. This unused throughput could be used to replace crude that currently arrives by pipeline.

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More modifications are planned to capture additional throughput increases, allowed by the Project’s increase in tank and pipeline throughput. In the February 2014 earnings call, the President of Tesoro Logistics, Phillip Anderson, stated: “The remainder of the organic growth is focused primarily in our Southern California assets, where we’re expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. Once we have that, we’ll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate.”<sup>241</sup> A project is currently pending at the POLB, the Berths 84-87 Tesoro Facility Improvements project.<sup>242</sup> Thus, the Project facilitates an increase in marine

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<sup>238</sup> “T-Berth” mistranscribed as “de-berth”.

<sup>239</sup> 5/1/14 Q1 2014 Tesoro Logistics Earnings Call Transcript, p. 7, Exhibit 25.

<sup>240</sup> Pacific L.A. Marine Terminal SEIR/DSEIR, Appx. D1, pp. D1-20/21; Available at: [https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix\\_D1\\_Throughput\\_Projection\\_Vessel\\_Mix\\_Methodology.pdf](https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix_D1_Throughput_Projection_Vessel_Mix_Methodology.pdf); see also LARIC DEIR, pp. 2-25/26/27 for description of marine terminals associated with the Tesoro Los Angeles Refinery.

<sup>241</sup> Tesoro Logistics Q4 2013 Earnings Call Transcript, February 6, 2014, Exhibit 3.

<sup>242</sup> G.J. Cardamonte, Port of Long Beach 2012 Capital Program Update, September 2012, pdf 37 (“Berths 84-87 Tesoro Facility Improvements”), Available at: [http://www.cmaasc.org/pdfs/092012\\_portoflb.pdf](http://www.cmaasc.org/pdfs/092012_portoflb.pdf). See also: <http://www.polb.com/civica/filebank/blobdownload.asp?BlobID=11974>.

throughputs consistent with plans to expand the capacity of these terminals.

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cont'd.

Further, my research indicates that in the baseline, Tesoro's West Coast refineries refined about 19% foreign heavy crudes, 30% foreign light crudes, 19% Alaska North Slope (ANS), 17% California heavy crudes, and 15% North American crudes.<sup>243</sup> My review of the DEIR and other publicly available information indicate that one purpose of the Project is to allow the Los Angeles Refinery to replace supply from ANS and California crudes and foreign crude oil imports (which is declining and/or more expensive)<sup>244</sup> with cost-advantaged North American crude oils delivered by marine vessel from the VET.

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More marine deliveries will be required to continue to support the Wilmington Operations in the face of these declining crude sources. It is well known that the California crudes delivered to both Wilmington and Carson by pipeline are in decline. Thus, to continue operating at or near capacity, the integrated refinery must import increased amounts of crude oil to replace declining pipeline supplies. The most likely source of replacement crude is marine deliveries from Tesoro's proposed marine terminal in Vancouver, Washington (VET). See Comment II. Tesoro's Los Angeles Refinery (the integrated Carson and Wilmington Operations) will receive from 50,000 bbl/day up to 300,000 bbl/day of crude oil by marine vessel from the Vancouver Terminal.<sup>245</sup>

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I estimated the increase in criteria pollutant emissions from increased marine deliveries to the Wilmington Marine Terminal using the lower end of the project VET export range, or post-Project marine deliveries of 50,000 bbl/day, assuming these would

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<sup>243</sup> Tesoro, Transformation through Distinctive Performance, Simmons Energy Conference, February 27, 2014, p. 18, Exhibit 26. Elsewhere, it is reported that the Wilmington Refinery primarily runs heavy crude produced in California and imported from abroad, while the Carson Refinery runs crude oil from Alaska's North Slope, the Middle East, and West Africa. Further, the presentation, Tesoro Transformation through Distinctive Performance, Exhibit 26, p. 13, indicates that the Tesoro Los Angeles refinery was then running 15% California heavy crude.

<sup>244</sup> California Energy Almanac, Crude Oil Supply Sources to California Refineries, Available at: [http://energyalmanac.ca.gov/petroleum/statistics/crude\\_oil\\_receipts.html](http://energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts.html).

<sup>245</sup> Tesoro's proposed marine terminal in Vancouver has a design capacity of 360,000 bbl/day, but achievable throughput is expected to average 300,000 bbl/day. Tesoro has committed to take at least 60,000 bbl/day, but could take up to the full output of the VET. Some crude from VET could go to Tesoro refineries in Martinez (California), Anacortes (Washington), and Kenai (Alaska), but the Los Angeles refinery is the largest and most likely destination. Likewise, Tesoro could handle crude at VET and its Los Angeles marine terminals that would then be supplied to other Los Angeles area refineries. See: Tesoro Analyst and Investor Presentation, December 9, 2014, pp. 13-14, Exhibit 15, and Ian Goodman Direct Testimony, Washington Energy Facility Siting Evaluation Council, Case No. 15-001, May 12, 2016, Exhibit 27, especially pp. 20-24.



replace pipeline imports, which comprise up to 65,000 bbl/day.<sup>246</sup> As the design throughput of the Los Angeles Refinery is 380,000 bbl/day<sup>247</sup> and about 17% arrived by pipeline from California sources in the baseline, up to about 65,000 bbl/day of pipeline imports could be replaced by marine deliveries. I also used the DEIR's emission factors for both Panamax and Aframax ships (Table 4.2-11) and the DEIR's baseline marine deliveries of 30,000 bbl/day.<sup>248</sup>

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cont'd.

My calculations, included in Exhibit 28 and summarized below in Table 4, show that if marine imports increased by 50,000 bbl/day, for Panamax vessels, the average daily increase in both VOC (84 lb/day) and NOx (2,367 lb/day) emissions exceed the CEQA significance thresholds. For Aframax vessels, the average daily increase in NOx (1,292 lb/day) exceeds the CEQA significance threshold (55 lb/day). Peak daily emission increases could be even higher as future increases in marine deliveries, relative to the baseline, could be even higher.

If future marine deliveries were 65,000 bbl/day higher than in the baseline, replacing 100% of pipeline imports, the increase in emission of VOC (84 lb/day) and NOx (2,367 lb/day) would exceed the CEQA significance thresholds assuming Panamax vessels. Ex. 28, Tab Panamax, summarized in Table 2. Assuming Aframax vessels, VOC (155 lb/day) and NOx (4,027 lb/day) emissions would exceed CEQA significance thresholds. Ex. 28, Tab Aframax, summarized in Table 2.

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**Table 4.**  
**Summary of Increases in Marine Emission Relative to the Baseline**

Vessel Type	Deliveries (bbl/day)	VOC (lb/day)	CO (lb/day)	NOx (lb/day)	SOx	PM10	PM2.5
Panamax	50,000	84	202	2367	-70	3	2
Panamax	65,000	228	548	6279	58	21	17
Panamax	100,000	564	1357	15,407	355	63	52
Aframax	50,000	51	147	1292	-128	2	1
Aframax	65,000	155	400	4027	-21	17	13
Aframax	100,000	396	992	10,407	227	52	41
Significance Threshold		55	550	150	150	150	55

<sup>246</sup> Amount of crude oil delivered by pipeline = Los Angeles Refinery capacity as reported in Tesoro 2015 10K report x percent of total supply from California = 280,000 x 0.17 = 64,600 bbl/day.

<sup>247</sup> Tesoro, Los Angeles Refinery; Available at: <http://tsocorp.com/refining/los-angelescalif/>.

<sup>248</sup> Crude oil deliveries by marine vessel to the Marine Terminal for the Wilmington Operations in the baseline (2012, 2013) are 10.940 million barrels or (10,940,000/365) = 29,973 bbl/day. DEIR, p. 4-28 and Table 4.2-10.

Finally, as shown in Table 4, if marine imports increased by 100,000 bbl/day, to support other terminal customers, using changes to the terminals made by the Project, the increase in VOC, CO, and NOx emissions would exceed CEQA significance thresholds for both Panamax and Aframax vessels.

G1-78.194  
cont'd.

The DEIR claims that there would be large emission decreases in all criteria pollutants due to the shutdown of the Wilmington FCCU and estimates the resulting net change in emissions in DEIR Table 4.2-4. Even assuming, *arguendo*, that the DEIR's emission changes due to the Project are valid (and some are not valid as discussed elsewhere in these Comments), the increase in VOC and NOx emission for Aframax and Panamax vessels remain significant. However, the significant CO impact for the 100,000 bbl/day Aframax case drops from 992 lb/day to 402 lb/day, below the significance threshold of 550 lb/day, due to the large claimed CO emission reductions (-909.62 lb/day)<sup>249</sup> from the shutdown of the FCCU.<sup>250</sup>

G1-78.195

#### B. Increase In Marine Vessel Emissions at Carson

At Carson, up to six new 500,000 barrel domed external floating roof crude oil storage tanks and five electrically-driven transfer pumps will be constructed adjacent to the Carson Crude Terminal to increase the crude unloading rate at the Carson Crude Terminal. Piping and instrumentation will be installed within the Carson Crude Terminal to connect these new tanks to existing pipelines to the Carson Operations and Marine Terminal 1.<sup>251</sup> The DEIR asserts these 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."<sup>252</sup>*

G1-78.196

However, the DEIR fails to disclose the anticipated increase in unloading rate and the baseline crude oil deliveries via marine vessels to the Carson Marine Terminal. The DEIR also fails to present any emission calculations for marine vessels at the Carson

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<sup>249</sup> DEIR, Table 4.2-4.

<sup>250</sup> Ex. 28, Tab: Panamax, Lines 16, 34, and 52; Tab: Aframax, Lines 16, 34, and 52.

<sup>251</sup> DEIR, pp. 1-6/7, 1-16/17, 2-46, 2-48, Figure 2-16; Appx. B-3, Table 1.

<sup>252</sup> DEIR, p. 1-17. See also similar assertions at DEIR pp. 2-4, 2-46, 6-1.



Marine Terminal. The DEIR does not contain sufficient information to allow me to estimate these emissions. Thus, the DEIR fails as an informational document.

G1-78.196  
cont'd.

**C. Increase in Marine Vessel Emissions Due to Larger Vessel Calls Post-Project Compared to Baseline**

The CSLC marine delivery data (Exhibit 31) show that in the baseline, only LR1 ships (25,000 to 80,000 DWT vessels, typically Panamax) serviced all of the marine terminals but berth 121. No LR2 ships (80,000 to 160,000 DWT vessels, typically Aframax) serviced berths 84, 84A, and 86, and only one LR2 vessel serviced berth 78 in the baseline, with light LR2 traffic at berths B84 and B86. Thus, the Project would facilitate an increase in LR2 ships compared to the baseline, especially at those terminals where no Aframax vessels called in the baseline. The DEIR did not consider this case, but rather assumed vessel calls by the same size vessel in both the baseline and post-Project and only calculated emission changes due to changes in unloading rate. This is inconsistent with the CEQA requirement that emission increase be calculated relative to the baseline. In the case of many of the berths, no Aframax vessels called in the baseline..

G1-78.197

The marine vessel emission calculations in Appendix B-5 indicates that unloading an LR2 ship (Aframax) would significantly increase emissions compared to unloading a Panamax ship, as summarized in Table 5. The length of each ship visit is unknown, but conservatively assuming the baseline unloading rate for an Aframax vessel of 5,149 bbl/hr and a load of 720,000 barrels, the entire cargo could be unloaded in 6 days.<sup>253</sup> Rounding this up to 10 days to account for transit and hoteling times, the NOx emissions are highly significant. If more than one Aframax called at ports where none called in the baseline, the increase in emissions would be even higher and could result in exceedances of other significance thresholds.

G1-78.198

<sup>253</sup> Worst case unloading time for an Aframax vessel = 720,000 bbl/(5,149 bbl/hr \* 24 hr/day) = 5.8 days. Unloading rate and Aframax capacity from DEIR, Appendix B-5, p. B-5-10.

**Table 5.  
Increase in Emissions from Aframax Visit  
Compared to Panamax Visit.<sup>254</sup>**

	Emissions per Ship Visit (lb/visit)				
	VOC	CO	NOx	PM10	SOx
Aframax	457	1111	12,000	63	468
Panamax	351	845	954	45	310
Increase	106	265	11,046	18	158
Significance Threshold (lb/day) Significant?	55	550	<b>55 Yes</b>	150	150

G1-78.198  
cont'd.

The EIR must be modified to disclose baseline vessel calls and emissions and marine vessel emissions must be estimated relative to the 2012-2013 baseline. Further, the EIR must be modified to require mitigation for the significant marine vessel NOx emissions as summarized in Tables 4 and 5.

**IV. GREENHOUSE GAS EMISSIONS ARE SIGNIFICANT**

The DEIR asserts that the Project will result in a decrease of greenhouse gas emissions (GHG) of 66,139 metric tons per year (MT/yr).<sup>255</sup> [Note that Appx. B-3, p. B-3-38 reports 70,321 MT/yr]. However, these calculations do not include the increases in GHG emissions from increased marine vessel calls at the ports, LPG train trips, combustion of increased amounts of LPG, and the GHG emissions from producing and delivering Bakken and/or tar sands crudes from their point of origin to the POLB marine terminals. The DEIR must be revised to include these additional sources and recommend mitigation for any significant impacts.

G1-78.199

**V. OPERATIONAL EMISSIONS FROM FIRED SOURCES ARE UNDERESTIMATED AND ARE SIGNIFICANT**

The Project includes modifications to many fired sources – heaters, furnaces, and boilers.<sup>256</sup> These modifications generally involve an increase in the permitted firing rate, increased utilization, or new equipment. The Project also includes the shutdown of the Wilmington FCCU. The emissions from many of these sources have been

G1-78.200

<sup>254</sup> Data summarized from DEIR, Appendix B-5.

<sup>255</sup> DEIR, p. 1-38 and Appendix B-3, Section 5.

improperly calculated under CEQA, resulting in significant impacts that were not disclosed in the DEIR.

G1-78.200  
cont'd.

**A. Heater Emissions Exclude Startups And Shutdown**

The DEIR evaluated the significance of the Project's operational emissions by calculating the change in daily emissions due to the Project, relative to the CEQA baseline in 2012 to 2013:<sup>257</sup>

$$\text{Increase in Emission} = \text{Project Emissions (lb/day)} - \text{Baseline Emissions (lb/day)}$$

The resulting emission changes for all Project components in pounds per day (lb/day) were then summed over all components and compared to the SCAQMD's CEQA significance thresholds. This analysis is presented in DEIR Table 4.2-4, which concluded that the Project would not result in any significant changes in emissions. However, this analysis is fundamentally flawed because it failed to include emissions during periods of startup and shutdown of fired sources, estimated to occur for 720 hours per year.<sup>258</sup>

G1-78.201

During periods of startup and shutdown, emission control devices, such as selective catalytic reduction (SCR) and low NOx burners, are either not working at all or are only partially working. Further, during these periods, incomplete combustion occurs, which increases emissions of NOx, VOC, and CO. The DEIR explicitly recognizes the impact of startup, shutdown and commissioning on NOx emissions, but did not include these emissions in its analysis of operational emission impacts in DEIR Table 4.2-4.

The SCAQMD CEQA significance thresholds used to evaluate operational emission impacts should be compared to the MAXIMUM day emissions.<sup>259</sup> Thus, the net increase in emissions due to the Project should be the maximum potential daily increase, which occurs during periods of startup, shutdown, and commissioning. The DEIR estimated 720 hours per year of SSC emissions would occur for each fired source. The Title V permits for fired sources explicitly exempt periods of startup and shutdown from complying with NOx limits.<sup>260</sup> The DEIR based its analysis of operational

G1-78.202

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<sup>256</sup> DEIR, Table 4.2-4 and Appx.B-23, Table A-1 to A-4.

<sup>257</sup> DEIR, Appx. B-3.

<sup>258</sup> DEIR, Appx. B-3, Table A-2.

<sup>259</sup> SCAQMD, CEQA Air Quality Handbook, April 1993, p. 6-3 ("In determining whether or not a project exceeds these thresholds, the project emissions should be calculated in the same manner as that for the SCAB (e.g., utilizing the highest daily emissions)").

<sup>260</sup> Draft Wilmington Title V Permit, Condition A99.X, pdf 19; Draft Carson Title V Permit, Condition

emission changes due to the Project on the average daily increase, excluding the maximum day.<sup>261</sup>

The DEIR, Appendix B-3, Table A-2, reports SSC emissions for NOx, but fails to report SSC emissions for CO or VOCs, which would also increase due to incomplete combustion during SSC conditions. As demonstrated below, NOx emissions are significant when SSC emissions are used to calculate the increase in NOx emissions.

For example, for the Wilmington H-100 heater, the DEIR indicates that the maximum daily nonroutine, startup, shutdown, and commissioning emissions are 881.27 lbs/day.<sup>262</sup> Using this revised estimate of the post-modification potential emissions, the net increase in NOx emissions from heater H-100 would be 528.80 lb/day, not -171.03 lb/day as reported in DEIR Table 4.3-4.<sup>263</sup> Correcting just the emissions from this one heater, the net increase in NOx emissions for the entire Project would increase from -38.18 lb/day to 662 lb/day,<sup>264</sup> which exceeds the CEQA significance threshold of 55 lb/day by a significant amount. Making similar corrections to other fired sources in DEIR Tables A-3 and A-4 would result in even greater exceedances of the NOx significance threshold. Similar results are expected for CO and VOC, which increase significantly during startups and shutdowns. Thus, the DEIR has misrepresented the significance of Project emission changes by comparing average daily changes to thresholds based on the maximum day.

G1-78.202  
cont'd.

#### B. The DEIR Used The Wrong Baseline for Heater Emissions

As noted in Comment V.A, the increase in emissions under CEQA is calculated relative to baseline emissions. This calculation uses the same averaging period for the baseline and post-Project emissions. For example, if the CEQA significance threshold is expressed in pounds per day, as here, the baseline and post-Project emissions are both calculated in average pounds per day. The same averaging period must be used in both the baseline and post-Project period.

G1-78.203

The DEIR has corrupted the calculation of emission increases from heaters by using different averaging conventions for the baseline and post-Project emissions. This makes it appear that emissions decrease when firing rates increase, when they actually increase, or are much lower than they actually are.

G1-78.204

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A99.X1, pdf 46.

<sup>261</sup> DEIR, Table 4.2-4 and Appx.B-3, Table A-2.

<sup>262</sup> DEIR, Appx. B-3, p. B-3-49, Table A-3.

<sup>263</sup> Post-modification NOx emissions from heater H-100:  $881.27 - 352.47 = 528.8$  lb/day.

<sup>264</sup> Net Change in Total Project NOx Emissions =  $-38.18 + 171.03 + 528.80 = 661.65$  lb/day.

The post-Project emissions in the DEIR are reasonably calculated from an emission factor times the new firing rate. However, the baseline emissions are calculated for each heater based on days where combined actual emissions from the modified heaters were at the 98<sup>th</sup> percentile of the maximum emissions.<sup>265</sup> The emissions appendix, Appendix B-3, explains: "Emissions Baseline (Daily Basis): Baseline emissions for each combustion unit are calculated as the emissions at the operating day where the emissions were at the 98<sup>th</sup> percentile of the sum of all modified combustion sources."<sup>266</sup> This, in effect, significantly underestimates the increase in emission from the proposed increase in firing rates of heaters by resulting in a very high baseline value, higher than the average emission rate after the firing rate is increased.

G1-78.204  
cont'd.

For example, the Project proposes to increase the firing rate of Delayed Coker Unit (DCU) Fresh Feed Heater H-100 from 252 MMBtu/hr to 302.4 MMBtu/hr,<sup>267</sup> a 20% increase. Emissions are directly proportional to firing rate unless modifications are made to the heater and/or its controls to reduce emissions. No modifications to heater H-100 or any other similarly modified heater are proposed. Thus, this change in firing rate should increase emissions by a factor of 1.2 ( $302.4/252 = 1.20$ ). Instead, the emissions summary table shows that this change in firing rate would **reduce** VOC emissions by -0.43 lb/day, CO emissions by -5.14 lb/day, NO<sub>x</sub> emissions by -171.03 lb/day, PM<sub>10</sub> emissions by -0.98 lb/day, and PM<sub>2.5</sub> emissions by -0.98 lb/day.<sup>268</sup> The error in NO<sub>x</sub> emissions for this one heater is sufficient by itself to tip Project NO<sub>x</sub> emissions over the CEQA significance threshold if NO<sub>x</sub> emissions are calculated using the correct method.

The reason that an increase in firing rate appears to reduce emissions, a highly counterintuitive and incorrect result, is that the DEIR used an improper baseline to calculate the change in emissions. Rather than using the average daily emissions in the baseline years (2012, 2013), it used the 98<sup>th</sup> percentile of the maximum emissions, which is substantially higher than the average daily and thus significantly underestimates emission increases. This is wrong.

G1-78.205

The SCAQMD permit engineer for the Project also observed that the increase in firing rate of H-100 should have resulted in an increase in emissions:<sup>269</sup>

G1-78.206

<sup>265</sup> DEIR, pp. 4-21, B-3-10, B-3-49, B-3-56, B-3-59/64.

<sup>266</sup> DEIR, p. B-3-10.

<sup>267</sup> DEIR, p. 1-11

<sup>268</sup> DEIR, Table 4.2-4.

<sup>269</sup> SCAQMD Application 567649, pdf 939.

Pages 4-15 and 4-17: The emissions change for Wilmington Operation H-100 DCU Heater duty bump indicates reductions in emissions of VOC, CO, NOx, and PM10. The emissions changes are based on post-project potential-to-emit of criteria pollutants minus pre-project actual emissions (98<sup>th</sup> percentile of maximum emissions for years 2012/2013). The increase in heater firing rate should have associated increases in pollutant emissions. Thus, the use of the 98<sup>th</sup> percentile of the maximum emissions and/or the years used for baseline emissions should be re-examined.

G1-78.206  
cont'd.

The DEIR, in fact, fails to report the average NOx emissions in the baseline years for modified heaters. The DEIR also fails to support the 98<sup>th</sup> percentile values that it substituted for daily average values in the emission increase calculations. Thus, the heater emission change calculations are not only wrong, but unsupported. The DEIR contains none of the information required to correct these errors.

### C. Flaring Emissions Were Omitted

The various modifications will include the installation of new pressure relief valves that will vent to the flares.<sup>270</sup> The DEIR asserts:<sup>271</sup>

"The proposed project includes modifications to existing units and new units that will be connected to vapor recovery and safety flare systems. Additional flaring from normal operations is prohibited by Rule 1118. The project is not expected to increase flaring at the Refinery. There will be no routine vents to the flare system or the flare gas recovery systems from any of the modifications. While the number of pressure relief valves tied in to the flare systems will increase with installation of new or modified process units, this will not cause an increase in flaring. There will however, be additional potential vent sources to the flare gas recovery and flare systems during unit upsets or emergencies."

G1-78.207

However, while these new connections will not increase routine flaring emissions, they will increase emergency flaring emissions, roughly in proportion to the number of new connections to the flares and the assumed capacity of new systems. As discussed for fired sources, the SCAQMD CEQA significance thresholds are based on the maximum day. Thus, emergency flaring emissions must be included in the operational emission summary in DEIR Table 4.2-4. The DEIR does not contain any of the information required to estimate these emissions. However, based on my experience, increased flaring from the increased number of connections to the flares would significantly increase NOx, CO, VOC, PM10 and PM2.5 emissions during flaring events.

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<sup>270</sup> DEIR, pp. 2-36, 2-37, 2-38, 2-39, 2-43, 2-44, 2-45, 2-46, 4-23.

<sup>271</sup> DEIR, p. 4-53.



The draft Carson Title V permit includes emission increases from connecting the Alkylation Unit to the No. 5 Flare System, but these were not included in the DEIR's emission summary in Table 4.2-4. The draft Carson Title V permit indicates this addition would increase both ROG and CO emissions.

G1-78.207  
cont'd.

**D. Emissions Exclude Increases in Crude Throughput**

The DEIR asserts that:

"The total crude oil rate capacity for the Los Angeles Refinery is 363,000 bbl/day. The crude oil rate for Wilmington Operations is primarily constrained by Crude Unit and Coker feed heater duty conditions described in the existing SCAQMD permit. Therefore, the Wilmington Operations is heat limited in its ability to process additional crude oil, which will be modified by the revision to the Heater H-100 permit. The Carson Operations crude rate is constrained by physical limitations of the equipment, including heater duty and pump/piping capacity limitations. In order to increase crude oil processing rate at Carson Operations, physical modifications to the heaters, pumps and piping would have to be made and the appropriate SCAQMD permits would need to be obtained. No such modifications are included as part of the proposed project."<sup>272</sup>

G1-78.208

Tesoro also reported the capacity of the Los Angeles Refinery as 363,000 bbl/day, just after its purchase of Carson.<sup>273</sup> The DEIR also reports a pre-Project capacity of 363,000 bbl/day<sup>274</sup> and indicates the Project would increase the throughput by 6,000 bbl/day by eliminating feed heater duty at the Wilmington Crude Unit and Coker, which would increase the crude capacity to 369,000 bbl/day.<sup>275</sup>

However, this is inconsistent with information reported by Tesoro to the U.S. Securities and Exchange Corporation (SEC) in its most recent Form 10-K, where Tesoro reported that the crude oil capacity of its Los Angeles Refinery is 380,000 bbl/day and its 2015 throughput was 369,000 bbl/day.<sup>276</sup> Similarly, Tesoro's website reports the refining capacity as 380,000 bbl/day.<sup>277</sup>

<sup>272</sup> DEIR, pp. 2-17, A-151.

<sup>273</sup> Tesoro, Acquisition of BP's Southern California Refining and Marketing Business, August 2012, Slides, p. 31, pdf 32 ("Wilmington/Carson CA 363 MBD"), Exhibit 12.

<sup>274</sup> DEIR, pp. 2-17 and A-151.

<sup>275</sup> DEIR, pp. 1-9, 1-11/12, 1-35, 2-2.

<sup>276</sup> 2015 Tesoro Form 10-K, p. 5.

<sup>277</sup> <http://tsocorp.com/refining/los-angelescalif/>.



Thus, Tesoro's current throughput as reported to the SEC equals or exceeds the throughput that the DEIR asserts will be achieved after the Project has been implemented. This suggests that modifications to debottleneck the refinery have already been completed or that the DEIR has understated the impact of the Project on throughput. It further suggests the Project described in the DEIR may further increase throughput, up to 380,000 bbl/day. In either case, emissions would be substantially higher than disclosed as increased throughput means increased emissions.

G1-78.208  
cont'd.

These types of issues cannot be reviewed and resolved by the public because the DEIR does not contain any of the information required to evaluate throughput claims, including baseline throughputs, modified processing unit throughputs, and emissions at modified processing units. Thus, the DEIR fails as an informational document and must be revised to include baseline crude throughputs, baseline operating throughputs for each modified refining source, crude source, and crude composition data. The revised DEIR must be recirculated for public review.

**E. Heater and Other Emission Increase Calculations Use Improper Baseline**

The DEIR estimated the increase in emissions from increased firing rates or increased throughputs at certain modified units by multiplying the increase in either firing rate or throughput by an emissions factor.<sup>278</sup> This effectively assumes the permit limit for the baseline. Emission increases for purposes of CEQA must be calculated relative to the baseline, which is 2012 to 2013. The DEIR does not include any baseline emissions for the subject sources.

G1-78.209

**F. Wilmington FCCU Emission Reductions Are Unsupported**

The major source of emission reductions, used to offset Project emission increases, is the shutdown of the Wilmington FCCU.<sup>279</sup> The DEIR contains no support for these huge emission reductions, presenting them as a fait accompli in Appendix B-3 in a table labeled "Wilmington FCCU Shutdown (Historic Actual Emissions)".<sup>280</sup> The parenthetical suggests the reported reductions are "historic actual" emissions, which implies they are measured, as they should be. However, the DEIR presents no further information on how "historic actual" emissions were calculated. This is a serious and significant omission as the FCCU shutdown is the major source of emission reductions used to offset Project emission increases.

G1-78.210

Historic actual emissions can be calculated in various way. The correct way would be to use the average of 2012 to 2013 actual measured emissions data from

G1-78.211

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<sup>278</sup> DEIR, Appendix B-3, Attachment A, pp. B-3-51/52.

<sup>279</sup> DEIR, Table 4.2-4.

<sup>280</sup> DEIR, Appendix B-3, p. B-3-14.

continuous emission monitoring systems (CEMS) where available,<sup>281</sup> corrected for current BACT. When CEMS data are not available, contemporaneous stack tests at the subject sources should be used. The resulting baseline data should be adjusted to eliminate exceedances of permit limits before calculating daily averages. The DEIR is silent on how it calculated FCCU emission reductions and thus fails as an information document.

The SCAQMD Application for the Project<sup>282</sup> indicates that this method was not used. Instead, generic “emission factors” for fired sources, not specific to the FCCU sources, and annual fuel consumption for 2012 and 2013 were used. The calculations used the same emission factors for NOx, CO, PM, and VOCs for all fired sources within the FCCU unit, even though their controls and operating characteristics differ. No actual measured emissions data was used. Thus, the claimed emissions reductions are suspect. The DEIR must be modified to support these reductions and expanded to include all supporting information, including stack tests, CEMS data, fuel use, and firing rates for the baseline years.

G1-78.211  
cont’d.

Further, the SCAQMD Application indicates that Tesoro has applied for ERCs for PM10 and VOC emissions from the CO boiler shutdown.<sup>283</sup> Further, correspondence indicates that Tesoro may apply to use additional emission reductions from the shutdown of the FCCU.<sup>284</sup> Thus, the VOC and PM10 emission reductions from shutting down the CO boiler cannot be used to offset Project emission increases.

## VI. STORAGE TANK VOC EMISSIONS ARE UNDERESTIMATED

Storage tanks are the major source of VOC emissions, amounting to 322.62 lb/day. Of this amount, 141.64 lb/day is from two new tanks at Wilmington and 112.51 lb/day are from six new tanks at Carson.<sup>285</sup> In addition, conversion of two existing fixed roof tanks to internal floating roof tanks and increased utilization of 11 existing tanks combined contribute an additional 68.4 lb/day.<sup>286</sup>

G1-78.212

<sup>281</sup> Aggregate NOx emissions from the FCCU Regenerator, CO Boiler, and Startup Heater are measured by stack CEMS. SCAQMD Application 567649, pdf 936. Thus, this data should be used to establish actual emissions in 2012 and 2013.

<sup>282</sup> SCAQMD Application 567649, pdf 276.

<sup>283</sup> SCAQMD Application 567649, pdf 276, notes.

<sup>284</sup> SCAQMD Application 567649, pdf 516 (Tesoro’s responses to SCAQMD question: “There may be more emission reductions associated with shutdown of the Wilmington Operations FCCU (WFCCU) than are required to offset project emissions; in this case Tesoro will request ERCs for the additional emission reductions.”)

<sup>285</sup> DEIR, Appx. B-3, p. B-3-45.

<sup>286</sup> DEIR, Table 4.2-4 and Appx.B-3, p. B-3-45.

At the Wilmington tank farm, two new 300,000 bbl internal floating roof storage tanks will replace two existing 80,000 bbl fixed-roof storage tanks (Tanks 80035 and 80036) in the north tank area.<sup>287</sup> At Carson, up to six new 500,000 barrel domed external floating roof crude oil storage tanks will be constructed adjacent to the Carson Crude Terminal.<sup>288</sup>

If VOC emissions from these new and existing tanks were as little as 2% greater than estimated in the DEIR, operational VOC emissions from the Project would exceed the SCAQMD daily VOC significance threshold. This would be a significant impact not disclosed in the DEIR. Due to the large number of errors and omissions in the tank calculations and absence of enforceable VOC emission limits for fired sources, the DEIR should be revised and recirculated for public review. My analysis below indicates that these emissions were significantly underestimated and are significant.

G1-78.212  
cont'd.

The increase in VOC emissions due to the omitted VOC sources would be accompanied by an increase in TAC emissions, which are estimated by multiplying the VOC emission increase by the weight percent of each TAC in the ROG emissions (i.e., the TAC speciation profile).

If the inclusion of these omitted emission sources exceeds the significance threshold of 55 lb/day, the SCAQMD must examine the impact of the increase in localized ROG emissions on ambient air quality and the local community and identify mitigation that is capable of reducing or eliminating these impacts to below a level of significance. To mitigate the Project's significant VOC emissions, the SCAQMD should consider feasible mitigation measures such as the use of zero-leak fugitive components; retrofit of geodesic domes on floating roof tanks; and use of cable-suspended, full-contact floating roofs on gasoline storage tanks.<sup>289</sup>

#### A. The TANKS Model Underestimates VOC Emissions

The DEIR used the EPA model, TANKS 4.0.9d, to estimate tank VOC emissions. The EPA no longer recommends using this model to calculate tank emissions. The TANKS website cautions "use at your own risk." Rather, EPA recommends using

G1-78.213

<sup>287</sup> DEIR, p. 2-39.

<sup>288</sup> DEIR, p. 2-46, Figure 2-16; Appx.B-3, Table 1.

<sup>289</sup> See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, December 2014, Final Negative Declaration (Carson Neg. Dec.), Available at <http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2014/phillips-66-fnd.pdf?sfvrsn=2>. and City of Richmond, Chevron Refinery Modernization Project DEIR (Chevron DEIR), Chapter 4.3, pp. 4.3-92, Available at: [http://chevronmodernization.com/wp-content/uploads/2014/03/4.3\\_Air-Quality.pdf](http://chevronmodernization.com/wp-content/uploads/2014/03/4.3_Air-Quality.pdf).



equations and algorithms in AP-42, Chapter 7 to estimate VOC emissions from storage tanks:<sup>290</sup>

*provide assistance to users of TANKS 4.09d. The model will remain on the website to be used at your discretion and at your own risk. We will continue to recommend the use of the equations/algorithms specified in AP-42 Chapter 7 for estimating VOC emissions from storage tanks. The equations specified in AP-42 Chapter 7*

G1-78.213  
cont'd.

Further, the TANKS 4.09d model used by the DEIR is known to underestimate VOC emissions in certain circumstances. These circumstances apply to existing Project tanks that will experience increased throughput, including the following:

- For heated tanks, TANKS incorrectly assumes that vapor-space and liquid-surface temperature ranges are equal, when this is not always the case. Wilmington tank 80067<sup>291</sup> is a heated tank.
- TANKS does not incorporate temperature as a variable when determining unheated, fixed-roof tank working losses. Instead, it assumes a fixed vapor-space temperature of 63 F. Carson tanks 062, 063, 502 and 959 and Wilmington tanks 80038 and 80074 are unheated, fixed-roof tanks.
- TANKS does not accommodate tanks that receive warmer-than-ambient stock but are not heated. Many of the increased utilization tanks store products that may have warmer than ambient temperatures, including gas oil, naphtha, and alkylate stored in Carson tanks 14, 31, 62, 63, 64, 502, and 959 and Wilmington tanks 80211, 80215, 80217, and 80038.
- Default inputs used for complex mixtures such as crude oil do not accurately capture the large variations in vapor pressure and composition.

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In these circumstances, EPA recommends the calculation procedures included in AP-42, Chapter 7.<sup>292</sup> However, these also underestimate tank emissions. It is well

<sup>290</sup> EPA, TANKS Emissions Estimation Software, Version 4.09D; Available at <https://www3.epa.gov/ttnchie1/software/tanks/>.

<sup>291</sup> Wilmington Title V Permit, pdf 91.

<sup>292</sup> ERA Environmental, Storage Tanks Emissions Calculation Guide, p. 18, Available at: <http://www.era-environmental.com/en-US/pdf/storage-tank-emissions-calculation-guide.pdf>; Trinity Consultants, Calculating Tank Emissions with TANKESP, January 7, 2016, Available at: <http://www.trinityconsultants.com/news/environmental-quarterly/calculating-tank-emissions-with-tankesp>; Sage Environmental Consulting, TankESP; Available at [http://www.sageenvironmental.com/air\\_quality/tankComparison](http://www.sageenvironmental.com/air_quality/tankComparison).

known that both the TANKS model and the AP-42 algorithms underestimate VOC emissions.<sup>293</sup> Actual measurements of tank emissions using DIAL compared to those calculated using AP-42 indicate that AP-42 underestimates VOC emissions by factors of 2 to 15, as demonstrated in the following summary data:

**Table 6.**  
**Comparison of DIAL Results and**  
**Tank Emissions Estimated Using AP-42.<sup>294</sup>**

Source	Source Description	Compound	Average DIAL flux, lb/hr <sup>2</sup>	Estimated emissions using standard estimating procedures with actual conditions at the time of the DIAL test, lb/hr
Tanks 1020, 1021, 1024, and 1025	EFR <sup>2</sup> tanks storing crude oil	VOC	6.4 <sup>2</sup>	1.3 – 1.9 <sup>2</sup>
Tanks 1052, 1053, and 1055	EFR tanks storing crude oil	VOC	16.3 <sup>2</sup>	1.8 – 2.3 <sup>2</sup>
Tanks 501, 502, 503, and 504	EFR tanks storing light distillates	VOC	6.6 <sup>2</sup>	3.0 – 3.9 <sup>2</sup>
Tank 43	VFR <sup>2</sup> tank storing fuel oil #6	VOC	2	1.3
			9.3	1.3
Tanks 60, 63, 11, 12, 18, 42, 61, and 65	VFR and EFR tanks storing various products	VOC	9	0.6 – 9.1 <sup>2</sup>
Tanks 54, 55, 56, and 98	VFR and EFR tanks storing various products	VOC	3.1 <sup>2</sup>	0.3 – 9.7 <sup>2</sup>
Tanks 53 and 55	VFR tanks storing diesel fuel	VOC	23.8 <sup>2</sup>	4.8 – 5.2 <sup>2</sup>

G1-78.214  
cont'd.

Another recent study concluded that “[c]rude oil and heated oil tank emissions measured by DIAL were 5-10 times higher than estimated by TANKS.<sup>295</sup>

**B. The TANKS Model Inputs Underestimate Emissions**

Vapor pressure and vapor molecular weight are key inputs to the TANKS model. The higher the vapor pressure and vapor molecular weight, the greater the VOC emissions. The DEIR assumed a vapor pressure for “light crude oil” of 10.5 psi and a vapor molecular weight of 50 lb/lb-mol. These assumptions are not realistic for Bakken crude oils, which will be imported and refined by this Project. They both underestimate VOC emissions.

G1-78.215

*First*, as noted in Comments II.B.1 and II.E.2, Bakken crude oils are known to have much higher true vapor pressures than the 10.5 psi RVP used to estimate VOC

<sup>293</sup> See literature review in EIP, Comments on EPA’s Draft “Emission Estimation Protocol for Petroleum Refineries, March 31, 2010, p. 5, Exhibit 29.

<sup>294</sup> U.S. EPA, Critical Review of DIAL Emission Test Data for BP Petroleum Refinery in Texas City, Texas, November 2010, Table 2; Available at: [https://www3.epa.gov/airtoxics/bp\\_dial\\_review\\_report\\_12-3-10.pdf](https://www3.epa.gov/airtoxics/bp_dial_review_report_12-3-10.pdf).

<sup>295</sup> Rod Robinson, The Application of Differential Absorption Lidar (DIAL) for Pollutant Emissions Monitoring, January 2015, pdf 46; Available at: [http://www.h-gac.com/taq/airquality/raqpac/documents/2015/Jan%202015/DIAL%20202015%20Houston%20Meeting%20January%20\(sent%20version\).pdf](http://www.h-gac.com/taq/airquality/raqpac/documents/2015/Jan%202015/DIAL%20202015%20Houston%20Meeting%20January%20(sent%20version).pdf).



emissions, ranging up to 16 psi reported as RVP.<sup>296</sup> The TANKS model runs assumed an RVP of 10.5 psi. As explained in Comment II.B.1, this corresponds to a true vapor pressure of about 11.5 psi, which would be permitted at 11 psi due to federal and SCAQMD regulations that limit vapor pressure of material in storage tanks without special controls.

However, as a practical matter, tank vapor pressure limits are rarely enforced as routine monitoring is not required to confirm the limits. None of the tank vapor pressure limits in the existing Carson and Wilmington Title V permits, for example, require any monitoring. The vapor pressure monitoring for tanks in the Wilmington Title V permit:<sup>297</sup>

D90.18 The operator shall periodically monitor the vapor pressure of the material stored in this storage tank according to the following specifications:

The operator shall determine the true vapor pressure by one of the following methods: 1) sample and test the materials stored, 2) derive the vapor pressure using engineering calculations, or 3) maintain on file a copy of the Material Safety Data Sheet (MSDS) of the material stored.

Records of material stored, and their MSDS if applicable, shall be retained for a period of five years and made available to the Executive Officer upon request.

G1-78.215  
cont'd.

The vapor pressure monitoring for tanks in the Carson Title V Permit:<sup>298</sup>

K67.21 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The operator shall determine the true vapor pressure of each material stored in the equipment by one of the following methods: 1) sample and test the materials stored, 2) derive the vapor pressure using engineering calculations, or 3) maintain on file a copy of the Material Safety Data Sheet (MSDS) of the material stored.

Records of material stored, and their MSDS if applicable, shall be retained for a period of five years and made available to the Executive Officer upon request.

These conditions do not require any actual monitoring as they allow the substitution of unspecified engineering calculations or reliance on a MSDS, a document

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<sup>296</sup> Intertek, Report of Analysis, Bakken Crude, March 2014; Available at <http://desmogblog.com/sites/beta.desmogblog.com/files/Northern%20Plains%20Bakken%20Crude%20Oil%20Sample%20Chemical%20Composition.pdf>; ConocoPhillips, Safety Data Sheet, Bakken Crude Oil, Sweet, p. 5; Available at <http://www.conocophillips.com/sustainable-development/Documents/2014.05.30%20825378%20Bakken%20Crude%20Oil.%20Sweet.pdf>; Dangerous Goods Transport Consulting, Inc., A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, May 14, 2004, p. 5; Available at <https://www.afpm.org/uploadedFiles/Content/documents/Survey-of-Crude-Oil-Characteristics.pdf>

<sup>297</sup> Wilmington Title V Permit, July 7, 2015, pdf 271.

<sup>298</sup> Carson Title V Permit, January 29, 2016, pdf 554.

that is not specific to any load of crude oil and is not routinely updated. And compliance need only be determined “periodically.” This condition grants full discretion to the applicant and is not enforceable. The DEIR must require enforceable vapor pressure monitoring using ASTM D6377, at 100 F and a vapor-liquid ratio of 4:1 at least quarterly or when material stored in the tank changes. Otherwise, VOC emissions from new and modified storage tanks must be calculated using the maximum measured vapor pressure for Bakken crude oil.

G1-78.215  
cont’d.

Thus, even if vapor pressure limits are established in the permit to operate, these limits would not be valid mitigation or guarantees under CEQA that higher vapor pressure materials would not be stored in the tanks. Thus, higher VOC emissions could occur unless mitigation requires mandatory and enforced monitoring and reporting.

*Second*, the TANK model runs for “light crude oil” assume a vapor molecular weight of 50 lb/lb-mol. However, the EPA default for much heavier crudes with a RVP of 5 psi is 50 lb/lb-mol.<sup>299</sup> A lighter crude oil would have more volatiles and thus a higher vapor molecular weight. The volatility of Bakken crude oils is more similar to gasoline than conventional 5 psi crude oil. The vapor molecular weight of an RVP 10 psi gasoline is 66 lb/lb-mol.<sup>300</sup> Alternatively, Bakken crude oil is more similar to naphtha (light, medium and heavy), which the DEIR assumed had a vapor molecular weight of 60 lb/lb-mol. Vapor molecular weight is not limited in permits to operate. Thus, this TANKS input, which determines VOC emissions, is not enforceable. This input should be restricted by a permit limit that requires monitoring and reporting to satisfy CEQA mitigation requirements.

G1-78.216

**C. Roof Landing, Degassing, and Cleaning Emissions Were Omitted**

The DEIR estimated VOC emissions from storage tanks using EPA’s model, TANKS 4.0.9d. This model only estimates rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. It does not estimate roof landing losses, inspection losses, or flashing losses. Thus, the DEIR underestimated tank emissions by failing to include all sources of tank VOC emissions.

G1-78.217

The EPA has explained that the TANKS model used to estimate tank VOC emissions in the DEIR does not include roof landings and recommended that they be estimated with the equations in AP-42, Section 7.1.3.2.2. In other words, the EPA TANKS model estimates evaporative emissions for normal operations only, *i.e.*, it assumes that the floating tank roof is always floating.<sup>301</sup> However, when a tank is

<sup>299</sup> EPA, AP-42, Table 7.1-2.

<sup>300</sup> *Ibid.*

<sup>301</sup> EPA, TANKS Software Frequent Questions, Updated February 2010, Available at:



emptied to the point that the roof no longer floats on the liquid but lands, evaporative losses occur. These losses are uncontrolled tank emissions and can be larger than routine controlled emissions. They are called “roof landing losses.” The DEIR did not include these emissions. I cannot estimate them because all of the inputs required to make the calculations are not provided in the DEIR.

G1-78.217  
cont’d.

In addition, “degassing and cleaning losses” occur when tanks are drained and degassed for inspection and/or cleaning. These include both roof landing emissions, complete tank degassing, and emissions from cleaning out accumulated sludge. These emissions are essentially uncontrolled tank emissions<sup>302</sup> and can be larger than normal operating emissions if uncontrolled. The DEIR is silent on these emissions. These emissions can be controlled using special degassing equipment.<sup>303</sup> The DEIR does not contain any commitment to use degassing equipment for tank cleaning.

G1-78.218

The tank cleaning emissions could be substantially higher for Bakken crudes than for other types of crude. Bakken crudes leave waxy deposits in pipelines and tanks, which require more frequent cleaning,<sup>304</sup> and thus higher cleaning emissions, than the crudes they would replace. Environmental impacts from chemical dispersants used to control these waxy deposits in tanks and pipelines also should be evaluated.

G1-78.219

The EPA recommends methods to estimate emissions from degassing, cleaning, and roof landing losses.<sup>305</sup> The method for estimating emissions depends on the construction of the tank, e.g., the flatness of the tank bottom and the position of the withdrawal line (the so-called liquid “heel”). Degassing, cleaning, and roof landing losses continue until the tank is refilled to a sufficient level to again float the tank roof. Total VOC emissions from floating roof tanks during a roof landing is the sum of

G1-78.220

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<http://www.epa.gov/ttnchie1/faq/tanksfaq.html>. (“How can I estimate emissions from roof landing losses in the tanks program? ... In November 2006, Section 7.1 of AP42 was updated with subsection 7.1.3.2.2 Roof Landings. The TANKS program has not been updated with these new algorithms for internal floating roof tanks. It is based on the 1997 version of section 7.1.”).

<sup>302</sup> See EPA guidance on estimating these emissions at <http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13>.

<sup>303</sup> See, for example, Envent Corp., Tank & Vessel Degassing; Available at <http://www.enventcorporation.com/services/degassing-vapor-control/tank-vessel-degassing/>.

<sup>304</sup> Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, Available at <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>; Gordon Schremp, Trends in Sources of Crude Oil, 2014 IEPR Workshop, June 25, 2014, p. 47; Available at [http://www.energy.ca.gov/2014\\_energy\\_policy/documents/2014-06-25\\_workshop/presentations/01\\_Schremp\\_Final\\_2014-06-25.pdf](http://www.energy.ca.gov/2014_energy_policy/documents/2014-06-25_workshop/presentations/01_Schremp_Final_2014-06-25.pdf).

<sup>305</sup> “How Can I Estimate Emissions from Degassing and Cleaning Operation During a Tank Turnaround? And How Can I Estimate Emissions from Roof Landing Losses in the TANKS Program?”, Available at <http://www.epa.gov/ttnchie1/faq/tanksfaq.html#13>.

standing idle losses and filling losses. They can be estimated using formulas contained in EPA's *Compilation of Air Pollutant Emission Factors* ("AP-42"), Chapter 7.1, Organic Liquid Storage Tanks, Section 7.1.3.2.2. These emissions are routinely included in emission inventories. They are required to be reported, for example, in Texas.<sup>306</sup> They are also included in the emission inventory for Tesoro's Vancouver Terminal, which imports similar crudes by rail and stores them in tanks.<sup>307</sup>

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cont'd.

**D. Tank Flashing Emissions Were Omitted**

Many Bakken crudes are transported raw, without stabilization, due to the lack of facilities in the oil fields. Unstabilized or "live" crude oils have high concentrations of volatile materials entrained in the bulk crude oil. Tank flashing emissions occur when these crude oils, such as Bakken, are exposed to temperature increases or pressure drops, such as may occur on a hot summer day. When this occurs, some of the compounds that are liquids at the initial pressure/temperature transform into gases and are released or "flashed" from the liquid. These emissions are in addition to working and breathing emissions from tanks and are not estimated by the EPA TANKS 4.0.9d model. These emissions can be calculated using standard procedures.<sup>308</sup> The DEIR did not mention or calculate these emissions, nor does it require that only stabilized crude oils be stored in the light crude oil (10.5 psi) tanks 300035, 300036, 80060, 80067, and 80079.

G1-78.221

**E. Water Draw Tank Emissions Were Omitted**

Crude oil typically contains small amounts of water, which is separated from the crude oil and accumulates in the bottom of storage tanks. This accumulated water, referred to as water draw, is typically transferred from the crude oil storage tanks into a

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<sup>306</sup> Memorandum from Dan Eden, Deputy Director, Office of Permitting, Remediation, and Registration; David C. Schanbacher, Chief Engineer; and John Steib, Deputy Director, Office of Compliance and Enforcement, Re: Air Emissions During Tank Floating Roof Landings, December 5, 2006, Available at: [http://www.tceq.state.tx.us/assets/public/permitting/air/memos/tank\\_landing\\_final.pdf](http://www.tceq.state.tx.us/assets/public/permitting/air/memos/tank_landing_final.pdf).

<sup>307</sup> Tesoro Savage, Application for Site Certification Agreement, Section 5.1.2.1.4, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf>.

<sup>308</sup> See, e.g., calculation methods at: Paul Peacock, Marathon, Bakken Oil Storage Tank Emission Models, March 23, 2010; TCEQ, Air Permit Reference Guide APDG 5941, Available at: [http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance\\_flas\\_hemission.pdf](http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/guidance_flas_hemission.pdf); Kansas Dept. of Health & Environment, Available at: [http://www.kdheks.gov/bar/download/Calculation\\_Flashing\\_Losses\\_Handout.pdf](http://www.kdheks.gov/bar/download/Calculation_Flashing_Losses_Handout.pdf); B. Gidney and S. Pena, Upstream Oil and Gas Storage Tank Project Flash Emissions Models Evaluation, July 16, 2009, Available at: <http://www.bdlaw.com/assets/htmldocuments/TCEQ%20Final%20Report%20Oil%20Gas%20Storage%20Tank%20Project.pdf>.



smaller water draw surge tank for processing prior to disposal. Over time, a thick layer of crude oil forms in the water draw surge tank. The water draw surge tank and processing of wastewaters from it emit VOC and TACs. The DEIR does not mention water draw, or include emissions from storing or processing it, which would increase as the vapor pressure of the stored crude increases, i.e., from a switch from San Joaquin Valley to Bakken crude.

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cont'd.

**F. Tank VOC Emissions Are Significant**

In sum, the DEIR has omitted many sources of tank VOC emissions and used an invalid calculation method, known to underestimate tank emissions by factors of 2 to 50. The DEIR does not contain sufficient information to correct the errors or estimate the missing emissions. However, an increase of only 6 lb/day or 2% more than estimated in the DEIR, would be required to exceed the CEQA significance threshold. In my opinion, the many errors and omissions in the tank calculations are sufficient to exceed the VOC significance threshold for the Project. Thus, mitigation for tank emissions must be required.

G1-78.223

To reduce emissions from tank breathing losses, degassing, cleaning and roof landing losses, the EIR should require Tesoro to install geodesic domes on all tanks that do not have them, thus avoiding emissions from these and other tank sources, including Wilmington tanks 300035, 300036, 80060, 80067, and 80079. Further, degassing control equipment should be required for all tank degassing and cleaning events.

Geodesic domes are feasible and should be required for all floating roof tanks affected by the Project. Many of the tanks at the subject facilities already are equipped with domes, including Carson Tanks 014, 031, 063, and 064 and Wilmington Tanks D650, D654, and D656. Further, over 10,000 aluminum domes have been installed on petrochemical storage tanks in the United States.<sup>309</sup> The ExxonMobil Torrance Refinery: "completed the process of covering all floating roof tanks with geodesic domes to reduce VOCs emissions from facility storage tanks in 2008. By installing domes on our storage tanks, we've reduced our VOC emissions from these tanks by 80 percent. These domes, installed on tanks that are used to store gasoline and other similar petroleum-derived materials, help reduce VOC emissions by blocking much of the wind that constantly flows across the tank roofs, thus decreasing evaporation from these tanks."<sup>310</sup>

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<sup>309</sup> M. Doxey and M. Trinidad, Aluminum Geodesic Dome Roof for Both New and Tank Retrofit Projects, *Materials Forum*, v. 30, 2006, Available at: [http://www.materialsaustralia.com.au/lib/pdf/Mats.%20Forum%20page%20164\\_169.pdf](http://www.materialsaustralia.com.au/lib/pdf/Mats.%20Forum%20page%20164_169.pdf).

<sup>310</sup> Torrance Refinery: An Overview of our Environmental and Social Programs, 2010, Available at: [http://www.exxonmobil.com/NA-English/Files/About Where Ref TorranceReport.pdf](http://www.exxonmobil.com/NA-English/Files/About%20Where%20Ref%20TorranceReport.pdf).

A crude storage project, recently proposed at the Phillips 66 Los Angeles Carson Refinery, required external floating roof tanks with geodesic domes to store crude oil with an RVP of 11.<sup>311</sup> The ConocoPhillips Wilmington Refinery added a geodesic dome to an existing oil storage tank to satisfy BACT.<sup>312</sup> Similarly, Chevron proposes<sup>313</sup> to use domes on several existing tanks to mitigate VOC emission increases at its Richmond Refinery.<sup>314</sup> The U.S. Department of Justice CITGO Consent Decree required a geodesic dome on a gasoline storage tank at the Lamont, Texas refinery.<sup>315</sup> Further, numerous vendors have provided geodesic domes for refinery tanks.<sup>316</sup> The crudes that would be stored in the Project tanks have vapor pressures that are comparable to gasoline (TSBC 2013, Sec. 3.2.7), justifying the use of geodesic domes to control tank emissions.

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cont'd.

## VII. HAZARD IMPACTS WERE UNDERESTIMATED AND NOT MITIGATED

The DEIR evaluated the consequences of accidents at several units at each facility, as summarized in Table 6. The DEIR characterizes the analyses in Table 7 as a worst case analysis. The DEIR also asserts that the Project “will not introduce the use of new flammable substances or hazardous materials that are not currently used at the Refinery...” Thus, it asserts that “no new sources of accidental releases of new hazardous materials would be present at the Refinery.”<sup>317</sup> These assertions are incorrect.

G1-78.225

<sup>311</sup> See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Table 1-1, Draft Negative Declaration, Available at: [https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft ND Phillips 66 Crude Storage.pdf](https://www.aqmd.gov/CEQA/documents/2013/nonaqmd/Draft%20ND%20Phillips%2066%20Crude%20Storage.pdf).

<sup>312</sup> SCAQMD Letter to G. Rios, December 4, 2009, Available at: [http://yosemite.epa.gov/r9/air/epss.nsf/e0c49a10c792e06f8825657e007654a3/e97e6a905737c9bd882576cd0064b56a/\\$FILE/ATTTOA6X.pdf/ID%20800363%20ConocoPhillips%20Wilmington%20-%20EPA%20Cover%20Letter%20-%20AN%20501727%20501735%20457557.pdf](http://yosemite.epa.gov/r9/air/epss.nsf/e0c49a10c792e06f8825657e007654a3/e97e6a905737c9bd882576cd0064b56a/$FILE/ATTTOA6X.pdf/ID%20800363%20ConocoPhillips%20Wilmington%20-%20EPA%20Cover%20Letter%20-%20AN%20501727%20501735%20457557.pdf).

<sup>313</sup> City of Richmond, Chevron Refinery Modernization Project, Environmental Impact Report, Volume 1: Draft EIR, March 2014 (Chevron DEIR), Available at: <http://chevronmodernization.com/project-documents/>.

<sup>314</sup> Chevron DEIR, Chapter 4.3.

<sup>315</sup> CITGO Petroleum Corp. Clean Air Act Settlement, Available at: <http://www2.epa.gov/enforcement/citgo-petroleum-corporation-clean-air-act-settlement>.

<sup>316</sup> See, e.g., Aluminum Geodesic Dome, Available at: <http://tankaluminumcover.com/Aluminum-Geodesic-Dome>; Larco Storage Tank Equipments, Available at: [http://www.larco.fr/aluminum\\_domes.html](http://www.larco.fr/aluminum_domes.html); Vacono Dome, Available at: [http://www.easyfairs.com/uploads/tx\\_ef/VACONODOME\\_2014.pdf](http://www.easyfairs.com/uploads/tx_ef/VACONODOME_2014.pdf); United Industries Group, Inc., Available at: <http://www.thomasnet.com/productsearch/item/10039789-13068-1008-1008/united-industries-group-inc/geodesic-aluminum-dome-roofs/>.

<sup>317</sup> DEIR, p. 4-52.

Table 7.  
Maximum Hazard Distance for  
Maximum Credible Events in Each Process Unit<sup>318</sup>

Unit	Injury Threshold	Distance to Hazard (feet)		Hazard (Projected/Existing)
		Projected	Existing	
<b>Carson Operations</b>				
51 Vacuum Unit	LFL	150	155	Flash Fire
Alkylation Unit	LFL	360	585	Flash Fire
HCU	30 ppm	1245	1250	Toxic (H <sub>2</sub> S)
Mid-Barrel Distillate Treater	1,600 Btu/(hr ft <sup>2</sup> )/ 30 ppm	275	400	Torch Fire/ Toxic (H <sub>2</sub> S)
Naphtha HDS	LFL	865	1035	Flash Fire
Naphtha Isomerization	LFL	665	530	Flash Fire*
LHU	LFL	600	585	Flash Fire
Wet Jet Treater	LFL	205	DNCE <sup>(b)</sup>	Flash Fire
New Caudé Tanks	1,600 Btu/(hr ft <sup>2</sup> )	340	DNCE	Pool Fire*
<b>Wilmington Operations</b>				
FCCU	Hazards eliminated due to unit shutdown			
HTU-1/2	LFL	1170	1065	Flash Fire
HTU-4	Modifications do not affect hazard zone			
CRU-3	30 ppm	1595	2190	Toxic (H <sub>2</sub> S)
PSIU	30 ppm	1085	2190 <sup>(c)</sup>	Toxic (H <sub>2</sub> S)
HCU	LFL	1320	1450	Flash Fire
SARF	3 ppm	1905	DNCE	Toxic (SO <sub>2</sub> )*
Replace Crude Tanks	1,600 Btu/(hr ft <sup>2</sup> )	265	190	Pool Fire
<b>Other</b>				
Interconnecting Pipelines	LFL	380	DNCE	Flesh Fire*
LPG Rail Car Unloading	1.0 psig	1,700	1,700	BLEVE

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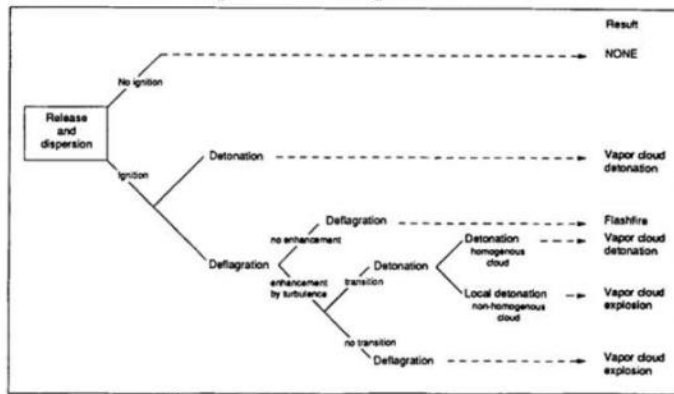
<sup>318</sup> DEIR, Table 4.3-2



A. Worst Case Accident Was Not Evaluated

The types of accidents that could occur when a flammable material is released and an ignition source is encountered are summarized in the event tree in Figure 12. The EIR failed to consider most of these possible scenarios. Rather, the DEIR asserts without any supporting analysis that there are certain “worst-case scenarios” for the modified process units.<sup>319</sup> The DEIR fails to document the process used to select these scenarios, preventing meaningful public review. Thus, the DEIR fails as an informational document.

Figure 12.  
Event Tree for Vapor Cloud Explosions and Flash Fires<sup>320</sup>



G1-78.226

The DEIR evaluated either a flash fire or a pool fire at all tanks, processing units, and pipelines, except the mid-barrel distillate treater, where it evaluated a torch fire. A pool fire occurs when a flammable liquid forms a puddle on the ground and catches on fire. See Figure 13. It is contained to the area where the spill occurs. If a flammable spill forms a vapor cloud that encounters an ignition source, the vapor cloud can catch fire and burn rapidly in what is called a “flash fire.” A “torch” fire results from the rupture of a pipeline followed by ignition. These fires do not represent a worst case.<sup>321</sup> In other words, the DEIR selected accidents that are contained and do not spread to surrounding equipment or cause explosions.

G1-78.227

<sup>319</sup> DEIR, Appx. C, Table 4-1.

<sup>320</sup> Center for Chemical Process Safety, Guidelines for Evaluating the Characteristics of Vapor Cloud Explosions, Flash Fires, and BLEVEs, 1994, Figure 2.1.

<sup>321</sup> Thomas Steinhaus and others, Large-Scale Pool Fires, Thermal Science Journal, v.11, no. 3, 2007; Available at: <http://www.doiserbia.nb.rs/img/doi/0354-9836/2007/0354-98360702101S.pdf>.

Figure 13:  
Pool Fire



G1-78.227  
cont'd.

A vapor cloud explosion is one of the most dangerous and destructive explosion that could result. These events result from the sudden release of a large quantity of flammable vapor, such as loss of tank containment, which could occur during a seismic event. The resulting vapor is dispersed throughout the general area while mixing with air. If the mixture encounters an ignition source, a vapor cloud explosion occurs. An example of a vapor cloud explosion is shown in Figure 14. In this vapor cloud explosion, triggered by backfire from an idling diesel pickup truck, 15 were killed and 180 injured.<sup>322</sup> Many ignition sources are present in a refinery, from idling vehicles to sparks generated during maintenance.

G1-78.228

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<sup>322</sup> U.S. Chemical Safety and Hazard Investigation Board, Investigation Report, Refinery Explosion and Fire, BP Texas City, Texas, March 23, 2005, Report No. 2005-04-I-TX, March 2007; Available at <http://www.csb.gov/assets/1/19/csbfinalreportbp.pdf>.



Figure 14: BP Texas City Vapor Cloud Explosion



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cont'd.

A BLEVE is also much more dangerous and destructive than the fire scenarios evaluated in the DEIR. A BLEVE occurs when a vessel containing a superheated liquid catastrophically fails, usually as a result of external fire exposure (i.e., a pool fire under the vessel or a jet- or torch-type fire impinging on the vessel wall).<sup>323</sup> In contrast to a pool fire or a vapor cloud explosion, the liquid within a tank does not have to be flammable to cause a BLEVE. An external fire around a tank or LPG rail car, for example, can heat the tank contents above its boiling point, resulting in an explosion.<sup>324</sup> The DEIR evaluated a BLEVE for LPG railcar unloading, but not for any other component of the Project. The new tanks within or adjacent to existing tank farms present opportunities for a BLEVE.

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The DEIR admits that “[t]he greatest threat to off-site receptors could occur from a vapor cloud explosion (release, dispersion, and explosion of a flammable vapor cloud), or a confined explosion (ignition and explosion of flammable vapors within a building or confined area).”<sup>325</sup> However, in spite of this admission, the DEIR fails to evaluate these types of accidents except for LPG railcar loading.

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<sup>323</sup> Michael W. Roberts, Analysis of Boiling Liquid Expanding Vapor Explosion (BLEVE) Events at DOE Sites, 2000; Available at: [http://efcog.org/wp-content/uploads/Wgs/Safety%20Working%20Group/Nuclear%20and%20Facility%20Safety%20Subgroup/Documents/Analysis%20of%20Boiling%20Liquid%20Expanding%20Vapor%20Explosion%20\(BLEVE\)%20Events%20at%20DOE%20Sites.pdf](http://efcog.org/wp-content/uploads/Wgs/Safety%20Working%20Group/Nuclear%20and%20Facility%20Safety%20Subgroup/Documents/Analysis%20of%20Boiling%20Liquid%20Expanding%20Vapor%20Explosion%20(BLEVE)%20Events%20at%20DOE%20Sites.pdf).

<sup>324</sup> <http://link.springer.com/article/10.1007/s11668-010-9360-9#page-2>.

<sup>325</sup> DEIR, p. 3-19.

Vapor cloud explosions and BLEVEs are more likely at the site post-Project than during the baseline, due to the volatility of Bakken crude. Further, vapor cloud explosions and BLEVEs are generally likely at the Los Angeles Refinery due to the proximity of many sources of ignition, e.g. busy roads, and the high density of tanks and process units that could be engulfed by the vapors.

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The release of a flammable material, such as Bakken crude, may result in a vapor cloud explosion, fireball or BLEVE, which could result in much more significant consequences than the accident scenarios that were evaluated in the DEIR. In a vapor cloud explosion, the vapors from a crude oil spill could engulf adjacent tanks or process units and ignite, presenting greater impacts than considered in the EIR.<sup>326</sup>

The two new 300,000 bbl storage tanks at Wilmington, for example, are within an existing tank farm.<sup>327</sup> Similarly, the six new 500,000 bbl storage tanks at Carson are across Sepulveda Boulevard from the main Carson tank farm.<sup>328</sup> If the contents of one of the new tanks were lost, such as might occur during a seismic event, and a vapor cloud were formed, it could engulf adjacent tanks. If the resulting vapor cloud encountered an ignition source, e.g., from traffic along Sepulveda Boulevard or from welding at an adjacent tank, a vapor cloud explosion could result. The risk of these types of events at the new tanks are significantly greater than at existing crude oil tanks as the new tanks will store Bakken crude oil, which is much more volatile and flammable than crude oils stored in the baseline.

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As another example, the Project includes an interconnecting pipeway between the Wilmington and Carson Operations. The new pipeway, comprising up to 15 pipelines, will be routed under two major roadways and above ground on pipe racks or ground level pipe supports, in the same corridors as existing pipelines.<sup>329</sup> These pipelines will transport gasoline and gasoline blending components, gas oil, crude oil, butylene, propylene, and LPG between the Carson and Wilmington Operations.

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The DEIR asserts that the proposed pipelines would have hazards of approximately the same magnitude as the existing pipelines, since the proposed and existing pipelines will convey similar materials at similar operating temperatures and pressures.<sup>330</sup> The DEIR is incorrect.

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<sup>326</sup> See photographs of vapor cloud explosions at: <https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=photographs+of+vapor+cloud+explosions>.

<sup>327</sup> DEIR, Appx. C, Figure 2-1.

<sup>328</sup> DEIR, Appx. C, Figures 2-2/2-3.

<sup>329</sup> DEIR, p. 4-54, Appx. C, p. 8.

<sup>330</sup> DEIR, p. 4-54.

The proposed and existing pipelines will not have similar hazards. The Project will increase the number of pipelines in the same corridors. Thus, it will cumulatively increase the potential hazards of an accident as an accident at one of the pipelines could involve the others. A pipeline break, for example, triggered by an earthquake, could release gasoline. This would create a vapor cloud that could ignite, involving not only other pipelines in the corridor, but other nearby facilities, such as tanks and process units.

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cont'd.

In sum, the DEIR has failed to disclose the basis for selecting accident scenarios, failed to disclose critical chemical and physical characterization data for the materials involved in the accidents, failed to select worst-case scenarios, and failed to disclose the true consequences of accidents at the Refinery. Thus, the DEIR fails as an informational document.

1. Accident History at the Refineries Not Provided

The DEIR did not review the history of accidents at refineries in general or at the Carson and Wilmington Operations. See, for example, the compilations of major accidents in Lees' seminal *Loss Prevention Handbook*.<sup>331</sup>

The starting point for a hazard analysis should be a review of the history of accidents at the subject refineries and refineries in general, particularly in this case as the subject refineries were built in 1919 and 1923.

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There have been many serious accidents at both the Carson and Wilmington Refineries, some of which were recently reviewed by the Los Angeles Times.<sup>332</sup> Further, more serious accidents have occurred at other refineries than analyzed in the DEIR, including at Tesoro refineries elsewhere.<sup>333</sup>

<sup>331</sup> Dr Sam Mannan, Lees' *Loss Prevention in the Process Industries: Hazard Identification, Assessment and Control*, Fourth Edition, 2012, Appendix 1, Case Histories.

<sup>332</sup> Los Angeles Times Staff, *South Bay Oil Refineries: A History of Destructive Explosions*, Los Angeles Times, February 18, 2015; Available at: <http://www.latimes.com/local/lanow/la-me-ln-south-bay-oil-refineries-history-explosions-20150218-story.html>.

<sup>333</sup> See, e.g., Chevron Refinery Fire, January 28, 2015; Available at: <http://www.csb.gov/chevron-refinery-fire/>; Tesoro Refinery Fatal Explosion and Fire, May 1, 2014; Available at <http://www.csb.gov/tesoro-refinery-fatal-explosion-and-fire/>; Valero Refinery Propane Fire, July 9, 2008; Available at: <http://www.csb.gov/valero-refinery-propane-fire/>; BP America Refinery Explosion, March 20, 2007; Available at: <http://www.csb.gov/bp-america-refinery-explosion/>; Motiva Enterprises Sulfuric Acid Tank Explosion, August 28, 2002; Available at: <http://www.csb.gov/motiva-enterprises-sulfuric-acid-tank-explosion/>; Tosco Avon Refinery Petroleum Naphtha Fire, March 21, 2001; Available at: <http://www.csb.gov/tosco-avon-refinery-petroleum-naphtha-fire/>.



A 2010 fatal explosion and fire at the Tesoro refinery in Anacortes, Washington, led state regulators to cite the company for 39 “willful” and 5 “serious” violations of health and safety regulations. The Washington Department of Labor and Industries called this accident the “worst industrial disaster in the 37 years that L&I has been enforcing the state’s workplace safety law.<sup>334</sup> The U. S. Chemical Safety Board concluded that the company’s “safety culture” was a key factor in the accident:<sup>335</sup>

**KEY ISSUES**

- INHERENTLY SAFER DESIGN
- TESORO PROCESS SAFETY CULTURE
- CONTROL OF NONROUTINE WORK
- MECHANICAL INTEGRITY INDUSTRY STANDARD DEFICIENCIES
- REGULATORY OVERSIGHT OF PETROLEUM REFINERIES

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The 2010 accident at the Anacortes Refinery was attributed to Tesoro’s “complacent” attitude towards flammable leaks and fires and failure to correct a history of recurring leaks, failure to maintain equipment, and a general “deficient refinery safety culture, weak industry standards for safeguarding equipment, and a regulatory system that too often emphasizes activities rather than outcomes.”<sup>336</sup>

2. Process Location Not Considered

The location of a process, such as the new tanks and pipelines in relation to other facilities is a key consideration in evaluating risks. The new tanks, for example, are within or adjacent to existing tank farms.<sup>337</sup> Further, the EIR fails to disclose the contents of the adjacent tanks or the process units, which must be known to assess the hazards they pose. An accident at one of the new tanks could generate a vapor cloud that would engulf one or more tanks in the adjacent tank farm, significantly increasing the impacts of an accident, or, alternatively, the vapor cloud from an accident in the

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<sup>334</sup> Eric de Place, Tesoro: A Track Record of Pollution, Hostility to Workers, and Meddling in Politics, Sightline Institute, March 21, 2014; Available at: <http://www.sightline.org/2014/03/21/tesoro-a-track-record-of-pollution-hostility-to-workers-and-meddling-in-politics/>.

<sup>335</sup> U.S. Chemical Safety and Hazard Investigation Board, Investigation Report, Catastrophic Rupture of Heat Exchanger (Seven Fatalities), Tesoro Anacortes Refinery, Anacortes, Washington, April 2, 2010, Report 2010-08-I-WA, May 2014, Exhibit 35.

<sup>336</sup> CSB Investigation Finds 2010 Tesoro Refinery Fatal Explosion Resulted from High Temperature Hydrogen Attack Damage to Heater Exchanger, Available at: <http://www.csb.gov/csb-investigation-finds-2010-tesoro-refinery-fatal-explosion-resulted-from-high-temperature-hydrogen-attack-damage-to-heat-exchanger/?SID=97>.

<sup>337</sup> DEIR, Figures 4.3-1 and 4.3-2.

adjacent tank farm could engulf the new tanks, resulting in significant impacts. If the vapor clouds from these types of events encountered an ignition source, a vapor cloud explosion or BLEVE could result.

Tank berms would not prevent the interaction between the new tanks and existing tank farms because vapor clouds would pass over the berm, from either the new tanks to the existing tank farms or vice versa. Further, it is well known that berms are frequently damaged in tank accidents,<sup>338</sup> which could spread the consequences of a tank accident into adjacent areas.

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### 3. Ignition Sources Not Considered

Vapor clouds generated by spilled flammable liquids, such as the imported crude oil, have the potential to ignite anywhere within their flammable limits if there is an ignition source. Ignition data is required to estimate risks but none is disclosed in the DEIR. There are many ignition sources at the site, including:<sup>339</sup>

- locomotives for LPG and coke trains on the local rail lines,
- traffic on the access road and traffic on adjacent heavily traveled public roadways,
- workers who smoke,
- hot surfaces,
- open flames as from welding,
- electric sparks from motors driving pumps and other equipment,
- suction of crude vapors into diesel engines and subsequent combustion,
- friction sparks, as from trains on the tracks and railcars jamming into each other during stops and starts,
- heaters and boilers, and
- increased flaring from new pressure relief valves that will tie into existing flares.

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<sup>338</sup> Davies et al., Bund Effectiveness in Preventing Escalation of Tank Farm Accidents, October 1995.

<sup>339</sup> DEIR, p. 2-37, 2-38, 2-39, 2-43, etc.

4. External Events Not Considered

The DEIR recognizes that external events, such as earthquakes and non-natural events, such as mechanical failure or human error can cause accidental releases.<sup>340</sup> The DEIR also recognizes that “The most significant potential geologic hazard is estimated to be seismic shaking from future earthquakes generated by active or potentially active faults in the regions.”<sup>341</sup> However, the DEIR fails to consider the impacts of a major earthquake as a triggering event for accidents, arguing instead that “[p]ast experience indicates that there has not been any substantial damage, structural or otherwise to the Wilmington and Carson Operations as a result of earthquakes.”<sup>342</sup> The DEIR fails to supply any support for this claim.

However, this is not a reasonable basis for excluding earthquake-induced accidents. First, experience is not a reliable indicator here as the only major earthquake in Long Beach on the nearest fault to the refinery occurred in 1933. The subject refineries were built in 1916 and 1923 and did not include most of the process units included in the hazard analysis as they had not yet been invented.<sup>343</sup> Second, the DEIR misrepresents the facts. The 1933 Long Beach earthquake caused significant damage in the surrounding area:<sup>344</sup>

**“Areas of Past Liquefaction**

In the Long Beach Quadrangle, numerous effects attributed to liquefaction were noted following the 1933 Long Beach earthquake including numerous leaks in gas lines, water mains broken, roads cracked, and displaced pavement (Barrows, 1974).

Part of the Port of Los Angeles is situated in the southwestern most corner of the Long Beach Quadrangle. During the 1994 Northridge earthquake significant damage occurred to facilities near Berths 121 to 126 and at Pier 300 (Stewart and others, 1994, p. 135). Features that developed at these localities, such as lateral spreading, settlement, and sand boils, manifested liquefaction (see Plate 1.2).”

Berth 121 served the Carson facility in the baseline and will serve the combined Los Angeles Refinery. The six new 500,000 bbl tanks are nearby.

<sup>340</sup> DEIR, pp. 1-19, 3-18.

<sup>341</sup> DEIR, p. 4-106.

<sup>342</sup> DEIR, p. 4-106. See also p. A-64.

<sup>343</sup> DEIR, Appendix A, Table 2-4

<sup>344</sup> Division of Mines and Geology, Seismic Hazard Zone Report for the Long Beach 7.5-Minute Quadrangle, Los Angeles County, California, 1998, p. 14; Available at: [http://gmw.consrv.ca.gov/shmp/download/quad/LONG\\_BEACH/reports/longb\\_eval.pdf](http://gmw.consrv.ca.gov/shmp/download/quad/LONG_BEACH/reports/longb_eval.pdf).

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Further, a California Division of Mines and Geology planning scenario for a major earthquake on the Newport-Inglewood fault zone, the closest fault zone to the Refinery, about 1.5 to 2.0 miles northeast,<sup>345</sup> evaluated the impact of an earthquake in this fault zone on refineries in the area, including the Carson (then owned by ARCO) and Wilmington (then owned by Union Oil) Operations. It noted that earthquakes may damage incoming crude oil transportation facilities and refineries may suffer "direct damage such as broken piping, buckled storage tanks, damage to processing towers, (b) suffer consequential damage from fire following the earthquake..." It goes on to identify damage to refineries during earthquakes, as follows:<sup>346</sup>

An earthquake. In the 1962 Kern County earthquake, the Paloma Cycling Plant survived the earthquake quite well until two large butane spheres collapsed releasing highly volatile material. The gaseous material spread out over the area and was ignited within minutes. The 1964 Niigata, Japan, earthquake resulted in fire at the Shell Oil Company refinery which burned continuously for two weeks. Fire occurred at failed storage tanks following the 1964 Alaska earthquake.

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The types of damage that might be expected from a major earthquake on the Newport-Inglewood fault zone include:

The use and storage of different types of hazardous materials at refineries are more of a hazard to the public than fire, because of the potential release of toxic fumes.

The low earthen embankments used as retention dikes around fuel and oil storage tanks are subject to failure from earthquake shaking. The locations of these types of structures, their vulnerability, and the consequences of failure need to be examined as part of any company's emergency planning program.

A further consideration is the age of the facilities. The DEIR assumed no significant adverse impacts from seismic hazards as the Project will comply with the California Building Code.<sup>347</sup> Building codes are evolving, routinely updated to address experience gained in recent seismic events. While a new facility in 2016-2017 may well comply with then current building codes, the facility may not comply with codes 20 years in the future, when a major earthquake may occur.

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<sup>345</sup> DEIR, p. 4-106.

<sup>346</sup> California Department of Conservation, Division of Mines and Geology, Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone, Special Publication 99, 1988, pp. 170-

<sup>347</sup> DEIR, pp. 2-33, 4-106 ("Thus, the proposed 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 structure 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.")



Further, while the new equipment and modifications to existing equipment must comply with California Building Code, existing processing equipment whose throughput is increased is many decades old. They were not built to current earthquake standards, which have changed considerably since the modified processing units were constructed.

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Thus, the DEIR's conclusion that "[n]o significant adverse impacts from seismic hazards are expected since the proposed project will be required to comply with the California Building Codes, including those addressing seismic effects,"<sup>348</sup> is misleading. In fact, the Project site is located in an area of historic (or has the potential for) liquefaction.<sup>349</sup> Thus, impacts due to liquefaction and expansion-induced accidents should have been considered.

Other external events not considered include sea level rise, floods, and sabotage.

#### B. Health Impacts of Accidents Were Not Evaluated

The DEIR evaluated the health impacts of routine operational emissions, but failed to evaluate the health impacts of emissions that occur during accidents. The DEIR selected toxic endpoints for five accident scenarios, based on ERPG's for H<sub>2</sub>S or SO<sub>2</sub>.<sup>350</sup> However, these toxic endpoints are not a reasonable basis to evaluate the significance of accidents that release TAPs and do not constitute or substitute for a health risk assessment. These include:

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- H<sub>2</sub>S from the HCU
- H<sub>2</sub>S from the Mid-Barrel Distillate Treater
- H<sub>2</sub>S from the CRU-3
- H<sub>2</sub>S from the PSTU
- SO<sub>2</sub> from the SARP

##### 1. The ERPG-2 Is Not a Reasonable Significance Criterion to Evaluate Accidental Releases

The significance of accidents involving the release of H<sub>2</sub>S and SO<sub>2</sub> was evaluated using Emergency Response Planning Guideline 2 (ERPG-2) levels.<sup>351</sup> These values do not protect public health. Further, these values are not reasonable significance criteria

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<sup>348</sup> DEIR, p. 4-106.

<sup>349</sup> DEIR, Appendix A, p. A-70.

<sup>350</sup> DEIR, Table 4.3.2.

<sup>351</sup> DEIR, Table 3.3-1, footnote (c), p. 4-45, Table 4.3-1; Appx. C, Table 3-1, p. 17.

for evaluating the public health impacts of releases of hazardous chemicals during refinery accidents.

An ERPG-2 is the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action. Sensitive members of the public, such as old, sick, or very young people are not covered by these guidelines and they may experience adverse effects at concentrations below the ERPG levels.<sup>352</sup> Thus, evaluations based on ERPGs are no substitute for a health risk assessment, which covers sensitive members of the population.

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These ERPGs are also not appropriate as endpoint hazard criteria for accidents. First, ERPGs are focused on an exposure of 1 hour. Exposures resulting from accidents are typically much longer. The American Industrial Hygiene Association (AIHA), who developed the ERPGs, "strongly advises against trying to extrapolate ERPG values to longer periods of times."<sup>353</sup> The proposed use as "endpoint hazard criteria" in the hazard analysis is inappropriate as exposures from accidents typically last longer than 1 hour. The DEIR fails to disclose the exposure duration associated with each accident scenario, and thus fails as an informational document.

ERPGs should be used to help protect the public only when AEGLs (Acute Exposure Guidelines Levels) aren't available and there has been a chemical release that is short-term in duration. The durations of the exposure from the modeled accidents were not disclosed in the DEIR, but are unlikely to be "short term". ERPGs estimate how nearly all of the public (except for sensitive individuals) would react to a release of this nature, so they can be used to identify areas where a hazard exists if the concentration of hazardous gas is exceeded for the specified exposure duration. For example, in areas with concentrations just above the ERPG-1, most people would experience temporary, non-disabling effects. On the other hand, in areas with concentrations just above the ERPG-2, most people would experience significant – but not life-threatening – health effects.<sup>354</sup> The DEIR's choice of the ERPG-2 to evaluate the significance of accidental releases of H<sub>2</sub>S eliminates the most sensitive segment of the population. This is a violation of CEQA, which does not recognize any cutouts for

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<sup>352</sup> Office of Response and Restoration, Emergency Response Planning Guidelines (ERPGs); Available at <http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html>.

<sup>353</sup> Ibid.

<sup>354</sup> Office of Response and Restoration, Emergency Response Planning Guidelines (ERPGs); Available at <http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html>.

sensitive populations. Au contraire, these populations are the most important to protect.

As AEGLs exist for H<sub>2</sub>S, they should have been used to evaluate the significance of accidents involving the release of hazardous substances. AEGLs estimate concentrations at which most people, including sensitive individuals, will begin to experience health effects. AEGLs should be used to help protect the public when there has been a chemical release that is short-term in duration. AEGLs estimate how the general public would react to a release of this nature, so they can be used to identify areas where a hazard exists if the concentration of hazardous gas is exceeded for the specified exposure duration. For example, in areas with concentrations just above the AEGL-1, most people would experience temporary, non-disabling effects. On the other hand, in areas with concentrations just above the AEGL-2, most people would experience significant – but not life-threatening – health effects.<sup>355</sup> The AEGLs for H<sub>2</sub>S, are:

Table 8: AEGLs for Hydrogen Sulfide<sup>356</sup>  
Hydrogen sulfide 7783-06-4 (Final)

	10 min	30 min	60 min	4 hr	8 hr
ppm					
AEGL 1	0.75	0.60	0.51	0.36	0.33
AEGL 2	41	32	27	20	17
AEGL 3	76	59	50	37	31

Table 8 shows that for H<sub>2</sub>S, the AEGL-1 and AEGL-2 levels are lower than the ERPG-2 value of 30 ppm used to evaluate the significance of accidents in the DEIR. The DEIR should be revised to substitute the AEGL-1 levels for the ERPG-2 levels used to evaluate significance, with the level selected based on the duration of the exposure.

2. The Use of ERPGs or AEGLs Is Not A Health Risk Assessment

Finally, the use of either of these metrics, EPRG or AEGL, is no substitute for a health risk assessment, which evaluates chronic, acute and carcinogenic risks. The DEIR does not include a health risk assessment for accidental releases. The significance

<sup>355</sup> Office of Response and Restoration, Acute Exposure Guideline Levels (AEGLs); Available at: <http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/acute-exposure-guideline-levels-aepls.html>.

<sup>356</sup> EPA, Hydrogen Sulfide Results – AEGL Program; Available at: <https://www.epa.gov/aegl/hydrogen-sulfide-results-aegl-program>.

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of accidents with a toxic endpoint was assessed for only a single pollutant. However, accidents typically release a complex soup of TAPs, none of which were identified in the DEIR. These include mercaptans, dimethyl sulfide, benzene, toluene, hydrogen cyanide, carbon monoxide, fine particulate matter, and smoke, among many others.<sup>357</sup> The acute, 8-hour and chronic reference exposure (RELs) levels used in health risk assessments are much lower than the EPRGs (or AEGLs) used to evaluate the significance of accidents that release TAPs. Table 9 compares ERPGs, AEGLs, and the acute (for a 1-hour exposure) REL for H<sub>2</sub>S. Table 9 shows that the DEIR selected the least protective metric to assess the significance of accidents that release toxic air pollutants. Thus, it is likely that many additional accident scenarios would result in significant impacts than disclosed in the DEIR.

Table 9.  
Comparison of Various Measures  
of 1-hr Exposure to H<sub>2</sub>S

Metric	Exposure Duration (Hr)	Concentration (ppm)
Acute REL <sup>358</sup>	1 hr	0.03
AEGL-1 <sup>359</sup>	1 hr	0.51
AEGL-2 <sup>360</sup>	1 hr	27
ERPG-2 <sup>361</sup>	1 hr	30

Note: Used in DEIR

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<sup>357</sup> Ruei-HaoShie and Chang-Chuan Chan, Tracking Hazardous Air Pollutants from a Refinery Fire by Applying On-Line and Off-Line Air Monitoring and Back Trajectory Modeling, *Journal of Hazardous Materials*, v. 261, October 2013, pp. 72-82; Available at: <http://www.sciencedirect.com/science/article/pii/S0304389413004962>.

<sup>358</sup> OEHHA Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary, March 28, 2016; Available at: <http://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary>.

<sup>359</sup> <https://www.epa.gov/aegl/access-acute-exposure-guideline-levels-aegls-values#chemicals>.

<sup>360</sup> <https://www.epa.gov/aegl/access-acute-exposure-guideline-levels-aegls-values#chemicals>.

<sup>361</sup> <https://www.aiha.org/get-involved/AIHAGuidelineFoundation/EmergencyResponsePlanningGuidelines/Documents/2015%20ERPG%20Levels.pdf>.

**C. All Feasible Hazard Mitigation Not Required**

The DEIR concluded that the impacts of the Project on hazards associated with the Naphtha Isomerization Unit, new crude tanks, SARP, and interconnecting piping are significant and would remain significant after mitigation.<sup>362</sup> Thus, all feasible mitigation is required.

The proposed mitigation requires: (1) an Emergency Action Plan<sup>363</sup>; (2) compliance with Process Safety Management requirement<sup>364</sup>; and (3) development of a Risk Management Plan<sup>365,366</sup>. These programs are required by existing federal and state regulations. Thus, they are not mitigation as they are required in the baseline.

Further, these programs were in place at Chevron at the time of the August 2012 accident discussed above, and the 2010 accident at Tesoro's Anacortes refinery. They obviously did not prevent these catastrophic accidents. Further, the U.S. Chemical Safety and Hazard Investigation Board concluded that these programs were not effective at preventing refinery accidents in its analysis of the Tesoro Anacortes accident.<sup>367</sup> The recent Chevron FEIR incorporated many additional mitigation measures to improve these programs,<sup>368</sup> which should be required for the Project. This mitigation program is attached to my comments as Exhibit 30.<sup>369</sup>

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**VIII. CONSTRUCTION MITIGATION**

The DEIR concluded that emissions of VOC and NOx from construction of the Project are significant.<sup>370</sup> The DEIR thus proposed eight mitigation measures with four exceptions plus eight best management practices.<sup>371</sup> The DEIR concludes that "[c]onstruction emissions for the proposed project for VOC and NOx are expected to

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<sup>362</sup> DEIR, p. 1-29, Sec. 1.9.2.3.

<sup>363</sup> 29 CFR 1910.38.

<sup>364</sup> 40 CFR Part 1910, Section 119.

<sup>365</sup> 19 CCR Division 2, Chapter 4.5.

<sup>366</sup> DEIR, p. A-143.

<sup>367</sup> U.S. Chemical Safety and Hazard Investigation Board, Tesoro Anacortes Refinery, May 2014, Section 7.8.

<sup>368</sup> Chevron Refinery Modernization Project, Revisions to Draft EIR Volumes 1& 2, p. 4-40, pp. 5-39 to 5-53, Available at: <http://chevronmodernization.com/project-documents/>.

<sup>369</sup> Chevron Refinery Modernization Project, Revisions to Draft EIR Volumes 1 & 2, p. 4-40, pp. 5-39 to 5-53, (Exhibit 30).

<sup>370</sup> DEIR, Table 4.2-2 and p. 4-36.

<sup>371</sup> DEIR, pp. 4-36 to 4-40.

remain significant following mitigation. 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<sup>372</sup> Thus, all feasible mitigation is required.

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**A. Proposed Mitigation Is Inadequate**

1. Electric Equipment

Mitigation Measures A-5 and A-6 require the project proponent to survey, identify, and document all construction areas served by electricity and to use only electric welders and power generators in these areas.<sup>373</sup> The documented survey is an excellent requirement. However, other construction equipment is available in electrical models. These include pumps, jack hammers, excavators,<sup>374</sup> augers, and trucks.<sup>375</sup> Thus, these two mitigation measures should be combined and revised to require the use of electrical equipment in all applications where it is available.

In addition to the narrow focus on only welders and generators, the EIR also contains "exceptions" if the equipment is leased or rented and the project proponent/contractor has "attempted in good faith and due diligence to lease the vehicle or equipment ...but that vehicle or equipment is not available." This allows poor planning and implementation to side step mitigation. Electric equipment is widely available and should be required with no exceptions.

G1-78.246

The BAAQMD, for example, recently recommended the following mitigation measures to reduce NOx emissions during construction of the proposed WesPac Pittsburg Energy Infrastructure Project ("WesPac Project"):<sup>376</sup>

- Prohibit diesel generators where access to the electrical grid is available.
- Require electrification of motors, pumps, and other power tools whenever feasible.<sup>377</sup>

<sup>372</sup> DEIR, p. 4-42.

<sup>373</sup> DEIR, p. 4-37.

<sup>374</sup> Hitachi Construction Machinery, Electric Construction Machinery; Available at: [https://www.hitachi-c-m.com/global/environment/showcase/motor\\_driven.html](https://www.hitachi-c-m.com/global/environment/showcase/motor_driven.html).

<sup>375</sup> The Electrical Resource; Available at: <http://www.theelectricalresource.com/category/earth-augers.html>.

<sup>376</sup> The WesPac Project application was withdrawn on November 16, 2015. However, this does not affect the BAAQMD's recommendation for appropriate construction mitigation measures.

<sup>377</sup> Jean Roggenkamp, BAAQMD, Letter to Kristin VahlPollot, City of Pittsburg, Re: WesPac Pittsburg



- The BAAQMD equivalent mitigation includes no escape clauses and requires electrification of all equipment, where feasible.

G1-78.246  
cont'd.

2. Compliance With Existing Regulations Not Valid CEQA Mitigation

Mitigation Measure A-4 (off-road vehicles) prohibits idling longer than 5 minutes for off-road vehicles.<sup>378</sup> Limiting idle time to 5 minutes is required by 13 CCR 2449[d][3], 2485 for off-road vehicles.<sup>379</sup> Thus, this is not valid CEQA "mitigation". This mitigation measure should be modified to lower the maximum idling time to 3 minutes. In addition to lowering the idling time, the construction contractor shall maintain a written idling policy and distribute it to all employees and subcontractors. The on-site construction manager shall enforce this limit.

G1-78.247

3. Buffer Zone

Best Management Practices (BMPs) require maintaining a 1000-foot buffer zone between truck traffic and sensitive receptors, where feasible.<sup>380</sup> This is not adequate mitigation for several reasons.

*First*, the measure is limited to "truck traffic." The measure should be expanded to include all diesel- and gasoline-powered on-site and off-site construction equipment.

*Second*, the DEIR does not provide any basis for selecting 1,000 feet as the buffer zone. Buffer zones should be determined from health risk assessments. The DEIR is inadequate as it failed to include a health risk assessment for construction emissions. As construction will occur near sensitive receptors and diesel exhaust is a potent carcinogen, construction health impacts may be significant with a 1,000 foot buffer zone.

G1-78.248

*Third*, the DEIR does not require that the buffer distance is enforced and verified as adequate. A field monitoring study should be conducted at each sensitive receptor(s) adjacent to each construction site to verify that 1,000 feet is adequate and adjusted accordingly.

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Energy Infrastructure Project Recirculated DEIR, September 13, 2013;  
<http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA%20Letters/WesPac%20Pittsburg%20Energy%20Infrastructure%20Project%20DEIR.ashx>.

<sup>378</sup> DEIR, pp. 4-36 and 4-37.

<sup>379</sup> [https://govt.westlaw.com/calregs/Document/ID1C693E02DDD11E197D9B83B68A61150?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/ID1C693E02DDD11E197D9B83B68A61150?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).

<sup>380</sup> DEIR, p. 4-40, BMP #3.



4. Exceptions

The DEIR includes “exceptions” to complying with mitigation measures A-2 to A-8 for on-road and off-road construction equipment and generator requirements. These exceptions allow stepdown to the next cleanest piece of equipment or vehicle available.<sup>381</sup> These “exceptions” relax mitigation if the equipment required to meet mitigation measures A-2 to A-8 is not available for lease or rental; funding has not arrived to cover the retrofit cost; or the equipment has not arrived when purchased at least 60 days before it is required and the equipment is not available for lease or short-term rental within 200 miles of the project site. These exceptions allow poor planning and implementation to trump mitigation and thus render the measures unenforceable. The DEIR should be modified to require backup mitigation of equal effectiveness if the primary mitigation is not available. Backup mitigation could include the following:

- If a compliant engine is not available, equip available engines with retrofit controls;
- Extend the search radius to 1,000 miles from the Project site;
- Modify on-site stationary source equipment to reduce NOx and VOC during the construction period.

G1-78.249

5. Additional Feasible Mitigation

An EIR may conclude that an impact is significant and unavoidable only if all available and feasible mitigation measures have been proposed, but are inadequate to reduce the impact to a less than significant level.<sup>382</sup> If supported by substantial evidence, the lead agency may make findings of overriding considerations and approve the project in spite of the significant and unavoidable impact(s). However, the lead agency cannot simply conclude that an impact is significant and unavoidable without requiring all feasible mitigation, as here.

G1-78.250

Additional feasible construction exhaust mitigation measures are included in CEQA guidelines of various air quality management districts, have been required in recent CEQA documents,<sup>383,384,385,386,387</sup> or are recommended by the U.S. EPA.<sup>388</sup> Some

<sup>381</sup> DEIR, pp. 4-38 to 4/39.

<sup>382</sup> See Cal. Code Regs. Titl.14 (“CEQA Guidelines”), § 15126.2.

<sup>383</sup> SWCA Environmental Consultants, Draft Initial Study and Mitigated Negative Declaration for the California American Water Slant Test Well Project, Prepared for City of Marina, May 20 (IS/MND).

<sup>384</sup> MBUAPCD 2008, Table 8-2 to 8-4, and 8-7.

<sup>385</sup> Chevron Refinery Modernization Project EIR, March 2014, Chapter 4.8, Greenhouse Gases; Available at [http://chevronmodernization.com/wp-content/uploads/2014/03/4.8\\_Greenhouse-Gases.pdf](http://chevronmodernization.com/wp-content/uploads/2014/03/4.8_Greenhouse-Gases.pdf) and Chapter 5, Mitigation Measure Monitoring and Reporting Program; Available at:

additional feasible mitigation measures from these sources that should be required for this Project are as follows:

- Implement EPA's National Clean Diesel Program;<sup>389,390,391</sup>
- Diesel- or gasoline-powered equipment shall be replaced by lowest emitting feasible for each piece of equipment from among these options: electric equipment whenever feasible, gasoline-powered equipment if electric infeasible;
- If cranes are required for construction, they shall be rated at 200 hp or greater equipped with Tier 4 or equivalent engines;
- Use electric fleet or alternative fueled vehicles where feasible including methanol, propane, and compressed natural gas;
- Use alternative diesel fuels, such as Clean Fuels Technology (water emulsified diesel fuel), or O2 diesel ethanol-diesel fuel (O2 Diesel) in existing engines;<sup>392</sup>
- Convert part of the construction truck fleet to natural gas;<sup>393</sup>

G1-78.250  
cont'd.

G1-78.251

<https://s3.amazonaws.com/chevron/Final+EIR/5+MMRP.pdf>

<sup>389</sup> San Luis Obispo County Air Pollution Control District, CEQA Air Quality Handbook, April 2012, [http://www.slocleanair.org/images/cms/upload/files/CEQA\\_Handbook\\_2012\\_v1.pdf](http://www.slocleanair.org/images/cms/upload/files/CEQA_Handbook_2012_v1.pdf)

<sup>390</sup> Bay Delta Conservation Plan RDEIR/SDEIS, 2015; [http://baydeltaconservationplan.com/RDEIRS/Ap\\_A\\_Rev\\_DEIR-S/App\\_22E\\_Gen\\_Conform\\_Determin.pdf](http://baydeltaconservationplan.com/RDEIRS/Ap_A_Rev_DEIR-S/App_22E_Gen_Conform_Determin.pdf)

<sup>391</sup> Verified Technologies List; [http://baydeltaconservationplan.com/RDEIRS/Ap\\_A\\_Rev\\_DEIR-S/App\\_22E\\_Gen\\_Conform\\_Determin.pdf](http://baydeltaconservationplan.com/RDEIRS/Ap_A_Rev_DEIR-S/App_22E_Gen_Conform_Determin.pdf)

<sup>392</sup> Northeast Diesel Collaborative, Best Practices for Clean Diesel Construction. Successful Implementation of Equipment Specifications to Minimize Diesel Pollution; <http://www2.epa.gov/sites/production/files/2015-09/documents/best-practices-for-clean-diesel-construction-aug-2012.pdf>

<sup>393</sup> U.S. EPA, Cleaner Diesels: Low Cost Ways to Reduce Emissions from Construction Equipment, March 2007; <http://www2.epa.gov/sites/production/files/2015-09/documents/cleaner-diesels-low-cost-ways-to-reduce-emissions-from-construction-equipment.pdf>

<sup>394</sup> NEDC Model Contract Specification, April 2008; <http://www2.epa.gov/sites/production/files/2015-09/documents/nedc-model-contract-specification.pdf>

<sup>395</sup> SCAQMD, Mitigation Measure Resources, Construction Emissions Mitigation Measures, <https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=scaqmd%20ceqa%20construction%20mitigation>



- Include “clean construction equipment fleet”, defined as a fleet mix cleaner than the state average, in all construction contracts;
- Fuel all off-road and portable diesel powered equipment with ARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road);
- Use electric fleet or alternative fueled vehicles where feasible including methanol, propane, and compressed natural gas;
- Use on-road, heavy-duty trucks that meet the ARB’s 2007 or cleaner certification standard for on-road diesel engines, and comply with the State on-road regulation;
- Use idle reduction technology, defined as a device that is installed on the vehicle that automatically reduces main engine idling and/or is designed to provide services, e.g., heat, air conditioning, and/or electricity to the vehicle or equipment that would otherwise require the operation of the main drive engine while the vehicle or equipment is temporarily parked or is stationary;<sup>394</sup>
- Minimize idling time either by shutting off equipment when not in use or limit idling time to 3 minutes (5 minutes is required by 13 CCR 2449[d][3], 2485, so is not “mitigation”). Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the 3 minute idling limit. The on-site construction manager shall enforce this limit.
- Prohibit diesel idling within a buffer zone established by health risk assessment to protect sensitive receptors and use an on-site monitor to enforce this distance;

G1-78.251  
cont’d.

G1-78.252

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<sup>393</sup> This is a mitigation measure used by PG&E to offset NOx emissions from its Otay Mesa Generating Project. See: GreenBiz, Natural Gas Trucks to Offset Power Plant Emissions, September 12, 2000; Available at: <http://www.greenbiz.com/news/2000/09/12/natural-gas-trucks-offset-power-plant-emissions>.

<sup>394</sup> EPA Names Idle Reduction Systems Eligible for Federal Tax Exemptions, March 2009, Available at: <http://www.greenfleetmagazine.com/channel/green-operations/article/story/2009/03/epa-names-idle-reduction-systems-eligible-for-federal-excite-tax-exemptions-grn.aspx>. See also: Idle Reduction, Wikipedia; Available at: [https://en.wikipedia.org/wiki/Idle\\_reduction](https://en.wikipedia.org/wiki/Idle_reduction) and Diesel Emissions Reduction Program (DERA): Technologies, Fleets and Project Information, Working Draft Version 1.0; Available at: <https://www.epa.gov/sites/production/files/2015-09/documents/420p11001.pdf>.

- Staging and queuing areas shall not be located within a buffer zone established by health risk assessment to protect sensitive receptors and use an on-site monitor to enforce this distance
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time;
- The engine size of construction equipment shall be the minimum practical size;
- Catalytic converters shall be installed on gasoline-powered equipment;
- Signs shall be posted in designated queuing areas and job sites to remind drivers and operators of the idling limit;
- Engine size of construction equipment shall be the minimum practical size;
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time;
- Construction worker trips shall be minimized by providing options for carpooling and by providing for lunch onsite;
- Use new or rebuilt equipment;
- Maintain all construction equipment in proper working order, according to manufacturer's specifications. The equipment must be check by an ASE-certified mechanic and determined to be running in proper condition before it is operated;
- Use low rolling resistance tires on long haul class 8 tractor-trailers;<sup>395</sup>

G1-78.253

G1-78.254

G1-78.255

<sup>395</sup> EPA, Verified Technologies for SmartWay and Clean Diesel, Learn About Low Rolling Resistance (LRR) New and Retread Tire Technologies; Available at: <https://www.epa.gov/verified-diesel-tech/learn-about-low-rolling-resistance-lrr-new-and-retread-tire-technologies>; EPA, Verified Technologies for SmartWay and Clean Diesel, SmartWay Verified List for Low Rolling Resistance (LRR) New and Retread Tire Technologies; Available at: <https://www.epa.gov/verified-diesel-tech/smartway-verified-list-low-rolling-resistance-lrr-new-and-retread-tire>.



- Use diesel-electric and hybrid construction equipment.<sup>396</sup>
- Maintain all construction equipment in proper working order, according to manufacturer’s specifications. The equipment must be check by an ASE-certified mechanic and determined to be running in proper condition before it is operated.

G1-78.256

To assure the construction mitigation program is carried out, all off-road diesel-powered equipment should be tested to assure tailpipe emissions do not exceed 20% opacity for more than 3 minutes in any hour. Any equipment found to exceed 20% opacity must be repaired immediately. A visual inspection of all in-operation equipment must be made at least daily by the contractor and witnessed monthly or more frequently by the SCAQMD, and a periodic summary of the visual survey results must be submitted by the contractor throughout the duration of the project to the SCAQMD. The summary should include the quantity and type of vehicles inspected and dates.

G1-78.257

All feasible mitigation must be required when an impact is significant and unavoidable. Thus, the EIR should be revised to include these additional mitigation measures and recirculated for public review.

**IX. HEALTH EFFECTS OF CONSTRUCTION EMISSIONS WERE NOT EVALUATED**

The DEIR is silent on health impacts from construction of the Project.<sup>397</sup> Construction uses diesel-fueled, off-road equipment such as backhoes, bulldozers, paving equipment, and cranes. This equipment emits large amounts of diesel particulate matter or DPM, which is a potent carcinogen.

G1-78.258

Construction is well known to result in significant health impacts in surrounding communities. In a study of construction health impacts in California,<sup>398</sup> the South Coast

<sup>396</sup> Tom Jackson, How 3 Diesel-Electric and Hybrid Construction Machines are Waging War on Wasted Energy, Equipment World, June 1, 2014; Available at: <http://www.equipmentworld.com/diesel-electric-and-other-hybrid-construction-equipment-are-waging-war-on-wasted-energy/>; Kenneth J. Korane, Hybrid Drives for Construction Equipment, Machine Design, July 7, 2009; Available at: <http://machinedesign.com/sustainable-engineering/hybrid-drives-construction-equipment>; Caterpillar’s D7E Electric Drive Redefines Dozer Productivity; Available at: <http://www.constructionequipment.com/caterpillars-d7e-electric-drive-redefines-dozer-productivity>.

<sup>397</sup> DEIR, Appx. B-4.

<sup>398</sup> Don Anair, Union of Concerned Scientists, Digging Up Trouble. The Health Risks of Construction in California, 2006, Figure 1. Available at [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean\\_vehicles/digging-up-trouble.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/digging-up-trouble.pdf).

air basin where the Project is located, ranked first in California with the greatest construction health impacts, including more than 700 premature deaths, more than 650 hospitalizations for respiratory and cardiovascular illness, more than 1,700 cases of acute bronchitis, nearly 21,000 incidents of asthma attack and other lower respiratory symptoms, and over 300,000 days of lost work and school absences. This loss of life and productivity cost South Coast residents an estimated \$5.9 billion.<sup>399</sup>

G1-78.258  
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The DEIR has failed to evaluate the impact of Project construction on the health of nearby sensitive receptors. Thus, the DEIR fails as an informational document.

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<sup>399</sup> *Id.*, pp. 1, 12, and Table 1.

ATTACHMENT C



**KAMALA D. HARRIS**  
*Attorney General*

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**DEPARTMENT OF JUSTICE**



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January 15, 2013

*Via U.S. and Electronic Mail*

Kristin V. Pollot  
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**RE: Recirculated Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project (SCH # 2011072053)**

Dear Ms. Pollot:

Attorney General Kamala D. Harris submits the following comments on the Recirculated Draft Environmental Impact Report (RDEIR) for the WesPac Pittsburg Energy Infrastructure Project (Project).<sup>1</sup> WesPac's proposed \$200 million, 134-acre Project will transform a long-inactive facility into a significant center for the storage, transfer, and transportation of crude oil by rail, pipeline, ship and barge and will bring new sources of crude to the Bay Area for refining. The Project's capacity is massive, with a maximum annual throughput of almost one-fifth of all oil currently processed each year in California.

As set forth below, our review of the RDEIR has revealed some significant legal problems under the California Environmental Quality Act (CEQA). As a threshold matter, the document fails to disclose the sources and analyze the environmental impacts of the new crude. There are a wide range of crudes with different chemical compositions currently available in commerce, and an increasing number of unconventional crudes, such as crudes produced from bitumen sands (so-called "oil sands" or "tar sands"). Different types of crude can have very

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<sup>1</sup> The Attorney General submits these comments pursuant to her independent power and duty to protect the environment and natural resources of the State. (See Cal. Const., art. V, § 13; Gov. Code, §§ 12511, 12600-12612; *D'Amico v. Bd. of Medical Examiners* (1974) 11 Cal.3d 1, 14-15.) This letter is not intended, and should not be construed, as an exhaustive discussion of the RDEIR's compliance with the California Environmental Quality Act.

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different types of impacts on such things as local air quality, greenhouse gas emissions, and the risks associated with accidental releases.

This fundamental defect affects the adequacy of the entire document. Because of this and other errors, the RDEIR fails to:

- Adequately disclose and analyze local air quality impacts to the already impacted community of Pittsburg;
- Consider the effects to other Bay Area communities of refining the new crudes;
- Propose and analyze feasible mitigation that could reduce local air quality impacts;
- Adequately disclose and address the risk of accidents that could result from transportation and storage of the new crudes;
- Fully disclose and consider mitigation for the Project's climate change-related impacts; and
- Consider a reasonable range of feasible alternatives that could reduce the Project's significant impacts.

We urge the City of Pittsburg to correct these deficiencies before certifying the RDEIR and approving the Project.

#### Summary of the Project

WesPac proposes to transform an existing oil storage and transfer facility that has been dormant for 15 years into a major facility with the capacity to receive, store, and transfer almost 20 percent of California's crude oil supply. The proposed Project is next to residential neighborhoods in the City of Pittsburg with no buffer zone and is located within a quarter-mile of a number of sensitive receptors including schools, an extended care facility, a head-start program, three parks, and several churches. The Office of Environmental Health Hazard Assessment has ranked central Pittsburg, the Project area, in the top ten percent of California communities that are already burdened by multiple sources of pollution and experiencing adverse public health effects.<sup>2</sup>

The Project will bring in large volumes of crude oil and partially refined crude oil<sup>3</sup> from unidentified "distant sources"<sup>4</sup> delivered daily by train (100-plus cars long), ocean-going ships, barges, and pipelines. The facility will store the crude in tanks and then transfer it by pipeline to nearby Bay Area facilities (and possibly elsewhere) for refining. Refineries that may receive the

<sup>2</sup> See <http://oehha.ca.gov/ej/ces11.html> (zip code 94565).

<sup>3</sup> The total annual average throughput for the Project will be approximately 88.3 million barrels per year, with a maximum throughput of over 136 million barrels per year. To put these numbers in context, all the refineries in California currently process well over 700 million barrels of oil annually, with Bay Area refineries processing 276 million barrels annually. <http://energyalmanac.ca.gov/petroleum/refineries.html>.

<sup>4</sup> RDEIR at p. 1.0-9

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crude include the Shell Martinez Refinery in Martinez; the Tesoro Golden Eagle Refinery in Martinez; the Conoco Phillips Refinery in Rodco; and the Valero Benicia Refinery in Benicia.<sup>5</sup> The Project will operate twenty-four hours per day, seven days per week.

#### Comments on RDEIR

##### **The RDEIR fails to disclose and analyze the local air quality impacts to the already impacted community of Pittsburg.**

CEQA mandates that an EIR identify and analyze all potentially significant adverse effects of a project, including, both direct and indirect impacts, short-term and long-term impacts, and growth-inducing impacts. (Pub. Resources Code, § 21100; Cal. Code Regs., tit. 14, §§ 15126, 15126.2.) The RDEIR's discussion of local air quality impacts is deficient in several respects, as set forth below.

##### **The RDEIR understates local air quality impacts.**

The Project's many ships, barges, tugboats, locomotives, process equipment and storage tanks will significantly increase the pollution in the surrounding community. According to the RDEIR, even after implementing the proposed mitigation measures, WesPac will exceed the Bay Area Air Quality Management District's (Air District's) recommended significance thresholds for nitrogen oxide (NOx) and organic compounds that contribute to smog and can exacerbate respiratory problems. The Project will also emit particulate matter, a pollutant that already accounts for more than 90 percent of premature mortality related to air pollution in the Bay Area.<sup>6</sup> Because the Project's estimated particulate emissions are under the Air District's recommended thresholds, the RDEIR concludes that the impacts are less than significant and proposes no mitigation. Further, the RDEIR concludes that Project's incremental cancer risk from localized pollution is 9.5 – meaning that the Project is expected to cause 9.5 excess cases of cancer per one million people exposed in a lifetime due to the operation of the Project. This is just under the Air District's recommended threshold of ten excess cancers. No mitigation is proposed.

The RDEIR's disclosure and analysis of localized air impacts is deficient in at least two important respects. First, there is no discussion of the types of crude that will be transported to and distributed from the facility.<sup>7</sup> Information on crude type, however, is critical to a full and fair analysis of potential impacts to local air quality. The amount and toxicity of air emissions and

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<sup>5</sup> RDEIR at p. 2.0-43, Table 2-6. It is not clear whether Chevron's Richmond refinery will receive oil from the Project.

<sup>6</sup> <http://www.baaqmd.gov/Divisions/Planning-and-Research/Particulate-Matter.aspx>.

<sup>7</sup> The rail and marine component of the Project will allow delivery of crude from almost anywhere in the world, including the oil sands of Alberta, Canada. See, e.g., BNSF, Crude-by-Rail presentation (Sept. 2013) at p. 10, available at <http://www.fra.dot.gov/Elib/Document/3436>.

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potential releases associated with transporting and storing crude<sup>8</sup> will vary based on the crude's chemical composition, including the contaminants it contains, its sulfur content, and whether it is blended with other chemicals such as diluent (used to make thick crudes like oil sands less viscous and easier to transport).<sup>9</sup> The failure to base local air impacts analysis on the Project's projected crude types causes the RDEIR to "fail[ ] as an informational document[.]" (See *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 89 [holding EIR deficient where the "project description is inconsistent and obscure as to whether the Project enables the Refinery to process heavier crude."])

Second, the RDEIR's emissions estimates for localized air pollutants do not appear to include all aspects of the Project. The RDEIR fails to include all "fugitive" emissions (for example, from leaks in pressurized equipment, pipelines, seals, and valves) and all aspects of transportation that affect local air quality.<sup>10</sup> Third, the RDEIR's pollution projections are based on hypothetical ship, barge, and rail fleets made up of new and efficient models, rather than real-world fleets made up in part of older, less efficient and higher polluting vehicles and vessels.<sup>11</sup> The RDEIR's reliance on hypothetical, cleaner fleets causes it to underestimate the Project's actual emissions.

Underestimating the Project's localized pollution emissions in this case is prejudicial, working against CEQA's informed decision making and public disclosure purposes. For example, even with the identified deficiencies, the RDEIR's estimated cancer risk is very close to the threshold of significance.<sup>12</sup> A relatively small increase in the estimated emissions may well place the Project over the threshold for cancer risk, requiring the City to consider mitigation for this impact, which it has not done in the RDEIR. Before approving the Project, the City must ensure that the environmental document accounts for crude types and includes all sources in estimating the Project's potential impacts to local air quality.

The RDEIR fails to analyze the significance of local air quality impacts on the already overburdened residents of Pittsburg.

In addition, the RDEIR fails to consider whether the Project's contribution to local air pollution is significant given central Pittsburg's existing pollution burdens. The significance of the Project's localized air emissions must be evaluated in context. (Cal. Code Regs., tit. 14, § 15064, subd. (b).) The context of an action or a specific impact may include the sensitivity of

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<sup>8</sup> E.g., releases and spills, fugitive emissions (discussed below), evaporative emissions, and emissions from storage tanks and thermal oxidizers. See Air District comment letter at p. 2.

<sup>9</sup> See, e.g., Crude Oil Material Data Safety Sheets, Keystone XL Pipeline, available at <http://keystonepipeline-xl.state.gov/documents/organization/205570.pdf>. See also comment letter from Natural Resources Defense Council, September 13, 2013, at pp. 8-21.

<sup>10</sup> The Air District noted that it was "unable to verify the potential health risks" from the Project because of defects in quantifying and modeling the Project's emissions. Air District comment letter at pp. 2-3.

<sup>11</sup> See Air District Letter at p. 3.

<sup>12</sup> RDEIR, 4.0-57, Table 4-21.

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the environment or of the persons affected; some affected persons may be more vulnerable than the general population (such as children, the elderly, or persons whose health already is compromised). In addition, some of those affected may already be subject to higher pollution burdens and thus more sensitive to even seemingly small incremental increases in that burden. (See *Kings County Farm Bur. v. City of Hanford* (1990) 221 Cal.App.3d 692, 718.) Given that the residents of Pittsburg are already facing some of the highest pollution burdens in California, and, for example, are in the 98<sup>th</sup> percentile for emergency room visits for asthma,<sup>13</sup> the environmental document for this Project must analyze whether adding additional pollution that can contribute to the community's existing public health problems is significant.

**The RDEIR fails to consider the effects to other Bay Area communities of refining the new crudes.**

One of the stated, central purposes of the Project is to replace California and Alaska crude stocks, whose volumes are declining, with new sources of crude oil. (RDEIR at pp. 1.0-2, 1.0-6, 1.0-9.) The RDEIR fails, however, to consider any impacts that may be experienced in the communities receiving and refining the new, high-volume deliveries of unidentified crude.

To comply with CEQA, the environmental document for this Project must evaluate whether there is the potential for new or increased impacts to the communities where the crude oil will be refined due to changes in delivered volume or in the composition of the crude. If, for example, the incoming crude oil requires more energy to refine it, or contains different or higher levels of contaminants than the current mix, there may be higher levels of emissions around the receiving refineries. Such impacts would constitute a "reasonably foreseeable indirect physical change in the environment which may be caused by the project. (See Cal. Code Regs., tit. 14, § 15064; *Muzzy Ranch Co. v. Solano County Airport Land Use Com.* (2007) 41 Cal. 4<sup>th</sup> 372, 387.) The fact that these indirect impacts will be experienced some distance from the Project's footprint is irrelevant. Indeed, "the purpose of CEQA would be undermined if the appropriate governmental agencies went forward without an awareness of the effects a project will have on areas outside of the boundaries of the project area." (*Napa Citizens for Honest Government v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4<sup>th</sup> 342, 369.)

**The RDEIR fails to analyze feasible mitigation that could reduce local air quality impacts.**

Under CEQA, "public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects...." (Pub. Resources Code, § 21002; *Mountain Lion Foundation v. Fish and Game Com.* (1997) 16 Cal.4<sup>th</sup> 105, 134.) By the RDEIR's own estimates,<sup>14</sup> localized air emissions from both construction and direct operations will exceed the Air District's significance thresholds for nitrogen oxides and organic compounds that result in smog. But the RDEIR's proposed mitigation measures fall far short.

<sup>13</sup> See CalEnviroScreen, <http://oehha.ca.gov/ej/ces11.html>.

<sup>14</sup> As noted above, the RDEIR may substantially underestimate local air emissions.

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Page 6

The RDEIR proposes to “offset” certain aspects of the Project’s local air pollution by buying or using credits previously earned for reducing emissions elsewhere (emissions reduction credits) rather than implementing on-site mitigation measures. While offsets might reduce air pollution in California or the general region (depending on where actual reductions take place), they will not reduce the localized air pollution impacts in the community where the Project is located. Stated simply, the mitigation does not match the impact. To address the specific local impacts identified, CEQA requires that the RDEIR analyze – and the Project should be required to achieve – all feasible emission reductions of localized air pollutant on-site first.

For instance, on-site mitigation could include requiring dock electrification (which can reduce emissions from marine vessels running their auxiliary engines), minimizing the idling time of diesel-powered construction equipment, prohibiting diesel generators where access to the electrical grid is available, and requiring all equipment meet at least the Tier II engine standard or be fitted with diesel particulate filters if Tier II engines are not available. Additional components of the Project, including the rail elements, could be electrified, and there may be additional process efficiencies that should be considered. The City should also consider whether creating a buffer around the Project, planting vegetation or creating other physical screens, or subsidizing the installation of air filters in the community could reduce air impacts. Further, the City should develop its suite of feasible mitigation measures in a process that is accessible to the public and the affected community. “Fundamentally, the development of mitigation measures, as envisioned by CEQA, is not meant to be a bilateral negotiation between a project proponent and the lead agency after project approval; but rather, an open process that also involves other interested agencies and the public.” (*Communities for a Better Environment, supra*, 184 Cal.App.4th at p. 93.)

**The RDEIR fails to adequately disclose and address the risk of accidents that could result from transportation, storage, and refining of the new crudes.**

The RDEIR states that the Project’s potential to “[c]reate a hazard to the public or environment through reasonably foreseeable upset or accident conditions involving the release of a hazardous material to the environment” is “[s]ignificant and unavoidable.”<sup>15</sup> This conclusion requires that the City discuss the risk in order to fashion appropriate mitigation measures to reduce the likelihood of accident in all phases of the operation, and increase the probability of an effective response should an accident occur. The RDEIR fails on both counts.

Because the RDEIR fails to identify the types of crude oil that will be handled at the facility, it necessarily also fails to identify the varied risks associated with transporting, storing, and refining these crudes. For instance, higher acid and/or sulfur content in a crude may increase the risk of corrosion to refinery equipment and pipes, which in turn can lead to leaks, explosion or fire.<sup>16</sup> Further, crudes and crude mixtures with a lower flash point present a greater risk of

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<sup>15</sup> RDEIR 10.0-31.

<sup>16</sup> Pipe corrosion contributed to the August 6, 2012 explosion and fire at Chevron’s Richmond refinery. See <http://www.dir.ca.gov/DIRNews/2013/IR2013-06.html>. Further, the Federal Railroad Administration has expressed concern about an increasing number of severe corrosion incidents and has noted that “[a] possible cause is contamination of the crude oil by materials

(continued...)



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explosion and fire<sup>17</sup> And certain types of crudes can be more challenging to contain and clean up in the event of an accidental release.<sup>18</sup> The National Oceanographic and Atmospheric Administration notes that “knowledge about the chemical properties and behavior of tar sands products during a marine spill is limited” and that “[t]hese gaps in information make effective spill planning and response more difficult ....”<sup>19</sup>

To ensure that the Project’s risks are adequately disclosed and that there is sufficient information to design tailored mitigation and accident response plans, the EIR for this Project must provide additional, detailed information about the new sources of crude, their chemical compositions, and the risks associated with their transportation, storage, and refining.

In addition, as of the date of the RDEIR, it appears that the City had failed to engage key agencies that will have essential roles in the event of an accident or threat of release. For example, the RDEIR states that the facility will not require any extra fire services and that the Contra Costa County Fire Protection District (“Fire District”) is fully capable of providing any required emergency services.<sup>20</sup> The Fire District, however, submitted a comment letter stating that it does not have an adequate number of personnel to properly respond to a fire incident at this facility or the necessary equipment/material such as industrial foam firefighting apparatus to handle a large-scale fire.<sup>21</sup> Moreover, there is nothing in the RDEIR demonstrating that the Project applicant or the City has actively engaged the California Department of Fish and Wildlife’s Office of Spill Prevention and Response (OSPR), the State’s lead agency for marine and off-highway oil spill prevention, response, and natural resource restoration, to ensure that OSPR has all the information it requires and is prepared and able to respond in case of a spill related to the Project.

Before this Project is approved, to ensure a full disclosure of the Project’s risks and an adequate analysis of specific, enforceable mitigation, the City and WesPac must work with all

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*(... continued)*

used in the fracturing process that are corrosive to the [rail] tank car tank and service equipment.” See <http://www.fra.dot.gov/eLib/details/L04717>.

<sup>17</sup> See <http://www.tsb.gc.ca/eng/medias-media/communiques/rail/2013/r13d0054-20130911.asp> (Canadian Transportation Board analysis of July 6, 2013 derailment and explosion in Lac-Mégantic, Quebec).

<sup>18</sup> A 2010 pipeline leak near Marshall, Michigan released an estimated at 843,000 gallons of tar sands oil. Substantial amounts of the oil remain on the river bottom to this day, and cleanup continues. See <http://www.epa.gov/enbridgespill/>.

<sup>19</sup> <http://response.restoration.noaa.gov/about/media/what-are-increased-risks-transporting-tar-sands-oil.html>.

<sup>20</sup> RDEIR at pp. 10.0-62-63.

<sup>21</sup> Troublingly, it appears that the RDEIR does not examine the adequacy of response to certain large-scale incidents that, while they may have a low probability, could have catastrophic consequences. For example, it does not consider the possibility of a major release with fire, a complete tank failure, or a rail spill that involves more than one rail car. RDEIR at pp. 10.0-41-42; 10.0-55-56; 10.0-61. Without explanation, it also fails to consider the possibility of derailment outside of Contra Costa County. RDEIR at p. 10.0-56.

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relevant response agencies, including those listed above, to develop a detailed, enforceable, and fully funded response plan for its facility and other areas where crude could be released.

**The RDEIR fails to fully disclose and consider mitigation for the Project's climate change-related impacts.**

The RDEIR calculates the Project's greenhouse gas emissions at over 35,000 metric tons per year, concludes that the Project's climate change impacts are significant, and summarily asserts that *no* mitigation measures are available to reduce the GHG emissions from the Project. The RDEIR does not explain why no mitigation measures are available or even what mitigation measures were considered and rejected. There are a number of problems with the RDEIR's analysis.

The Project may substantially underestimate greenhouse gas emissions by not, for example, basing calculations on the expected crude mix<sup>22</sup> and on the current and projected fleets for barges, ships, ground equipment and rail. In addition, it is unclear why the RDEIR considers greenhouse gas emissions for rail operations only within Contra Costa County, and considers only those emissions from marine tankers that occur within 54 nautical miles of the Project.<sup>23</sup> Unlike localized air emissions, greenhouse gases are global pollutants that have effects worldwide and in California regardless of where the emissions occur. If the Project is causing new rail and vessel traffic resulting in additional greenhouse gas emissions, this would appear to be a growth-inducing aspect of the Project that should at the very least be disclosed in the document.

The RDEIR also errs in jumping to the conclusion that the Project's impacts related to climate change are significant and unavoidable, without conducting the analysis of *why* this is the case. (*Keep Berkeley Jets Over the Bay Com. v. Board of Port Comrs.* (2001) 91 Cal.App.4th 1344, 1371 [holding that "simply labeling the impact 'significant' without accompanying analysis" violates "the environmental assessment requirements of CEQA.")] For this particular long-term infrastructure investment Project, the question of the Project's significance may turn less on the precise volume of greenhouse gases that will be emitted, and more on how the Project is or is not consistent with the State's energy and climate objectives.

The RDEIR states that the Project is needed to ensure reliable sources of transportation fuels for California, citing the California Energy Commission's 2009 Integrated Energy Policy Report, and asserts that demands for crude oil in California are increasing as a result of increasing vehicle miles traveled. (RDEIR at pp. 1.0-3, 1.0-6.) But the 2009 report, based on 2008 data, is significantly outdated. The California Energy Commission published a superseding 2011 Energy Policy Report and a 2012 update, and recently issued its final 2013 Integrated Energy Policy Report. These more recent documents show that conditions relating to traditional vehicle fuels have changed substantially in recent years, due in part to policies and laws designed

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<sup>22</sup> See Congressional Reporting Service, Canadian Oil Sands: Life-Cycle Assessments of Greenhouse Gas Emissions, Richard K. Lattanzio (March 15, 2013), Summary, available at [www.fas.org/spp/crs/misc/R42537.pdf](http://www.fas.org/spp/crs/misc/R42537.pdf).

<sup>23</sup> RDEIR at pp. 5.0-10; 4.0-36.

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to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and GHG emissions from the transportation sector, and reduce vehicle miles traveled.<sup>24</sup>

The RDEIR also fails to note and address the numerous state laws and policies specifically designed to reduce the need for conventional, high-carbon transportation fuels. These include California's Low Carbon Fuel Standard Program, its Zero Emission Vehicle Program, and the Sustainable Communities Strategies Act (SB 375), whose purpose is to reduce vehicle miles traveled. It is the State's goal to "transform[ ] personal transportation so that virtually all vehicles in the state are zero-emission by 2050, and ultimately reducing transportation sector greenhouse gas emissions by 80 percent below 1990 levels."<sup>25</sup> The revised EIR should include evidence and analysis addressing whether and how this Project meets any interim need as the State transitions to low- and zero-carbon transportation fuels and to renewable energy sources – changes that are essential to meeting of the State's objective to reduce California's greenhouse gas emissions to 80% below their 1990 levels by 2050 in order to reduce the risk of dangerous climate change.<sup>26</sup>

In addition, it is simply not plausible that there are *no* feasible mitigation measures that could reduce the Project's greenhouse gas emissions. The CEQA Guidelines set out examples of potential measures, including off-site mitigation<sup>27</sup> and energy conservation. (Cal. Code Regs., tit. 14, § 15126.4, subd. (c); see also Appendix F to the CEQA Guidelines, addressing energy conservation.) In addition, the document should discuss the possibility of requiring minimum standards for the marine vessels and rail engines servicing the Project, dock electrification, and potential electrification of other aspects of the Project that could reduce the use of fuels with higher carbon intensities. The Final EIR must consider these and any other feasible mitigation measures that could apply to this Project.

**The RDEIR fails to consider a reasonable range of feasible alternatives that could reduce the Project's significant impacts.**

One of the "core" requirements of an EIR is an adequate consideration of alternatives. (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564.) Under CEQA, an EIR must "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." (Cal. Code Regs., tit. 14, § 15126.6, subd. (a).)

<sup>24</sup> 2013 Integrated Energy Policy Report - Final Lead Commissioner Report, available at [http://www.energy.ca.gov/2013\\_energy\\_policy/](http://www.energy.ca.gov/2013_energy_policy/). See, e.g., *id.* at pp. 192 and 229.

<sup>25</sup> California Energy Commission, Integrated Energy Policy Report, 2012 Update, at p. 61, available at [http://www.energy.ca.gov/2012\\_energy\\_policy/index.html](http://www.energy.ca.gov/2012_energy_policy/index.html).

<sup>26</sup> This deficiency is also present in the RDEIR's statement of "Purpose and Need" beginning at p. 1.0-6.

<sup>27</sup> Off-site mitigation for greenhouse gas emissions may be appropriate where reductions outside the facility can reduce climate change impacts as effectively as on-site mitigation.

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The RDEIR is fundamentally defective because it considered only *one* action alternative: a version of the Project that reduces storage capacity by 18%. (The reduced capacity alternative would create a slight buffer zone between single family residences adjacent to some of the storage tanks but is otherwise very similar to the proposed Project.) There are other feasible alternatives that the City could have considered. For example, the City summarily rejected an alternative that would utilize docks and storage tanks at existing refineries. It cited the 2009 California Energy Commission report, which the City believes supports its view that existing “facilities are currently at or near capacity, resulting in a need for additional marine terminal and storage capacity infrastructure.”<sup>28</sup> Based on current trends, however, it is possible that there is sufficient infrastructure to meet the State’s need for imported oil; if this is the case, then smaller, dispersed upgrades to existing facilities in the Bay Area and elsewhere could in fact be sufficient. Another alternative might be to remove the Project’s rail terminal component (which was only recently added) and rely on an electrified marine terminal and pipelines. In a revised document, the City must consider a full range of alternatives that could meet most of the Project’s objectives.

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<sup>28</sup> RDEIR at 2.0-138.

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January 15, 2013  
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**Conclusion**

We urge the City of Pittsburg to substantially revise the environmental document for this Project so that it will fully inform the public and the City Council of the impacts of this Project to the residents of Pittsburg, to the other Bay Area communities that will refine the incoming crude, and to the State as we transition to a low-carbon economy and make long-term infrastructure investments.

We appreciate your consideration and would be happy to answer any question you might have about our comments.

Sincerely,

/s/

JANILL L. RICHARDS  
Supervising Deputy Attorney General  
ROSE B. FUA  
Deputy Attorney General

For KAMALA D. HARRIS  
Attorney General

cc: Ken Alex, Director, Governor's Office of Planning and Research  
Thomas Gibson, General Counsel, Department of Fish and Wildlife  
Michael Levy, Chief Council, California Energy Commission

ATTACHMENT D





EDMUND G. BROWN JR.  
GOVERNOR

STATE OF CALIFORNIA  
GOVERNOR'S OFFICE of PLANNING AND RESEARCH



KEN ALEX  
DIRECTOR

December 3, 2013

Kristin Pollot, Associate Planner  
City of Pittsburg, Planning Department  
65 Civic Avenue  
Pittsburg, CA 94565  
[kpollot@ci.pittsburg.ca.us](mailto:kpollot@ci.pittsburg.ca.us)

Re: WesPac Pittsburg Energy Infrastructure Project, Tar Sands

Dear Ms. Pollot:

The public comment period for the Recirculated Draft Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project closed on September 13, 2013. We apologize for missing that deadline, but ask that this letter be included in the record before the City Council at the time the WesPac project comes before the Council.

The Governor's Office of Planning and Research (OPR) is California's comprehensive state planning agency and serves the Governor and his Cabinet as staff for long-range planning and research. The RDEIR includes the following information:

1. WesPac proposes to modernize and reactivate the existing oil storage and transfer facilities located at the NRG Energy, Inc. Pittsburg Generating Station. The proposed Terminal "would be designed to receive crude oil and partially refined crude oil from trains, marine vessels, and pipelines, store oil in existing or new storage tanks, and then transfer oil to nearby refineries."
2. The total annual throughput for the Terminal would be approximately 88.3 million barrels of crude oil or partially refined crude oil per year.

The WesPac project may impact planning for greenhouse gas emission reduction and infrastructure and is therefore of interest to OPR. As a result, we pose three straight-forward questions that we believe should be answered in the course of review of the project:

1. Can the WesPac project receive, store, or transfer crude oil or partially refined crude oil from tar sands?
2. What are the anticipated sources of crude oil or partially refined crude oil that WesPac will receive, store, or transfer?
3. If the anticipated sources of crude change, who makes that decision, and if the crude mix change results in increased environmental impacts, how will those impacts be addressed?

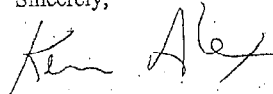
**APPENDIX G: RESPONSE TO COMMENTS**

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Kristin Pollot, Associate Planner  
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Many thanks for your consideration of these issues.

Sincerely,



Ken Alex  
Director

Cc Members of the Pittsburg City Council

# ATTACHMENT E



Technical Consultation, Data Analysis and  
Litigation Support for the Environment

2656 29<sup>th</sup> Street, Suite 201  
Santa Monica, California 90405

Matt Hagemann  
Tel: (949) 887-9013  
Email: [mhagemann@swape.com](mailto:mhagemann@swape.com)

June 7, 2016

Rachael Koss  
Adams Broadwell Joseph & Cardozo  
601 Gateway Boulevard, Suite 1000  
South San Francisco, CA 94080

**Subject: Comments on the Tesoro Los Angeles Refinery Integration and Compliance Project**

Dear Ms. Koss:

I have reviewed the March 2016 Draft Environmental Impact Report (DEIR) for the Tesoro Los Angeles Refinery Integration and Compliance Project ("Project"), which proposes: (1) reconfiguration of the combined refinery complex (Carson and Wilmington Operations) which will allow for the shuttering of the Fluid Catalytic Cracking Unit at the Wilmington Operations; (2) installing interconnecting pipelines; and (3) installing new heat exchangers and modifying existing units. The Refinery includes the Wilmington Operations in the Wilmington District of the City of Los Angeles and the Carson Operations in the City of Carson.

G1-78.259

I have found the DEIR to inadequately disclose contaminated soil and groundwater conditions. As a result, construction worker health may be compromised during construction and water quality impacts may result. A revised DEIR must be prepared to disclose contaminants in the subsurface and to include mitigation measures that will ensure worker safety and environmental protection provisions.

**Contaminants in Soil and Groundwater are Inadequately Disclosed**

The refinery has a long history of releases of contaminants to soil and groundwater from operations. As a result, the Los Angeles Regional Water Quality Control Board has issued Cleanup and Abatement Orders for the Carson Operations (CAO 90-121) and the Wilmington Operations (CAO 88-70 and CAO R4-2011-0037). Monitoring and remediation efforts under these orders are ongoing.

G1-78.260

Soil contamination and contamination of the groundwater with a light non-aqueous phase liquid (LNAPL) at the Carson and Wilmington Operations were documented in a 2015 report that was referenced in the DEIR.<sup>1</sup> In summarizing the results of this report, the DEIR states (p. 3-25):

Of the 44 soil samples analyzed, samples indicate that 95 percent of the soil to be potentially excavated will be classified as non-hazardous waste. During the soil sampling activities, air sampling consistent with SCAQMD Rule 1166 was performed.

The DEIR makes no conclusions about impacts of the Project on worker health when contaminated soils and groundwater are encountered during excavation. Simply comparing the results to hazardous waste and air emissions criteria is inappropriate for disclosure of conditions that may impact construction workers who touch contaminated soil or who breathe contaminated vapors. Health risks should be estimated in a revised DEIR by comparing soil sampling results to screening levels that are health protective of construction workers as published in the widely used San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels (ESLs).<sup>2</sup>

G1-78.260  
cont'd.

To estimate potential health risks to construction workers, we compared results included in the 2015 soil sampling report to the construction worker soil exposure ESLs. We found two things: (1) exceedances of the construction worker ESLs were found near areas where Project construction will take place and; (2) with a couple of exceptions, samples were not collected where Project improvements are likely to disturb soil and sampling density was woefully inadequate to characterize soil contamination.

G1-78.261

#### ESL Exceedances

The maps we prepared (below) show where soil ESLs for construction workers will be exceeded near where soil will be excavated. This indicates the potential for soil in the areas for construction of the Project to also exceed construction worker ESLs.

G1-78.262

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<sup>1</sup> Soil Characterization, Tesoro Refinery Integration Project, 2350 East 223rd Street, Carson, California, Trihydro Corp., January 5, 2015

<sup>2</sup> [http://www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/ESL/ESL%20Workbook\\_ESLs\\_PDF\\_Rev2.pdf](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/ESL/ESL%20Workbook_ESLs_PDF_Rev2.pdf), "Any Land Use/Any Depth Soil Exposure: Construction Worker"



G1-78.262  
cont'd.





G1-78.262  
cont'd.

Health effects of the compounds detected above ESLs at the Wilmington and Carson Operations include:

TPH: Some TPH compounds, affect the central nervous system, causing headaches and dizziness, a nerve disorder called "peripheral neuropathy," and effects on the blood, immune system, lungs, skin, and eyes. Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals.<sup>3</sup>

Mercury: Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.<sup>4</sup>

The DEIR did not disclose or mitigate the Project's potentially significant health impacts on construction workers from the excavation of contaminated soils.

<sup>3</sup><http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=423&tid=75>

<sup>4</sup><http://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=113&tid=24>



Sampling Density is Inadequate

The maps above, while indicating the potential for exceedances in areas of Project construction also depict inadequate sampling where earthmoving activities are to take place. The maps show that sampling was not targeted to the Project and is therefore inadequate as a basis for decision making about potential hazards.

The 2015 report purported sampling in “the locations where soil will be generated during the Integration Project” (p. 1). The maps we prepared show, instead, that very few samples were collected in areas where Project improvements will be made.

Because sampling did not successfully target areas of Project improvements, potential soil contamination in those areas has not been adequately disclosed. A DEIR must be prepared to include the results of a sampling investigation in areas to be excavated. Comparison of the results to construction worker ESLs should also be included. Any exceedances of the ESLs should be mitigated by ensuring proper personal protective equipment, including gloves, respirators and protective suits.

We also prepared a map to show where a pipeline “bundle” would be completed under the Alameda Corridor and Sepulveda Boulevard as part of the work that will connect pipelines between the Wilmington and Carson Operations. The pipeline bundle will require a 54-inch bore using horizontal directional drilling to advance 80 feet underneath South Alameda Street and East Sepulveda

G1-78.263

Boulevard.



G1-78.263  
cont'd.

The figure we prepared shows the underground pipeline bundle to cross through or near a pool of LNAPL to the east of Alameda Street and directly east of the Dominguez Channel. The LNAPL, as measured in October of 2013, was 0.74 feet thick and found at a depth of approximately 14 feet.<sup>5</sup> Because the pipeline bundle would extend 80 feet below ground in this area, the pipeline has the potential to penetrate the LNAPL in this vicinity.

No assessment was made in the DEIR about penetrating the LNAPL with the pipeline bundle and the environmental impacts that would result. Environmental impacts that must be considered and mitigated where necessary in a revised EIR include:

- Potential to smear the LNAPL to deeper depths when penetrated by the pipeline bundle. As drilling advances, the 54-inch bore may intersect the LNAPL and drag down relatively shallow contaminants to deeper levels, potentially further contaminating soil and groundwater.
- Potential need to dewater and the need to handle the LNAPL and the contaminated groundwater associated with the LNAPL. In Los Angeles, dewatering is regulated by Order R4-

G1-78.264

<sup>5</sup> Semi-Annual Groundwater Monitoring Report, Second Semester, 2013, URS, January 14, 2014, Table 4

2013-0095<sup>6</sup> and requires conformance with a "General Permit" whereby the discharger must submit a Notice of Intent and obtain authorization for a discharge under an appropriate monitoring and reporting program. A revised DEIR must acknowledge these requirements and show how the Project will comply.

- Special needs for worker health and safety associated with potential need to physically handle the LNAPL, which may include pure gasoline, diesel fuel, jet fuel, fuel oil or a mixture of these compounds. A revised DEIR should include, as mitigation, measures to protect workers from direct contact with the LNAPL and from exposure to vapors.

G1-78.264  
cont'd.

Sincerely,



Matt Hagemann, P.G., C.Hg.

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<sup>6</sup>[http://www.waterboards.ca.gov/losangeles/board\\_decisions/adopted\\_orders/permits/general/npdes/r4-2013-0095/Dewatering%20Order.pdf](http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/permits/general/npdes/r4-2013-0095/Dewatering%20Order.pdf)



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Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

**Geologic and Hydrogeologic Characterization**  
**Industrial Stormwater Compliance**  
**Investigation and Remediation Strategies**  
**Litigation Support and Testifying Expert**  
**CEQA Review**

**Education:**

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.

B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

**Professional Certifications:**

California Professional Geologist

California Certified Hydrogeologist

Qualified SWPPP Developer and Practitioner

**Professional Experience:**

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 – 2003);



## APPENDIX G1: RESPONSE TO COMMENTS

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- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

### **Senior Regulatory and Litigation Support Analyst:**

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 100 environmental impact reports since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, Valley Fever, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

## APPENDIX G1: RESPONSE TO COMMENTS

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- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.



- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

### **Executive Director:**

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

### **Hydrogeology:**

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

## APPENDIX G1: RESPONSE TO COMMENTS

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- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nationwide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

### Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, *Oxygenates in Water: Critical Information and Research Needs*.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

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### **Geology:**

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

### **Teaching:**

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt taught physical geology (lecture and lab and introductory geology at Golden West College in Huntington Beach, California from 2010 to 2014.

### **Invited Testimony, Reports, Papers and Presentations:**

**Hagemann, M.F.**, 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

**Hagemann, M.F.**, 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

**Hagemann, M.F.**, 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Colorado.

**Hagemann, M.F.**, 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

**Hagemann, M.F.**, 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

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Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

**Hagemann, M.F.**, 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

**Hagemann, M.F.**, 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

**Hagemann, M.F.**, 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

**Hagemann, M.F.**, 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal representatives, Parker, AZ.

**Hagemann, M.F.**, 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

**Hagemann, M.F.**, 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

**Hagemann, M.F.**, 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

**Hagemann, M.F.**, 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

**Hagemann, M.F.**, 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

**Hagemann, M.F.**, 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

**Hagemann, M.F.**, 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

**Hagemann, M.F.**, 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

**Hagemann, M.F.**, 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

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**Hagemann, M.F.**, 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

**Hagemann, M.F.**, 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

**Hagemann, M.F.**, and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

**Hagemann, M.F.**, 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

**Hagemann, M.F.**, 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

**Hagemann, M.F.**, and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

**Hagemann, M.F.**, Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

**Hagemann, M. F.**, Fukunaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

**Hagemann, M.F.**, 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

**Hagemann, M.F.** and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

**Hagemann, M.F.**, 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

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**Hagemann, M.F.**, 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

**Other Experience:**

Selected as subject matter expert for the California Professional Geologist licensing examination, 2009-2011.



[Attachment F was submitted electronically as a separate file and is presented as Comment Letter 79]

**Response to Comment Letter No. G1-78**

**Adams Broadwell Joseph & Cardozo**

**Comment G1-78.1**

We are writing on behalf of Safe Fuel and Energy Resources California (“SAFER California”), Peter Estrada, Leonardo Parra and Nicolas Garcia to provide comments on the Draft Environmental Impact Report (“DEIR”) prepared by the South Coast Air Quality Management District (“Air District”) pursuant to the California Environmental Quality Act (“CEQA”), for the Tesoro Los Angeles Refinery Integration and Compliance Project (“Project”). Tesoro Refining & Marketing Company LLC (“Applicant”) proposes to modify and integrate its Wilmington Operations located at 2101 East Pacific Coast Highway in the City of Los Angeles, and its Carson Operations, located at 2350 East 223<sup>rd</sup> Street in the City of Carson.

G1-78.1

**Response G1-78.1**

The comment is introductory to the comment letter and summarizes the parties that the commenter is representing. It is not a comment on the proposed project or DEIR; therefore, no response is required under CEQA.

**Comment G1-78.2**

Based on our review of the DEIR, the documents referenced in the DEIR, public records within the Air District’s possession and publicly available information, we conclude that the DEIR is deficient and must be revised and recirculated for public review and comment. Although the DEIR includes various analytical errors, the major defect in the DEIR is that it entirely fails to disclose the implications of the crude slate switch facilitated by the Project. Substantial evidence shows that the Project is designed to achieve maximum flexibility in crude slate to reduce operating costs and maximize profits by refining the cheapest

G1-78.2

available crude, including Bakken and other similar light crudes, and tar sands and other heavy crudes. The Air District completely fails to acknowledge this in the DEIR and fails to evaluate the impacts from the Project’s reasonably foreseeable crude slate changes. The Air District also fails to disclose that the Project’s proposed crude storage tank and piping modifications facilitate an increase in delivery of these cost-advantaged crudes to the Los Angeles Refinery. The resulting, reasonably foreseeable throughput increases would cause significant environmental impacts that are not disclosed in the DEIR.

G1-78.2  
cont’d.

**Response G1-78.2**

The comment summarizes the comments that follow.

The comment raises several issues regarding the objectives of the proposed project. The comment claims that the proposed project is more extensive than as described in the DEIR. In particular, the comment focuses on crude oil flexibility, transport, and storage. The comment

tries to show that the Refinery crude oil capacity and blend will change as a result of the proposed project.

However, the proposed project does not contain any of the necessary elements to expand crude oil capacity beyond the 6,000 bbl/day analyzed in the DEIR or to process a substantially different crude oil blend. In order to increase capacity or change the crude oil blend, the Refinery would have to make modifications to the crude oil processing equipment and related downstream units. Such modifications would include increasing the size and or changing configuration of the Crude Unit distillation columns for lighter crude oils, increase in Delayed Coker Unit capacity for heavier crude oils, and additional sulfur recovery processing equipment for higher sulfur-bearing crude oils.

The Carson and Wilmington Operations were originally constructed in the early 1900's to process locally available crude oils. As more crude oil supplies became available, the Refinery modified operations to handle more diverse types of crude oil available globally. The Carson Operations were optimized to process Alaska North Slope (ANS) crude oil. When the supply of ANS crude oil began to decline, the Carson Operations began purchasing globally available crude oils that were similar in properties to ANS crude oil or could be blended to approximate ANS properties. The Wilmington Operations were optimized to maintain a California-type blend of crude oil. These crude oils are obtained from throughout the world as various cost-effective supplies become available. While cost is a major factor and continually fluctuates, the crude oils that are purchased must be able to be processed within the constraints of the Refinery design. Thus, the individual crude oils purchased can and do change at any time.

The list of individual crude oils purchased by the Refinery is called the "crude oil slate." Before individual crude oils can be processed, they are blended with other crude oils to meet certain specifications based on weight, sulfur content, and other factors. The resultant mix is called the "crude oil blend." The proposed project does not include any physical changes to the Refinery that would enable a change to the crude oil blend that is processed, except to the extent that the permit revisions to the DCU H-100 heater may allow the processing of a slightly heavier crude oil blend.<sup>120</sup>

The comment also attempts to equate an increase in crude oil storage and transfer rate to an increase in Refinery crude oil capacity. These are completely independent systems. Increasing crude oil storage does not facilitate an increase in production; it simply reduces the number of port calls each ship must make and/or the amount of time that each ship must wait at the docks. An analogy is to consider one's personal shopping; if you purchase a gallon as opposed to a quart of milk, you will reduce the number of trips needed to purchase milk from the market. Unless something else changes in your consumption pattern, the amount of milk you purchase and consume will remain unchanged. Without changes to the Refinery processing units, the crude oil capacity cannot change.

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<sup>120</sup> The proposed project does include a permit modification that would allow either the increase of up to 6,000 bbl/day of crude oil capacity or a slightly heavier blend of crude oil to be processed.

The unsubstantiated claims that the proposed project will result in a change in the crude oil blend processed at the Refinery is the basis for the resultant opinions that additional impacts will occur from the proposed project. The comments include discussions of emission increases, potential hazard impacts, health effects, and marine vessel delivery impacts. As explained in the subsequent responses to the individual comments, the DEIR fully described and analyzed the proposed project and the associated environmental impacts.

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery is currently processing a blend of various crude oils and will continue to do so with or without the proposed project. The proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend.

The proposed project analyzed the potential impacts associated with proposed new and replacement storage tanks, modifications to existing processing units, proposed new processing units, and increased utilization of existing storage tanks and processing units as a result of the proposed project (see Chapter 4 of the DEIR). As discussed below, the potential impacts of a change in crude oil capacity have been fully analyzed in the DEIR, and the impacts of processing a slightly heavier crude oil blend were found to be less than the impacts of increased crude oil capacity. Please see Master Responses 4, 6, and 7 for further information regarding limitations on the Refinery to process crude oils, blending of crude oil, and crude oil capacity increase.

**Comment G1-78.3**

Other deficiencies in the DEIR include the Air District's failure to establish the existing environmental setting for the purpose of analyzing impacts on air quality, public health, soils and groundwater. As a result of these defects, and other errors and omissions in the DEIR, the Air District fails to identify and address the Project's significant air quality impacts, impacts from greenhouse gas emissions, cancer risks and other public health impacts, hazards impacts, land use impacts, and impacts to soils and groundwater. These numerous defects, set forth in greater detail in the following paragraphs, are fatal errors. The Air District must prepare a revised DEIR which fully complies with CEQA.

G1-78.3

**Response G1-78.3**

The comment summarizes comments made later in the letter. The comment summarizes the conclusions reached in the comment letter. The concerns raised in the comment are provided in more detail in subsequent comments and responded to in detail in subsequent responses as noted in Table 78.3-1. As further explained in the following responses, the DEIR fully described the existing setting and analyzed all project impacts as required by CEQA.

Table 78.3-1

Topics Raised in Comments and Location of Responses

Topic	Response	
	Master Response Number	Specific Response Number
Existing Environmental Setting	12	G1-78.29 – G1-78.32 and G1-78.50
Air Quality Impacts	-	G1-78.34 – G1-78.38, G1-78.43 – G1-78.44, G1-78.46 – G1-78.47, and G1-78.49 – G1-78.61
Mobile Source GHG Emissions	-	G1-78.48
Cancer Risks	3	G1-78.40
Health Impacts	3	G1-78.39, G1-78.62, and G1-78.72 – G1-78.76
Hazard Impacts	9	G1-78.39, G1-78.63 – G1-78.71
Land Use Impacts	-	G1-78.88 – G1-78.90
Soil and Groundwater	-	G1-78.77 – G1-78.81

Note: - = No Master Response prepared on this topic.

**Comment G1-78.4**

We prepared these comments with the assistance of technical experts Phyllis Fox, Ph.D., QEP, PE, DEE and Matt Hagemann, P.G., C.Hg. Dr. Fox's and Mr. Hagemann's technical comments and curriculum vitae are attached and hereby submitted to the Air District in addition to the comments in this letter. Therefore, the Air District must respond to the comments of Dr. Fox and Mr. Hagemann separately.

G1-78.4

**Response G1-78.4**

The SCAQMD acknowledges that it has received and responded to the comments included in the technical attachments.

**Comment G1-78.5**

**I. STATEMENT OF INTEREST**

SAFER California advocates for safe processes at California refineries to protect the health, safety, the standard of life and the economic interests of its members. For this reason, SAFER California has a strong interest in enforcing environmental laws, such as CEQA, which require the disclosure of potential environmental impacts of, and ensure safe operations and processes for, California oil refineries. Failure to adequately address the environmental impacts of crude oil and fuel products transport, refining, storage and distribution processes poses a substantial threat to the environment, worker health, surrounding communities, and the local economy.

G1-78.5

Refineries and fuel storage and distribution facilities are uniquely dangerous and capable of generating significant fires and the emission of hazardous and toxic

substances that adversely impact air quality, water quality, biological resources and public health and safety. These risks were recognized by the Legislature and Governor when enacting SB 54 (Hancock). Absent adequate disclosure and mitigation of hazardous materials and processes, refinery workers and surrounding communities may be subject to chronic health problems and the risk of bodily injury and death.

Poorly planned refinery and fuel products storage and distribution projects also adversely impact the economic wellbeing of people who perform construction and maintenance work in these facilities and the surrounding communities. Plant shutdowns in the event of accidental release and infrastructure breakdown have caused prolonged work stoppages. Such nuisance conditions and catastrophic events impact local communities and can jeopardize future jobs by making it more difficult and more expensive for businesses to locate and people to live in the area. The participants in SAFER California are also concerned about projects that carry serious environmental risks and public service infrastructure demands without providing countervailing employment and economic benefits to local workers and communities.

The members represented by the participants in SAFER California live, work, recreate and raise their families in Los Angeles County, including in or near the City of Carson and the community of Wilmington. Accordingly, these people would be directly affected by the Project's adverse environmental impacts. The members of SAFER California's participating unions may also work on the Project itself. They will, therefore, be first in line to be exposed to any hazardous materials, air contaminants, and other health and safety hazards, that exist onsite.

These comments are also submitted on behalf of individuals who reside and/or work in the Project area, including Peter Estrada, Leonardo Parra and Nicolas Garcia.

G1-78.5  
cont'd.

### Response G1-78.5

The comment is a general statement regarding the objectives of SAFER and does not comment on the proposed project. Therefore, no response is necessary under CEQA. Responses to specific comments about the proposed project are provided below.

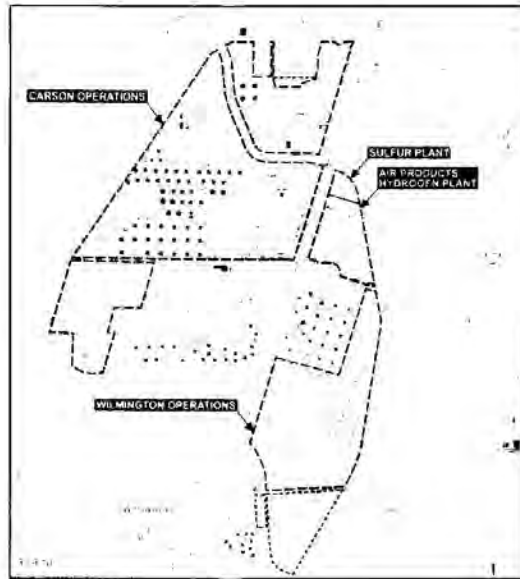
### Comment G1-78.6

#### II. PROJECT BACKGROUND

The Applicant's Los Angeles Refinery, depicted in the figure below, includes two adjacent facilities, the Wilmington Operations and the Carson Operations. The Applicant acquired the Wilmington Operations and the Carson Operations in 2007 and 2013, respectively. The Wilmington Operations are located primarily within the Wilmington community and are within the jurisdiction of the City of Los Angeles. The Carson Operations are located entirely within the City of Carson.

G1-78.6





G1-78.6  
cont'd.

The Los Angeles Refinery is located approximately three miles northwest of the Port of Long Beach. The Los Angeles Refinery receives crude oil from ships which unload at three Port of Long Beach marine terminals operated by Tesoro Logistics Operations, LLC: Marine Terminal 2 (Berths 76-78), the Long Beach Terminal (berths 84-87) and Marine Terminal 1 (Berth 121).<sup>1</sup> Crude oil is unloaded at the marine terminals and transferred to the Los Angeles Refinery by underground pipelines.

<sup>1</sup> DEIR, p. 2-27.

### Response G1-78.6

The comment summarizes the project location which is found in Section 2.3 of the DEIR and does not require a response.

### Comment G1-78.7

In 2014, the Air District considered the Applicant's proposed Storage Tank Replacement and Modification Project, which included the following modifications to the Wilmington Operations:

- (1) Removing two existing 80,000 barrel ("bbl") fixed-roof petroleum product storage tanks (tanks 80035 and 80036);

G1-78.7

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- (2) Installing two new 300,000 bbl internal floating roof storage tanks (tanks 300035 and 300036) in the same location as the tanks that are being removed;
- (3) Modifying one existing 80,000 bbl storage tank (tank 80038) to change the type of commodity to be stored in the tank to also include light gas oil and to connect the tank to the existing vapor recovery system in the tank farm;
- (4) Increasing the throughput of an additional 80,000 bbl storage tank (tank 80079) from 350,000 bbl per month (bbl/month) to 500,000 bbl/month;
- (5) Removing 12-inch diameter piping that connects four tanks with Tesoro's marine terminal; and
- (6) Replacing the 12-inch diameter piping with 42-inch diameter piping to connect tanks throughout the tank farm with Tesoro's existing marine terminal pipeline.

The Air District prepared an Initial Study and Negative Declaration ("IS/ND") for the Tesoro Storage Tank Replacement and Modification Project.

SAFER California reviewed the IS/ND and submitted comments on it to the Air District.<sup>2</sup> SAFER California's comments showed that the IS/ND failed to satisfy CEQA's requirements. The IS/ND failed to disclose the operational implications of the 1200% increase in crude throughput in the affected tanks from the tank farm piping modifications. SAFER California explained that the increase would allow the tank farm and one of Applicant's marine terminals to increase its throughput, and would facilitate a substantial increase in the delivery of cost-advantaged crudes to the Los Angeles Refinery. SAFER California showed that the resulting, reasonably foreseeable throughput increases at the tank farm and marine terminal would cause significant environmental impacts that were not disclosed in the IS/ND. The IS/ND failed to identify and address significant air quality impacts, cancer risks and hazards impacts. SAFER California also showed that the Air District improperly piecemealed environmental review by failing to analyze the Tesoro Storage Tank Replacement and Modification Project together with reasonably foreseeable modifications to the Los Angeles Refinery's refining processes. As a result of these numerous defects, SAFER California recommended that the Air District withdraw the IS/ND and prepare an EIR which fully complies with CEQA. In August of 2014, the Air District withdrew the IS/ND for the Tesoro Storage Tank Replacement and Modification Project. The District stated that it would prepare a new CEQA document that includes the Tesoro Storage Tank Replacement and Modification Project and the "Tesoro-BP Refinery Integration Project." In September of 2014, the Air District released a Notice of Preparation of a Draft EIR for the Project.

<sup>2</sup> Attachment A: SAFER California Comments on the Draft Negative Declaration and Initial Study for the Tesoro Storage Tank Replacement & Modification Project, June 10, 2014

G1-78.7  
cont'd.

G1-78.7  
cont'd.

### Response G1-78.7

The SCAQMD acknowledges that it issued a draft Negative Declaration on the Tesoro Proposed Storage Tank Replacement Project and that SAFER submitted comments. The draft Negative Declaration fully disclosed the potential impacts of the proposed storage tank project. Because the proposed tank project was delayed and the implementation schedule overlapped with the proposed project, the proposed storage tank project was included in the DEIR in order to fully

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assess all of the impacts of the combined proposed projects. Comments submitted on the draft Negative Declaration (Attachment A to Comment Letter 78) are no longer pertinent and no responses are necessary because the proposed project includes the equipment (i.e., storage tanks) from the previous project and comments were made on the storage tanks as part of the comments on the DEIR.

### Comment G1-78.8

Now, the Applicant proposes to further integrate the Carson and Wilmington Operations by installing interconnecting pipelines “to allow efficient transfer of hydrocarbons between the facilities to allow gasoline blending optimization, process unit feedstock optimization, and increased diesel production.”<sup>3</sup> The Project also includes adding a sulfuric acid regeneration plant, a wet jet treater and a propane recovery and treatment facility, and upgrading existing liquefied petroleum gas (“LPG”) rail facilities to enable an increase of 4,000 barrel per day of LPG (or 10 railcars per day).<sup>4</sup> In addition, the Project includes constructing six new 500,000 barrel tanks at the Carson Crude Terminal, replacing two 80,000 barrel tanks at the Wilmington Operations with two 300,000 barrel tanks, and installing piping to connect the six new Carson Crude Terminal 500,000 barrel tanks to the Carson Operations and Marine Terminal 1.<sup>5</sup> The two 300,000 barrel tanks at the Wilmington Operations will<sup>6</sup> connect to the Long Beach Terminal.

<sup>4</sup> *Id.*, p. 1-6.

<sup>5</sup> *Id.*, pp. 1-6, 1-18.

<sup>6</sup> *Id.*, p. 1-7.

<sup>6</sup> *Id.*

G1-78.8

### Response G1-78.8

The comment summarizes portions of the proposed project found in the DEIR project description, Section 2.7. The comment requires no response.

### Comment G1-78.9

#### III. THE AIR DISTRICT FAILED TO DISCLOSE TO THE PUBLIC ALL INFORMATION NECESSARY TO FULLY AND MEANINGFULLY EVALUATE THE PROJECT'S ENVIRONMENTAL AND PUBLIC HEALTH AND SAFETY IMPACTS

As a preliminary matter, the Air District failed to disclose to the public all information necessary to fully and meaningfully evaluate the Project's environmental and public health and safety impacts. Since the Air District's release of the DEIR, we have submitted several requests for records necessary for the public to conduct a complete and accurate review of the Project's public health and safety and environmental impacts.<sup>7</sup> While the Air District provided some

G1-78.9

## APPENDIX G1: RESPONSE TO COMMENTS

records in response to our requests, the Air District has failed to disclose to the public the following:

- Firing rates and throughputs used to calculate emissions in the DEIR;
- Live Excel spreadsheets used to support the emissions estimates in Appendices A through H of applications 575838, 575876, 578248, 578249, 567644, 567439, 567643, 567645, 567646, 567647, 567648, 567649, 575837, 575839, 575940, 575841, 575874, 575875, 567619, 575873 and 567642;
- Attachments E and F to applications 567645, 567646, 567647, 567648, 567649, 575937, 575939, 575939, 575940, 575940, 575974, 575975, 575876, 578249, 567439 and 567619;
- Baseline amount of crude oil throughput for the Carson Operations;
- Baseline amount of crude oil throughput for the Wilmington Operations;
- Contents of Carson Operations tanks for the period 2010 to 2015;
- Contents of Carson Crude Terminal tanks for the period 2010 to 2015;
- Contents of Wilmington Operations tanks for the period 2010 to 2015;
- Contents of Marine Terminal 1 (Berth 121) tanks for the period 2010 to 2015;
- Contents of Marine Terminal 2 (Berths 76-78) tanks for the period 2010 to 2015;
- Contents of Long Beach Terminal (Berths 84-87) tanks for the period 2010 to 2015;
- Vapor pressures of Carson Operations tanks storing crude oil for the period 2010 to 2015;
- Vapor pressure of Carson Crude Terminal tanks storing crude oil for the period 2010 to 2015;
- Vapor pressure of Wilmington Operations tanks storing crude oil for the period 2010 to 2015;
- Vapor pressures of Marine Terminal 1 (Berth 121) tanks storing crude oil for the period 2010 to 2015;
- Vapor pressures of Marine Terminal 2 (Berths 76-78) tanks storing crude oil for the period 2010 to 2015; and
- Vapor pressures of Long Beach Terminal (Berths 84-87) tanks storing crude oil for the period 2010 to 2015.

G1-78.9  
cont'd.

G1-78.9  
cont'd.

<sup>7</sup> Request from Cody Elliott for All Documents Referenced in DEIR, March 8, 2016 (SCAQMD form); Letter from Cody Elliott to Danny Luong re: Request for Documentation Per Rule 212, March 18, 2016; Letter from Rachael Koss to Public Records Coordinator re: Public Records Act Request - Tesoro Refining Los Angeles Refinery Integration and Compliance Project, April 12, 2016; Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Tesoro Refining Los Angeles Refinery Integration and Compliance Project, April 27, 2016; Email from Cody Elliott to Danny Luong re: Tank Numbers/Device I.D. - Tesoro Refinery Integration Project, April 28, 2016; Request from Cody Elliott for Title V permits, April 28, 2016 (SCAQMD form); Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Emission Inventories, May 2, 2016; Email from Cody Elliott to Danny Luong re: Tank Numbers/Device I.D. - Tesoro Refinery Integration Project, May 3, 2016; Email from Rachael Koss to Danny Luong re: Tank Numbers/Device I.D. - Tesoro Refinery Integration Project, May 3, 2016; Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Tesoro Los Angeles Refinery Integration Project, May 3, 2016; Letter from Rachael Koss to Public Records Coordinator re: Request for Documents - Tesoro Los Angeles Refinery Integration and Compliance Project, May 25, 2016.

### Response G1-78.9

The DEIR contained all of the information relied upon and used in the DEIR analysis and necessary to analyze the impacts of the proposed project. The SCAQMD acknowledges that the commenter has submitted numerous public records requests seeking additional information. The SCAQMD has responded to each request for records identified in footnote 7 and promptly provided all of the information that was in SCAQMD staff's possession and subject to

disclosure. The documents are often provided on a rolling basis. Table 78.9-1 provides the final response date for each request identified in footnote 7 of the comment.

**Table 78.9-1  
Public Records Requests and Response Dates**

<b>Date of Request</b>	<b>Description</b>	<b>Date Closed</b>
3/8/2016	Cody Elliott to SCAQMD Form	3/15/2016
3/18/2016	Cody Elliott to Danny Luong	4/8/2016
4/12/2016	Rachael Koss to Public Records	9/15/2016
4/27/2016	Rachael Koss to Public Records	9/15/2016
4/28/2016	Cody Elliott to Danny Luong	5/12/2016
4/28/2016	Cody Elliott to SCAQMD Form	5/12/2016
5/2/2016 (rec'd 5/3/2016)	Rachael Koss to Public Records	5/13/2016
5/3/2016	Cody Elliott to Danny Luong	7/20/2016
5/3/2016	Rachael Koss to Danny Luong	7/20/2016
5/3/2016 (rec'd 5/4/2016)	Rachael Koss to Public Records	7/20/2016
5/25/2016	Rachael Koss to Public Records	6/3/2016

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery is currently processing a blend of various crude oils and will continue to do so with or without the proposed project. The proposed project will not result in a substantial change in the crude oil blend processed by the Refinery except as identified in the DEIR. The proposed project is not a crude oil flexibility project and will not increase crude oil capacity at the Refinery beyond the 6,000 bbl/day analyzed in the DEIR.

**Comment G1-78.10**

The Air District's failure to disclose this information violates CEQA, the Public Records Act and the Federal Clean Air Act. First, CEQA requires the Air District to disclose all documents referenced or relied upon in the DEIR for the entire comment period.<sup>8</sup> Further, an EIR must be "a compilation of all relevant data into a single formal report...which would facilitate both public input and the decisionmaking process."<sup>9</sup> Second, the California Public Records Act requires the Air District to disclose all air pollution emissions data.<sup>10</sup> Finally, the federal Clean Air Act requires the Air District to disclose to the public emission data,<sup>11</sup> including "[i]nformation necessary to determine the identity, amount, frequency, concentration, or other characteristics" of emissions or pollutants.<sup>12</sup>

Until the Air District discloses the above-listed records, it is impossible for the public to conduct a complete and accurate review of the Project's public health and safety and environmental impacts. Therefore, we hereby reserve our right to file supplemental comments on the DEIR at a later date.

G1-78.10

<sup>8</sup> Cal. Pub. Resources Code § 21092(b)(1); 14 Cal. Code Regs. § 15087(c) ("CEQA Guidelines").

<sup>9</sup> *Russian Hill Improvement Association v. Board of Permit Appeals* (1975) 44 Cal. App. 3d 158, 168.

<sup>10</sup> Cal. Govt. Code § 6254.7(e).

<sup>11</sup> 42 U.S.C. § 7414(c).

<sup>12</sup> 40 C.F.R. § 2.301(2)(i).

**Response G1-78.10**

SCAQMD has complied with all applicable disclosure requirements. See Response G1-78.9 for further information. The reservation of rights is noted.

**Comment G1-78.11**

**IV. THE DEIR FAILS TO SATISFY CEQA'S PURPOSE AND GOALS**

CEQA has two basic purposes, neither of which the DEIR satisfies. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.<sup>13</sup> CEQA requires that an agency analyze potentially significant environmental impacts in an EIR.<sup>14</sup> The EIR must not rely on scientifically outdated information to assess the significance of impacts, and must instead result from "extensive research and information gathering" including consultation with state and federal agencies, local officials, and the interested public.<sup>15</sup> To be adequate, the EIR must evidence the lead agency's good faith effort at full disclosure.<sup>16</sup> The EIR has been described as "an environmental alarm bell" whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return.<sup>17</sup> Thus, the EIR protects not only the environment but also informed self-government.<sup>18</sup> The EIR's purpose is to inform responsible officials of the environmental consequences of their decisions *before* those decisions are made.

G1-78.11

G1-78.11  
cont'd.

<sup>13</sup> CEQA Guidelines § 15002(a)(1).

<sup>14</sup> Pub. Resources Code § 21000; CEQA Guidelines § 15002.

<sup>15</sup> *Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm.* (2001) 91 Cal. App. 4th 1344, 1367; see also *Schaeffer Land Trust v. San Jose City Council* (1989) 215 Cal. App. 3d 612, 620.

<sup>16</sup> CEQA Guidelines § 15151; see also *Laurel Heights I* (1998) 47 Cal. 3d 376, 406.

<sup>17</sup> *County of Inyo v. Yorty* (1973) 32 Cal. App. 3d 795, 810 (internal quotations omitted).

<sup>18</sup> *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal. 3d 553, 564 (citations omitted).

**Response G1-78.11**

The comment is an opinion of the general purposes of CEQA. The portion of the comment discussing the DEIR is general and does not raise a specific comment on the DEIR or the proposed project; therefore, no further response is required under CEQA.

**Comment G1-78.12**

The second purpose of CEQA is to require public agencies to avoid, reduce or prevent environmental damage when possible by requiring appropriate mitigation measures and through the consideration of environmentally superior alternatives.<sup>19</sup> The EIR serves to provide public agencies, and the public in general, with information about the effect that a proposed project is likely to have on the environment and to "identify ways that environmental damage can be avoided or significantly reduced."<sup>20</sup> If a project has a significant effect on the environment, the agency may approve the project only upon a finding that it has "eliminated or substantially lessened all significant effects on the environment where feasible," and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns" specified in CEQA section 21081.<sup>21</sup> As described in our comments below, the DEIR fails to satisfy these two basic purposes of CEQA.

G1-78.12

<sup>19</sup> CEQA Guidelines § 15002(a)(2)-(3); *Berkeley Keep Jets Over the Bay Comm.*, 91 Cal. App. 4th at 1354.

<sup>20</sup> CEQA Guidelines § 15002(a)(2).

<sup>21</sup> *Id.*, § 15092(b)(2)(A)-(B).

**Response G1-78.12**

The comment is an opinion of the general purposes of CEQA. The portion of the comment discussing the DEIR is general and does not raise a specific environmental issue; therefore, no further response is required under CEQA.

**Comment G1-78.13**

**V. THE PROJECT DESCRIPTION IS INADEQUATE**

The courts have repeatedly held that “[a]n accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR.”<sup>22</sup> CEQA requires that a project be described with enough particularity that its impacts can be assessed.<sup>23</sup> “A curtailed or distorted project description may stultify the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal’s benefit against its environmental costs . . . .”<sup>24</sup> As stated by the court in *County of Inyo v. City of Los Angeles*, “a curtailed, enigmatic or unstable project description draws a red herring across the path of public input.”<sup>25</sup>

G1-78.13

G1-78.13  
cont’d.

<sup>22</sup> *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.

<sup>23</sup> *Id.* at 192.

<sup>24</sup> *Id.* at 192-193.

<sup>25</sup> *Id.* at 197-198.

**Response G1-78.13**

The comment is an opinion of CEQA’s project description requirements and does not raise a specific comment on the proposed project or the DEIR. Therefore, no response is necessary under CEQA.

**Comment G1-78.14**

CEQA Guidelines section 15378 defines “project” to mean “the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.”<sup>26</sup> “The term “project” refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. The term project does not mean each separate governmental approval.”<sup>27</sup> Courts have explained that a complete description of a project must “address not only the immediate environmental consequences of going forward with the project, but also all “*reasonably foreseeable* consequence[s] of the initial project.”<sup>28</sup> “If a[n]...EIR...does not adequately apprise all interested parties of the true scope of the project for intelligent weighing of the environmental consequences of the project, informed decisionmaking cannot occur under CEQA and the final EIR is inadequate as a matter of law.”<sup>29</sup>

G1-78.14

<sup>26</sup> CEQA Guidelines § 15378.

<sup>27</sup> *Id.*, § 15378(c).

<sup>28</sup> *Laurel Heights Improvement Association v. Regents of University of California* (1988) 47 Cal. 3d 376, 398 (emphasis added); see also *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 449-50.

<sup>29</sup> *Riverwatch v. Olivenhain Municipal Water Dist.* (2009) 170 Cal. App. 4th 1186, 1201.



**Response G1-78.14**

The comment is an opinion of CEQA’s project description requirements and does not discuss the proposed project or the DEIR. Therefore, no response is necessary under CEQA.

**Comment G1-78.15**

The DEIR fails to meet CEQA’s requirements for an adequate project description by omitting from the analysis the reasonably foreseeable consequences of the Project. In particular, the DEIR fails to identify and analyze reasonably foreseeable changes in crude oil throughput and crude slate. First, the DEIR fails to disclose that the Project would facilitate an increase in crude oil throughput. Second, the DEIR fails to identify with a sufficient degree of particularity the type and amount of crudes that will be imported, stored and refined after the Project is operational. The DEIR fails to disclose that the Project would facilitate the Los Angeles Refinery to receive a broader range of crudes and facilitate the Refinery’s transition to cost-advantaged crudes, including crudes from the Bakken field in North Dakota and Canadian tar sands. In short, the Project description in the DEIR is invalid because it misleads the reader about the Applicant’s purpose and goals and the Project’s effect on Los Angeles Refinery operations.

G1-78.15

G1-78.15  
cont’d.

**Response G1-78.15**

The DEIR fully complies with CEQA’s requirements for an adequate project description. As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery is currently processing a blend of various crude oils and will continue to do so with or without the proposed project. The proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend, as identified in the DEIR. The DEIR fully describes and analyzes the impacts of the proposed project including the impacts of the 6,000 bbl/day increase in crude oil capacity. See Master Responses 4 and 6 that further explain that the proposed project does not expand the Refinery’s crude oil capacity or change the blend processed by the Refinery, except to the extent that the DCU H-100 heater permit revision may allow either a small increase in production, or the processing of a slightly heavier crude oil blend (see FEIR Sections 2.7.1.3 and 4.1.2.1). Additionally, the proposed project is not dependent upon processing any particular crude oil.

**Comment G1-78.16**

**A. The DEIR Fails to Adequately Disclose the Reasonably Foreseeable Consequences of the Project's Tank and Pipeline Modifications**

The DEIR states that the purpose of adding and enlarging crude storage tanks and pipelines is to increase ship unloading efficiency, thereby reducing ship emissions.<sup>40</sup> This truncated description of the Project's purpose is simply not credible given the significant proposed tank and piping modifications (six new 500,000 barrel tanks at the Carson Crude Terminal, replacing two 80,000 barrel tanks at the Wilmington Operations with two 300,000 barrel tanks, and installing associated piping to connect the tanks to the marine terminals). The Air District obscures the magnitude of the Project's environmental impacts by omitting any mention of the implications of the proposed equipment modifications in terms of the Refinery's operations. Substantial evidence shows that the Project would facilitate a substantial increase in crude oil throughput at the tank farms and the marine terminals, and the increased storage of cost-advantaged crudes.

<sup>40</sup> DEIR, p. 2-4.

G1-78.16

**Response G1-78.16**

The DEIR fully described and analyzed the increase in offloading capacity at the marine terminals and the increase in storage capacity for crude oils (see Sections 2.7.1.9, 2.7.2.11, and 4.2.2 of the DEIR). The purpose of the modifications is to allow marine vessels to fully unload the crude oil deliveries in one dock visit, and/or reduce the time that vessels must wait at the dock during unloading. This will improve unloading efficiency and reduce costs since marine vessels would no longer need to partially unload, and remain at the dock or go out to anchor while running their engines, and then resume unloading or return to the terminal when more on-shore storage tank capacity is available to complete unloading. The impacts of the new and replacement storage tanks have been fully analyzed in the DEIR. It should be noted that the emission reductions from the reduction in marine vessel hoteling and transport emissions were not credited in the DEIR, so the analysis in the DEIR conservatively provides a worst-case estimate of post-project emissions. See Master Response 6 and Responses G1-78.143 and G1-78.144 for more information on Refinery capacity and tank emissions.

**Comment G1-78.17**

The DEIR includes a series of statements regarding the Project's effects on the Los Angeles Refinery's operation which are inaccurate or otherwise misleading. The DEIR claims that the Project: (1) is not designed to enable the Refinery to change its feedstock or crude oil blend; (2) would not impact the refining process; (3) would not change or increase the ship deliveries of crude oil; and (4) would allow no more than a 6,000 bbl/day throughput increase. ***These assertions should be struck from the Air District's analysis because they are contradicted by the DEIR itself, documents in the Air District's possession, and the Applicant's public statements and regulatory filings.*** As fully documented by Dr. Fox<sup>41</sup> and summarized below, these contentions are inaccurate, or otherwise misleading.

<sup>41</sup> Attachment B: Phyllis Fox Comments on the Draft Environmental Impact Report for the Tesoro Los Angeles Refinery Integration and Compliance Project, June 10, 2016 ("Fox Comments"), pp. 4-7, 78-79.

G1-78.17

**Response G1-78.17**

The information in the DEIR is accurate and reflects the proposed project. The SCAQMD has addressed each of Phyllis Fox’s claims in Responses G1-78.92 through G1-78.258. Much of the information that Phyllis Fox referenced is not related to the proposed project, has been taken out of context, or is erroneous, and some Tesoro statements or presentations have been altered or misstated. Therefore, the referenced information does not constitute substantial evidence. Review of the accurate, relevant data in context makes it clear that the proposed project will not have any impact on the type of crude oil used at the Refinery or on Refinery capacity except as explained in the DEIR. See Master Responses 4, 6, and 7 that further explain that the proposed project does not enable a substantial change in the crude oil capacity or blend processed by the Refinery. Additionally, the proposed project is not dependent upon processing any particular crude oil.

It should be noted that the DEIR does not state that the proposed project would not impact the refining process. Rather, the DEIR analyzed the impacts of the proposed project on Refinery operations (see Section 4.2.2 of the DEIR).

Further, the DEIR analyzed the potential 6,000 bbl/day increased deliveries of crude oil via marine vessel (see Section 4.2.2.2.2 of the DEIR).

**Comment G1-78.18**

First, as explained more fully below, the Project will change the range of crude oils that will be imported to include a broader range of crudes, such as Bakken and Canadian tar sands crudes. The import, storage and refining of these crude oils will result in distinct, potentially significant impacts that the Air District failed to identify and mitigate in the DEIR. Second, the Project would impact downstream refining processes by supplying the Los Angeles Refinery with a different crude slate. Third, the Project facilitates the unloading of a greater proportion of bigger ships, as compared to baseline operations, or even unloading ships on more days. Simply put, if ships can be unloaded faster, more or larger ships can be unloaded, increasing imports and exports. Finally, the Project would allow the amount of crude imports to the Los Angeles Refinery to increase, as compared to baseline conditions, by removing tank and pipeline throughput constraints.

The DEIR fails as an informational document. Rather than disclosing the Project accurately and completely, the DEIR deceives the public about the Project’s scope and the Project’s significant impacts on the environment.

G1-78.18

G1-78.18  
cont’d.

**Response G1-78.18**

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery currently processes blends of various crude oils and will continue to do so with or without the proposed project. The proposed project will not change the crude oil blend processed by the Refinery except to the extent that changes to the DCU H-100 heater may allow the processing of a slightly heavier crude oil blend (see FEIR Sections 2.7.1.3 and 4.1.2.1). The Refinery combines crude oils to create a crude oil blend with the properties

necessary to meet the processing constraints of the Refinery. Additionally, while the crude oil can be offloaded more efficiently from the marine vessels that deliver the crude oil, the environmental impacts associated with increased unloading rates and possible increases in Refinery capacity were fully disclosed and analyzed in the DEIR.

As presented in the DEIR, the Wilmington Operations marine vessel unloading rate could increase from 5,000 bbl/hr to 15,000 bbl/hr when unloading to floating roof tanks (see DEIR page 4-26). However, the proposed project will not increase the capacity of the Refinery, other than a potential 6,000 bbl/day (or 2.2 million bbl/yr) increase associated with changes to DCU H-100 heater, because Refinery capacity is otherwise constrained by the physical limitations of equipment generally, and as explained in Section 2.5.4.1 of the DEIR. The DEIR analyzed the effect of the potential increase of 6,000 bbl/day of crude oil processing in the Wilmington Operations and concluded that the emissions reduction from reduced marine vessel hoteling sufficiently compensates for the additional marine vessels potentially needed to deliver the 2.2 million bbl/year of crude oil, and also reduces marine vessel emissions annually (see pages 4-26 to 4-29 of the DEIR, Master Response 6 and Responses G1-78.143 through G1-78.148).

See Response G1-78.157 which explains that the impacts of the new and replacement storage tanks were fully analyzed in the DEIR. See also Response G1-78.180 which explains that the type/size and number of marine vessels that will visit Tesoro's marine terminals post-project is independent of the project.

**Comment G1-78.19**

**B. The DEIR Fails to Adequately Identify the Crudes Proposed to Be Imported, Stored and Refined**

CEQA requires the Air District to identify the crudes that may be imported, stored and refined at the Los Angeles Refinery from Project implementation with sufficient particularity to enable environmental review. The DEIR completely fails to satisfy this CEQA requirement.



G1-78.19

**Response G1-78.19**

Disclosure of more detailed information about crude oils imported, stored and refined at the Refinery is not required by CEQA because:

- The proposed project does not involve any changes that would facilitate the processing of different crude oils at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see FEIR Sections 2.7.1.3 and 4.1.2.1).
- It makes no difference to the environmental impacts analysis of process emissions because all crude oils used at the Refinery, whatever their source or composition, will be blended to match the Refinery's existing crude oil operating envelope and it is changing this envelope that would trigger different impacts. The crude oil storage and associated

pipng emissions for the new and replacement crude oil storage tanks were conservatively analyzed based on crude oil properties approaching 11 psia TVP in the hottest month of the year to ensure the Refinery complies with SCAQMD Rule 463 and to allow flexibility to store any crude oils allowed by local regulations. It is common practice for refineries to maintain flexible operating permits by matching permit limitations to regulatory limits.

- Due to the frequent variability in sourcing crude oils, it is not feasible to project a precise future crude oil slate.

See Master Response 4 and Responses G1-78.94 through G1-78.174 for additional information on this issue.

### Comment G1-78.20

In *Communities for a Better Environment v. City of Richmond*, the First District Court of Appeal held that an EIR for a refinery project must disclose whether the proposed project would allow the refinery to process heavier crude where a change in feedstock is a reasonably foreseeable consequence of the proposed project.<sup>32</sup> The California Attorney General and the Governor's Office of Planning Research concur in the determination that CEQA requires the disclosure of changes in fuel, by source and chemical composition. Each agency has stated that an environmental document for a fuel project is deficient under CEQA unless it discloses the change in the products that the project proponent intends to process at the facility.<sup>33</sup> The failure to identify and address a crude switch narrows the scope of environmental review and "stultif[ies] the objectives of the reporting process."<sup>34</sup>

G1-78.20

<sup>32</sup> *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal. App. 4th 70, 89.

<sup>33</sup> **Attachment C:** Letter from the Office of the Attorney General to the City of Pittsburg Planning Department regarding Recirculated Environmental Impact Report for the WesPac Pittsburg Energy Infrastructure Project (SCH # 2011072053), Jan. 15, 2013; **Attachment D:** Letter from the Governor's Office of Planning and Research to The City of Pittsburg Planning Department, regarding WesPac Pittsburg Energy Infrastructure Project, Tar Sands, Dec. 3, 2013.

<sup>34</sup> *County of Inyo v. City of Los Angeles*, 71 Cal. App. at 192-193.

### Response G1-78.20

In the case cited by the comment, the Chevron Richmond Refinery project involved modifications to the Refinery to enable the processing of a wider range of crude oils. Thus, information on the type of crude oils that would be processed was relevant and necessary information to determine the impacts of the Chevron project. That is not the case in the proposed project.

Unlike the Chevron Richmond project, the proposed project does not include improvements to enable the refinery to process higher sulfur crude oils. The Chevron Richmond project included a number of refinery modifications to handle increased sulfur including: (1) the construction of a new recycle hydrogen amine contactor in the FCCU Hydrotreater; (2) modifications to a fresh amine storage tank; (3) construction of a new rich amine storage tank; (4) construction of a new amine regenerator; (5) upgrades to the sour water processing system; (6) construction of a new acid gas scrubber; (7) construction of a new fresh caustic tank; (8) construction of a new spent caustic tank; (9) modifications to the existing sulfur recovery units; and, (10) installation of a new sulfur loading rack. All of these modifications at Chevron, as well as the construction of a

new hydrogen plant, allowed the processing of high sulfur crude oils and gas oils. These types of modifications are not proposed as part of the proposed project (see Section 2.7 of the DEIR). Therefore, the proposed project differs from Chevron and the DEIR fully analyzed the potential impacts of the proposed project.

Similarly, the WesPac Pittsburg Energy Infrastructure Project correspondence referenced as Attachments C and D of Comment Letter 78 are not applicable to the proposed project because the proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see FEIR Sections 2.7.1.3 and 4.1.2.1 and Master Response 4). Therefore, no responses are necessary to Attachments C and D.

### Comment G1-78.21

In *Communities for a Better Environment v. City of Richmond*, the petitioners argued that the EIR was inadequate because the project description failed to clearly and consistently state whether the project would facilitate the future processing of heavier crudes at the refinery, and to analyze the consequences of such a change.<sup>45</sup> In that case, the EIR acknowledged that the proposed project would allow the refinery to process a wider range of crude oils, including crude that contains a higher amount of sulfur and associated contaminants.<sup>46</sup> However, the lead agency denied claims that the refinery would also be able to process heavier crudes than before.<sup>47</sup> Petitioners pointed to conflicting statements in the EIR and the project proponent's SEC filings, as well as the project proponent's rejection of a permit limitation precluding the alteration of the baseline crude slate mix, all of which suggested that the project would (contrary to the lead agency's claim) enable the refinery to process heavier crudes.<sup>48</sup> The court agreed with petitioner that a crude switch was reasonably foreseeable and invalidated the EIR "because the EIR's project description ... [was] inconsistent and obscure as to whether the Project enables the Refinery to process heavier crudes."<sup>49</sup>

G1-78.21

<sup>45</sup> *Communities for a Better Environment v. City of Richmond*, 184 Cal. App. 4th 83.

<sup>46</sup> *Id.* at 76-77.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.* at 83-85.

<sup>49</sup> *Id.* at 89.

### Response G1-78.21

The difference in the Chevron project referenced by the comment and the proposed project is that Chevron was installing new process equipment, and modifying its existing equipment, to enable a change in the crude oil blend (or mix) that could be processed at the Richmond Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see FEIR Sections 2.7.1.3 and 4.1.2.1 and Master Response 4). The proposed project is not designed to facilitate a change in the crude oil blend processed at the Refinery. Thus, the decision in the *CBE v. Richmond* case is not applicable to this project. See Response G1-78.20 that explains the differences between the Chevron Richmond project and the proposed project.

**Comment G1-78.22**

Here, the DEIR suffers from a similar error. The DEIR states that the Los Angeles Refinery's crude slate would not change as a result of the Project.<sup>10</sup> However, as described below, the Project would facilitate the import of cost-advantaged crudes, such as Bakken crudes and tar sands crudes. Moreover, the DEIR places no limits on the amount of cost-advantaged crudes the Applicant can import. Dr. Fox explains in her comments that "[t]he source of, and chemical and physical composition of, the individual crude oils that have been and will be refined are essential to determine numerous impacts, including air quality, public health, odor or consequences of accidents."<sup>11</sup> Indeed, for example, the DEIR acknowledges that the "hazards [from accidents] that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions."<sup>12</sup> Yet, the DEIR completely fails to disclose the physical and chemical properties of the crudes that will be imported, stored and refined at the Los Angeles Refinery after the Project is operational. This is a blatant violation of CEQA.

G1-78.22

<sup>10</sup> DEIR, p. 2-2.

<sup>11</sup> Fox Comments, p. 3.

<sup>12</sup> DEIR, p. 1-27.

**Response G1-78.22**

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the Refinery currently processes blends of various crude oils and will continue to do so with or without the proposed project. The proposed project will not result in a substantial change in the crude oil blend processed by the Refinery except as identified and analyzed in the DEIR. The SCAQMD has addressed each of Phyllis Fox's contentions regarding crude oils in Responses G1-78.94 through G1-78.258.

**Comment G1-78.23**

**1. The DEIR Fails to Disclose that the Project Facilitates the Import of Bakken Crudes**

The Applicant asserts, without any support, that the Project will not change the crude slate or crude quality. Substantial evidence shows otherwise. The following substantial evidence shows that the Project is designed to facilitate a crude switch to Bakken: (1) the vapor pressure of the proposed Project tanks is designed to contain Bakken; (2) Material Safety Data Sheets submitted with the initial tank applications identify Bakken; and (3) the Project proposes to remove storage and unloading constraints, which facilitates importing Bakken by marine vessel.

G1-78.23

**Response G1-78.23**

The Refinery already purchases, stores, and processes Bakken and other light crude oils with similar RVPs. The Safety Data Sheet (SDS, formerly called a Material Safety Data Sheet (MSDS)) submitted with the SCAQMD permit applications (AN 545645 and AN 545646) is for generic "light sweet crude oil," not specifically Bakken crude oil as the comment claims (see Response G1-78.134). The purpose of the new storage tanks is to improve marine vessel delivery efficiency as explained in Master Response 4 and Responses G1-78.176 and G1-78.180, and no characteristic of the tanks implies that the new storage will house Bakken crude oil or any other crude oil in particular.



**Comment G1-78.24**

First, the DEIR indicates that all of the new floating roof storage tanks will be permitted with a Reid Vapor Pressure limit of 10.5 psi (which corresponds to a True Vapor Pressure of approximately 11.5 psi).<sup>13</sup> Dr. Fox explains that there are very few existing tanks at either the Wilmington or Carson Operations that are permitted to store crude oil with a vapor pressure of 11 psi.<sup>14</sup> Dr. Fox shows that the new tanks would increase 11 psi crude storage by a factor of eight at Wilmington and by a factor of seven at Carson, facilitating the import of Bakken and other similar light crude oils.<sup>15</sup> Indeed, the Project goal of increasing the production of gasoline or distillate by 30,000 to 40,000 bbl/day requires a lighter crude slate.<sup>16</sup> In addition, several Project components, such as the shutdown of the Wilmington FCCU, require an increase in lighter crude.<sup>17</sup>

G1-78.24

<sup>13</sup> Fox Comments, p. 22.

<sup>14</sup> *Id.*, p. 19.

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*, p. 20.

<sup>17</sup> *Id.*

**Response G1-78.24**

As explained further in Response G1-78.126, the tanks would be permitted to ensure compliance with the SCAQMD Rule 463 true vapor pressure (TVP) limit of 11 psia. Additionally, G1-78.126 explains that the comment misstates the Refinery’s current capabilities for storing light, or high vapor pressure crude oil. The emission calculations for the new and replacement storage tanks were performed based on the maximum allowable true vapor pressure approaching 11 psia to ensure a worst-case analysis was performed, which is a common practice. Additionally, Phyllis Fox mistakenly concludes that the flexibility to switch between diesel and gasoline production will require Bakken or other light crude oils and will increase the product output of the Refinery. The proposed project is designed to maintain the Refinery’s overall production of transportation fuels and will allow the Refinery to switch production between either gasoline or distillates by 30,000 to 40,000 bbl/day without any increase in production (see Response G1-78.142).

**Comment G1-78.25**

Second, the Applicant submitted Material Safety Data Sheets (“MSDS”) for Bakken crude oil with its initial permit applications for the new Wilmington tanks. Further, Tesoro submitted the same MSDSs for its proposed Vancouver Export Terminal, which proposes to ship Bakken crude oil to the Los Angeles Refinery.<sup>18</sup> In its December 2015 Analyst and Investor Day earnings call, the Applicant stated:

G1-78.25

When you think about formalizing competitive advantage and fully integrating our value chain, that is really what the Los Angeles Integration and Compliance Project is about. And when we think about creating value, we are not just thinking about advantaged crude oils in front of our refineries, but we’re thinking about how that supply to the west coast of advantaged crude oils can change the shape of the crude oil supply/demand dynamics for the west coast. And that’s what we are trying to accomplish through Vancouver Energy.<sup>19</sup>

G1-78.25  
cont’d.

<sup>18</sup> *Id.*, p. 25.

<sup>19</sup> Tesoro 2015 Analyst and Investor Day, December 9, 2015, Edited Transcript, p. 10, available at <http://phx.corporateir.net/External.File?item=UGFyZW50SUQ9NjA1MTY0fENoaWxkSUQ9MzE2NDI2FR5cGL9MQ==&t=1>

### Response G1-78.25

The Safety Data Sheet (SDS, formerly called a Material Safety Data Sheet (MSDS)) submitted with the SCAQMD permit applications (AN 545645 and AN 545646) is for generic “light sweet crude oil,” not specifically Bakken crude oil as the comment claims. See Response G1-78.134.

Responses G1-78.136 and G1-81.22 provide a detailed description of the December 2015 Analyst and Investor Day quote, which the comment takes out of context. Simply because the projects are summarized together in an overview is not an indication that the projects are related. The quotation references two separate projects—the proposed project and the Vancouver Energy Project—as each helping Tesoro accomplish general corporate goals, but the speaker never links the two projects together or states that Tesoro has plans to change the crude oil slate at the Refinery. When put in proper context, it is clear that Tesoro's Senior Vice President of Strategy and Business Development at the time, Mr. Keith Casey, is discussing two separate and distinct projects. The proposed project will not result in a substantial change in the crude oil blend processed by the Refinery.

### Comment G1-78.26

Finally, the Project's increased capacity of crude storage tanks that serve the associated marine terminals would eliminate storage and unloading constraints and, in turn, facilitate Bakken crude imports by marine vessel. Specifically, Project implementation would allow the Applicant to import Bakken via marine vessel from its proposed Vancouver Energy Terminal. These imports would replace crude currently delivered by pipeline from California sources and by marine vessel from the Alaska North Slope and various foreign sources.<sup>50</sup> The Applicant anticipates exporting 80% Bakken crude and 20% other crudes from its Vancouver Energy Terminal.<sup>51</sup> The Applicant also reports that "...we're very confident that the movement of Bakken crude oil to the West Coast will continue to make sense over time. Or we don't see any changes there, and our commitment to Vancouver Energy hasn't wavered from the very first day."<sup>52</sup> Dr. Fox explains in her comments that, by removing storage and unloading constraints, the Project would allow an increase of 59,000 barrels per day of throughput capacity at the marine terminals.<sup>53</sup>

G1-78.26

<sup>50</sup> Fox Comments, p. 26.

<sup>51</sup> Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013. Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%20201301%20Volume%201/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%201.pdf>; 2/27/13 Tesoro Presentation, p. 17 and Kristen Hays and Erwin Seba, Update 1 – Tesoro Delivering First Bakken Crude Unit Train to California, Reuters, September 11, 2013. Available at: <http://www.reuters.com/article/2013/09/11/tesoro-rail-crude-idUSL2N0H70U420130911>.

<sup>52</sup> Fox Comments, p. 32, quoting Tesoro Q2 2015 Earnings Call, p. 22.

<sup>53</sup> *Id.*, p. 34.

### Response G1-78.26

The increased storage capacity is designed to allow marine vessels to unload in one dock visit rather than two or more trips, and reduce time spent waiting at the dock until the entire delivery can be unloaded. Increasing storage capacity will reduce hoteling emissions and demurrage, regardless of the origin of the crude oil. The impacts of these modifications have been fully analyzed in the DEIR, although the emission reductions from the marine transport and hoteling were not credited, thus providing a worst-case analysis. There is no evidence to suggest a decline in California crude oil production in the foreseeable future, and the claim in the comment

that marine vessel deliveries will increase to replace pipeline deliveries is unsubstantiated. See Response G1-78.104. As explained in Master Response 8, the Vancouver Energy Project is wholly independent from the proposed project and is undergoing environmental review by the State of Washington. In addition to Master Response 8, the claims that the Vancouver Energy Project would supply the Refinery with Bakken and heavy Canadian crude oils are addressed in detail in subsequent Responses G1-78.134, G1-78.139, G1-78.141, and G1-78.143 through G1-78.145. Also see Responses G1-78.143 and G1-78.144 that address marine terminal throughput capacity.

**Comment G1-78.27**

Substantial evidence shows that it is reasonably foreseeable that the Project will involve a change in amount and quality of crude imported to the Los Angeles Refinery. The failure of the DEIR to analyze, let alone mitigate, any of the potentially significant environmental impacts associated with Bakken crude renders the DEIR inadequate. The Air District must either expand its analysis to encompass the reasonably foreseeable possibility that Bakken crude will be imported or condition the approval of the Project to prohibit the import of Bakken and other similar light crudes.

G1-78.27

**Response G1-78.27**

Because the Refinery must consistently blend the crude oils that it receives in order to meet the operational constraints of the Refinery, utilization of different crude oils in the blend will not increase processing impacts. The DEIR has fully analyzed all of the proposed project's impacts. As described in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94 the Refinery is currently processing a blend of various crude oils and will continue to do so with or without the proposed project. Further, any pre-blending impacts were included as part of the new and replacement storage tank evaluations (see Response G1-78.122).

**Comment G1-78.28**

**2. The DEIR Fails to Disclose that the Project Facilitates the Import of Tar Sands Crudes**

While publicly available information and the proposed vapor pressure limit on the new tanks suggest that Bakken crudes are the most likely Project feedstock, the Project description is general enough to allow imports of other cost-advantaged crudes, such as tar sands. Dr. Fox explains that the Project, along with the Applicant's recently completed projects at the Los Angeles Refinery, would facilitate refining increased amounts of heavy sour crudes, such as tar sands.<sup>54</sup> For example, the hydrogen plant at the Wilmington Operations was recommissioned to remove constraints for the hydrocracker and hydrotreaters at both facilities, allowing them to refine increased amounts of heavy crudes, such as tar sands.<sup>55</sup> The Wilmington Operations sulfur recovery unit was "debottlenecked," increasing its capacity by 10 ton/day. According to Dr. Fox, this increased capacity would be required to run significant amounts of high sulfur tar sands crudes.<sup>56</sup> A blending system was also installed at the Carson Operations to mix light and heavy crudes to eliminate metallurgy (e.g., corrosion due to high total acid number ("TAN") tar sands crudes) or yield constraints (e.g., reductions in yield due to system design).<sup>57</sup> Dr. Fox explains that, "[a]ll of these projects at the Los Angeles Refinery, and especially the Wilmington Operations, allow the Refinery to process increased amounts of tar sands crudes."<sup>58</sup>

In sum, the DEIR fails to identify the Project crude slate by source and chemical composition, and fails to disclose that the Project would facilitate the import, storage and refining of cost-advantaged crudes, such as Bakken crudes and tar sand crudes. As a result, the Air District cannot accurately identify the Project's environmental impacts. The Air District must prepare a revised DEIR that identifies the Project crude slate with sufficient particularity that its impacts may be assessed.

<sup>54</sup> *Id.*, pp. 36-41.

<sup>55</sup> *Id.*, p. 38.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*, p. 38.

<sup>58</sup> *Id.*

G1-78.28

**Response G1-78.28**

See Master Responses 4, 6, and 7. The proposed project does not facilitate the introduction of any particular crude oil. The comments of Phyllis Fox are addressed more fully in the Responses G1-78.135 through G1-78.150. See also Response G1-78.19 above explaining why CEQA does not require disclosure of further information about a projected crude oil slate.

**Comment G1-78.29**

**III. THE DEIR FAILS TO ESTABLISH THE ENVIRONMENTAL SETTING**

CEQA requires the lead agency to include a description of the physical environmental conditions in the vicinity of a project as they exist at the time

G1-78.29

**APPENDIX G1: RESPONSE TO COMMENTS**

environmental review commences.<sup>59</sup> The description of the environmental setting constitutes the baseline physical conditions by which a lead agency may assess the significance of a project's impacts. The EIR must also describe the existing environmental setting in sufficient detail to enable a proper analysis of project impacts.<sup>60</sup>

Describing the environmental setting accurately and completely for each environmental condition in the vicinity of the project is critical to an accurate and meaningful evaluation of environmental impacts. The courts are clear that, "[b]efore the impacts of a Project can be assessed and mitigation measures considered, an [environmental review document] must describe the existing environment."<sup>61</sup> It is:

a central concept of CEQA, widely accepted by the courts, that the significance of a Project's impacts cannot be measured unless the DEIR [or IS/ND] first establishes the actual physical conditions on the property. In other words, baseline determination is the first rather than the last step in the environmental review process.<sup>62</sup>

<sup>59</sup> CEQA Guidelines § 15125(a); see also *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 321.  
<sup>60</sup> *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109, 1121-22.  
<sup>61</sup> *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 952.  
<sup>62</sup> *Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 125.

G1-78.29  
cont'd.

**Response G1-78.29**

The comment summarizes the commenter's understanding of the environmental setting under CEQA and requires no response.

**Comment G1-78.30**

Additionally, it is axiomatic that the baseline information on which a lead agency relies must be supported by substantial evidence.<sup>63</sup> The CEQA Guidelines define "substantial evidence" as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion."<sup>64</sup> "Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts . . . [U]nsubstantiated opinion or narrative [and] evidence which is clearly inaccurate or erroneous . . . is not substantial evidence."<sup>65</sup>

<sup>63</sup> See CEQA Guidelines §15063(a)(3) ("An initial study may rely upon expert opinion supported by facts, technical studies or other substantial evidence to document its findings.")  
<sup>64</sup> CEQA Guidelines §15384.  
<sup>65</sup> Pub. Resources Code § 21082.2(c).

G1-78.30

**Response G1-78.30**

The comment summarizes what constitutes substantial evidence under CEQA and thus requires no response.

**Comment G1-78.31**

**A. The DEIR Fails to Establish the Environmental Setting Against Which to Measure the Project's Air Quality, Public Health, Odor and Hazards Impacts**

The DEIR is deficient because it fails to identify the existing crudes that are imported, stored and refined at the Los Angeles Refinery. The quality and chemical composition of the existing crudes are necessary to evaluate the Project's air quality, public health, odor and hazards impacts. Rather than disclose the existing crude information, the DEIR claims that the Project would not modify the crude slate imported, stored and refined at the Los Angeles Refinery. The DEIR's claim is an assumption that cannot be verified by any data and is entirely unsupported. Rather, as summarized above, and documented at length by Dr. Fox in her comments, the Project clearly facilitates a crude switch by allowing the import and storage of a broader range of crudes than previously received at the Los Angeles Refinery.

The Air District must prepare a revised analysis that describes the existing crudes by source and chemical composition. This information is necessary for the Air District to evaluate the Project's air quality, public health, odor and hazards impacts.

G1-78.31

**Response G1-78.31**

Chapter 3 of the DEIR fully describes the existing setting. As previously explained, individual crude oils that are processed by the Refinery continually change based on supply costs, availability and other factors. The proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. See Sections 2.5.3, 2.5.4, and Appendix F of the DEIR, Sections 2.7.1.3 and 4.1.2.1 of the FEIR, Master Response 4, and Response G1-78.94. Also see Responses G1-78.94 through G1-78.150 that address Phyllis Fox's specific comments.

**Comment G1-78.32**

**B. The DEIR Fails to Establish the Environmental Setting Against Which to Analyze the Project's Health and Safety Impacts from Onsite Soil and Groundwater Contamination**

The Los Angeles Refinery has a long history of releases of contaminants to soil and groundwater. A 2015 soil characterization report prepared for the Project documents both soil and groundwater contamination with a light non-aqueous phase liquid ("LNAPL") at the Carson and Wilmington Operations. The DEIR states that, according to the 2015 report, "[o]f the 44 soil samples analyzed, samples indicate that 95 percent of the soil to be potentially excavated will be classified as non-hazardous waste."<sup>66</sup> However, hazardous materials expert Matt Hagemann reviewed the 2015 report and found that the DEIR fails to disclose that: (1) exceedances of construction worker health and safety environmental screening levels ("ESL") were found in soils close to areas where Project construction will take place; (2) with few exceptions, samples were not collected where Project construction would disturb soil; and (3) sampling density was "woefully inadequate"

G1-78.32

to characterize soil contamination.<sup>67</sup> In other words, the DEIR fails to establish the environmental setting against which to measure the Project's public health and safety impacts from the Project's mobilization of onsite soil and groundwater contamination. The Air District must prepare a revised DEIR that includes the results of adequate sampling that targets areas of Project improvements.

G1-78.32  
cont'd.

<sup>66</sup> DEIR, p. 3-25.

<sup>67</sup> **Attachment E:** Letter from Matt Hagemann to Rachael Koss re: Comments on the Tesoro Los Angeles Refinery Integration and Compliance Project, June 6, 2016, p. 2.

### Response G1-78.32

See the detailed responses to Matt Hagemann's comments found in Responses G1-78.259 through G1-78.264. The information provided by Matt Hagemann to support his conclusions is unsubstantiated and based on environmental screening levels for areas other than Los Angeles.

### Comment G1-78.33

#### VI. THE DEIR FAILS TO DISCLOSE AND ANALYZE ALL OF THE PROJECT'S POTENTIALLY SIGNIFICANT AND SIGNIFICANT ENVIRONMENTAL AND PUBLIC HEALTH IMPACTS

An EIR must disclose all potentially significant adverse environmental impacts of a project.<sup>68</sup> As explained in an appellate court CEQA decision:<sup>69</sup>

The EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated and discussed and it must permit the significant effects of the project to be considered in the full environmental context.<sup>70</sup> We interpret this Guideline broadly in order to "afford the fullest possible protection to the environment."<sup>71</sup> In so doing, we ensure that the EIR's analysis of significant effects, which is generated from this description of the environmental context, is as accurate as possible.<sup>72</sup>

G1-78.33

The DEIR for this Project fails to provide the legally required disclosure. The DEIR fails to adequately disclose and analyze the Project's potentially significant impacts to air quality, public health, soils and groundwater, land use impacts, and impacts from greenhouse gas emissions and hazards.

The DEIR must be revised to address these impacts and recirculated for public review. CEQA requires recirculation of an EIR when significant new information is added to the EIR following public review but before certification.<sup>73</sup> New information is significant if "the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse

environmental effect of the project" including, for example, "a disclosure showing that . . . [a] new significant environmental impact would result from the project."<sup>74</sup> The following new, significant environmental impacts would result from the Project and must be addressed in a revised DEIR that is recirculated for public review.

G1-78.33  
cont'd.

<sup>68</sup> Pub. Resources Code § 21100(b)(1).

<sup>69</sup> *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, 874 (2003).

<sup>70</sup> CEQA Guidelines § 15125(c).

<sup>71</sup> *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal. App. 3d 692, 720.

<sup>72</sup> See also Remy et al., *Guide to the Cal. Environmental Quality Act* (10th ed. 1999), pp. 374-376.

<sup>73</sup> Pub. Resources Code § 21092.1.

<sup>74</sup> CEQA Guidelines § 15088.5.



**Response G1-78.33**

The DEIR fully analyzed and disclosed the proposed project's impacts. The comment summarizes the comment's understanding of the CEQA's requirements for recirculation and introduces the comments that follow. The specific comments are addressed below.

**Comment G1-78.34**

**A. The DEIR Fails to Evaluate the Potentially Significant Impacts to Air Quality and Public Health from the Full Range of Crude Oil Types that Could Be Imported as a Result of the Project**

The DEIR asserts that the Project would not result in significant impacts from alternate crudes that could be imported to the Los Angeles Refinery because the crudes would be blended to the same API gravity and sulfur content as the current operating range.<sup>75</sup> Dr. Fox explains that the DEIR is wrong for several reasons, and shows that the reasonably foreseeable crude slate switch would result in significant environmental impacts not identified in the DEIR, including: significant increases in VOC emissions, contributing to existing violations of ozone ambient air quality standards; significant increases in TAC emissions, resulting in significant health impacts; significant increases in malodorous sulfur compounds, resulting in significant odor impacts; significant increases in combustion emissions, contributing to existing violations of ambient air quality standards; significant increases in corrosive sulfur compounds, leading to increased risk of accident; and significant increases in flammability and thus the potential for more dangerous accidents involving the 52% increase in terminal storage tank capacity and unloading operations.

G1-78.34

<sup>75</sup> DEIR, p. 2-16; DEIR, Appendix A, pp. 4-6.

**Response G1-78.34**

The proposed project is not designed to, and will not in fact, facilitate a switch to any particular crude oils (see Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94). The proposed project is designed to meet the objectives expressly stated in Section 2.2 of the DEIR. See Master Response 4 and Responses G1-78.94 through G1-78.258 that address chemical and physical characteristics of crude oils and the analysis of the potential impacts of the proposed project, including the new storage tanks as raised by Phyllis Fox.

**Comment G1-78.35**

First, Dr. Fox explains that many of the impacts of concern occur from emissions from tanks and fugitive components *before* the crude is blended and sent to processing units.<sup>76</sup>

G1-78.35

<sup>76</sup> Fox Comments, p. 45.

**Response G1-78.35**

As explained further in Responses G1-78.124 through G1-78.133, G1-78.157 and G1-78.212 through G1-78.224, the impacts of the proposed project, including those from tank and fugitive

components before the crude is blended, were fully analyzed in the DEIR. Responses G1-78.109 and G1-78.122 specifically address potential pre-blending issues that were fully analyzed in the DEIR.

**Comment G1-78.36**

Second, Dr. Fox describes several physical and chemical properties of crude, unrelated to API gravity and sulfur content, which vary and would result in significant environmental impacts without affecting refining characteristics. These include, for example, increased VOCs, increased TACs (like benzene), highly malodorous and toxic compounds (like mercaptans), higher volatility and higher flammability. These characteristics may be present in newly imported crudes even if new crudes have identical sulfur content and API gravity to the current crude

G1-78.36

slate.<sup>77</sup> For example, because vapor pressure determines the amount of VOC and TAC emissions when crude is transported, stored and refined.<sup>78</sup> Thus, a crude slate may have identical sulfur content and API gravity, but would result in dramatically different VOC and TAC emissions.<sup>79</sup> Notably, Bakken crudes have uniquely elevated vapor pressures compared to the light sweet crudes they would replace.<sup>80</sup> Bakken and other light crudes also contain large amounts of natural gas liquids called "light ends," such as methane, propane, butane, ethane and pentane.<sup>81</sup> The light ends are the components of crude that volatilize, burn or explode in an accident. The high concentration of light ends makes these types of crude highly flammable and more likely to cause accidents.<sup>82</sup> Thus, "[t]he unique chemical and physical characteristics of each crude, as it relates to potential environmental impacts, [must] be separately evaluated."<sup>83</sup>

G1-78.36  
cont'd.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

<sup>79</sup> *Id.*

<sup>80</sup> *Id.*, p. 48.

<sup>81</sup> *Id.*, p. 51.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.*, p. 45.

**Response G1-78.36**

Chapter 4 of the DEIR analyzed all the potential impacts of storing and transferring unblended crude oils, assuming compliance with the highest volatility (vapor pressure) allowed to be stored by SCAQMD Rule 463 (TVP approaching 11 psia). The analysis considered TACs, such as benzene, using a worst-case hybrid crude oil TAC speciation. The proposed project has been fully analyzed for hazard impacts based on a worst-case consequence analysis. See Responses G1-78.122 through G1-78-174. As explained in Master Response 4, the crude oils that are processed at the Refinery are blended to meet the operational restrictions of the Refinery units (see Response G1-78.150). Each individual crude oil is not processed separately and, therefore, need not be evaluated independently. Since the crude oil blend properties are not changing, there will be no impacts from processing different crude oils. And, the proposed project was not designed, and will not, in fact, facilitate a switch to any particular crude oils.

**Comment G1-78.37**

Finally, Dr. Fox explains that Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in increased emissions from refinery operating issues.<sup>84</sup> This is because these blended crudes result in waxy coatings on storage tanks, greater development of sludges and solids, elevated hydrogen sulfide, fouling of the cold preheat train, desalter upsets, fouling of hot preheater exchangers and furnaces, and corrosion.<sup>85</sup>

<sup>84</sup> *Id.*, p. 51.

<sup>85</sup> *Id.*

G1-78.37

**Response G1-78.37**

As described in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4 and Response G1-78.94, the proposed project is not designed to facilitate a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. The entire basis for the comment, that the proposed project enables a change in the crude oil blend processed at the Refinery, is inaccurate. However, numerous misstatements and generalizations regarding Bakken crude oil are made in the comment that should be addressed and corrected. A closer look at the article upon which the comments are based shows the photos and discussions on wax deposition are predominately focusing on Eagle Ford shale oils from Texas and Utica oils from Pennsylvania. These other shale oils are widely known in the industry as being light crude oils containing wax crystals that can settle out of the oil because the oil has low viscosity and low density allowing the waxes to settle. See also Responses G1-78.161 and G1-78.162.

**Comment G1-78.38**

The Air District's conclusion that the Project would not result in significant impacts from a crude slate change is not supported by substantial evidence. Rather, substantial evidence shows that the Project's reasonably foreseeable crude slate switch would result in significant air quality, public health, hazards and odor impacts. The Air District must disclose, analyze and mitigate these impacts in a revised DEIR that is circulated for public review and comment.

G1-78.38

**Response G1-78.38**

As explained in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. Thus, the DEIR has fully analyzed all of the impacts of the proposed project.

**Comment G1-78.39**

**B. The DEIR Fails to Disclose the Project's Significant Cancer Risks from TAC Emissions**

The MSDSs included in the Applicant's original application for the new storage tanks, reported benzene (a TAC) concentrations of five to seven percent for light sweet crude oil, such as Bakken crude oil. However, the DEIR's analysis of health impacts assumes a very low benzene concentration (0.2 percent) in crude oil, and the health risk assessment ("HRA") prepared for the Project assumes a crude oil with low concentrations of TACs. According to Appendix B-3 to the DEIR, more than 98 percent of the Project's benzene emissions are from the tanks and fugitive sources that handle crude oil. Thus, the DEIR underestimates the Project's health impacts from TAC emissions.<sup>86</sup>

G1-78.39

<sup>86</sup> *Id.*, p. 46.

**Response G1-78.39**

As fully explained in Response G1-78.157, the DEIR does not underestimate TAC emissions or health impacts. Master Response 4 explains that the proposed project does not enable the Refinery to process a significantly different or additional crude oil blend, such as a blend containing predominantly Bakken crude oil as suggested by the comment. The vapor pressure of crude oil is relevant to calculation of VOCs and TACs from storage tanks and fugitive emissions. It is for this reason that the maximum vapor pressure allowable by SCAQMD Rule 463 (approaching the TVP limit of 11 psia) was used as the basis of the emission calculations for VOCs and TACs for the new and replacement storage tanks and fugitive emissions in the DEIR. Any pre-blending impacts were included as part of the new and replacement storage tanks evaluations (see Response G1-78.122). In order to perform the most accurate HRA, speciated toxics data from actual laboratory analyses is preferred. The speciated data included all the toxic air contaminants that are detected even at low concentrations in laboratory analyses and the data is more accurate than the conservative ranges shown in SDSs. Specifically, the CCT benzene concentration of 0.472 percent is the highest benzene content listed in the speciated data of crude oils analyzed.

**Comment G1-78.40**

The DEIR reports the Project's cancer risk ranges from 2.1 cases in a million at the nearest sensitive receptor to 9.2 million at the nearest off-site worker.<sup>87</sup> The cancer significance threshold is 10 in one million. Dr. Fox adjusted the HRA calculations to reflect the upper bound benzene concentration in Bakken crude (7 percent) and found that the Project's cancer risk increases from 3.64 to 45 in a million for the maximum exposed individual resident ("MEIR"), 9.19 to 10.2 in a million for the maximum exposes individual worker ("MEIW) and 2.09 to 32 in a million for the sensitive receptor.<sup>88</sup> Thus, if the HRA used the upper bound benzene concentration for Bakken crude oil (or the light crude oil listed in the MSDS submitted with the Applicant's tank application), the cancer risk at all three receptors would exceed the significance threshold of 10 in a million. The DEIR fails to disclose, analyze or mitigate this significant public health impact.

G1-78.40

<sup>87</sup> DEIR, Appx. B-1, Table 10.

<sup>88</sup> Fox Comments, p. 18.

**Response G1-78.40**

The projected cancer risk values listed in the comment are based on a claim made in the comment regarding benzene concentration in Bakken crude oil. This claim is incorrect because it uses the SDS information for a generic light sweet crude oil, which as explained in Response G1-78.157 is overly conservative and does not represent a crude oil that actually exists or is processed by the Refinery. The DEIR for the proposed project analyzed emissions from crude oil using the worst-case hybrid analysis of the toxic content of crude oils currently and potentially processed at the Refinery, including Bakken and Canadian crude oil. The DEIR conservatively assessed potential health risks from the proposed project. See Responses G1-78.157 through G1-78.159 that address Phyllis Fox's specific comments.

**Comment G1-78.41**

**C. The DEIR's Analysis of Air Quality Impacts from Marine Vessel Emissions is Fatally Flawed; the Project Would Result in Significant Air Quality Impacts from Marine Vessel Emissions**

The Los Angeles Refinery receives crude oil by ship at three marine terminals at the Port of Long Beach: (1) Long Beach Terminal (Berths 84 and 86), which serves the Wilmington Operations; (2) Marine Terminal 1 (Berth 121), which serves the Carson Operations; and (3) Marine Terminal 2 (Berths 76-78), which serves the

Carson Operations. Together, the marine terminals have a storage capacity of 6.6 million barrels.<sup>89</sup>

<sup>89</sup> *Id.*, 61.

G1-78.41

G1-78.41  
cont'd.

**Response G1-78.41**

The comment presents data on existing marine terminal tankage not affected by the proposed project. No comment on the adequacy of the DEIR has been made; therefore, no further response is needed.

**Comment G1-78.42**

The Project includes modifications to tanks and pipelines that serve the marine terminals. Specifically, the Project would replace two 80,000 barrel tanks with two 300,000 barrel tanks at the Wilmington Operations, and will add six 500,000 barrel tanks at the Carson Crude Terminal, adjacent to the Carson Operations. In total, the Project would increase the Los Angeles Refinery's storage capacity by 3,440,000 barrels.<sup>90</sup> The Project's new storage tanks and pipelines facilitate significant increases in the unloading rate and capacity for the marine terminals.<sup>91</sup>

<sup>90</sup> DEIR, p. 2-7; Fox Comments, pp. 34-35.

<sup>91</sup> Fox Comments, pp. 61.

G1-78.42

**Response G1-78.42**

The comment summarizes one aspect of the proposed project and, as such, requires no response.

**Comment G1-78.43**

The DEIR states that the new tanks and pipelines would increase the unloading rate at the marine terminals, reducing the time that ships remain at the terminals and, therefore, *reducing* marine vessel emissions. The DEIR's conclusion is wrong for several reasons.

First, the marine deliveries for the Carson and Wilmington Operations could include crude oils with much higher vapor pressures, increasing tank VOC emissions. All of the new storage tanks would be permitted with a Reid vapor pressure of 10.5 psi (or a true vapor pressure of 11+ psi), which is much higher than the permitted vapor pressure of any existing crude storage tanks.<sup>92</sup>

<sup>92</sup> *Id.*, p. 64.

G1-78.43

**Response G1-78.43**

Table 4.2-4 of the DEIR presents the increase in VOC emissions from the proposed project crude oil storage tanks. The emission estimates were based on the maximum expected vapor pressure approaching the true vapor pressure limit in SCAQMD Rule 463 of 11 psia. This analysis presents the most conservative (highest, worst-case) estimates for emissions associated with crude oil delivery. The selection of this allowable permit limit does not mean that any or all of the tanks will hold crude oils with the maximum permitted vapor pressure. It should be noted that Tesoro already purchases, stores, and processes Bakken and other lighter crude oils with a TVP of up to 11 psia. Many of the existing storage tanks receiving crude oil have vapor pressure limits that will continue to be adhered to with or without the proposed project and, therefore, there will be no change in emissions from existing tankage. The information in the comment does not support the conclusion that marine vessel emissions would not be reduced as a result of the project. See Responses G1.78-122 and G1.78-179 that address the specific comments of Phyllis Fox.

**Comment G1-78.44**

Second, the DEIR incorrectly assumes that the Long Beach Terminal would continue to receive crude oil in the same size vessels as those currently delivering crude. The crude oil unloading rate is proposed to *increase* from 5,000 bbl/hr to 15,000 bbl/hr and the storage capacity serving the Long Beach Terminal will *increase* by 440,000 barrels.<sup>93</sup> This will allow a greater proportion of bigger ships to unload and/or allow ships to unload on more days. If ships can unload faster, more and/or larger ships can be unloaded, increasing emissions.<sup>94</sup> Dr. Fox explains that emissions would increase if the number of ship calls increased or if the mix of ships changed to favor larger ships.<sup>95</sup> The DEIR completely fails to consider these scenarios. In Dr. Fox's opinion, "it is entirely possible, especially in the absence of

any enforceable conditions of approval on marine deliveries, that the Project would increase marine deliveries, increasing emissions of VOC, NOx, CO, PM10 and PM2.5."<sup>96</sup>

<sup>93</sup> DEIR, p. 4-26.

<sup>94</sup> Fox Comments, p. 62.

<sup>95</sup> *Id.*, p. 64.

<sup>96</sup> *Id.*, p. 65.

G1-78.44

G1-78.44  
cont'd

### Response G1-78.44

As explained in Master Response 6, the type/size and number of marine vessels that will visit the Long Beach Marine Terminal post-project is independent of the proposed project. The shipping companies select the marine vessels used to transport oil based on the depth of water at the loading and unloading dock and other factors. The number of each type of vessel arriving in a given year is speculative. Vessel transiting and maneuvering emission rates are higher than hoteling emission rates, and the transit time to the berth is approximately 13 hours. Therefore, the peak day consists of 13 hours of transit emissions and 11 hours of hoteling. The peak day emissions for the marine vessel will not change as a result of the proposed project since both the pre- and post-project scenarios require the same amount of transit, maneuvering, and a portion of hoteling. See Responses G1-78.177, G1-78.180 and G1.78.181 that address the specific comments of Phyllis Fox.

### Comment G1-78.45

Third, the DEIR incorrectly assumes that the Project would increase the Refinery's throughput by only 6,000 bb/day. The Project facilitates an increase in marine deliveries far more than the 6,000 bbl/day increase in design throughput since storage capacity would increase by 3,440,000 barrels and unloading rates would increase.<sup>97</sup> Further, marine deliveries would likely replace existing pipeline deliveries.<sup>98</sup> Dr. Fox explains that the Los Angeles Refinery historically received crude oil by pipeline from the San Joaquin Valley and Los Angeles Basin, and by ship from the Alaska North Slope and foreign sources.<sup>99</sup> Pipeline deliveries are not only more expensive, but are, in fact, declining.<sup>100</sup> Thus, it is reasonably foreseeable that marine deliveries would replace pipeline deliveries. Indeed, this is consistent with the Applicant's express plans to expand marine terminal throughputs.<sup>101</sup>

We have two of our terminals are being expanded (sic) to handle additional capacity, and those expansion will come online this summer. And that will allow us to bump up volumes either very later in the second quarter or early in the third quarter.

Our marine facility down there [referring to its terminals in Long Beach], 121, which is the large neighbor de-berth in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, P-2 in Long Beach. And between P-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity.<sup>102</sup>

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<sup>97</sup> *Id.*, pp. 61, 67.

<sup>98</sup> *Id.*, pp. 62-63.

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> Thompson Reuters Streetevents Edited Transcript, 'TLLP - Q12014 Tesoro Logistics LP Earnings Conference Call, pp. 6-7, available at <http://seekingalpha.com/article/2183263-tesoro-management-discusses-q1-2014-results-earnings-call-transcript?part=single>.

### Response G1-78.45

It is important to note that an increase in offloading capacity at the marine terminals and the increase in storage capacity for crude oils does not equate to an increase in crude oil processing capability at the Refinery. There are no contemplated increases in marine imports beyond the 6,000 bbl/day analyzed in the DEIR. The SCAQMD acknowledges the increase in offloading



capacity at the marine terminals and the increase in storage capacity for crude oils. The impacts of these modifications have been fully analyzed in the DEIR.

As discussed in Responses G1-78.178 and G1-78.186, data available from the EIA shows that California crude oil production has declined historically, but it has remained relatively constant for the past six years. There is no evidence to suggest a decline in California crude oil production in the foreseeable future, and the claim in the comment that marine vessel deliveries will increase to replace pipeline deliveries is unsubstantiated (see also Response G1-78.104).

It should be noted, however, that the quotation, “We have two of our terminals are (sic) being expanded to handle additional capacity....,” is taken out of context<sup>121</sup>. This statement is referencing increased capacity at Tesoro Logistics’ product distribution terminals, not the marine terminals that handle crude oil. Tesoro Logistics’ product terminals are not in any way associated with the proposed project. The next quotation referenced in Comment G1-78.143 does refer to the marine terminals, “Our marine terminal down there, 121, which is the large [corrected T-berth] in Long Beach, stays pretty full. We have our legacy Long Beach Terminal, we probably have an additional 100,000 plus bbl/day of capacity.” The comment references existing capability and not an expansion plan as misstated by the comment.

**Comment G1-78.46**

Dr. Fox estimated the increase in criteria pollutants from increased marine deliveries to the Long Beach Terminal for the Wilmington Operations. Since the design throughput of the Los Angeles Refinery is 380,000 bbl/day and

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approximately 17 percent of the crude arrives by pipeline from California sources (which are in decline), Dr. Fox estimated that up to 65,000 bbl/day of pipeline imports could be replaced by marine deliveries.<sup>103</sup> Using the DEIR’s emission factors and baseline marine deliveries (30,000 bbl/day), Dr. Fox found that if Panamax vessel marine imports increased by 50,000 bbl/day, the average daily increase in both VOC (84 lb/day) and NOx (2,367 lb/day) emissions exceed the Air District’s CEQA significance thresholds. For Aframax vessels, the average daily increase in NOx emissions (1,292 lb/day) would exceed the Air District’s CEQA significance threshold.<sup>104</sup> Further, if future marine deliveries replaced 100 percent of pipeline imports (an increase of 65,000 bbl/day by marine vessels), the increase in emissions from Panamax vessels of VOC (84 lb/day) and NOx (2,367 lb/day) would exceed the Air District’s CEQA significance thresholds. For Aframax vessels, VOC (155 lb/day) and NOx (4,027 lb/day) emissions would exceed significance thresholds.<sup>105</sup>

G1-78.46  
cont’d.

<sup>103</sup> Fox Comments, p. 70.

<sup>104</sup> *Id.*, p. 71.

<sup>105</sup> *Id.*

**Response G1-78.46**

The suggestion in the comment that the proposed project will replace pipeline deliveries with marine vessel deliveries (facilitating a shift of up to 65,000 bbl/day) is unsupported by evidence.

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<sup>121</sup> See Attachment G, Declaration of Holly Kranzmann, Vice President, Logistics Development-West Coast, of Tesoro Logistics.

The proposed project would have no impact on the supply of California crude oils. Any decline in the availability of California crude oil would occur with or without the proposed project and is independent of the proposed project. The claim that the proposed project might not only replace pipeline deliveries to the Refinery with marine vessel deliveries but could also import additional barrels of crude oil to support other terminal customers is also unsupported and speculative. No evidence is offered in support of these statements. Therefore, the calculations summarized in Table 4 in Comment G1-78.194 are not based on facts. See Master Responses 4 and 8 that address footnote 103, which discusses the purported crude switch and supply from the Vancouver Energy Project. See also Responses G1-78.104, G1-78.178, G1-78.186, G1-78.188, and G1-78.194 that address the specific comment from Phyllis Fox regarding the decline and cost of California crude oil, the displacement of pipeline deliveries by marine vessels and explain that the emission calculations in the comment are unsupported by fact.

**Comment G1-78.47**

For the Carson Operations, up to six new 500,000 barrel domed external floating roof crude oil storage tanks and five electrically-driven transfer pumps will be constructed adjacent to the Carson Crude Terminal to increase the crude unloading rate at the Carson Crude Terminal. Piping and instrumentation will be installed within the Carson Crude Terminal to connect these new tanks to existing pipelines to the Carson Operations and Marine Terminal 1.<sup>106</sup> According to the DEIR, these 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.<sup>107</sup>

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However, the DEIR fails to disclose the anticipated increase in unloading rate and the existing crude oil deliveries by marine vessels to Marine Terminal 1. The DEIR also provides no emission calculations for marine vessels at Marine Terminal 1. As a result, it was impossible for Dr. Fox to estimate these emissions.<sup>108</sup>

In short, the DEIR underestimates marine vessel emissions. Substantial evidence shows that the Project's increase in marine vessel emissions related to the Wilmington Operations are significant and unmitigated. The Air District must revise the DEIR to disclose and mitigate this significant impact. The DEIR also fails to include the necessary information to determine the Project's increase in marine vessel emissions related to the Carson Operations, and thus fails as an informational document. The Air District must revise the DEIR accordingly.

G1-78.47  
cont'd.

<sup>106</sup> DEIR, pp. 1-6, 7, 1-16, 17, 2-46, 2-48, Figure 2-16; Appx. B-3, Table 1.

<sup>107</sup> DEIR, p. 1-17. See also similar assertions at DEIR pp. 2-4, 2-46, 6-1.

<sup>108</sup> Fox Comments, p. 72.

**Response G1-78.47**

The DEIR does analyze emissions from marine vessels, but it does not take credit for the emissions reductions that it finds, in order to present a conservative emissions analysis.

The SCAQMD's significance thresholds are peak day thresholds. As discussed on pages 4-26 to 4-27 of the DEIR, peak daily emissions for marine deliveries occur when the marine vessel is transiting the harbor (i.e., arriving or departing). Since peak day emissions do not change, the analysis of marine vessel emissions is limited to annual changes in the number of marine deliveries. As explained on page 4-27 of the DEIR, the number of additional marine vessels per year needed to transport the additional crude oil would either be six Panamax or three Aframax vessels.

As discussed in Response G1-78.184, the only increase in marine vessel emissions associated with the proposed project will result from additional deliveries to accommodate the increased crude oil capacity of up to 6,000 bbl/day (approximately 2.2 million bbl/yr), as described in the DEIR (see pages 4-26 through 4-29). Accordingly, the calculations presented in the DEIR also include the incremental increase of 2.2 million bbl/yr of crude oil deliveries over baseline. Therefore, as shown in Table 4.2-11, of the DEIR, any combination of vessels in the post-project will be an emission benefit over baseline deliveries even with an additional 2.2 million bbl/yr of crude oil. The comment asserts the project will result in an increase in marine vessel emissions without providing evidence to support the claim. See Responses G1-78.176, G1-78.194 and G1-78.196 that address the specific comments raised by Phyllis Fox.

**Comment G1-78.48**

**D. The DEIR Fails to Adequately Analyze the Project's Significant Impacts from Greenhouse Gas Emissions**

The DEIR states that the Project will decrease greenhouse gas ("GHG") emissions by 66.139 metric tons per year. The DEIR's calculations are flawed because they fail to include the increase in GHG emissions from: increased marine vessel calls, LPG train trips, combustion of increased amounts of LPG and from producing and delivering Bakken and/or tar sands crudes from their point of origin to the Los Angeles Refinery's associated marine terminals.<sup>109</sup> The Air District must prepare a revised DEIR that includes these additional sources of GHG emissions.

<sup>109</sup> *Id.*, p. 74.

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**Response G1-78.48**

The analysis of the GHG impacts associated with the proposed project is provided in detail in Section 5.2.2 of the DEIR (see pages 5-21 through 5-27). Appendix B-3 includes GHG onsite emissions, Appendix B-5 includes the mobile source GHG emissions, and Appendix B-1 includes the construction GHG emissions. As discussed on page 4-27 of the DEIR, the proposed project has two aspects that will potentially affect marine vessel annual emissions: (1) increasing the offloading rate, and (2) additional deliveries to accommodate the increased crude oil capacity of up to 6,000 bbl/day (2.2 million bbl/year). As shown in Appendix B-5 on page B-5-9 of the DEIR, the net effect of these potential changes is a reduction in criteria pollutants and GHG emissions. The potential increase in GHG emissions from LPG train trips is included in the DEIR and shown in Table 5.2-8 (see page 5-26) and includes both offsite and onsite rail emissions, emissions from mobile sources, and construction emissions. The transport of Bakken or heavy Canadian crude oil to the Refinery will not increase as a result of the proposed project (see Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4

and Response G1-78-94). Therefore, no increase in GHG emissions would occur from the delivery of Bakken or heavy Canadian crude oil. See Response G1-78.199 that addresses the specific comments raised by Phyllis Fox.

**Comment G1-78.49**

**E. The DEIR Fails to Disclose the Project's Significant Air Quality Impacts from Operational Emissions from Fired Sources**

The Project includes modifications to heaters, furnaces and boilers.<sup>110</sup> These modifications include increased firing rates, increased utilization or new equipment. The DEIR concludes that the Project would not result in any significant changes in emissions from fired sources. However, Dr. Fox shows that the DEIR underestimates operational emissions from these modifications.

First, the DEIR estimates the increase in emissions from increased firing rates or increased throughputs at certain modified units by multiplying the increase in either the firing rate or throughput above the maximum firing rate or throughput under an existing permit by an emissions factor.<sup>111</sup> By doing so, Dr. Fox explains that the Air District "effectively assumes the permit limit for the baseline."<sup>112</sup> The California Supreme Court made it clear that the Air District's approach violates CEQA.<sup>113</sup> Rather, the Air District must calculate the Project's emission increases relative to actual emissions.

<sup>110</sup> DEIR, Table 4.2-4 and Appendix B-23, Table A-1 to A-4.

<sup>111</sup> DEIR, Appendix B-3, Attachment A, pp. B-3-51, 52.

<sup>112</sup> Fox Comments, p. 79.

<sup>113</sup> *Communities for a Better Environment v. South Coast Air Quality Management District*, 48

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cont'd.

**Response G1-78.49**

The DEIR did not use the permit limit as the baseline for increases in emissions due to changes in heater firing. The DEIR used the 98<sup>th</sup> percentile of the existing operating levels as the baseline. The DEIR disclosed the expected additional emissions as compared to the baseline. For the proposed project, the emission increases result from increased utilization of these existing heaters, not any physical modifications. To calculate the increases in emissions associated with this expected increased utilization from heaters listed in Table 4.1-1, the increased firing rate—above the baseline—is multiplied by the emission factors applicable to each physical heater. Please see Response G1-78.209 for a detailed response to the comments of Phyllis Fox.

**Comment G1-78.50**

Second, the DEIR uses the wrong existing conditions against which to evaluate the Project's potentially significant impacts from heater emissions. The DEIR calculates the existing emissions for each heater based on days where combined actual emissions from heaters were at the 98<sup>th</sup> percentile.<sup>114</sup> The correct baseline to calculate the Project's change in emissions is average daily emissions in the baseline years (2012 and 2013).<sup>115</sup> Dr. Fox explains that, "[t]his, in effect, significantly underestimates the increase in emissions from the proposed increase in firing rates of heaters by resulting in a very high baseline value, higher than the average emission rate after the firing rate is increased."<sup>116</sup> Dr. Fox illustrates the DEIR's error with an example. Dr. Fox explains that the Project proposes to increase the firing rate of Delayed Coker Unit Fresh Feed Heater H-100 from 252 MMBtu/hr to 302.4 MMBtu/hr (a 20 percent increase). Further, "[e]missions are directly proportional to firing rate unless modifications are made to the heater and/or its controls to reduce emissions," but [n]o modifications are made to the heater and/or its controls to reduce emissions."<sup>117</sup> Therefore, according to Dr. Fox,

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this change in firing rate should increase emissions by a factor of 1.2 (302.4/252 = 1.20). Instead, the emissions summary table shows that this change in firing rate would **reduce** VOC emissions by -0.43 lb/day, CO emissions by -5.14 lb/day, NOx emissions by -171.03 lb/day, PM10 emissions by -0.98 lb/day and PM2.5 emissions by -0.98 lb/day. The error in NOx emissions for this one heater is sufficient by itself to tip Project NOx emissions over the CEQA significance threshold if NOx emissions are calculated using the correct method.<sup>118</sup>

Notably, this fatal flaw in also means that the Air District cannot rely on the DEIR to issue the draft Title V permit modifications for the Project. This is because the proposed permit modifications do not ensure the emission reductions assumed in the DEIR are actually achieved or are enforceable. By artificially inflating the baseline, the Air District ascribed much lower emissions changes than would actually occur from the Project.<sup>119</sup> The Air District must modify the proposed Title V permits to ensure that the assumed emission reductions in the DEIR are achieved in practice and are enforceable, or the Air District must revise the DEIR to use the correct baseline.

G1-78.50  
cont'd.

<sup>114</sup> DEIR, pp. 4-21, B-3-10, B-3-49, B-3-56, B-3-59, B-3-64.

<sup>115</sup> Fox Comments, p. 79.

<sup>116</sup> *Id.*, p. 76.

<sup>117</sup> *Id.*

<sup>118</sup> *Id.*, pp. 76-77.

<sup>119</sup> See **Attachment F: Safe Fuel and Energy Resources California Comments on the Proposed Title V Significant Permit Revisions for Tesoro Refining & Marketing Co. LLC's Carson and Wilmington Sites**, June 10, 2016.

**Response G1-78.50**

Consistent with CEQA Guidelines § 15064.7, the SCAQMD has established significance thresholds that are quantitative. The SCAQMD's significance thresholds are peak daily emissions, not average emissions. The DEIR correctly compares (1) the post-project peak daily potential emissions to (2) the 98<sup>th</sup> percentile of actual pre-project emissions. As discussed in detail in Master Response 12, the SCAQMD's decision to calculate baseline criteria pollutant emissions for modified heaters using a 98th percentile metric, as opposed to an average emissions metric, is reasonable, supported by substantial evidence, and consistent with prevailing guidance and standard practice. This metric was selected because it was a conservative near-peak measurement based on actual emissions data that corresponds with existing criteria pollutant air quality standards.

No physical changes will be made to the DCU H-100 heater. The new permit conditions ensure a reduction in emissions from baseline. See Responses G1-78.204 through G1-78.206 that addresses the specific comments raised by Phyllis Fox.

**Comment G1-78.51**

Third, the DEIR excludes emissions from periods of startup and shutdown of fired sources, which would occur approximately 720 hours per year for each fired source.<sup>120</sup> Dr. Fox explains that, during startup and shutdown, emission control devices such as selective catalytic reduction and low NOx burners, are partially working or not working at all.<sup>121</sup> Also, during these periods, incomplete combustion occurs, which increases emissions of NOx, VOC and carbon monoxide.<sup>122</sup> The DEIR fails to include these emissions in the analysis of operational emissions.

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<sup>120</sup> DEIR, Appendix B-3, Table A-2.

<sup>121</sup> Fox Comments, p. 75.

<sup>122</sup> *Id.*

**Response G1-78.51**

Table 4.2-4 of the DEIR fully analyzed the peak normal operating day. During equipment startup and shutdown, total mass emissions are typically less than the peak normal operating day. Total mass emissions are the product of the emission concentration and emission rate. Permit conditions include limitations of short-term concentration and mass emissions and also include requirements to vent to specific control devices. During startup and shutdown, equipment may exceed the short-term concentration limit but is operating at a lower rate as it comes on-line or shuts down, and, therefore, is operating at a lower emission rate, which results in less mass emissions than the peak normal operating day emissions. Thus, on a daily basis, mass emissions are not expected to be greater than the peak normal operating day emissions. See Response G1-78.201 that addresses the specific comments by Phyllis Fox.

**Comment G1-78.52**

Fourth, the DEIR bases its analysis of operational emissions on the *average* daily increase in emissions. This is incorrect. According to the Air District's CEQA Air Quality Handbook, the analysis should be based on the *maximum* daily increase in emissions.<sup>123</sup> The maximum daily increase in emissions occurs during periods of startup, shutdown and commissioning.<sup>124</sup> Notably, the proposed Title V permits for the Project explicitly exempt periods of startup and shutdown from complying with NOx limits.<sup>125</sup> Dr. Fox shows that, when startup, shutdown and commissioning emissions are included in the analysis of potentially significant impacts, NOx emissions are significant. For example, for the Wilmington Operations H-100 heater, the DEIR reports that the maximum daily non-routine startup, shutdown and commissioning emissions are 881.27 lbs per day.<sup>126</sup> Using this estimate of the post-Project potential emissions, Dr. Fox determined that the net increase in NOx

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emissions from heater H-100 would be 528.80 lbs per day (not -171.03 lbs per day reported in the DEIR).<sup>127</sup> Correcting emissions from this one heater, the net increase in NOx emissions for the entire Project would increase from -38.18 lbs per day to 662 lbs per day.<sup>128</sup> This greatly exceeds the CEQA significance threshold of 55 lb per day. Making similar corrections to the Project's other fired sources would result in greater exceedances of the NOx significance threshold. Dr. Fox anticipates similar results for CO and VOC, which increase significantly during startup and shutdown. However, Dr. Fox could not calculate the increases because the DEIR does not report startup, shutdown and commissioning emissions for CO or VOCs.

G1-78.52  
cont'd.

<sup>124</sup> SCAQMD, CEQA Air Quality Handbook, April 1993, p. 6-3.

<sup>124</sup> Fox Comments, p. 75.

<sup>125</sup> Draft Wilmington Title V Permit, Condition A99.X, pdf 19; Draft Carson Title V Permit Condition A99.X1, pdf 46.

<sup>126</sup> DEIR, Appendix B-3, p. B-3-49.

<sup>127</sup> Fox Comments p. 75.

<sup>128</sup> *Id.*

### Response G1-78.52

As stated in Response G1-78.51, Table 4.2-4 of the DEIR analyzed the peak normal operating day. The emissions presented in Table 4.2-4 of the DEIR represent the worst-case (i.e., greatest impacts) from the proposed project. The example and emissions provided in the comment regarding the DCU H-100 heater ignores the fact that the frequency and duration of startup and shutdown operational conditions will be the same whether or not the heaters are operated at the current or proposed permit-described heater duties. See Responses G1-78.201 and G1-78.202 that address the specific comments and calculations by Phyllis Fox.

### Comment G1-78.53

Fifth, the DEIR omits flaring emissions. The Project includes the installation of new pressure relief valves that will vent to the flares. The DEIR states that the Project would not increase flaring.<sup>129</sup> Dr. Fox explains that, while the Project would not increase routine flaring emissions, it would increase emergency flaring emissions.<sup>130</sup> In Dr. Fox's opinion, increased flaring from increased connections to flares would significantly increase NOx, CO, VOC, PM10 and PM2.5 emissions during flaring events.<sup>131</sup>

G1-78.53

<sup>129</sup> DEIR, p. 4-53.

<sup>130</sup> Fox Comments, p. 77.

<sup>131</sup> *Id.*

### Response G1-78.53

Refinery flares are safety devices that are necessary to safely combust excess gas that occurs as a result of upsets, breakdowns, start-ups, and shutdowns of equipment. Flaring event emissions will not be increased proportionally to the number of new connections as the comment claims. Pressure relief valves (PRVs) are actually connected to the flare gas recovery system rather than directly to the flare. The intent of the flare gas recovery system is to recover hydrocarbons for use as a fuel in Refinery process heaters. The flare gas recovery system manages PRV hydrocarbons by sending them to the fuel gas system up to its maximum recovery capacity. Once maximum capacity is achieved, the flare, which normally operates in standby mode ready to incinerate excess emissions, is utilized to maintain safety. PRVs are connected to the flare gas recovery system to recover hydrocarbons and minimize the need to flare.



## APPENDIX G1: RESPONSE TO COMMENTS

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Emergency situations that result in venting process gas to the flare are not expected to occur more often or have increased impacts from the proposed project. Emergency conditions that have resulted in flaring emissions at the Refinery include circumstances such as power failures, fires, and loss of cooling water.

Please see Response G1-78.207 for further information regarding the potential impacts of flaring.

### Comment G1-78.54

Finally, the DEIR excludes emissions from an increase in crude throughput. According to the DEIR, the throughput rate for Wilmington Operations is "primarily constrained by Crude Unit and Coker Feed heater duty conditions" and the rate for the Carson Operations is "constrained by physical limitations of the equipment, including heater duty and pump/piping capacity limitations."<sup>132</sup> The DEIR states that the Los Angeles Refinery's crude oil rate capacity is 363,000 bbl/day<sup>133</sup> and the Project would increase the throughput by 6,000 bbl/day "by eliminating feed heater duty at the Wilmington Crude Unit and Coker."<sup>134</sup> However, in its most recent Form 10-K, the Applicant reported to the U.S. Securities and Exchange Commission, that the throughput capacity of the Los Angeles Refinery is 380,000 bbl/day and its 2015 throughput was 369,000 bbl/day. Thus, either modifications to debottleneck the refinery were already completed, or the DEIR understates the impact of the Project on throughput. Either way, since increased throughput translates to increased emissions, the emissions reported in the DEIR would be substantially higher.

G1-78.54

The DEIR fails to include increased emissions from fired sources in the analysis of operational emissions. Substantial evidence shows that these sources would result in significant increases in emissions. The Air District must prepare a revised DEIR that discloses, analyzes and mitigates significant air quality impacts from fired sources.

G1-78.54  
cont'd.

<sup>132</sup> DEIR, pp. 2-17, A-151.

<sup>133</sup> *Id.*, p. 2-17.

<sup>134</sup> *Id.*, p. 1-9.

### Response G1-78.54

Master Response 5 and Response G1-78.208 address the difference in crude oil capacity listed in the DEIR versus the SEC 10K filing. The FEIR notes the difference in the current crude oil processing capacity between 363,000 bbl/day and 380,000 bbl/day. Also, as explained in Master Response 6 and Response G1-78.208, the proposed project will not increase the crude oil processing capacity above the 6,000 bbl/day analyzed in the DEIR.

**Comment G1-78.55**

**F. The DEIR Underestimates VOC Emissions from Storage Tanks**

The DEIR uses the EPA TANKS 4.0.9d model to estimate tank VOC emissions. Dr. Fox points out that the EPA no longer recommends using this model to calculate tank emissions and cautions "use at your own risk."<sup>135</sup> The TANKS model is known to underestimate VOC emissions in the following circumstances: (1) heated tanks (like Wilmington Operations tank 80067); (2) unheated, fixed-roof tanks (like Carson Operations tanks 062, 063, 502 and 959, and Wilmington Operations tanks 80038 and 80074); (3) tanks that receive warmer-than-ambient stock but are not heated (like Carson Operations tanks 14, 31, 62, 63, 64, 502 and 959, and Wilmington Operations tanks 80211, 80215, 80217 and 80038); and (4) tanks that store complex mixtures, like crude oil.<sup>136</sup> In these circumstances, the TANKS model underestimates VOC emissions by factors of 2 to 15.<sup>137</sup>

G1-78.55

<sup>135</sup> Fox Comments, p. 81.

<sup>136</sup> *Id.*, p. 81.

<sup>137</sup> *Id.*, p. 82.

**Response G1-78.55**

See Responses G1-78.213 through G1-78.215 that specifically address the comments by Phyllis Fox. The TANKS program continues to operate successfully on many current operating systems. The TANKS program continues to be used by both SCAQMD engineering staff and the industry to calculate storage tank emissions for permit to construct evaluations as well as emission inventories. Notably, the U.S. EPA TANKS emissions model implements the equations and algorithms in AP-42, Chapter 7 (i.e., precisely what U.S. EPA recommends in the quote cited in the comment).

**Comment G1-78.56**

Further, the TANKS model runs for the Project assume a vapor pressure of 10 psi and vapor molecular weight of 50 lb/lb-mol. However, the EPA default for heavier crudes with a vapor pressure of 5 psi is 50 lb/lb-mol. A lighter crude, like Bakken, would have a higher vapor molecular weight. According to Dr. Fox, the vapor molecular weight of a Bakken is 60 lb/lb-mol and the vapor molecular weight of a 10 psi gasoline is 66 lb/lb-mol.<sup>138</sup> Permits to operate do not limit vapor molecular weight. Thus, this TANKS input, which determines VOC emissions, is not enforceable.

G1-78.56

<sup>138</sup> *Id.*, pp. 83-84.

**Response G1-78.56**

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the slate of crude oils purchased by the Refinery, or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend.

Contrary to the claim in the comment, higher vapor pressure products do not typically have higher vapor molecular weights. Actually, high vapor pressure compounds typically indicate the

increased presence of smaller and lower molecular weight compounds in the petroleum liquid. It is these smaller and lighter molecular weight compounds that evaporate (i.e., “escape” and migrate to the vapor space).<sup>122</sup> Therefore, 50 lb/lb-mol is a reasonable assumption for the molecular weight of high vapor pressure crude oils stored onsite, and in fact, may overstate the vapor molecular weight. The TANKS calculations for the proposed project used appropriate assumptions and the calculations provide a conservatively high estimate of emissions. See Response G1-78.216 that addresses the specific comments raised by Phyllis Fox.

**Comment G1-78.57**

Similarly, Bakken crudes have vapor pressures up to 16 psi.<sup>139</sup> Dr. Fox points out that, while the tanks may be permitted at 10.5 psi, “tank vapor pressure limits are rarely enforced as no monitoring is required to confirm the limits. None of the tank vapor pressure limits in the refineries’ existing Title V permits, for example, require routine monitoring.”<sup>140</sup> Therefore, even if vapor pressure limits are established in the permit to operate, the limits would not guarantee that crudes with vapor pressures greater than 10.5 psi would not be stored in the tanks. As a result, higher VOC emissions could reasonably occur, but were not considered by the Air District.

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

G1-78.57

G1-78.57  
cont’d.

**Response G1-78.57**

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94 the proposed project is not designed to facilitate a change in the slate of crude oils purchased by the Refinery, or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. See Response G1-78.125 regarding misleading and unsupported assertions that storage tanks will contain crude oils with much higher vapor pressures than the RVP 10.5 (11 psia TVP) and that vapor pressure limits are not enforceable or “rarely enforced”. A TVP limit of 11 psia is the maximum allowed vapor pressure of SCAQMD Rule 463, U.S.EPA NSPS Kb and U.S. EPA MACT CC for floating roof tanks. Tesoro is required to comply with these vapor pressure limitations for the commodities in its storage tanks. See Response G1-78.215 that addresses the specific comments raised by Phyllis Fox.

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<sup>122</sup> <http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch14/liquids.php>

**Comment G1-78.58**

The TANKS model also underestimates the Project's VOC emissions from tanks because it does not include roof landings, degassing and cleaning emissions. The TANKS model only estimates evaporative emissions from normal operations. For example, the TANKS model assumes that a floating roof tank is always floating. Dr. Fox explains that when a tank is emptied to the point where the roof no longer floats on the liquid, evaporative losses occur.<sup>141</sup> "These losses are uncontrolled tank emissions and can be larger than routine controlled emissions."<sup>142</sup> The DEIR completely fails to include these "roof landing losses" emissions. The DEIR also fails to include degassing and cleaning losses, which occur when tanks are drained and degassed for inspection and/or cleaning. These are uncontrolled tank emissions that can be larger than normal operating emissions.<sup>143</sup>

G1-78.58

<sup>141</sup> *Id.*, p. 84.

<sup>142</sup> *Id.*, p. 85.

<sup>143</sup> *Id.*

**Response G1-78.58**

See Responses G1-78.217 and G1-78.218 that address the specific comments raised by Phyllis Fox.

Use of a control device during periods of roof landings maintains VOC emissions at or below "normal" daily operating conditions as evaluated by the U.S. EPA TANKS program. Therefore, storage tank emissions presented in the DEIR are evaluated using the highest or peak operating day emissions. All floating roof tanks evaluated by this DEIR have either a fixed roof exterior with a floating interior roof or an external floating roof with a geodesic dome. Under normal operating conditions, tank inspections are performed using only visual and measurement methods (i.e., no opening or removing of the storage tank seals occur). Therefore, additional emissions will not occur as a result of inspection.

**Comment G1-78.59**

Similarly, the TANKS model underestimates the Project's VOC emissions by omitting tank flashing emissions. Tank flashing emissions occur when crude oils with high concentrations of volatile materials, like Bakken, are exposed to temperature increases or pressure drops. When this occurs, some of the compounds transform from liquids to gases and are released or "flashed."<sup>144</sup> The DEIR fails to include these tank flashing emissions in its analysis.

G1-78.59

<sup>144</sup> *Id.*, p. 86.

**Response G1-78.59**

The comment correctly notes that flashing losses typically occur when crude oil pressure is reduced and/or temperatures are increased. Flashing losses can occur at crude oil production facilities where crude oil is removed from underground pressurized conditions and stored in a relatively low pressure atmospheric storage tanks. Crude oil production facility flashing occurs prior to transportation to a refinery. The proposed project does not include equipment to enable flashing of crude oil under storage or transfer conditions as suggested in the comment. See Responses G1-78.217 and G1-78.221 that address the specific comments raised by Phyllis Fox.

**Comment G1-78.60**

The TANKS model also underestimates the Project's VOC emissions by omitting water draw tank emissions. Crude oil typically contains small amounts of water, which accumulates in the bottom of storage tanks. This accumulated water is called "water draw," and is typically transferred from storage tanks to smaller water draw surge tanks for processing prior to disposal.<sup>145</sup> Over time, a thick layer of crude oil forms in the water draw surge tank, and, as a result, the water draw surge tank and processing waters from it emit VOC and TACs.<sup>146</sup> The DEIR fails to include these water draw tank emissions in its analysis.

G1-78.60

G1-78.60  
cont'd.

<sup>145</sup> *Id.*, pp. 86-87.

<sup>146</sup> *Id.*, p. 87.

**Response G1-78.60**

The volume of crude oil delivered to the Carson Crude Terminal after implementation of the proposed project is expected to be the same as is currently being received in the existing storage tanks. Therefore, no change in the amount of water draw for the Carson Operations would occur as a result of the proposed project. The emissions from the increased water draw from the potential 6,000 bbl/day crude oil capacity increase at the Wilmington Operations were included in the increased crude oil delivery. The volume of crude oil delivered was considered to be 100 percent crude oil with entrained water being delivered to the new 300,000 bbl storage tanks. A very small amount of water is carried with the crude oil sent to the storage tanks. All of the emissions associated with the management of crude oil, including water draw emissions, were accounted for at the crude oil storage tanks. The worst-case maximum vapor pressure has already been incorporated into the emission calculations used in the analysis in Chapter 4 of the DEIR. See Response G1-78.222 for responses to the specific comments raised by Phyllis Fox.

**Comment G1-78.61**

In short, the DEIR omits many sources of tank VOC emissions. Dr. Fox explains that the DEIR does not contain sufficient information to correct the omissions. However, according to Dr. Fox, "an increase of only 6 lb/day or 2% more than estimated in the DEIR, would be required to exceed the CEQA significance threshold."<sup>147</sup> In Dr. Fox's opinion, "the many errors and omissions in the tank calculations are sufficient to exceed the VOC significance threshold for the Project. Thus, mitigation for tank emissions must be required."<sup>148</sup> Dr. Fox recommends that, to reduce the Project's emissions from tank breathing losses, degassing, cleaning and roof landing losses, the Air District should require the Applicant to install geodesic domes on all tanks that do not have them and require degassing control equipment for all tank degassing and cleaning vents.<sup>149</sup>

G1-78.61

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

<sup>149</sup> *Id.*, pp. 87-88.

**Response G1-78.61**

As discussed in Responses G1-78.212 through G1-78.223, the DEIR accurately and correctly calculated the potential increase in VOC emissions from the proposed project. Compliance with SCAQMD Regulation XIII requirements to provide VOC offsets is part of the proposed project

(see pages 4-18 of the DEIR). Therefore, no significant VOC emission impacts were identified and, as such, no mitigation is required. All proposed storage tanks would have either domed external floating roofs as requested in the comment or internal floating roofs, which are equivalent and meet current BACT requirements. Moreover, controls are required for all degassing and cleaning activities pursuant to SCAQMD Rule 1149. Therefore, no modification to the proposed project is necessary. Also see Response G1-78.224 that respond to the specific issues regarding tank breathing losses, degassing, cleaning and roof landing losses raised by Phyllis Fox.

**Comment G1-78.62**

**G. The DEIR Fails to Disclose the Project's Health Impacts from Construction Emissions**

Project construction requires the use of diesel-fueled, off-road equipment such as backhoes, bulldozers, paving equipment and cranes. The equipment emits large amounts of diesel particulate matter. Dr. Fox explains that construction is known to cause significant health impacts in surrounding communities.<sup>150</sup> The South Coast Air Basin, where the Project is located, ranks first in California for the greatest construction health impacts, including more than 700 premature deaths, more than 650 hospitalizations for respiratory and cardiovascular illness, more than 1,700 cases of acute bronchitis, nearly 21,000 incidents of asthma attacks and other lower respiratory symptoms, and over 300,000 days of lost work and school absences.<sup>151</sup> Despite this evidence, the DEIR completely fails to disclose the Project's health impacts from construction emissions.

G1-78.62

<sup>150</sup> *Id.*, pp. 110-111.

<sup>151</sup> Don Anair, Union of Concerned Scientists, Digging Up Trouble: The Health Risks of Construction in California, 2006, Figure 1, available at [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean\\_vehicles/digging-up-trouble.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/clean_vehicles/digging-up-trouble.pdf).

**Response G1-78.62**

A health risk assessment regarding the diesel particulate emissions from the construction of the proposed project has been prepared and is included in Appendix H of the FEIR. This health risk assessment has been reviewed by the SCAQMD modeling staff and found to have adequately addressed the complexities of a varying construction schedule. The health risk assessment for construction emissions determined the construction health risk to be 2.9 in one million at the maximum residential receptor location and 2.5 in one million at the maximum worker receptor location. The results of the construction health risk analysis and the combined construction and operational health risks of 9.3 in one million for the MEIW and 5.7 in one million for the MEIR are below the SCAQMD significance threshold for operational health risks. Therefore, the additional information provided on the construction health risk does not substantially increase the severity of the health risk assessment or change the significance determination made in the DEIR on health risk. See Response G1-78.258 for responses to the specific comments raised by Phyllis Fox.

**Comment G1-78.63**

**H. The DEIR Underestimates the Project's Hazards Impacts from Accidents**

The DEIR characterizes its analysis of accident consequences at several units for the Wilmington and Carson Operations as a worst case analysis. The DEIR asserts that the Project would “not introduce the use of new flammable substances or hazardous materials that are not currently used at the Refinery” and “no new sources of accidental releases of new hazardous materials would be present at the Refinery.”<sup>152</sup> The DEIR concludes that the Project poses no greater hazards risks than currently exist at the Los Angeles Refinery. These assertions and conclusions are unsupported and incorrect.

<sup>152</sup> DEIR, p. 4-52.

G1-78.63

**Response G1-78.63**

The comment summarizes the conclusions in the DEIR and does not raise any specific issues with the DEIR. Therefore no response is required.

**Comment G1-78.64**

**1. The Project May Result in More Severe Accident Scenarios than Disclosed or Analyzed in the DEIR**

The DEIR did not analyze a “worst case” accident, let alone all reasonably foreseeable accident scenarios as a result of the Project. Dr. Fox lists the types of accidents that could occur when a flammable material is released and an ignition source is encountered, including, for example, vapor cloud detonation, vapor cloud explosion and flash fire.<sup>153</sup> The DEIR fails to consider most of these reasonably foreseeable scenarios. Rather, the DEIR evaluates either a flash fire or a pool fire at all tanks, processing units and pipelines, except at the mid-barrel distillate treater, where the DEIR evaluated a torch fire. Dr. Fox explains that a pool fire occurs when a flammable liquid forms a puddle on the ground and catches on fire.<sup>154</sup> The accident is contained to the area where the spill occurs. If a flammable spill forms a vapor cloud that encounters an ignition source, the vapor cloud can catch fire and burn rapidly. This is a flash fire. A torch fire is similar to a pool fire, but burns in the form of a torch. These are not reasonably foreseeable worst case accidents because they are contained and do not spread to surrounding equipment or cause explosions.<sup>155</sup>

<sup>153</sup> Fox Comments, p. 90.

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*

G1-78.64

**Response G1-78.64**

A Worst-Case Consequence Analysis for the proposed project was performed (see Appendix C of the DEIR). The analysis performed for the DEIR included multiple scenarios, but only reported the maximum impact or worst-case results (see Section 4.3 and Appendix C of the DEIR). The comment provided no evidence to contradict the analysis presented in the DEIR. See Responses G1-78.226 through G1-78.228 for responses to the specific comments raised by Phyllis Fox.



**Comment G1-78.65**

On the other hand, a “vapor cloud explosion is one of the most dangerous and destructive explosions that could result.”<sup>156</sup> A vapor cloud explosion result from the sudden release of a large quantity of flammable vapor, such as loss of tank containment. The resulting vapor is dispersed throughout the general area while mixing with air. If the mixture encounters an ignition source, a vapor cloud explosion occurs.<sup>157</sup> Dr. Fox explains that there are many ignition sources present in a refinery, from idling vehicles to sparks generated during repairs.<sup>158</sup> A Boiling Liquid Vapor Explosion (“BLEVE”) is also one of the more dangerous and destructive accident scenarios. A BLEVE occurs when a vessel containing a superheated liquid catastrophically fails.<sup>159</sup> Unlike a pool fire or vapor cloud explosion, the liquid within a tank does not have to be flammable to cause a BLEVE. Dr. Fox explains that the Project’s new tanks within or adjacent to existing tank farms present opportunities for a BLEVE.<sup>160</sup> Indeed, the DEIR acknowledges that “[t]he greatest threat to off-site receptors could occur from a vapor cloud explosion (release, dispersion and explosion of a flammable vapor cloud) or a confined explosion (ignition and explosion of flammable vapors within a confined area).<sup>161</sup> Yet, the DEIR only evaluates these types of accidents for LPG railcar loading.

G1-78.65

G1-78.65  
cont’d.

<sup>156</sup> *Id.*, p. 91.

<sup>157</sup> *Id.*

<sup>158</sup> *Id.*, p. 92.

<sup>159</sup> *Id.*

<sup>160</sup> *Id.*

<sup>161</sup> DEIR, p. 3-19.

**Response G1-78.65**

See Responses G1-78.228 through G1-78.231 for responses to the specific comments raised by Phyllis Fox. The comment has mixed a discussion on potential storage tank releases with potential process unit releases. The potential release scenarios are not the same because crude oil storage tanks typically operate at atmospheric conditions (ambient temperature and pressure) while process units operate at higher temperatures and pressures. Therefore, the potential release hazards are not the same. The expected hazard from a contained release of liquid material from a storage tank is a pool fire where the vapors above the liquid ignite. As presented in Table 4.3-2 of the DEIR, the pool fire presents the greatest impact. Flash fires from vapor clouds igniting were analyzed for operating process units and were determined to be the worst-case scenario for some process units (see Table 4.3-2 of the FEIR).

While the comment correctly states that the liquid inside a tank does not have to be flammable to cause a Boiling Liquid Expanding Vapor Explosion (BLEVE), a BLEVE can only occur when the pressure in the vessel exceeds the capacity of the vessel to contain that pressure. Because pressure vessels have safety devices to prevent over-pressure BLEVEs do not occur frequently. The pressure relief valves on pressure vessels are designed to accommodate an increase in pressure in the vessel from the heat from a pool fires below the vessel (i.e., the pressure relief valve will release the pressure to prevent a BLEVE). If a pressure vessel is involved in a BLEVE, the safety equipment may have been damaged. A BLEVE cannot occur in an atmospheric or near-atmospheric, non-pressurized tank such as a crude oil storage tank, regardless of the tank contents.

## APPENDIX G1: RESPONSE TO COMMENTS

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As discussed in Master Response 9 and Responses G1-78.94 and G1-78.122, crude oils with various properties, including Bakken crude oil, are blended at the Refinery today. Safety systems in place at the Refinery are discussed in Section 3.3.6 of the DEIR.

### Comment G1-78.66

The DEIR's failure to evaluate these reasonably foreseeable accident scenarios is particularly alarming because vapor cloud explosions and BLEVEs are more likely to occur when Bakken crude is being handled.<sup>162</sup> Further, vapor cloud explosions and BLEVEs are likely to occur on the Project site because of the proximity of many ignition sources and the high density of tanks and process units that could be engulfed by vapors.<sup>163</sup> In Dr. Fox's opinion:

The release of a flammable material, such as Bakken crude, may result in a vapor cloud explosion, fireball or BLEVE, which could result in much more significant consequences than the accident scenarios that were evaluated in the DEIR. In a vapor cloud explosion, the vapors from a crude oil spill could engulf adjacent tanks or process units and ignite, presenting greater impacts than considered in the DEIR.<sup>164</sup>

<sup>162</sup> Fox Comments, p. 93.

<sup>163</sup> *Id.*

<sup>164</sup> *Id.*

G1-78.66

### Response G1-78.66

The comment provided no evidence to contradict the analysis presented in the DEIR. The analysis presented in the DEIR included multiple scenarios, but reported the maximum impact results that are possible based on the specific characteristics of the Refinery and the proposed project (see Table 4.3-2 of the DEIR). The process units were evaluated compared to baseline conditions in the existing units. The worst-case consequences are presented in the DEIR. Response G1-78.229 addresses the potential for a BLEVE. Additionally, the analysis was based on worst-case crude oil properties that would ensure compliance with SCAQMD Rule 463 vapor pressure limits and that would include all crude oils the Refinery would foreseeably process, including Bakken crude oil. See Responses G1-78.227, G1-78.229 and G1-78.230 that address the specific comments raised by Phyllis Fox.

### Comment G1-78.67

Dr. Fox provides examples of these reasonably foreseeable scenarios. According to Dr. Fox, if the contents of one of the new storage tanks within the existing tank farm at the Wilmington Operations, or one the new tanks at the Carson Operations,

adjacent to the main Carson tank farm, were lost (e.g. during a seismic event), a vapor cloud could engulf adjacent tanks and could ignite (e.g., from welding at an adjacent tank), causing a vapor cloud explosion.<sup>165</sup> "The risks of these types of events at the new tanks are significantly greater than at existing crude oil tanks as they will store Bakken crude oil, which is much more volatile and flammable than crude oils stored in the baseline."<sup>166</sup> Also, for example, the Project includes a pipeway between the Wilmington and Carson Operations. The pipeway includes up to 15 pipelines that would transport gasoline and gasoline blending components, gas oil, crude oil, butylenes, propylene and LPG. Since the Project would increase the number of pipelines in the pipeway, it would increase the potential hazards of an accident.<sup>167</sup> A pipeline break, for example, triggered by an earthquake, could release gasoline and create a vapor cloud that could ignite, involving not only other pipelines in the corridor, but also other nearby facilities, such as tanks and process units.<sup>168</sup> The DEIR fails to disclose these reasonably foreseeable accident scenarios.

G1-78.67

G1-78.67  
cont'd.

<sup>165</sup> *Id.*  
<sup>166</sup> *Id.*  
<sup>167</sup> *Id.*, p. 94.  
<sup>168</sup> *Id.*

### Response G1-78.67

As discussed in Master Response 9 and Responses G1-78.94 and G1-78.122, crude oils with various properties, including Bakken crude oil, are blended at the Refinery today. The comment provided no evidence that a vapor cloud explosion (VCE) would produce a larger impact than the pool fire analyzed in the DEIR. The worst-case consequence analysis in the DEIR evaluates the impacts of a single release of a pipeline in the Interconnecting Piping between Carson and Wilmington Operations. If there are multiple lines in the same pipeline corridor, should there be a concurrent failure of multiple lines; the impact will be defined by the vulnerability zone of the individual line with the largest potential vulnerability zone. The vulnerability zones are not additive; rather, the largest potential vulnerability zone encompasses the vulnerability zones of the other lines. The analysis evaluated, among other things, the flammable properties of materials, temperatures, pressures, and line sizes to determine the worst-case impacts from a release. Responses G1-78.227 and G1-78.228 explain why VCEs will not occur in an unconfined area such as a tank berm. Similarly, VCEs will not occur in the pipeways at the Refinery that are also unconfined. The analysis in Section 4.3.2.3 of the DEIR includes a flash fire hazard from the interconnecting pipeline as the worst-case hazard associated with the pipelines. See Responses G1-78.231 and G1-78.232 that address the specific comments raised by Phyllis Fox.

### Comment G1-78.68

The Applicant is no stranger to these types of severe accident scenarios. For example, a 2010 fatal explosion and fire at the Applicant's refinery in Anacortes, Washington, led state regulators to cite the company for 30 "willful" and five "serious" violations of health and safety regulations. The Washington Department of Labor and Industries called this accident the "worst industrial disaster in the 37 years that L&I has been enforcing the states' workplace safety law."<sup>169</sup> The U.S. Chemical Safety Board concluded that the company's "safety culture" was a key factor in the accident.<sup>170</sup> The accident was attributed to the Applicant's "complacent" attitude towards flammable leaks and failure to correct a history of recurring leaks, failure to maintain equipment and general "deficient refinery safety culture, weak industry standards for safeguarding equipment, and a regulatory system that too often emphasizes activities rather than outcomes."<sup>171</sup>

G1-78.68

<sup>169</sup> Eric de Place, *Tesoro: A Track Record of Pollution, Hostility to Workers, and Meddling in Politics*, Sightline Institute, March 21, 2014; Available at: <http://www.sightline.org/2014/03/21/tesoro-a-track-record-of-pollution-hostility-to-workers-and-meddling-in-politics/>.

<sup>170</sup> U.S. Chemical Safety and Hazard Investigation Board, *Investigation Report, Catastrophic Rupture of Heat Exchanger (Seven Fatalities), Tesoro Anacortes Refinery, Anacortes, Washington, April 2, 2010, Report 2010-08-I-WA*, May 2014; Available at: [file:///C:/Users/Phyllis/Downloads/Tesoro\\_Anacortes\\_2014-May-01.pdf](file:///C:/Users/Phyllis/Downloads/Tesoro_Anacortes_2014-May-01.pdf).

<sup>171</sup> CSB Investigation Finds 2010 Tesoro Refinery Fatal Explosion Resulted from High Temperature Hydrogen Attack Damage to Heater Exchanger, Available at: <http://www.csb.gov/csb-investigation-finds-2010-tesoro-refinery-fatal-explosion-resulted-from-high-temperature-hydrogen-attack-damage-to-heat-exchanger/?SID=97>.

### Response G1-78.68

The comment references the Chemical Safety Board's (CSB) report on the 2010 Anacortes Refinery incident. The CSB's findings and recommendations regarding the Anacortes Refinery incident are based on the incident investigation and do not include a corporate-level assessment. Therefore, the CSB report concerning process safety culture were expressly limited to the Anacortes Refinery and do not apply to any other Tesoro refineries. (See the CSB investigation report referenced in the comment Footnote 335 at Section 1.2.2, paragraphs 18-19; Section 8.6.) The Anacortes Refinery is not related to the proposed project in any way. See Response G1-78.234 for additional information regarding the Anacortes Refinery incident.

### Comment G1-78.69

The DEIR fails to disclose or analyze all of the Project's reasonably foreseeable accident scenarios. The Air District must revise the DEIR accordingly.

G1-78.69

### Response G1-78.69

The comment summarizes the preceding comments, see responses to the above comments that address the specific issues raised.

### Comment G1-78.70

#### 2. The DEIR Fails to Consider the Location of New Tanks as a Factor in Assessing Hazards Impacts

Dr. Fox explains that "[t]he location of a process, such as the new tanks and pipelines in relation to other facilities is a key consideration in evaluating risks."<sup>172</sup> Dr. Fox points out that the Project's new tanks, for example, are within or adjacent to existing tank farms.<sup>173</sup> Thus, an accident at one of the new tanks could generate a vapor cloud that would engulf one or more tanks in the existing tank farms or a vapor cloud from an accident in the tank farm could engulf the new tanks. The location of the Project tanks "significantly increas[es] the impacts of an accident" and "result[s] in significant impacts. If the vapor clouds from these types of events encountered an ignition source, a vapor cloud explosion or BLEVE could result."<sup>174</sup> The Air District must revise the DEIR to consider the location of the Project's proposed tanks.

G1-78.70

<sup>172</sup> Fox Comments, p. 95.

<sup>173</sup> *Id.*

<sup>174</sup> *Id.*, pp. 95-96

### Response G1-78.70

As explained in Response G1.78-227, VCEs are not expected to cause nearby storage tank or process units to become involved in a release scenario because the potential overpressure wave<sup>123</sup> would be insufficient to cause damage to adjacent structures. Contrary to the comment, a BLEVE cannot be generated by an atmospheric tank as explained in Response G1-78.229. Also see Response G1-78.235 that addresses the specific issues raised by Phyllis Fox.

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<sup>123</sup> Attachment H, Quest Consultants Memoranda

**Comment G1-78.71**

**3. The DEIR Fails to Disclose Ignition Sources**

Vapor clouds from spilled flammable liquids, such as imported crude oil, can ignite anywhere within their flammable limits if there is an ignition source.<sup>175</sup> There are many ignition sources at the Project site, including:

- locomotives for LPG and coke trains on the local rail lines;
- traffic on the access road and heavily traveled adjacent public roads;
- workers who smoke;
- hot surfaces;
- open flames from welding;
- electric sparks from motors driving pumps and other equipment;
- suction of crude vapors into diesel engines and subsequent combustion;
- friction sparks, as from trains on the tracks and railcars jamming into each other during stops and starts;
  
- heaters and boilers; and
- increased flaring from new pressure relief valves that will tie into existing flares.

The Air District did not disclose or consider these emissions sources in its analysis of the Project's hazards impacts. The Air District must revise the DEIR accordingly.

<sup>175</sup> *Id.*, p. 96.

G1-78.71

G1-78.71  
cont'd.

**Response G1-78.71**

The ignition source has no bearing on the result of the consequence analysis. The consequence analysis prepared for the proposed project utilizes worst-case dispersion assumptions to generate the largest event that is ignited by any ignition source (see Section 4.3.2.1 of the DEIR). The worst-case scenario for a flammable vapor release was analyzed in the DEIR. See Response G1-78.236 that addresses the specific comments raised by Phyllis Fox.

**Comment G1-78.72**

**4. The DEIR Fails to Include a Health Risk Assessment for Impacts from Refinery Accidents**

The DEIR evaluates the health impacts from the Project's routine operational emissions, but fails to include a health risk assessment for emissions that occur during refinery accidents. The DEIR's analysis of health impacts from routine operational emissions cannot be applied to impacts from refinery accidents for four reasons.

First, the DEIR uses toxic endpoints for five scenarios based on the Emergency Response Planning Guideline 2 ("ERPG-2") for hydrogen sulfide ("H<sub>2</sub>S") and sulfur dioxide ("SO<sub>2</sub>"). However, Dr. Fox points out that "these toxic endpoints are not a reasonable basis to evaluate the significance of accidents that release [toxic air pollutants] and do not constitute or substitute for a health risk assessment."<sup>176</sup> This is because the ERPG-2 values do not protect public health.<sup>177</sup> "An ERPG-2 is the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action."<sup>178</sup> However, "[s]ensitive members of the public, such as old, sick or very young people are not covered by these guidelines and they may experience adverse effects at concentrations below the ERPG levels."<sup>179</sup> Rather, a health risk assessment covers these sensitive members of the public.

G1-78.72

<sup>176</sup> Fox Comments, p. 99.

<sup>177</sup> *Id.*

<sup>178</sup> *Id.*, p. 100

<sup>179</sup> *Id.*

**Response G1-78.72**

See Responses G1-78.240 and G1-78.241 for responses to the specific issues raised by Phyllis Fox. The OEHHA Air Toxic Hot Spots Guidance Manual released in February 2015 provides guidance on preparing health risk assessments. The Manual states, "The emissions reported under this program are routine or predictable, and include continuous and intermittent releases and predictable process upsets or leaks. Emissions for unpredictable releases (e.g., accidental catastrophic releases) are not reported under this program." Therefore, it is not appropriate to use the OEHHA HRA methodology with respect to hazard release scenarios as suggested in the comment.

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. A review of recently certified CEQA documents has shown that it is common practice by lead public agencies to use ERPGs for assessing hazard impacts without adjusting for sensitive populations.

**Comment G1-78.73**

Second, ERPGs are not an appropriate endpoint hazard criteria for accidents because they are focused on exposure of one hour. Dr. Fox explains that exposures from accidents are typically much longer.<sup>180</sup> The American Industrial Hygiene

Association (“AIHA”) developed the ERPGs and “strongly advises against trying to extrapolate ERPG values to longer periods of time.”<sup>181</sup>

<sup>180</sup> *Id.*

<sup>181</sup> Office of Response and Restoration, Emergency Response Planning Guidelines (ERPGs); Available at: <http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/emergency-response-planning-guidelines-erpgs.html>.

G1-78.73

G1-78.73  
cont’d.

**Response G1-78.73**

The use of ERPG2 levels was selected because it represents the “maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual’s ability to take protective action.”<sup>124</sup> While an incident may have a duration of longer than one hour, the ERPG2 is established to allow individuals to evacuate the area within an hour of exposure at the ERPG2 concentration if an evacuation is required. See Response G1-78.241 for responses to the specific comments raised by Phyllis Fox.

**Comment G1-78.74**

Third, ERPGs should only be used when Acute Exposure Guidelines Levels (“AEGLS”) are unavailable.<sup>182</sup> AEGLS are available for H<sub>2</sub>S. AEGLS estimate concentrations at which most people, including sensitive receptors, will experience health effects.<sup>183</sup> Dr. Fox shows that the AEGL H<sub>2</sub>S concentrations at which most people would experience health effects are lower than the ERPG H<sub>2</sub>S concentrations.<sup>184</sup>

<sup>182</sup> Fox Comments, p. 101.

<sup>183</sup> *Id.*

<sup>184</sup> *Id.*

G1-78.74

**Response G1-78.74**

The SCAQMD, as the lead agency, has the discretion to establish significance criteria (CEQA Guidelines §15064.7). The use of ERPGs or AEGLS for a one-hour exposure would yield similar results (AEGL2= 27, ERPG2 = 30). The use of the ERPGs is appropriate for short duration exposures since ERPGs were specifically created to anticipate adverse health effects from once-in-a-lifetime, short-term (1-hour) exposure to a chemical release emergency. See Response G1-78.242 for responses to specific comments by Phyllis Fox.

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<sup>124</sup> 2016 ERPG/WEEL Handbook, available at <https://www.aiha.org/get-involved/AIHAGuidelineFoundation/EmergencyResponsePlanningGuidelines/Documents/ERPG%20Intro%20%282016%20Handbook%29.pdf>, page 4.



**Comment G1-78.75**

Finally, even AEGLs are no substitute for a health risk assessment which evaluates chronic, acute and carcinogenic risks. Moreover, health risk assessments cover many toxic air pollutants (such as mercaptans, dimethyl sulfide, benzene, toluene, hydrogen cyanide, carbon monoxide, fine particulate matter and smoke, among others), not just a single pollutant, such as H<sub>2</sub>S or SO<sub>2</sub>.<sup>185</sup> In addition, Dr. Fox shows that the reference exposure levels used in health risk assessments are much lower than that AEGLs and EPRGs.<sup>186</sup> For H<sub>2</sub>S, for example, the reference exposure level is 0.03 ppm, the AEGL-1 is 0.51 ppm, the AEGL-2 is 27 ppm and the ERPG-2 is 30 ppm.<sup>187</sup>

G1-78.75

<sup>185</sup> *Id.*, p. 102.

<sup>186</sup> *Id.*

<sup>187</sup> *Id.*

**Response G1-78.75**

Health risk assessment one-hour exposure evaluations are based on a one-hour exposure concentration that could persist for an entire hour (e.g., operational fugitive emissions), on any hour of the year. This could be a single hour in a year or every hour in a year. This is not the case for an emergency situation, where there may be an exposure duration of less than one hour. As discussed in Response G1-78.240, acute REL values are not appropriate for accidental catastrophic releases. ERPG levels, however, are based on single short duration exposures and establish thresholds that would not cause permanent health effects. A significance threshold based on analyzing permanent health effects is appropriate for unpredictable accidental releases. An HRA, on the other hand, seeks to analyze the risks from predictable process upset emissions that could create an acute exposure, and thus seeks to prevent non-permanent health impacts. For purposes of hazard impacts analysis, the exposure duration is short due to the rapid release rate when equipment fails and is more appropriately compared to an ERPG. Thus, the DEIR used the appropriate significance criteria for hazard impacts (see also Response G1-78.243).

**Comment G1-78.76**

In short, the DEIR's conclusion that the Project poses no greater hazards risks than currently exist at the Los Angeles Refinery is unsupported by evidence and incorrect. Furthermore, substantial evidence shows that the Project would result in significant impacts from accidents. The Air District must revise the DEIR accordingly.

G1-78.76

**Response G1-78.76**

The comment summarizes preceding comments; see responses above that address the specific issues raised. The DEIR's conclusions are supported by substantial evidence; therefore, no revision of the DEIR is required.

**Comment G1-78.77**

**I. The DEIR Fails to Adequately Disclose and Analyze the Project's Health and Safety Impacts from Onsite Soil and Groundwater Contamination**

The Los Angeles Refinery has a long history of releases of contaminants to soil and groundwater. The DEIR refers to a 2015 soil characterization report prepared for the Project documents soil and groundwater contaminated with LNAPL at the Carson and Wilmington Operations. The DEIR states that, according to the 2015 report, "[o]f the 44 soil samples analyzed, samples indicate that 95 percent of the soil to be potentially excavated will be classified as non-hazardous waste."<sup>188</sup> However, Mr. Hagemann reviewed the 2015 report and found that the DEIR fails to disclose that: (1) exceedances of construction worker health and safety ESLs were found in soils close to areas where Project construction will take place; (2) with few exceptions, samples were not collected where Project construction would disturb soil; and (3) sampling density was "woefully inadequate" to characterize soil contamination.<sup>189</sup> Thus, the DEIR's conclusion is unsupported.

<sup>188</sup> DEIR, p. 3-25.

<sup>189</sup> Hagemann Comments, p. 2.

G1-78.77

**Response G1-78.77**

The DEIR has fully disclosed and analyzed soil and groundwater conditions and potential impacts of the proposed project in Sections 3.3.5 and 4.3.2.6 of the DEIR. The DEIR analysis appropriately characterized the site and presented information on the known contamination at the Refinery in Sections 3.3.5 and Subsections 3.3.5.1 and 3.3.5.2 as part of the Environmental Setting of the DEIR. As indicated in Section 3.3.5 of the DEIR, in order to characterize the soil for disposal purposes, soil samples were collected in areas of the Refinery where previous characterization is limited and construction of the proposed project is to take place. As explained in Section 4.3.2.6 of the DEIR on pages 4-61 through 4-66, the analysis describes the numerous existing rules, regulations, and requirements related to hazards with which the project must comply, and provides support for the fact that construction workers are professionally trained and provided with safety equipment to safely work around the potentially hazardous conditions that are known to exist within the Refinery. See Response G1-78.260 that addresses the specific comments by Matt Hagemann.

**Comment G1-78.78**

Mr. Hagemann evaluated the Project's potential public health and safety impacts from on-site contamination. Based on the 2015 report, Mr. Hagemann prepared maps for the Wilmington and Carson Operations showing the locations near Project construction where soil ESLs for construction workers will be exceeded.<sup>190</sup> In Mr. Hagemann's opinion, if samples targeted the areas proposed to be disturbed by the Project, it is possible that those soil samples would also exceed construction worker ESLs.<sup>191</sup>

<sup>189</sup> Hagemann Comments, p. 2.

<sup>190</sup> *Id.*, pp. 3, 4.

<sup>191</sup> *Id.*, p. 2.

G1-78.78

**Response G1-78.78**

See Responses G1-78.260 and G1-78.261 that address the specific comments by Matt Hagemann. As explained in Response G1-78.260, further health risk analysis is not required and the comment has misapplied the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) environmental screening levels (ESLs) to the proposed project, which is not located in the San Francisco Bay area. Further, as stated in the Disclaimer of the SFBRWQCB ESL User’s Guide, “The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate adverse effects on human health or the environment, rather that additional evaluation is warranted.” The DEIR has provided analysis of the nature and extent of site contamination, and the safety measures and regulations that workers must follow to protect worker safety.

**Comment G1-78.79**

In his comments, Mr. Hagemann describes the health effects of the compounds detected above ESLs at the Wilmington and Carson Operations. For TPH compounds, health effects include central nervous system disruptions (such as headaches, dizziness and peripheral neuropathy) and effects on the blood, immune system, lungs, skin and eyes. For mercury exposure at high levels, health effects include damage to the brain, kidneys and developing fetus. For short-term mercury vapor exposure, health effects include lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes and eye irritation.<sup>192</sup> Despite these health effects, the DEIR completely fails to disclose or mitigate the Project’s potentially significant health impacts on construction workers from the excavation of contaminated soils.

<sup>192</sup> *Id.*, p. 4.

G1-78.79

G1-78.79  
cont’d.

**Response G1-78.79**

Response G1-78.262 addresses the specific comments by Matt Hagemann. The DEIR fully analyzed and correctly determined the proposed project impacts related to soil and groundwater contamination to be less than significant. The purpose of conducting preliminary sampling is to identify areas where potential construction may encounter contamination and allow for the construction team to prepare, appropriately train workers, and provide the proper personal protective equipment to workers in areas where the potential for exposure has been identified. The soil characterization activities relied upon in the DEIR were performed in areas of the proposed project where prior soil characterization had not been performed and where construction would be expected. Therefore, the DEIR provides sufficient information to determine and mitigate potential impacts.

**Comment G1-78.80**

Further, based on the sampling conducted for the Project, the Air District could not determine the extent of the Project’s health impacts from soil and groundwater contamination. As explained above, sampling was not targeted to the Project. While the 2015 report purported sampling in “locations where soil will be generated during the Integration Project,” the maps prepared by Mr. Hagemann show that very few samples were collected in areas where Project construction would occur.<sup>193</sup>

<sup>193</sup> *Id.*, pp. 3-4.

G1-78.80

**Response G1-78.80**

No evidence was provided in the comment to verify the accuracy of the graphic depictions or any supporting calculations of ESL results and thus, the opinion in the comment is unsubstantiated. The soil characterization activities relied upon in the DEIR were performed in areas of the proposed project where prior soil characterization had not been performed and where construction was expected. Therefore, the DEIR provides sufficient information to determine and mitigate potential impacts. See Response G1-78.262 that addresses the specific comments by Matt Hagemann.

**Comment G1-78.81**

Mr. Hagemann also prepared a map showing the location of the Project's proposed pipeline bundle (under the Alameda Corridor and Sepulveda Boulevard) in relation to the disclosed LNAPL. The pipeline bundle requires drilling 80 feet underground. The map shows that the bundle would cross through or near a pool of 0.74-foot thick LNAPL at a depth of 14 feet.<sup>194</sup> The DEIR completely fails to analyze the potentially significant impacts that may result from penetrating the LNAPL. According to Mr. Hagemann, the Project may result in soil and groundwater contamination from "smear[ing] the LNAPL to deeper depths" because "[a]s drilling advances, the 54-inch bore may intersect the LNAPL and drag down relatively shallow contaminants to deeper levels."<sup>195</sup> The DEIR also fails to disclose the "[p]otential need to dewater and the need to handle the LNAPL and the contaminated groundwater associated with the LNAPL."<sup>196</sup> Finally, the DEIR fails to include measures to protect construction workers from direct contact with the LNAPL and from exposure to vapors.<sup>197</sup> In short, the DEIR fails to disclose, analyze and mitigate the Project's potentially significant impacts to construction health and safety, and to soil and groundwater quality, from penetrating the LNAPL. The Air District must revise the DEIR accordingly.

G1-78.81

<sup>194</sup> *Id.*, pp. 5-6.

<sup>195</sup> *Id.*, p. 6.

<sup>196</sup> *Id.*

<sup>197</sup> *Id.*

**Response G1-78.81**

See Response G1-78.263 that addresses the specific comments by Matt Hagemann. No documentation was provided in the comment to verify the accuracy of the information provided in the maps regarding soil sampling. As explained in Response G1-78.261, the soil characterization activities relied upon in the DEIR were performed in areas of the proposed project where prior soil characterization had not been performed during the remediation efforts overseen by the Los Angeles RWQCB (see Sections 3.3.5 and 4.3.2.6 of the DEIR). There was no need to sample in areas of known contamination where on-going remediation is taking place, because that information was already available. The information regarding existing contamination was utilized in the DEIR's analysis as well. The conclusions in the DEIR regarding potential hazards associated with soil and groundwater contamination are thus supported by this adequately disclosed and reasonable sampling method.

**Comment G1-78.82**

**VII. THE DEIR'S PROPOSED MITIGATION MEASURES ARE INADEQUATE**

CEQA prohibits agencies from approving projects with significant environmental impacts when feasible mitigation measures can substantially lessen

or avoid such impacts.<sup>198</sup> An agency may not approve a project unless it has "[e]liminated or substantially lessened all significant effects on the environment where feasible."<sup>199</sup> The mitigation measures that are adopted by the agency must be enforceable through conditions of approval, contracts, or other means that are *legally* binding.<sup>200</sup> Incorporating mitigation measures into conditions of approval ensures that the measures will be implemented, not merely adopted and ignored.<sup>201</sup> Therefore, a project proponent's agreement to a mitigation measure, by itself, is insufficient under CEQA. The mitigation measure must be adopted in a way that makes it an enforceable agreement that actually mitigates the significant environmental impact.<sup>202</sup> The DEIR's proposed measures to mitigate the Project's significant air quality impacts from Project construction, and the Project's significant hazards impacts, are inadequate under CEQA.

<sup>198</sup> Pub. Resources Code § 21002.

<sup>199</sup> CEQA Guidelines § 15092(b)(2).

<sup>200</sup> Pub. Resources Code § 21081.6(b).

<sup>201</sup> *Federation of Hillside & Canyon Ass'ns v. City of Los Angeles* (2000) 83 CA 4th 1252, 1261

<sup>202</sup> *Woodward Park Homeowners Ass'n v. City of Fresno* (2007) 150 CA 4th 683, 730

G1-78.82

G1-78.82  
cont'd.

**Response G1-78.82**

The comment summarizes the comment's understanding of CEQA's mitigation measure requirements and makes a general conclusion that the DEIR proposed mitigation is inadequate. No substantial evidence is provided to support the conclusion. Therefore, no response is required.

**Comment G1-78.83**

**A. The DEIR's Proposed Mitigation Measures for Significant Air Quality Impacts from Construction Emissions are Inadequate**

The DEIR concludes that emissions of VOC and NOx from Project construction are significant.<sup>203</sup> The DEIR proposes eight mitigation measures (with four exceptions), and eight best management practices for construction.<sup>204</sup> However, the DEIR concludes that "[c]onstruction emissions for the proposed project for VOC and NOx are expected to remain significant following mitigation."<sup>205</sup> The DEIR's proposed mitigation is inadequate.

First, mitigation measures A-5 and A-6 require the Applicant to survey, identify and document all construction areas served by electricity and to use only electric welders and power generators in these areas. In Dr. Fox's opinion, the documented survey is an effective measure. However, Dr. Fox points out that other construction equipment is available in electrical models, including pumps, jack hammers, excavators, augers and trucks.<sup>206</sup> The Air District should require the Applicant to use all available electric construction equipment.

<sup>203</sup> DEIR, Table 4.2-2 and p. 4-36.

<sup>204</sup> DEIR, pp. 4.36 – 4-40.

<sup>205</sup> *Id.* p. 4-42.

<sup>206</sup> Fox Comments, p. 104.

G1-78.83

**Response G1-78.83**

The DEIR presents a conservative construction analysis. In order to avoid underestimating emissions from construction, only equipment that Tesoro has full control over was included in the mitigated emissions analysis. This includes the use of electric welders where grid power is available. The use of this assumption in the DEIR, however, does not mean that electrified equipment will not be used elsewhere. On the contrary, Mitigation Measure A-1 requires the inclusion of Best Management Practices in the Construction Management Program. Best Management Practice 7 requires the use of electric power in lieu of diesel power. Therefore, all equipment will be electrified where feasible and available, including the use of power tools. See Response G1-78.246 that addresses the specific comments by Phyllis Fox.

**Comment G1-78.84**

Second, the DEIR's best management practices require maintaining a 1,000-foot buffer zone between truck traffic and sensitive receptors, where feasible. This is not adequate mitigation for three reasons: (1) the measure is limited to truck traffic, but should be expanded to include all diesel and gasoline powered on-site and off-site construction equipment; (2) there is no basis for selecting 1,000 feet as the buffer, which should be determined by health risk assessments (which were not conducted for the Project's construction emissions); and (3) the DEIR fails to require that the buffer be enforced or verified as adequate.

G1-78.84

**Response G1-78.84**

See Response G1-78.248. No offsite construction is planned within 1,000 feet of sensitive receptor locations, so the measure would only apply to trucks. Therefore, the mitigation measure does not require modification. The 1,000-foot buffer zone is not an arbitrary distance. The buffer zone follows the recommendations outlined in the Los Angeles County Metro Green Construction Policy. Also as explained in Response G1-78.258, the health risk impacts from construction are less than significant for sensitive receptors and offsite workers, including the residential receptors within the proposed 1,000-foot buffer zone. Consequently, there is no need to modify the buffer zone since no significant health risks were identified in these areas. Therefore, additional mitigation is not warranted.

**Comment G1-78.85**

Finally, the DEIR includes exceptions to complying with mitigation measures A-2 through A-8 for on-road and off-road construction equipment and generator requirements. These exceptions allow the Applicant to step down to dirtier equipment or vehicles if: (1) cleaner equipment is not available for lease or short-term rental within 200 miles of the Project site; (2) agency funding was not provided to cover the equipment retrofit or purchase cost; (3) equipment purchased at least 60 days prior to use has not arrived; or (4) the equipment would be used for less than 10 days.<sup>207</sup> Simply put, these exceptions allow the Applicant to plan poorly and avoid mitigation, rendering the measures meaningless. For effective mitigation, the Air District should require the following feasible alternative measures: (1) if a compliant engine is not available, equip available engines with retrofit controls; (2) extend the search radius to 1,000 miles from the Project site; and (3) modify on-site stationary source equipment to reduce NO<sub>x</sub> and VOC emissions during Project construction.<sup>208</sup>

G1-78.85

<sup>207</sup> DEIR, p. 4-38.

<sup>208</sup> Fox Comments, p. 106.

**Response G1-78.85**

See Response G1-78.249 that addresses the specific comments by Phyllis Fox. The mitigation measures in the DEIR are more restrictive and thus more beneficial than the proposed language in Comment G1-78.246, which more vaguely allows avoiding mitigation where not “feasible”. The DEIR specifically limits the project proponent's discretion to make a determination that the cleanest equipment is not feasible or available, to those instances defined in the mitigation measure itself, see Response G1-78.246. The 200-mile radius included in the mitigation measure covers the Los Angeles and San Diego metropolitan areas, which are highly urbanized areas with heavy construction. If the requisite equipment is available, it will most likely be found in the metropolitan areas that are within 200 miles of the proposed project. Extending the search radius to 1,000 miles is not expected to change the limitations brought on by availability and feasibility.

**Comment G1-78.86**

In addition, Dr. Fox recommends the following feasible mitigation measures to reduce the Project's significant impact from construction emissions:<sup>209</sup>

- Implement EPA's National Clean Diesel Program;
- Diesel- or gasoline-powered equipment shall be replaced by lowest emitting feasible equipment for each piece of equipment from among these options: electric equipment whenever feasible, gasoline-powered equipment if electric infeasible;
- If cranes are required for construction, they shall be rated at 200 hp or greater equipped with Tier 4 or equivalent engines;

G1-78.86



## APPENDIX G1: RESPONSE TO COMMENTS

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- Use electric fleet or alternative fueled vehicles where feasible including methanol, propane, and compressed natural gas;
- Use alternative diesel fuels, such as Clean Fuels Technology (water emulsified diesel fuel), or O2 diesel ethanol-diesel fuel (O2 Diesel) in existing engines;
- Convert part of the construction truck fleet to natural gas;
- Include "clean construction equipment fleet", defined as a fleet mix cleaner than the state average, in all construction contracts;
- Fuel all off-road and portable diesel powered equipment with ARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road);
- Use electric fleet or alternative fueled vehicles, where feasible, including methanol, propane, and compressed natural gas;
- Use on-road, heavy-duty trucks that meet the ARB's 2007 or cleaner certification standard for on-road diesel engines, and comply with the State on-road regulation;
- Use idle reduction technology, defined as a device that is installed on the vehicle that automatically reduces main engine idling and/or is designed to provide services, e.g., heat, air conditioning, and/or electricity to the vehicle or equipment that would otherwise require the operation of the main drive engine while the vehicle or equipment is temporarily parked or is stationary;
- Minimize idling time either by shutting off equipment when not in use or limit idling time to 3 minutes (5 minutes is required by 13 CCR 2449[d][3], 2485, so is not "mitigation"). Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the 3 minute idling limit. The on-site construction manager shall enforce this limit;

G1-78.86  
cont'd.

APPENDIX G1: RESPONSE TO COMMENTS

- Prohibit diesel idling within a buffer zone established by health risk assessment to protect sensitive receptors and use an on-site monitor to enforce this distance;
- Staging and queuing areas shall not be located within a buffer zone established by health risk assessment to protect sensitive receptors and use an on-site monitor to enforce this distance;
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time;
- The engine size of construction equipment shall be the minimum practical size;
- Catalytic converters shall be installed on gasoline-powered equipment;
- Signs shall be posted in designated queuing areas and job sites to remind drivers and operators of the idling limit;
- Engine size of construction equipment shall be the minimum practical size;
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time;
- Construction worker trips shall be minimized by providing options for carpooling and by providing for lunch onsite;
- Use new or rebuilt equipment;
- Maintain all construction equipment in proper working order, according to manufacturer's specifications. The equipment must be check by an ASE-certified mechanic and determined to be running in proper condition before it is operated;
- Use low rolling resistance tires on long haul class 8 tractor-trailers;
- Use diesel-electric and hybrid construction equipment;
- Maintain all construction equipment in proper working order, according to manufacturer's specifications. The equipment must be check by an ASE-certified mechanic and determined to be running in proper condition before it is operated; and
- All off-road diesel-powered equipment must be tested to confirm tailpipe emissions do not exceed 20% opacity for more than three minutes in any hour. Any equipment found to exceed 20% opacity must be repaired immediately. The Air District should require a weekly visual inspection of all in-operation equipment by the contractor and witnessed monthly or more frequently by the Air District. A periodic summary of the visual survey results must be submitted by the contractor throughout the duration of the project to the Air District. The summary should include the quantity and type of vehicles inspected and dates.

G1-78.86  
cont'd.

G1-78.86  
cont'd.

The Air District must revise the DEIR to include all feasible measures necessary to mitigate the Project's significant impact from construction emissions.

<sup>208</sup> Fox Comments, p. 106.

<sup>209</sup> *Id.*, pp. 106 - 110.

**Response G1-78.86**

As explained in Response G1-78.258, the health risk impacts from construction at receptor locations (sensitive or worker) are below the CEQA health risk thresholds. Therefore, no additional mitigation is required. See Responses G1-78.246 through G1-78.257 that address the specific proposed additional mitigation measures proposed by Phyllis Fox.

**Comment G1-78.87**

**B. The DEIR's Proposed Mitigation Measures for Significant Hazards Impacts from Accidents are Inadequate**

The DEIR concludes that the Project's hazards impacts from the Naptha Isomerization Unit, new crude tanks, SARP and interconnecting piping would remain significant after the incorporation of mitigation.<sup>210</sup> The DEIR's proposed mitigation measure is inadequate.

Substantial evidence shows that these programs were in place when two catastrophic events occurred – the 2010 accident at the Applicant's Anacortes refinery and the 2012 accident at the Chevron refinery.<sup>211</sup> Clearly, the programs were not enough to prevent these catastrophic accidents. Indeed, the U.S. Chemical Safety and Hazard Investigation Board concluded that these programs were not

effective at preventing refinery accidents in its analysis of the Tesoro Anacortes accident.<sup>212</sup>

The Chevron Refinery Modernization Project EIR incorporated many additional mitigation measures to reduce that project's significant hazards impacts from accidents. Dr. Fox includes the list of feasible measures in Exhibit 30 to her comments and recommends that these measures be included in a revised DEIR.

G1-78.87

G1-78.87  
cont'd.

<sup>210</sup> DEIR, p. 1-29.

<sup>211</sup> Fox Comments, p. 103.

<sup>212</sup> U.S. Chemical Safety and Hazard Investigation Board, Tesoro Anacortes Refinery, May 2014, Section 7.8.

**Response G1-78.87**

See Response G1-78.244 that addresses the specific proposed additional mitigation measures proposed by Phyllis Fox. Contrary to the suggestion in the comment, compliance with regulatory programs and requirements are considered appropriate mitigation under CEQA. Additionally, the SCAQMD has reviewed the Chevron FEIR hazard mitigation measures. Those related to safety plans and inspections are functionally equivalent to HHM-1 of the DEIR that requires early implementation of safety requirements, such as Process Safety Management (PSM) hazards assessments and updates to the Risk Management Plan (RMP), Hazardous Materials Business Plan, and Spill Prevention Control and Countermeasure Plan. Other mitigation measures required in the Chevron FEIR are specific to the Chevron Richmond Refinery and thus are not applicable to or necessary for the proposed project.

**Comment G1-78.88**

**VIII. THE DEIR FAILS TO DISCLOSE THE PROJECT'S INCONSISTENCIES WITH THE CITY OF CARSON'S GENERAL PLAN**

Under California law, a general plan serves as a "charter for future development"<sup>213</sup> and embodies "fundamental land use decisions that guide the future growth and development of cities and counties."<sup>214</sup> The general plan has been aptly described as "the constitution for all future developments" within a city or county.<sup>215</sup> Further, the "propriety of virtually any local decision affecting land use and development depends upon consistency with the applicable general plan and its elements."<sup>216</sup> The consistency doctrine has been described as the "linchpin of California's land use and development laws: it is the principle which infuses the concept of planned growth with the force of law."<sup>217</sup>

The DEIR fails to acknowledge the Project's conflicts with a number of the City of Carson's General Plan goals and policies. These goals and policies were adopted for the purpose of avoiding or mitigating environmental impacts.<sup>218</sup> Therefore, these inconsistencies are significant environmental impacts. The Air District must revisit the DEIR's General Plan consistency analysis and must disclose and mitigate any inconsistencies in a revised DEIR that is circulated for public review and comment. The following are examples of these inconsistencies:

G1-78.88

<sup>213</sup> *Leshar Communications, Inc. v. City of Walnut Creek* (1990) 52 Cal.3d 531, 54.

<sup>214</sup> *City of Santa Ana v. City of Garden Grove* (1979) 100 Cal.App.3d 521, 532.

<sup>215</sup> *Families Unafraid to Uphold Rural El Dorado County v. Board of Supervisors of El Dorado County* (1998) 62 Cal.App.4th 1334, 1335.

<sup>216</sup> *Citizens of Goleta Valley v. Board of Supervisors of County of Santa Barbara* (1990) 52 Cal.3d 553, 570.

<sup>217</sup> *Corona-Norco Unified School District v. City of Corona* (1993) 17 Cal.App.4th 985, 994.

<sup>218</sup> CEQA Guidelines §X(b).

**Response G1-78.88**

The comment summarizes the commenter's understanding of CEQA's consistency with general plan requirements and makes a general conclusion that the proposed project is inconsistent with the City of Carson's general plan. No substantial evidence is provided to support the conclusion. Therefore, no response is required under CEQA.

Under CEQA §15125, an agency is required to identify and discuss any inconsistencies between a proposed project and the applicable general plan. In Section 4.10.7, the DEIR explained that all land uses in the vicinity of the proposed project are zoned for heavy industrial use, and therefore the project is consistent with all land use and planning requirements, including those set forth in the City of Carson's General Plan.

Responses G1-78.89 and G1-78.90 further explain that the proposed project is not inconsistent with the City of Carson's General Plan.

**Comment G1-78.89**

**A. The Project is Inconsistent with Public Safety Goals 4 and 5**

The City of Carson General Plan considers “[p]ublic safety relating to the handling and exposure of the community to hazardous materials.”<sup>219</sup> The purpose of Goal SAF-4 is to “[m]inimize the threat to the public health and safety and to the environment posed by a release of hazardous materials.”<sup>220</sup> The General Plan also recognizes the risk of urban fires “to both residents and workers within Carson,” which “can result in the release of hazardous toxic substances...”<sup>221</sup> The purpose of Goal SAF-5 is to “[m]inimize the public hazard from fire emergencies.”<sup>222</sup>

The Project is inconsistent with Goals SAF-4 and SAF-5 because, as described above and in the attached comments of Dr. Fox, the Project would result in significant, unmitigated hazards impacts associated with accident risks (explosion, fire, spills) from the increased import and storage of Bakken (or similar light) crude oil. Thus, the Project *increases* the public health and safety threats from hazardous materials and fires.

G1-78.89

<sup>219</sup> City of Carson General Plan, p. SAF-32.

<sup>220</sup> *Id.*

<sup>221</sup> *Id.*, p. SAF-33.

<sup>222</sup> *Id.*, p. SAF-34.

**Response G1-78.89**

The comment correctly states the general considerations and goals of the City of Carson’s General Plan with respect to hazardous materials and urban fires. However, the comment omits the specific policies that the City of Carson adopted in order to further those goals, and those policies make clear that the City’s General Plan does not intend to ban any activity which could result in hazards or fires. Instead, the City of Carson requires strict enforcement of all applicable federal, state, and local laws and regulations to ensure that these threats will be minimized (see, e.g., Policy SAF-4.1 & SAF-5.5, <http://ci.carson.ca.us/content/files/pdfs/GenPlan/Chapter06.Safety.pdf>). The proposed project’s adherence to such laws and regulations and all feasible hazards mitigation is thus consistent with these goals and policies.

As explained in response to the numerous other comments alluded to within the comment, including Phyllis Fox’s comments as well as the comment’s own assertions regarding the hazards analysis associated with accident risks, the DEIR fully and properly evaluated the potential worse-case hazards impact. Additionally, as explained in Master Response 9, the proposed project does not introduce new chemicals that have different flammable characteristics than those currently in use. Also, the comment provides no evidence to contradict the analysis as presented in the DEIR. See Master Response 9, Responses G1-78.225 to G1-78.244 and Responses G1-78.63 to G1-78.76 that address the specific comments by Phyllis Fox and the comment regarding the hazards analysis and associated mitigation.

The hazard analysis takes a worst-case approach by assuming that the entire contents of a tank or other equipment would rapidly be released, and that no safety measures are implemented that could reduce the severity of an accidental release. It is expected that hazard impacts would be less than analyzed because the Refinery has safety measures in place and specified employees are trained regarding safety measures. Further, the DEIR imposes measures to mitigate hazard impacts (see Section 4.3.3 of the DEIR). Finally, as described in Section 3.3.7 of the DEIR, the

Refinery is subject to many laws and regulations that address safety and emergency responses in the event of an accident.

The proposed project is not inconsistent with the broad and largely permissive language of SAF-4 and SAF-5 aiming to minimize “the threat to the public health and safety and to the environment posed by a release of hazardous toxic substances” and “the public hazard from fire emergencies.” The comment does not identify any particular standard or mandatory provision in the City of Carson’s General Plan with which the proposed project potentially conflicts. Therefore, pursuant to *City of Long Beach v. Los Angeles Unified Sch. Dist.*, no further analysis is required.

**Comment G1-78.90**

**B. The Project is Inconsistent with Air Quality Goals and Policies**

The General Plan recognizes that “dust not only creates a nuisance, but those temporary and permanent uses which generate substantial amounts of dust can impact the health of residents.”<sup>223</sup> Thus, the purpose of Goal AQ-1 is to reduce “particulate emissions from paved and unpaved surfaces and during building construction.”<sup>224</sup> Policy AQ-1.1 is to “mandate the use of dust control measures to minimize this nuisance.”<sup>225</sup> Also, Goal AQ-2 is to improve regional air quality to meet State and federal standards.<sup>226</sup> In addition, Goal AQ-5 is “[r]educe emissions related to industry to enhance air quality.”<sup>227</sup> Policy AQ-5.1 is to use the “City’s Planning processes” to “reduce air pollutant emissions by mitigating air quality impacts associated with facilities/industries in Carson, to the greatest extent possible.”<sup>228</sup>

The Project is inconsistent with these air quality goals and policies because, as described above and in Dr. Fox’s attached comments, Project construction and operation would result in significant, unmitigated air quality impacts. The Project would increase particulate emissions, fails to utilize all feasible measures to reduce particulate emissions, would deteriorate regional air quality, and would increase industry-related emissions. Therefore, the Project would worsen air quality, not improve it.

G1-78.90

G1-78.90  
cont’d.

<sup>219</sup> City of Carson General Plan, p. SAF-32.

<sup>223</sup> *Id.*, p. AQ-10.

<sup>224</sup> *Id.*

<sup>225</sup> *Id.*

<sup>226</sup> *Id.*, p. AQ-11.

<sup>227</sup> *Id.*, p. AQ-15.

<sup>228</sup> *Id.*

**Response G1-78.90**

The comment correctly states the general considerations and goals of the City of Carson’s General Plan with respect to air quality and is accurate in its statement that the air quality impacts of the proposed project’s construction emissions are expected to be significant. However, the comment’s conclusory assertion that the proposed project is inconsistent with Goals AQ-1, AQ-2, and AQ-5 is not supported by substantial evidence.

Goal AQ-1 and the comment’s assertions focus on the dust emissions that result from construction. While dust is a subset of particulate matter, the two are not synonymous. With respect to dust specifically, SCAQMD Rule 403 contains the same general purpose as AQ-1,

which is to reduce particulate matter as a result of dust sources. As such, the proposed project's dust emissions will be regulated by the actions required to "prevent, reduce or mitigate dust emissions" under SCAQMD Rule 403. Additionally, the general guiding principle of AQ-1 underscores the impact of dust on the health of residents. As explained in Response G1-78.258, the health risk impacts from construction were determined to be less than significant. As such, the proposed project is not in conflict with the general goals and principles of AQ-1. See Responses G1-78.245 to G1-78.258 and G1-78.62 that addresses the specific comments by Phyllis Fox and the comment regarding the construction emissions and the associated health risk assessment.

As explained in Section 4.2.2.2 of the DEIR, upon completion, the proposed project will result in regional and local reductions in CO emissions and local reductions of operational NOx, SOx, PM10, and PM2.5 emissions, largely attributed to the shutdown of the Wilmington Operations Fluidized Catalytic Cracking Unit (FCCU). The increase in operational VOC emissions associated with the proposed project was found to be less than significant. The proposed project emissions are described in detail in Section 4.2 of the DEIR and are summarized in Table 4.2-4 (see pages 4-16 through 4-18). The proposed project will result in local overall reductions in GHG emissions, as described in Section 5.2 of the FEIR and summarized in Table 5.2-8 (see page 5-26). These local beneficial reductions are squarely consistent with Carson's General Plan in that they achieve the industry related emission reductions sought by Goal AQ-5.

With respect to regional emissions, the DEIR conservatively concludes that proposed project's impact will be neutral as a result of the state and local cap-and-trade programs. Based upon these programs, the SCAQMD assumes any local or project-specific emission reductions will not result in regional reductions because another facility could purchase the project's right to produce those emissions. Because the proposed project's regional emissions are conservatively neutral and will not increase, the proposed project is consistent with the broad and largely permissive language of Goal AQ-2 which aims to generally achieve "air quality which meets State and Federal standards."

As just discussed, the proposed project is not inconsistent with the City of Carson's General Plan and the comment does not identify any particular standard or mandatory provision in the General Plan with which the proposed project conflicts. Therefore, pursuant to *City of Long Beach v. Los Angeles Unified Sch. Dist.*, no further analysis is required under CEQA.

**Comment G1-78.91**

**IX. CONCLUSION**

The DEIR is inadequate and must be withdrawn. We urge the Air District to prepare and circulate a revised DEIR which includes a complete Project description and an accurate description of the environmental setting upon which to measure the whole Project's reasonably foreseeable impacts. The revised DEIR must also identify *all* of the Project's potentially significant impacts, and require all feasible mitigation measures to reduce the Project's significant environmental and public health and safety impacts.

We thank you for the opportunity to provide these comments on the DEIR.

G1-78.91



**Response G1-78.91**

The comment is a general summary statement based on the entirety of the comment letter. As explained in detail in the responses to the comment letter and the Fox and Hagemann attachments, the DEIR adequately analyzes the impacts of the proposed project and applies all feasible mitigation. No substantial evidence has been provided that would change the conclusions of the DEIR.

**Comment G1-78.92**

**I. INTRODUCTION, SUMMARY AND CONCLUSIONS**

I have reviewed the Draft Environmental Impact Report (DEIR) for the Tesoro Los Angeles Refinery Integration and Compliance Project (Project).<sup>1</sup> This Project will allow Tesoro to integrate the operation of two adjacent refineries, the Carson Operations and the Wilmington Operations, into a single refinery, the Los Angeles Refinery.

Based on my review, I conclude this DEIR is fundamentally defective in that it omits crucial information required to understand the Project's significant impacts, omits many significant impacts, and underestimates impacts that were included, as follows:

- The DEIR fails to analyze the air quality and other impacts from refining a different crude slate than in the baseline;
- The Project is piecemealed;
- The DEIR reports the capacity of the Los Angeles Refinery as 363,000 bbl/day, but fails to disclose baseline throughput. Tesoro's most recent SEC 10K filing indicates that the Refinery achieved 363,000 bbl/day in 2015 and that the design capacity of the refinery is 380,000 bbl/day. Thus, the Project could increase throughput by up to 17,000 bbl/day or double the amount claimed in the DEIR;
- The DEIR fails to acknowledge the increase in marine vessel emissions, which are significant;
- The DEIR incorrectly calculated the increase in heater emissions from increased firing rates, resulting in a significant underestimate of toxic air pollutants and criteria pollutants. When these errors are corrected, the increase in NOx emissions from increases in heater firing rates results in a significant and unmitigated NOx impact.
- Emission reductions from the shutdown of the Wilmington FCCU are unsupported and improperly calculated.

G1-78.92

## APPENDIX G1: RESPONSE TO COMMENTS

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- Greenhouse gas emissions from crude and LPG transport to/from the refinery as well as from advantaged crude production were omitted from the emission inventory, would increase, and are significant;
- Flaring emissions were omitted and, combined with other omitted emission sources, are significant;
- Operational VOC emissions from fired sources are underestimated and are significant;
- Cancer risks are significant at the MEIR, MEIW, and sensitive receptor when revised to use the crude oil benzene concentration disclosed in the new tank applications;
- Storage tank VOC emissions are underestimated and are significant;
- Impacts from accidents were underestimated and are significant;
- All feasible mitigation was not required for identified significant accident impacts;
- Construction emissions are significant and all feasible mitigation was not required; and
- Health effects of construction were not evaluated.

Specifically, the DEIR does not disclose the Project's baseline and post-project crude slate, relies on flawed analyses in addressing whether the Project would enable refining of substantial quantities of Bakken crudes and tar sands, relies on unsupported assumptions as to the Project's light crude composition, and underestimates the Project's operational emissions of volatile organic compounds (VOCs), nitrogen oxides (NOx), and toxic air contaminants (TACs). When these underestimates are corrected, the Project results in significant air quality and public health impacts. The emission increase calculations are unsupported, because Tesoro has claimed key emission input data as confidential business information. The District must correct these defects and recirculate the DEIR, so that the public and decision-makers can be fully informed of the Project's air quality, public health, and safety impacts.

<sup>1</sup> Environmental Audit, Inc., Tesoro Los Angeles Refinery Integration and Compliance Project, Draft Environmental Impact Report, Submitted to: South Coast Air Quality Management District, SCH No. 2014091020, March 2016; Available at: <http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects>. The Tesoro Los Angeles Refinery Integration and Compliance Project is sometimes referred to as the LARIC Project, notably in DEIR, p. 2-20 and Appendix. F.

G1-78.92  
cont'd.

### Response G1-78.92

The comment summarizes the conclusions reached in the comment letter. The concerns raised in the comment are provided in more detail in subsequent comments and responded to in detail in subsequent responses as noted in Table 78.92-1.

**Table 78.92-1**

**Topics Raised in Comments and Location of Responses**

Topic	Response	
	Master Response Number	Specific Response Number
Crude Oil Slate	4	G1-78.94 – G1-78.174
Accurate Project Description	-	G1-78.99, G1-78.105, G1-78.146, and G1-78.148
Refinery Capacity	5	G1-78.208
Marine Vessel Emissions	6	G1-78.175 – G1-78.198
Heater Emissions	12	G1-78.200 – G1-78.206
FCCU Emission Reductions	13	G1-78.210 and G1-78.211
Mobile Source GHG Emissions	-	G1-78.199
Flaring Emissions	15	G1-78.207
Operational VOC Emissions	-	G1-78.201 and G1-78.202
Health Risk Assessment	-	G1-78.156 – G1-78.159
Storage Tank Emissions	-	G1-78.212 – G1-78.224
Hazard Impacts	9	G1-78.225 – G1-78.243
Hazard Mitigation	-	G1-78.244
Construction Emissions and Mitigation	-	G1-78.245 – G1-78.257
Construction Health Risk Assessment	-	G1-78.258

Note: - = No Master Response prepared on this topic.

**Comment G1-78.93**

My resume is included in Exhibit 1 to these Comments. I have over 40 years of experience in the field of environmental engineering, including air emissions and air pollution control; greenhouse gas (GHG) emission inventory and control; air quality management; water quality and water supply investigations; hazardous waste investigations; hazard investigations; risk of upset modeling; environmental permitting; nuisance investigations (odor, noise); environmental impact reports, including CEQA/NEPA documentation; risk assessments; and litigation support.

G1-78.93

## APPENDIX G1: RESPONSE TO COMMENTS

I have M.S. and Ph.D. degrees in environmental engineering from the University of California at Berkeley with minors in Hydrology and Mathematics. I am a licensed professional engineer (chemical) in California and a Board Certified Environmental Engineer, certified in Air Pollution Control by the American Academy of Environmental Engineers.

I have prepared comments, responses to comments and sections of EIRs for both proponents and opponents of projects on air quality, water supply, water quality, hazardous waste, public health, risk assessment, worker health and safety, odor, risk of upset, noise, land use and other areas for well over 100 CEQA documents. This work includes Environmental Impact Reports (EIRs), Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries; crude oil rail terminals in California, Louisiana, Oregon, New York, Texas, and Washington; and various other permitting actions for tar sands and light shale crude refinery upgrades in Indiana, Louisiana, Michigan, New York, Ohio, South Dakota, Utah, and Texas and liquefied natural gas (LNG) facilities in Texas, Louisiana, and New York. I worked on environmental issues at the Wilmington Refinery for a previous owner of the refinery.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (2001) 111 Cal.Rptr.2d 598 and *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310.

My comments on the FEIR were prepared with assistance from Ian Goodman on crude supply for the Tesoro Los Angeles Refinery.<sup>2</sup>

<sup>2</sup> Ian Goodman testimony regarding the Vancouver Energy Terminal (VET), a major source of future crude supply for the Tesoro Los Angeles Refinery: Ian Goodman Direct Testimony, Washington Energy Facility Siting Evaluation Council, Case No. 15-001, May 12, 2016, Exhibit 27. Ian Goodman Resume, Exhibit 27, pdf 65-93, also available at: <http://www.thegoodman.com/pdf/TGG20160122IanGoodmanCV.pdf>.

G1-78.93  
cont'd.

### Response G1-78.93

The comment summarizes the resume of Phyllis Fox, but does not comment on the proposed project or the environmental analysis in the DEIR. No response is necessary.

### Comment G1-78.94

#### II. THE DEIR FAILS TO ANALYZE THE AIR QUALITY AND OTHER IMPACTS FROM REFINING DIFFERENT TYPES OF CRUDE

The DEIR has failed to disclose any information about the crudes that were refined in the baseline and crudes that will be refined after the Project is operational. The source of, and chemical and physical composition of, the individual crude oils that have been and will be refined are essential to determine numerous impacts, including air quality, public health, odor, and consequences of accidents. The DEIR, for example, explains that the "hazards [from accidents] that are likely to exist are identified by the physical and chemical properties of the materials being handled and the process conditions."<sup>3</sup> In spite of this clear recognition of the importance of the physical and

chemical properties of the materials being handled (e.g., crude oil and intermediate refining streams), the DEIR asserts that all of this information is confidential business information (CBI).

<sup>3</sup> DEIR, p. 1-27.

G1-78.94

G1-78.94  
cont'd.

**Response G1-78.94**

The proposed project is not designed to, and will not in fact, facilitate any change in the slate of crude oils purchased by the Refinery. See Master Response 4.

As explained in Sections 2.5.3 and 2.5.4 of the DEIR, the Refinery is currently processing a blend of various crude oils and the proposed project is not designed to facilitate a change in the crude oil blend<sup>125</sup> processed by the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend. The DEIR explains on page 2-37, that revision of the permit description for the DCU H-100 heater has the potential for a small increase in crude oil capacity (6,000 bbl/day) or a slightly heavier crude oil blend. Section 2.5.4.3 and Appendix F of the DEIR includes the independent evaluation of the proposed project by Dr. Stephen McGovern, a refinery expert, who concluded that the project will not allow for a significant change in the properties of the crude oil blend. Dr. McGovern has also provided a Response to Comment Letter 78 which is included as Attachment D and further explains his conclusions. Additionally, Master Response 4 explains the proposed project does not substantially change the crude oil blend processed at the Refinery. Because the crude oil blend does not change significantly, even if the individual crude oils purchased change as a result of the market, there will be no associated potential impacts of processing various crude oils at the Refinery.

The various crude oil properties raised in the comments are addressed in detail in subsequent responses as shown in Table 78.94-1.

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<sup>125</sup> For clarity, the list of individual crude oils that can be or is purchased to be mixed together to be processed in the Refinery is called the “crude oil slate.” The resultant proportional mix of crude oils is called the “crude oil blend.”

**Table 78.94-1  
Crude Oil Properties Location of Responses**

<b>Topic</b>	<b>Response Numbers</b>
Crude Oil Vapor Pressure	G1-78.114 – G1-78.118, G1-78.122, G1-78.124 – G1-78.133
Light Sweet Crude SDS Properties	G1-78.157
Additional Crude Oil Evaluations Performed by Tesoro	G1-78.150, G1-78.170, G1-78.171, G1-78.174
Bakken is a Class III Flammable Material	G1-78.160
Bakken Does not Have Wax Deposits	G1-78.162
Benzene in Dilbits Comparable to Conventional Crude Oils	G1-78.164
Dilbit Yields Comparable to Other Heavy Crude Oils	G1-78.165
Mercaptans Occur in All Crude Oil	G1-78.167
Asphaltene/Resins in Dilbit Comparable to Other Heavy Crude Oils	G1-78.170
Hydrogen Deficiency in Dilbit Comparable to Other Heavy Crude Oils	G1-78.171
Bitumen Crude Oil Contaminants Comparable to Other Heavy Crude Oils	G1-78.172
Metal Content of Dilbit Comparable to Other Heavy Crude Oils	G1-78.172, G1-78.173
TAN Limits	G1-78.172, G1-78.174
Sulfur Species Hazards	G1-78.111, G1-78.166, G1-78.168
Crude Oil Odors	G1-78.112

Because the proposed project was not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery, or a significant change in the crude oil blend that can be processed by the Refinery, the information that the comment requests on crude oil properties was not relied upon or necessary to complete the impact analysis in the DEIR. Further, the information requested (detailed information about the crude oil slate purchased by the Refinery and crude oil blend processed by the Refinery) is trade secret/confidential business information that is protected pursuant to Public Resources Code § 21160. The petroleum refining business is competitive. As explained in Master Response 2, strategic, trade secret information is present in all aspects of the business including, but not limited to, crude oil supply, blending and processing capacity, Refinery process unit configuration, individual process stream parameters, process unit rates and design details, Refinery product yields, and product distribution capabilities. Tesoro’s crude oil slate (the list of crude oils processed by the Refinery at a given time), blend (the proportional mixture of crude oils processed by the Refinery at a given time) and processing rate are all trade secret information. If this information were made publicly available, Tesoro’s competitors could use it to their advantage. For example, a competitor of Tesoro might not have concluded that certain cost-effective crude oils could be blended and processed at their refinery. Once armed with the knowledge that Tesoro was processing a particular crude oil blend, the competitor could evaluate those crude oils for their Refinery crude oil blend and pursue purchase of these crude oils. This additional demand could potentially drive up the price of these crude oils. In this scenario, Tesoro’s competitive



advantage could be harmed in two ways: (1) the knowledge that a particular crude oil blend can be processed for a given refinery configuration is now known to the competition and the potential advantage of being unique in the ability to mix this crude oil into the Refinery's blend is lost; and (2) the resultant crude oil price increase would harm Tesoro's profitability and could lead to the increased price of motor fuels to public consumers. While limited information on crude oil imports to various refineries is made available from the U.S. Energy Information Administration (U.S. EIA), this information on its own is not adequate to deduce a refinery's crude oil processing slate or blend.

As summarized above, the properties of the individual crude oils that have been or will be processed by the Refinery do not need to be separately analyzed, except for potential storage and transfer impacts associated with new and modified crude oil storage tanks that were fully analyzed in Chapter 4 of the DEIR. Additionally, information regarding specific crude oils processed by the Refinery is a trade secret that will not be disclosed.

The comment cites a general statement in the Executive Summary (page 1-27 of the DEIR) that hazards are identified by the physical and chemical properties of the materials handled and the process conditions. The statement is accurate, but is not specific to crude oil properties. The DEIR contains information required to assess the hazards as analyzed in Section 4.3 (pages 4-45 through 4-68) and Appendix C of the DEIR.

**Comment G1-78.95**

In the baseline, 2012 and 2013, crude oil from California, the Alaska North Slope, and foreign imports were refined. The Project would displace some of these imports with Bakken, other light crudes, and tar sands crudes, imported from proposed terminals and/or existing terminals.

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G1-78.95

**Response G1-78.95**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see FEIR sections 2.7.1.3 and 4.1.2.1 and Master Response 4). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. As explained in detail in the DEIR, the proposed project is designed to meet the objectives stated in Section 2.2 of the DEIR. Implementation of the proposed project will not displace crude oil previously refined by the Refinery, and the comment fails to support with facts the claim that it will do so. Master Response 8 and the Declaration of Douglas Miller<sup>126</sup> describe the factors that determine the optimal crude oil supply for the Refinery, including the crude oil properties that can meet the Refinery's processing

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<sup>126</sup> See Attachment C, Declaration of Douglas Miller, Vice President, California Value Chain Strategy of Tesoro Companies, Inc.



**APPENDIX G1: RESPONSE TO COMMENTS**

constraints, price, availability, and the logistics of transporting specific crude oils to the Refinery. As explained in Master Response 4, the crude oils that have historically been received by the Refinery vary with market availability, and this will continue with or without the proposed project. The proposed project does not change the Refinery’s processing constraints and it does not displace current crude oil imports with imports from proposed and/or existing terminals. As described in Responses G1-78.178 and G1-78.186, no decline in California crude oil production is foreseeable, and there is no evidence that the proposed project would displace California crude oils. Any crude oil sources other than California, such as Alaska, or other world-wide sources, would continue to arrive in marine vessels and the change would occur with or without the proposed project.

The various crude oil supply topics raised in the comment are addressed in detail in subsequent responses as shown in Table 78.95-1.

**Table 78.95-1  
Topics Raised in Comment and Location of Responses**

Topic	Response	
	Master Response Number	Specific Response Number
Crude Oil Supply	8	G1-78.134 – G1-78.140, G1-78.142, G1.78-146 – G1.78.155
Crude Oil Processed by the Refinery	4	
California Crude Production	-	G1-78.178, G1-78.186

**Comment G1-78.96**

Tesoro, in a joint venture with Savage Companies, is proposing a new 360,000 bbl/day rail-to-marine terminal at the Port of Vancouver in Washington (Vancouver Energy Terminal or VET). The VET would receive Bakken and tar sands crudes<sup>4</sup> by rail and then transport the crudes by marine vessel to Tesoro’s California refineries and other west coast refineries. The VET DEIS, for example, in the accidents and oil spills analyses, assumes Bakken crude oil and diluted bitumen (DilBit), a Canadian tar sands crude, would be handled.<sup>5</sup> While other crudes could be handled by the VET, these are the most likely, given Tesoro’s public statements and filings in many fora, reviewed below and proximity of the sources to the VET.

G1-78.96

<sup>4</sup> Energy Facility Site Evaluation Council (EFSEC), Tesoro Savage Vancouver Energy Project, Draft Environmental Impact Statement (VET DEIS), January 22, 2016, pp. 2-65, 2-73, 4-29/31, 5-51, Appendix B, p. 1 (“The Facility would be designed and constructed to unload Bakken crude oil, and possibly other heavier grades such as diluted bitumen crude oil, from railcars in Terminal 5.”), Appendix E, p. 39, Appendix J; Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/SEPA%20-%20DEIS/DEIS%20PAGE.shtml>.

<sup>5</sup> VET DEIS, Tables 4-6 and 4-7 and pp. 4-33/34 (explaining that DilBit or diluted bitumen is a Canadian tar sands crude).

**Response G1-78.96**

As described in Master Response 8, the Final EIS has not yet been issued for the Vancouver Energy Project, nor has the project been approved. Additionally, as explained in Section 4.1.2.5

of the DEIR, the Vancouver Energy Project is wholly independent from the proposed project and is undergoing separate environmental review by the Washington State EFSEC.

In addition to Master Response 8, the responses to claims that the Vancouver Energy Project would supply the Refinery with Bakken and heavy Canadian crude oils are addressed in detail in subsequent Responses G1-78.134, G1-78.139, G1-78.141, and G1-78.143 through G1.78-145.

**Comment G1-78.97**

Bakken is the largest and most likely source of light sweet crude as the rail haul distance between Bakken and the VET is shorter, faster, and lower cost than to other actual and potential markets for Bakken. Further, the VET DEIS assumes both Bakken and DilBit can and will be handled by the VET and analyzes impacts of both spills and accidents for both crude types.<sup>6</sup> Finally, Tesoro is heavily invested in Bakken.<sup>7</sup>

G1-78.97

<sup>6</sup> VET DEIS pp. 4-29 through 31, 4-26, 5-51, 2-65, 2-73; Appendix E, p. 39; Appendix J.

<sup>7</sup> 12/9/14 Tesoro and Tesoro Logistics Analyst and Investor Day Transcript, p. 17, Exhibit 15 (“Obviously, our Bakken business, which has been the center of a lot of our growth, it’s where we really work on acquisition of crude oil. We pick it up in trucks; we have gathering pipelines; we have our mainlines. We store crude; we deliver it to rail facilities and we deliver it to Tesoro’s refinery...We’ve obviously been investing quite a lot around our Bakken system; we’re investing in our West Coast system to grow our capabilities there, matched to the things Tesoro is trying to do.”)

**Response G1-78.97**

Tesoro is a refining and marketing company that does not own or invest in crude oil production fields. Tesoro owns infrastructure and facilities to transfer and process crude oil produced by others. Response G1-78.123 further addresses the claim regarding Tesoro investments in the Bakken formation area in the mid-Continent in more detail. Although the Vancouver Energy Project, if approved, might handle Bakken crude oil, there is nothing in the proposed project scope that would cause an increase in the amount of Bakken crude oil processed at the Refinery. The comment is general and does not raise any issues regarding the impacts of the proposed project; therefore, no further response is required. Rather, the comment is focused on the Vancouver Energy Project, which is independent of the proposed project and is being analyzed in a separate DEIS.

**Comment G1-78.98**

These new crudes differ chemically and physically from the current crude slate. These differences will cause environmental impacts that were not considered in the DEIR. As explained by Tesoro in its VET DEIS<sup>8</sup>:

Different crude oils exhibit a wide range of properties based on the proportions of these chemicals within them. Crude oil chemical composition influences fate and transport in the environment as well as potential toxicity to human and other biologic receptors. Important physicochemical properties of crude oil include:

- API gravity (a measure of how dense an oil is compared to water);
- Vapor pressure, which indicates how quickly the crude oil will evaporate;
- Flash point, which is the lowest temperature at which the crude oil will vaporize and ignite in air;
- Viscosity, which determines how readily the crude oil would flow when released;
- Solubility, which represents the propensity of crude oil to dissolve in water; and
- Chemical constituents present in the oil (proportion and volume).

These characteristics influence the level of evaporation or volatilization of the released liquid in the environment, its persistence in the environment, and the amount of potentially toxic material that could dissolve or disperse into the aquatic environment. For instance, if a crude oil has an API gravity greater than 10, it indicates that the oil is lighter than water and will float; conversely, a crude oil with an API gravity less than 10 will sink in water.

<sup>8</sup> VET DEIS, pp. 4-32/33.

G1-78.98

**Response G1-78.98**

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see FEIR Sections 2.7.1.3 and 4.1.2.1). As described in Response G1-78.95 above, the proposed project is not predicated on refining any particular type of crude oil. Rather, Sections 2.5.4.1 and 2.5.4.2 of the DEIR explain the basic crude oil operating envelope, or acceptable ranges of basic crude oil properties (API gravity and sulfur content) specific to the Refinery. The Refinery purchases crude oils based on both the ability to process the crude oil within the Refinery operating envelope and cost, and this practice will continue after the proposed project is implemented. The proposed project does not change these Refinery crude oil processing constraints. The storage and transfer of unblended crude oil in the proposed new and replacement storage tanks has been fully analyzed in Chapter 4 of the DEIR based on worst-case properties of crude oils currently and potentially stored in the tanks, including Bakken crude oil. Master Response 8 explains that the Vancouver Energy Project is a separate independent project that will go forward with or without the proposed project.

The Section of the Vancouver Energy Project DEIS quoted in the comment refers to environmental factors affecting crude oil spill impacts. For the purposes of assessing potential spill impacts of a new marine terminal (e.g. the Vancouver Energy Project), these factors are pertinent. However, as an existing facility that receives crude oil from around the world (see Master Response 4 Table 2.4-1) with varying crude oil properties, the Refinery already receives and processes crude oil with these properties and the proposed project does not change the types of crude oils processed. Therefore, the potential spill impacts from the various crude oil properties will remain the same as the baseline potential impacts.

The issues raised in the comment are specific to transport and storage and are not applicable to processing because the crude oil is blended and the proposed project does not change the crude oil operating envelope or the crude oil blend.

**Comment G1-78.99**

Instead of disclosing baseline and post-Project crude quality information and basing analyses on these changes, Tesoro asserts that there will be no change in the crude slate or crude quality. This assertion is contrary to information that Tesoro has disclosed in various presentations, earnings calls, and SEC filings. These sources, as demonstrated below, indicate that Tesoro is planning to change its crude slate, including importing significant amounts of Bakken and tar sands crudes to its Los Angeles Refinery. These crude slate changes are facilitated by the Project.

My review of the DEIR and other publicly available Tesoro information indicates that the Project is designed to achieve maximum flexibility in crude slate to reduce operating costs and maximize profits by refining the cheapest available crude. Precedent (piecemealed) projects coupled with the Integration Project allow the Refinery to process a range of crudes, from a significant amount of Bakken and other similar light crudes, to a significant amount of tar sands and other heavy crudes. The DEIR should have acknowledged this and evaluated the maximum impacts from the reasonably foreseeable slate changes, which would be encompassed by a largely Bakken slate and a largely tar sands slate.

Further, the Tesoro Los Angeles Refinery did not refine Bakken crude in the baseline and refined only very small amounts of tar sands crude in the baseline. The information reviewed below indicates that Tesoro plans to significantly increase the amount of Bakken and tar sands crudes that will be refined as a result of the Project. Thus, the DEIR must evaluate the environmental impacts of a crude slate change.

G1-78-99

G1-78.99  
cont'd.

**Response G1-78.99**

The comment attempts to redefine the proposed project scope as a crude oil flexibility project based on other unrelated corporate statements. A comprehensive review of Tesoro's corporate statements and their intent in the context in which they were made is provided in Responses G1-78.132 through G1-78.154. None of those corporate statements specify the objectives or goals of the proposed project and there are no corporate statements that state or even imply that the proposed project is designed to facilitate a change in the crude oil blend processed by the Refinery. Corporate statements are high-level company-wide goal-oriented objectives.

As detailed in subsequent responses, which are listed in Table 78.94-1, Bakken and heavy Canadian crude oils are similar to other light and heavy crude oils currently processed by the Refinery. As explained in Master Response 4, and Response G1-78.150, in the future, as now, any Bakken or heavy Canadian crude oils processed would have to be combined with other crude oils to create a crude oil blend that matches the Refinery's processing capabilities and permit limitations. This is what has occurred with the Bakken, heavy Canadian, and many other heavy and light crude oils that were utilized in the baseline period, and is what will continue after the construction of the proposed project. It is correct to say that Tesoro makes ongoing efforts to provide "advantaged crude oil", as that term is used by Tesoro (i.e., any economically advantaged crude oil capable of being processed at each of Tesoro's refineries). Providing

“advantaged crude oil” to Tesoro refineries, including the Los Angeles Refinery, is occurring independent of the proposed project. Any increased use of Bakken or heavy Canadian crude oils, or any other specific crude oils, would not be caused by the proposed project. Moreover, the proposed project’s impacts were analyzed in detail using the worst-case assumptions (e.g., the maximum vapor pressure of crude oil allowable by SCAQMD rules), which would account for any impacts from increased use of Bakken or heavy Canadian crude oil.

In any event, as described in more detail in Response G1-78.160 and page 4 of Attachment D, Dr. McGovern's Response to Letter 78, Bakken and heavy Canadian crude oils have similar properties to conventional light and heavy crude oils. No additional impacts from Refinery operations have been experienced or would be expected if Bakken and heavy Canadian crude oils are processed within the Refinery's crude oil blend.

**Comment G1-78.100**

**A. The DEIR Must Evaluate the Impacts of the Full Range of Crude Oil Types That Could Be Refined**

The DEIR fails to disclose specific crude oil sources (which determine emissions from transport) and chemical and physical composition data for materials that were refined in the baseline and that would be refined in the future by the Project.<sup>9</sup> The DEIR only reports operating ranges for sulfur and API gravity.<sup>10</sup> The full physical and chemical composition of the individual crudes that make up a crude slate and the final crude slate itself determine many environmental impacts, including air quality, public health, odor, water quality impact in the event of spills, and consequences of accidents, among others.

G1-78.100

<sup>9</sup> DEIR, Appx. F, p. F-7 (“...detailed information concerning the quality and potential sources of crude oil both processed in the past and contemplated to be processed in the future at Tesoro’s Los Angeles Refinery are business confidential information and therefore are not included in the EIR or this report.”)

<sup>10</sup> DEIR, p. 2-16. (Acceptable ranges “for Carson Operations is an API gravity range of 28 degrees to 35 degrees and sulfur content of 0.6 to 3.5 weight percent sulfur. The basic crude oil operating envelope for the Wilmington Operations Crude Unit is an API gravity range of 19 degrees to 37 degrees and sulfur content of 0.0 to 2.5 weight percent sulfur.”)

**Response G1-78.100**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4 and FEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery’s operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery’s crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro’s future crude oil slates. Additionally, as further described below, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

As described in Section 2.5.4.1 of the DEIR, API gravity and total sulfur are the critical parameters needed to understand whether a crude oil blend will fit into the operating envelope for the Refinery. As explained in Section 2.5.4.2 of the DEIR, the Refinery currently uses a proprietary Linear Program to determine whether the individual crude oils available can be processed or blended with another available crude oil to be processed within the parameters of the Refinery. The crude oil characteristics considered in Linear Program evaluations include sulfur and nitrogen content, gravity (or density), organic acid content, TAN, the content of metals and other impurities, and cost. While API gravity and sulfur content are the key considerations for the basic crude oil operating envelope, other parameters are evaluated. See Responses G1-78.150, G1-78.170, and G1-78.172 for further discussion of additional crude oil evaluations performed to ensure that crude oil blends fit into the Refinery process equipment limitations. If the crude oil can be blended to fit within the operating envelope of the Refinery, it can be purchased, and there will be no resultant change in impacts; if it does not fit within the operating envelope, it will not be purchased. The use of the Linear Program and other crude oil evaluation tools will continue with or without the proposed project. As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend.

Potential environmental impacts including air quality, public health, potential odors, water quality in the event of spills and consequences of accidents have all been fully analyzed with respect to the 6,000 bbl/day increased crude oil capacity associated with the DCU H-100 heater and new equipment, such as the Carson Crude Terminal storage tanks, and included in Chapter 4 of the DEIR. The new storage tanks were analyzed to accommodate the variety of crude oils expected to be stored and, once blended, the processing of the crude oil is the same as the current operations. The proposed project analyzed impacts of the modifications to be made to the Refinery that would have environmental impacts (e.g., increased utilization of heaters; see Section 4.1.2.1 of the DEIR).

Crude oil sources constantly change and will continue to change in the future based on market conditions. To the extent that crude oil may be transported by the Vancouver Energy Project, the impacts are analyzed in the DEIS for that project.<sup>127</sup> The proposed project does not affect the sourcing of crude oil. In any event, the proposed project's impacts were analyzed using the worst-case assumptions (e.g., the maximum vapor pressure allowable by SCAQMD rules), which would account for any impacts from the increased use of Bakken, heavy Canadian or any other crude oil at the Refinery.

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<sup>127</sup> Draft EIS for the Tesoro Savage Vancouver Energy Distribution Terminal Project available at <http://www.efsec.wa.gov/Tesoro%20Savage/SEPA%20-%20DEIS/DEIS%20PAGE.shtml>.

**Comment G1-78.101**

The reported API gravity and total sulfur content of the current crude slate are just lumped parameters that are not useful for evaluating environmental impacts. The specific chemicals in the crude and their concentrations are required to evaluate impacts. This type of information is reported in a crude assay or “fingerprint” of the oil, which are available to Tesoro, and in fact, are routinely collected to evaluate any crude under consideration. Yet, this information was excluded from the DEIR, foreclosing any meaningful public review of environmental impacts.

G1-78.101

**Response G1-78.101**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery. Master Response 4 and Section 2.5 of the DEIR describe that refineries obtain crude oil from multiple sources based on economic and transportation considerations. A variety of crude oils are processed by the Refinery during any operating year and at any particular time. As explained in Response G1-78.94 and Master Response 217, Tesoro’s individual crude oil assays are trade secret information. Nonetheless, new storage tank permits and the DEIR evaluate specific properties of the materials stored in those tanks. This is often done, as it was for the proposed project, by evaluating a range of properties of materials that could be stored in the tanks. A “hybrid” of the combined data (see Appendix B-3 Table A-19 (pages B-3-110 through B-3-112 of the DEIR)) is developed to ensure that the evaluated data is the highest value of the properties in the data sets. This ensures that the storage tank crude oil properties evaluated are conservative, represent the variety of crude oils that may be stored in the tanks, and present the worst-case impacts. With respect to Refinery processing equipment, as described in Section 2.5.4 of the DEIR, the crude oil blend processed by the Refinery will not change significantly since it must meet the physical and permit constraints associated with the processing equipment. Therefore, no additional crude oil processing impacts are expected from the proposed project beyond those evaluated in Chapter 4 of the DEIR. The crude oil blends must be within the operating envelope of the Refinery as explained in Master Response 4. Each individual crude oil is not processed separately and need not be evaluated independently.

**Comment G1-78.102**

Rather, the DEIR asserts that there would be no changes because all crudes will be blended to the same API gravity and sulfur content operating range. The only mention in the DEIR of alternate crudes is a response to comment on the Storage Tank Replacement and Modification project. In response to this comment, the DEIR asserts that “[t]he Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oil, and no modifications are being proposed in the Tesoro Refinery Integration and Compliance Project that would increase the ability of the Refinery to process Bakken crude oil.”<sup>11</sup> This is incorrect. The Los Angeles Refinery has processed Bakken crude oil and concluded that it is “ideal” for the refinery as it increases yields of gasoline and distillate. Further, numerous disclosures by Tesoro in other fora indicate that it plans to import both Bakken and tar sands crudes to the integrated Los Angeles Refinery.

G1-78.102

<sup>11</sup> DEIR, Appx. A, p. 4-5/6.



### Response G1-78.102

The comment summarizes specific comments made later in the letter. See Responses to Comment G1-78.132 through G1-78.138 addressing the specific issues raised in the comment. See also Master Response 4.

The Refinery has limited ability to process Bakken or other light crude oils because of physical limitations of the existing Crude Unit distillation columns. Therefore, regardless of whether processing Bakken crude oil at the Refinery would be advantageous in some way, as explained in Section 2.5 of the DEIR, the Refinery is unable to increase processing of this crude oil without blending and ensuring that the resultant crude oil blend fits within the existing crude oil operating envelope due to operating and permitting constraints that will continue to exist after completion of the proposed project. See Response G1-78.135 that clarifies a statement by Tesoro’s President and CEO Greg Goff that based on the then-current market, Bakken “is still the right supply source for the [Anacortes] Refinery.”

### Comment G1-78.103

1. DEIR Appendix F Claims Are Incorrect

Instead of disclosing this critical information, essential to evaluate Project impacts, the District retained a “refinery expert” to buttress the claim that there would be no changes in the crude slate.<sup>12</sup> However, a “refinery expert” does not have the required expertise to opine on the relationship between crude quality and public health, air quality, risk of upset, and other environmental impacts. The information in Appendix F is irrelevant, misleading, and inconsistent with CEQA as it fails to recognize that impacts under CEQA must be determined relative to the baseline. These erroneous Appendix F arguments are carried over into the DEIR to justify not evaluating impacts due to changes in the crude slate, even though Tesoro has admitted that changes in crude slate affect environmental impacts in other fora<sup>13</sup> and has publicly disclosed its intention to change the Los Angeles Refinery crude slate.

G1-78.103

<sup>12</sup> DEIR, p. 2-20 and Appx. F.

<sup>13</sup> VET DEIS, pp. 4-32/33.

### Response G1-78.103

The purpose of Dr. McGovern’s assessment was to provide an evaluation of the proposed project scope based on his technical refinery expertise given his educational background, over 40 years of technical refinery experience and numerous patents and published papers (see Appendix F, pages F-5 and F-33 – F-37 of the DEIR). The primary objective was to determine whether the scope of the proposed project could accommodate a change in the crude oil blend processed by the Refinery, and whether a change would cause increases in air pollutants or increase the risk of upsets. Specifically, Dr. McGovern, was retained to, and is qualified to evaluate the questions below (see page F-5, Appendix F of the DEIR):

1. *Does the proposed LARIC Project provide the ability to change the slate of crude oil that could be delivered and processed at the Tesoro Los Angeles Refinery?*

2. *If so, how would those qualities change and what effect could they have in the blending and crude processes (even if the permits for those processes are not changing?) Would the crudes be significantly heavier (have lower American Petroleum Institute (API) gravities) and/or contain more sulfur and be more acidic than the crudes they would replace? Would the crudes delivered to the Tesoro Los Angeles Refinery be significantly lighter and/or contain more volatile organic hydrocarbons than the crudes they would replace?*
3. *If the Tesoro Los Angeles Refinery modifications would facilitate refining a different slate of crude oil, would that change in slate cause an increase in criteria air pollutants, toxic air containments or GHG emissions from the Tesoro Los Angeles Refinery during the refining process?*
4. *If the Tesoro Los Angeles Refinery modifications would facilitate refining a different slate of crude oil, would that change in slate cause an increase in the risk of upset (increase in the potential for accidents that could lead to emergency events)?*

The evaluation of potential increases in air pollutants and risk of upset is based on chemical and physical properties of crude oils, with which Dr. McGovern has significant expertise. Contrary to the comment, Dr. McGovern was not hired to opine on the relationship between crude oil quality and public health, or other environmental impacts.

**Comment G1-78.104**

First, Dr. McGovern argues “the LARIC project will not change the modes by which Tesoro receives crude oil into the refinery complex. As such, the LARIC project will not allow Tesoro to access crudes that are not currently available to the refinery.”<sup>14</sup> I agree that the “modes” of crude receipt, pipeline and marine vessel, will not change. However, this is not the relevant factor under CEQA. The “availability” by mode is not the relevant factor under CEQA, but rather, the actual amount of each crude that arrived in the baseline compared to future projections. It is immaterial if it was “available” but not actually used. As demonstrated below, no Bakken and very little tar sands was refined in the baseline, 2012-2013.

The Project facilitates a change in the relative amounts of crude that can be received by marine vessel compared to pipeline by significantly increasing marine terminal storage tank capacity and marine vessel unloading speed. The maximum potential increase in marine deliveries in barrels per day (and corresponding decrease in pipeline deliveries), relative to baseline deliveries, is the metric relevant for CEQA impact analyses. As demonstrated below, the Project will result in an increase in both marine vessel emissions and storage tank emissions, relative to the baseline, due to Project changes in crude slate.

<sup>14</sup> DEIR, p. 2-20 and Appx. F, p. F-6.

G1-78.104

**Response G1-78.104**

The comment opines that marine deliveries of crude oil will increase and displace pipeline deliveries, refers to no or limited amounts of Bakken and “tar sands” crude oils being processed in the baseline period, and assumes that California crude oil supply is declining and will be replaced by Bakken or Canadian suppliers. The comment speculates on the supply and demand

of crude oil but ignores economics and crude oil supply issues that are essential to crude oil sourcing decisions made by refiners.<sup>128129</sup> Crude oil sourcing decisions depend on a number of factors that must be evaluated in near real time to account for variability of crude oil pricing, quality and other factors.

As explained in Responses G1-78.178 and G1-78.186, California crude oil production declined historically, but that decline has leveled off and production has increased slightly in the recent past as shown in Figure 78.186-1. There is no evidence to suggest a decline in California crude oil production in the foreseeable future, and the claim in the comment that marine vessel deliveries will increase to replace pipeline deliveries is unsubstantiated. The proposed project has no impact on the supply of California crude oils, which are received by the Refinery via pipeline. Any decline in the availability of California crude oil would occur with or without the proposed project and is independent of the proposed project. According to Tesoro, the Refinery currently receives ten to 20 percent of its crude oil via pipeline and the rest via marine terminal. The proposed project is not expected to have an impact on pipeline crude oil deliveries. Because there is no foreseeable decline in pipeline receipts of crude oil, the DEIR does not project or analyze any expected increase in marine deliveries to replace pipeline receipts.

It is incorrect to assume that increasing the Refinery's crude oil storage capacity and the marine vessel unloading rate would increase Refinery capacity (see Master Response 6) or marine vessel emissions. Refinery capacity is limited by processing equipment capacity, not marine vessel unloading rate. The project will reduce marine vessel emissions since marine vessels would no longer need to partially unload, maneuver out to anchor and "hotel" while running their engines, and then return to the dock when more storage capacity is available to complete unloading. The crude oil storage portions of the proposed project enable Tesoro to discontinue using marine vessels essentially as floating storage tanks, and eliminate the associated marine vessel emissions. Instead the proposed project enables crude oil to be transferred more efficiently to fixed, land-based storage tanks with BACT emission controls. Attachment D, Dr. McGovern's Response to Comment Letter 78, further explains that there is no causal link between increased crude oil storage capacity and increased deliveries of crude oil via marine vessels.

As explained in Response G1-78.188, the impact analysis in the DEIR included the potential increased crude oil refining capacity that would result from the proposed project (i.e., 6,000 bbl/day or 2.2. million bbl/yr) and assumed that it would be delivered by marine vessel to the Long Beach Marine Terminal.

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<sup>128</sup> See Attachment C, Declaration of Douglas Miller, Vice President, California Value Chain Strategy of Tesoro Companies, Inc.

<sup>129</sup> Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G178.104.

**Comment G1-78.105**

*Second*, Dr. McGovern argues that “processing configurations” limit the instantaneous quality of the crude mix that can be processed.<sup>15</sup> However, blending is used at refineries to reduce concentrations of substances that cause refining issues, but not environmental impacts. Further, many of the impacts of concern occur in the storage tanks and from fugitive components before the crude is blended into a “slate” in the charging tanks and reach processing units, where processing constraints come into play.

G1-78.105

Refineries have two types of tanks: (1) storage tanks, which receive crude oil and are generally limited to a single type of crude oil and (2) charging tanks, which feed crude oil into the distillation units. Storage tanks typically hold the crude for about 24 hours to allow any water to separate. The oil is then pumped to charging tanks, where different crudes are mixed to achieve an optimal mix for the distillation tower.<sup>16</sup> The objectionable refining parameters, such as too much sulfur, are blended out in these charging tanks, but not the parameters responsible for environmental impacts. Tesoro has already installed a blending system at Carson to mitigate refining problems caused by a change in crude slate. This is one of several piecemealed projects, as discussed elsewhere in these comments.

G1-78.105  
cont'd.

<sup>15</sup> DEIR, p. 2-20 and Appx. F, p. F-6.

<sup>16</sup> John Kemp, Operational Constraints Limit Crude Storage at U.S. Refineries, Reuters, September 14, 2015; Available at: <http://www.reuters.com/article/us-usa-refineries-oilstorage-kemp-idUSKCN0RE17620150914>.

**Response G1-78.105**

Pre-blending impacts associated with the proposed project’s storage tanks and fugitive emissions are analyzed in the DEIR (see page 4-22 through 4-23 and Table 4.2-4 of the DEIR). The potential environmental impacts associated with the new and replacement storage tanks have been analyzed carefully. In order to ensure that emission estimates were conservatively high, the crude oil vapor pressure allowable by SCAQMD Rule 463 (approaching the TVP limit of 11 psia) was assumed as a basis for the new and replacement storage tanks and fugitive emissions in the DEIR (see Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.105).

The Carson Operations has had a blending system in place for many years that utilizes both in-line blending and tank blending. In-line blending is mixing of crude oil or products in a piping manifold, where multiple pipelines combine into a single pipeline containing the blended material. Tank blending is the circulation of materials in a tank to make a blend. In 2013, prior to Tesoro’s acquisition of the Carson Operations, BP upgraded the crude oil blending system at the Carson Crude Terminal to increase in-line blending capabilities. This pre-existing blending system is not a part of the proposed project and was installed before Tesoro owned the Carson Operations or developed the proposed project scope. The proposed project contains no modifications to the crude oil blending system. The operation of the crude oil blending system is part of the baseline. Further information regarding the crude oil blending system upgrade is provided in Response G1-78.148. The blending system functions the same, regardless of the source of crude oil being blended. It provides an efficient method to ensure a well-blended crude oil mix to meet the processing constraints of the Refinery.

Contrary to the article in Footnote 16, the Refinery prefers not to blend crude oil in charge tanks. While tank blending does occur, in-line blending is preferable to tank blending for several reasons including efficient mixing and reduced emissions. Tank blending may not be efficient or effective and could result in layers of various crude oils in tanks instead of a well-blended (homogeneous) mixture. If this occurs, the crude oil quality fed to the unit would vary over time, and could change suddenly, as the tank is emptied. This in turn could cause unit upsets if the crude unit is not fed a homogeneous mixture of crude oil because distillation tower operation is sensitive to varying feed composition. Additionally, mixing crude oil in a tank results in emissions from circulating the tank; in-line blending does not have these emissions since the piping is a closed system. These are some of the reasons that in-line blending systems are preferred and installed or improved at refineries.

**Comment G1-78.106**

*Third*, the constituents in crudes that may result in environmental impacts (e.g., benzene) do not cause processing constraints and are very different from those that do cause processing problems (e.g., sulfur, waxes, naphthenic acids).

*Fourth*, Dr. McGovern asserts the crude slate (characterized by API gravity and sulfur content) will not change and thus operating emissions, criteria air pollutants, TACs, or greenhouse gas emissions, would not change.<sup>17</sup> However, there are many physical and chemical properties of the crude that are not related to API gravity and sulfur content that vary independent of these crude slate variables and can result in

<sup>17</sup> DEIR, p. 2-20 and Appx. F, p. F-6.

G1-78.106

**Response G1-78.106**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery’s operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery’s crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro’s future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

Chapter 4 of the DEIR analyzed all the potential impacts of storing and transferring unblended crude oils, including TACs, such as benzene, using a worst-case hybrid crude oil TAC speciation (see Response G1-78.157). As explained in Sections 2.5.3 and 2.5.4 of the DEIR, the Refinery is currently processing a blend of various crude oils in its crude oil blend.

The Refinery does consider many properties in blending crude oil. Page 2-16 of the DEIR includes a discussion of the crude oil characteristics considered when blending crude oils: “The crude oil characteristics considered include sulfur and nitrogen content, gravity (or density), organic acid content, TAN, the content of metals and other impurities, and cost.” While API gravity and sulfur content are the key considerations for the basic crude oil operating envelope, other parameters are evaluated. See Responses G1-78.150, G1-78.170, and G1-78.172 for further discussion of additional crude oil evaluations performed to ensure that crude oil blends fit into the Refinery process equipment limitations. See Response to Comment G1-78.106 in Attachment D, Dr. McGovern's Response to Comment Letter 78, that specifically addresses stringent benzene and VOC product specifications that are part of the Refinery optimization process. As explained in Master Response 4, any changes in the sources of crude oil processed by the Refinery would occur with or without the proposed project.

**Comment G1-78.107**

*Fifth*, Dr. McGovern asserts that “changes being made as a result of this project will not allow the refinery to process a different slate of crude oil.”<sup>18</sup> This is inconsistent with public statements made by Tesoro and is inconsistent with the Project description, which includes many modifications that will allow a change in crude slate, including:

(1) 3.66 million barrels of additional marine terminal storage capacity with a Reid Vapor Pressure of 10.5 psi, which is much higher than crudes received at the terminals in the baseline;

(2) shutdown of the Wilmington FCCU;

(3) recovery of propane;

(4) a new wet jet treater to remove mercaptans and reduce total acid number;

(5) increase in capacity of units that process light process streams including the No. 51 Vacuum Unit and HTU-1, -2, and -4; and

(6) increased firing rates of various heaters, among others.

These changes will allow the integrated refinery to import and process significant amounts of very light crude oils, such as Bakken crudes, as well as Canadian tar sands crudes and blends of these two. These crudes have chemical characteristics that set them apart from the crude slate currently refined, even though they may be blended to the same general range of sulfur and API gravity in the crude slates charged to the distillation units.

<sup>18</sup> DEIR, p. 2-20 and Appx. F, pp. 6/7.

G1-78.107

G1-78.107  
cont'd.

**Response G1-78.107**

See Attachment D, Dr. McGovern’s Response to Comment Letter 78, Response to Comment G1-78.107.

The proposed project is not designed to facilitate the processing of significant amounts of light crude oil or heavy Canadian crude oil or blends of these two crude oils. As explained in Section 2.2 of the DEIR, one of the primary objectives of the proposed project is to recover and upgrade

distillate range material from FCCU feeds. In simple terms, this project focuses on distillate, essentially the middle portion of a barrel of crude oil. Many proposed project elements will be implemented to recover and then treat distillate recovered from FCCU gas oil feed, thereby reducing the volume of gas oil remaining to be processed in the Carson Operations FCCU, once the Wilmington FCCU is shut down. The Carson Operations FCCU does not have sufficient capacity to process the gas oil produced at both the Carson and Wilmington Operations without recovering distillate out of the gas oil and separately treating the recovered distillate. The propane in the crude oil itself is recovered in the Crude Unit, where it is fed into the Refinery fuel gas system. Thus, light ends from the crude oil are not available in downstream units. The Wet Jet Treater is proposed to enable jet fuel range distillate treating to meet stringent jet fuel requirements for sale. Combined with other integration project elements explained in Section 2.7, the recovery and upgrade distillate range material from FCCU feeds enables shutdown of the Wilmington Operations FCCU. These modifications also provide the Refinery flexibility to shift its production from gasoline to distillates (diesel and jet fuel). See Response to Comment G1-78.107 in Attachment D, Dr. McGovern's Response to Comment Letter 78 that specifically explains that the six proposed project elements (equipment or process changes) referenced in the comments will not facilitate the processing of lighter crude oil blends.

The proposed project does not enable a lighter crude oil blend to be processed by the Refinery. In order to process a lighter crude oil blend, modifications would be needed in the crude units to relieve the distillation column hydraulic limits or “lift” in the crude units (see pages 2-17 and 2-18 of the DEIR).

The comment is a summary of the more detailed Comment G1-78.138 that further addresses the purpose of the propane recovery, 51 Vacuum Unit and hydrotreating unit modifications and increased heater firing permit descriptions elements of the proposed project. Response G1-78.138 explains in detail why these proposed modifications are not associated with a change in the crude oil blend that can be processed by the Refinery.<sup>130</sup> The purpose of the new and replacement crude oil storage tanks is to allow larger ships to fully unload crude oil deliveries in one dock visit. This will improve unloading efficiency, and reduce ship emissions, as well as reduce costs, since marine vessels would no longer need to partially unload, maneuver out to anchor and “hotel” while running their engines, and then return to the dock when more storage capacity is available to complete unloading.

Table 78.94-1 lists some of the responses that address in further detail the claims that Bakken and heavy Canadian crude oils have unique chemical characteristics. As detailed in subsequent responses, which are listed in Table 78-94.1, Bakken and heavy Canadian crude oils are similar to other light and heavy crude oils currently processed by the Refinery.

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<sup>130</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.107.



**Comment G1-78.108**

2. API Gravity And Sulfur Content Do Not Determine Environmental Impacts

The DEIR asserts that the Refinery is not making any equipment modifications that would allow it to receive crude oils that cannot be blended to the same API gravity and sulfur content parameters than it currently receives.<sup>19</sup> The DEIR further asserts that the crude “slate” will not change, where “slate” is defined as “a list of potential crude oils that the refinery can choose to purchase and be delivered as input to the refinery or it can refer to the blend of crude oils actually purchased and processed in a refinery.”<sup>20</sup>

These assertions are incorrect and side step the issue of the impact of individual crudes in the slate on environmental impacts both before they are blended (e.g., from tanks and fugitive components) and after they are blended, during refining. These impacts are discussed below for the two most likely imports, Bakken and other light domestic crudes (Comment II.B) and tar sands crudes (Comment II.C). This section discusses why changes to crude slate that do not alter the API gravity and sulfur content of crude oil can still result in crude-related environmental impacts.

There are important differences between crudes that are not related to the API gravity and total sulfur content that are not considered in blending crudes and that can result in adverse environmental impacts. Even if the weight and sulfur content of a particular crude blend fall within the range specified in the DEIR, or don't change at all, other components in the crude, such as toxic air contaminants, like benzene, or highly malodorous (and toxic) compounds such as mercaptans, may be present at much higher concentrations than in the crudes they replace with identical sulfur and API gravity. Further, blending does not eliminate these issues.

<sup>19</sup> DEIR, p. 4-6; Appx. F.

<sup>20</sup> DEIR, Appx. F, p. F-5.

G1-78.108

G1-78.108  
cont'd.

**Response G1-78.108**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.108

The potential impacts of transferring and storing crude oil prior to blending in order to process it at the Refinery have been analyzed in Sections 4.2 and 4.3 of the DEIR. In order to ensure that emission estimates were conservatively high, the maximum true vapor pressure (TVP) allowable by SCAQMD regulations was assumed as a basis for tank and fugitive emission calculations (see for example Appendix B, page B-3-122 of the DEIR that lists Reid vapor pressure (RVP)=10.5 (TVP limit of 11 psia) under "Basis for Vapor Pressure Calculations").<sup>131</sup> A worst-case hybrid speciation of TAC concentrations (see Appendix B, pages B-3-110 through B-3-112 of the DEIR), including benzene, was used to calculate TAC emissions, as detailed in Response G1-78.157.<sup>132</sup> The crude oil total sulfur analyses conducted by the Refinery include all sulfur compounds, including mercaptans. Total sulfur is taken into consideration when evaluating a crude oil blend for processing at the Refinery.

**Comment G1-78.109**

*a. Blending Does Not Address Impacts that Occur Prior to Blending*

The individual crudes that make up a "slate" are typically transported and stored as single components before blending occurs.<sup>21</sup> The "storage tanks," for example, typically contain only one type of crude. The unloading, transport, and storage of individual crudes emit VOCs and TACs at unloading racks, tanks, and from fugitive components, such as pumps, compressors, and valves before any blending occurs. Blending does not eliminate these impacts. Thus, while the blended crude slate or the "average" crude may remain within baseline sulfur and API gravity bounds, the individual crudes in the blend arrive and are stored separately and thus may have different environmental impacts. Impacts that occur before blending obviously would not be eliminated by blending.

<sup>21</sup> Some blending could occur at the VET, which is equipped to blend crudes before they are transferred to marine vessels.

G1-78.109

**Response G1-78.109**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other

<sup>131</sup> RVP and TVP are both measurements of the vapor pressure of hydrocarbon materials. RVP is the vapor pressure measured at 100°F, while TVP is measured at actual storage temperature of the material.

<sup>132</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.108.

crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.109.

Any impacts associated with transferring and storing various crude oils prior to blending has been analyzed in the DEIR. Transportation emissions will be reduced since marine vessels would no longer need to partially unload, maneuver out to anchor and “hotel” while running their engines, and then return to the dock when more storage capacity is available to complete unloading. The new and replacement crude oil storage tanks are only connected to the marine terminals, and the marine vessels unload directly into the crude oil receiving tanks; there are no associated unloading racks or unloading emissions other than fugitive emissions. In order to ensure that emission estimates were conservatively high, the maximum TVP allowable by SCAQMD regulations was assumed as a basis for tank and fugitive emission calculations including emissions from transfer and storage. A worst-case hybrid of TACs, including benzene, was used to calculate TACs, as detailed in Response G1-78.157.<sup>133</sup>

### Comment G1-78.110

*b. Blending Does Not Address Environmentally Important Chemicals*

The environmental impacts of a crude slate depend upon the specific chemicals in the slate and their concentrations, not gross lumpsum parameters such as total sulfur and API gravity. The specific chemicals in a slate are not a function of the API gravity or the sulfur content, but rather depend upon chemical and physical characteristics of the individual crudes in the blend. The chemical and physical characteristics that are relevant for environmental impacts – VOC, TACs, sulfur species, volatility, flammability – are not related to total sulfur and API gravity. Total sulfur, one of the two metrics relied on by Dr. McGovern, is a good example.

G1-78.110

### Response G1-78.110

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery’s operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery’s crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro’s future crude oil slates.

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<sup>133</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.109.

Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.110.

The responses listed in Table 78.94-1 address in further detail the claims that Bakken and heavy Canadian crude oils have unique chemical characteristics, which they do not. In fact, Bakken and other light crude oils and heavy Canadian and other heavy crude oils currently processed by the Refinery are all similar to each other. Contrary to the suggestion in the comment that any individual crude oil should be evaluated for environmental impacts, a variety of crude oils are continually processed at the Refinery in its crude oil blend and changes in the crude oil slate are not activities that require any agency approvals or permits. Among other things, Master Response 4 further explains that a variety of crude oils are processed by the Refinery during any operating year and at any particular time. With respect to the Refinery processing equipment, crude oil blends must meet the physical and permit constraints associated with the processing equipment. Mixing of crude oils into a blend for processing blends down, or dilutes, any property including those listed in the comment that may be relevant for environmental impacts – VOC, TACs, sulfur species, and volatility and API gravity, whose environmental impacts were analyzed in Chapter 4 of the DEIR. Section 2.5.3 of the DEIR and Responses G1-78.171 and G1-78.174 describe some of the other crude oil evaluations that are performed to ensure various crude oils can be mixed into a blend that is capable of being processed by the Refinery.

**Comment G1-78.111**

*c. Total Sulfur Does Not Address Impacts of Individual Sulfur Compounds*

Sulfur is not simply sulfur, but is made up of a complex collection of individual chemical compounds such as hydrogen sulfide, mercaptans, thiophene, benzothiophene, methyl sulfonic acid, dimethyl sulfone, thiacyclohexane, etc. Each crude has a different suite of individual sulfur compounds. And each sulfur compound results in different environmental impacts at different concentrations.

G1-78.111

The impacts of "sulfur" depend upon the specific sulfur chemicals and their relative concentrations, not on the range of the "gross" amount of total sulfur expressed as weight percent sulfur, as argued in DEIR Appendix F. The fact that the range in the total sulfur content of crude that would be refined by the Project and the current crude slate may be the same<sup>22</sup> is irrelevant.

The role of the specific sulfur compounds, for example, was clearly and tragically demonstrated in the August 2012 catastrophic accident at the Chevron Richmond Refinery. This accident was caused by the erroneous assumption that sulfur is sulfur, which led to significant corrosion. Similarly, while the lighter sulfur compounds such as mercaptans and disulfides found in light sweet crudes may not significantly increase the overall weight percent sulfur in the crude slate, they do lead to impacts, such as aggressive sulfidation corrosion, which can lead to accidental releases. These compounds concentrate in the lower boiling naphtha fraction and contribute to aggressive sulfidation corrosion in the convection section of naphtha hydrotreating furnaces.<sup>23</sup> The DEIR did not evaluate these impacts.

<sup>22</sup> The DEIR has not demonstrated that the sulfur content of crudes imported to support the Project will be the same as the current crude slate at Carson and Wilmington Operations.

<sup>23</sup> See, for example, Jim McLaughlin, Changing Your Crude Slate, Becht News, May 24, 2013, Available at <http://becht.com/news/becht-news/>.

G1-78.111  
cont'd.

### Response G1-78.111

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.111.

In addition, the Refinery does not consider only the total sulfur in the crude oil blend to be processed. It also considers sulfur reactivity and corrosivity and Refinery operating constraints as further explained below. It is true that different sulfur types have different corrosion rates. Operating limits are set on the allowable content of sulfur compounds in the feed to each Refinery unit. These limits are set based on sulfur removal capacity, product specifications, sulfur reactivity and corrosivity, and the Refinery operating permits. The limits for each unit are set for proper corrosion control within each process unit. Non-destructive testing is periodically performed to measure equipment and piping metal thickness to ensure corrosion rates are as

expected and that the metal thickness is greater than the minimum thickness requirement, or to trigger repairs or replacement of the equipment or piping. Inspection frequency for equipment and piping is determined based on remaining metal thickness corrosion rates that are observed. Whenever the Refinery considers processing crude oil that has not been previously processed, an evaluation is performed to ensure that any new crude oil will be processed in a way that does not impact safety, environmental requirements, unit reliability, or product specifications. This evaluation includes specific corrosion mechanisms, such as sulfidic corrosion, that caused the Chevron Richmond incident.

Tesoro's crude oil assays contain total sulfur and mercaptan data, and models are used to predict and manage the amount of other sulfur types found in crude oils. Tesoro uses these confidential planning models along with evaluation of the sulfur content in downstream process unit feedstocks to keep the units within their operating envelopes. The sulfur content of the crude oil blends and each intermediate product is monitored to make sure that they are within the operating limits, permit requirements, and product specifications, and maintain unit integrity for the various Refinery units.

Note that it is not required to evaluate each individual sulfur compound to assess potential impacts from sulfur species. Based on total sulfur and mercaptan content, proprietary models developed by Tesoro provide accurate estimates of reactive (corrosive) and non-reactive (non-corrosive) sulfur compounds. These models are based on information, such as the McConomy Curves, that describe correction factors that apply to total sulfur content to predict corrosion impacts from sulfur.<sup>134</sup>

Hydrogen sulfide is the most corrosive and toxic compound found in crude oil.<sup>135</sup> Hydrogen sulfide is more hazardous, toxic and odiferous than mercaptans.<sup>136</sup> OEHHA lists toxic sulfur compounds that require evaluation in health risk assessments, including cancer, chronic, and acute health risks in the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values.<sup>137</sup> No mercaptans are on the list, only hydrogen sulfide is listed. In Chapter 4, the DEIR appropriately evaluated potential impacts from hydrogen sulfide. Hydrogen sulfide is a gas at ambient temperature; therefore, hydrogen sulfide tends to separate from the liquid crude oil at the crude oil production wellhead and concentrate in the gases that are removed during the crude oil production process. Hydrogen sulfide concentrations in crude oils delivered to the Refinery are typically quite low, usually less than 5 ppm, the lower detection limit of the laboratory method used to determine H<sub>2</sub>S in crude oil.

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<sup>134</sup> Materials Selection for Hydrocarbon and Chemical Plants, David Hansen and Robert Puyear, Appendix 5: McConomy Curves, <https://books.google.com/books?id=KK0JfgBXeMIC&pg=PA372&lpg=PA372&dq=crude+oil+reaCTIVE+SULFUR&source=bl&ots=E8kAbmVQxq&sig=is0ie2dtDwvMruNTjZ-UdS10FA&hl=en&sa=X&ved=0ahUKEwjvoebApOrPAhWBOSYKHYGIBM04ChDoAQgfMAE#v=onepage&q=crude%20oil%20reaaCTIVE%20SULFUR&f=false>, Accessed October 21, 2016.

<sup>135</sup> Chemical Safety and Hazard Investigation Board (CSB) January 2015, Final Investigation Report, Chevron Richmond Refinery Pipe Rupture and Fire, page 35, <http://www.csb.gov/chevron-refinery-fire/> (accessed 8/29/16).

<sup>136</sup> Mercaptans are a class of compounds containing carbon, sulfur, and hydrogen atoms.

<sup>137</sup> <https://www.arb.ca.gov/toxics/healthval/contable.pdf>.

An emergency incident that occurred in 2012 at the Chevron Richmond Refinery is not relevant to the proposed project. The Chemical Safety and Hazard Investigation Board (CSB) concluded that the Chevron incident was caused by improper metallurgy in the section of piping that consequently failed from sulfidic corrosion and caused the incident.<sup>138 139</sup> Proper piping upstream of the failed section that was exposed to the same sulfur compounds showed very little corrosion. The CSB report does not conclude that the accident was caused by the assumption that “sulfur is sulfur” as claimed in the comment. The CSB report of the Chevron accident states that hydrogen sulfide (H<sub>2</sub>S) is the most corrosive sulfur compound and as the comment notes, its impact is discussed in the DEIR. Tesoro's process unit limits and non-destructive equipment metal thickness testing program described above address the potential for this corrosion mechanism and possible equipment failure at the Refinery.

As with all major incidents at U.S. refineries, findings/lessons learned from the Chevron incident have been made available to the refining industry. The Refinery has evaluated similar processes for the potential issues that caused the Chevron incident and confirmed that those conditions do not exist at the Refinery. As recommended on page 112 of the CSB Report on the Chevron Richmond Refinery fire, a 100 percent component inspection has been conducted at the Refinery Crude Units, and Tesoro has verified that the Crude Units do not contain carbon steel piping components with less than 0.10 weight percent silicon. Low carbon steel silicon content was one of the major factors in the line failure and resulting fire at the Chevron Richmond Refinery.

**Comment G1-78.112**

Odor impacts are another example of the importance of considering the specific sulfur compounds. Sulfur compounds, such as mercaptans and sulfides, are highly odiferous. Different crudes have different mixtures of sulfur compounds. The NOP/IS concluded odor impacts were less than significant because the Project would not modify units handling hydrogen sulfide.<sup>24</sup> Thus, the DEIR did not even consider odor impacts.

However, odor impacts originate from a complex mixture of sulfur compounds in the crude oil, which vary from crude to crude. These compounds are emitted from storage tanks and fugitive components, which will be modified by the Project. Thus, a change in crude slate, which is facilitated by the Project (by expanding crude storage at the terminals and other Project changes), will alter the suite of sulfur compounds present in emissions from tanks, fugitive components and vents throughout the refinery, even if they are not physically modified by the Project. This could result in significant odor and/or health impacts at sensitive receptors near the storage tanks.

<sup>24</sup> DEIR, Appx. A, p. A-128.

G1-78.112

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<sup>138</sup> Chemical Safety and Hazard Investigation Board (CSB) January 2015, Final Investigation Report, Chevron Richmond Refinery Pipe Rupture and Fire, pages 5 - 7 and 35 – 40, <http://www.csb.gov/chevron-refinery-fire/> (accessed 8/29/16).

<sup>139</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comments G1-78.110 and G1-78.111.



**Response G1-78.112**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.112.

Cold Lake, a heavy Canadian "tar sands" crude oil, is processed at the Refinery frequently and there have been no odor complaints associated with storing and transferring Cold Lake crude oil. See Master Response 11 for an overview of issues identified at the Carson and Wilmington Operations that are believed to have caused odors from the Refinery in the past and resolution of those issues. At the Wilmington Operations, fixed roof tanks that control vapors by venting to a vapor recovery system have had issues in the past. While the vapor recovery system at Wilmington complies with the SCAQMD requirements for vapor control from tanks, it is very different than the vapor controls that are proposed for the new and replacement storage tanks in the proposed project. The new and replacement storage tanks will meet BACT standards via installation of floating roofs on the tanks including either external floating roofs with domes or fixed roof tanks with internal floating roofs. Compliant floating roof tank operations have not been found to be the source of odor complaints at the Refinery.

As explained in Response G1-78.167, mercaptans are present in most, if not all, crude oils. The odor threshold and exposure limits for mercaptans are higher than those for H<sub>2</sub>S. According to CDC and OSHA websites, hydrogen sulfide is more odiferous and hazardous than any mercaptan and the impact of H<sub>2</sub>S is addressed in the DEIR.<sup>140</sup> Because the crude oil storage and transfer operations are tightly regulated to control tank and fugitive emissions, odors are expected to be controlled (see Master Response 11). The upper range of mercaptans (approximately 100 ppm) in dilbit crude oils cited in Comment G1-78.167 is less than the quantity of mercaptans (171 to 180 ppm) found in Arab light crude oil that is frequently processed by the Refinery. Since the Refinery does not currently experience odor complaints from mercaptans or hydrogen sulfide

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<sup>140</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comments G1-78.112 and G1-78.113.

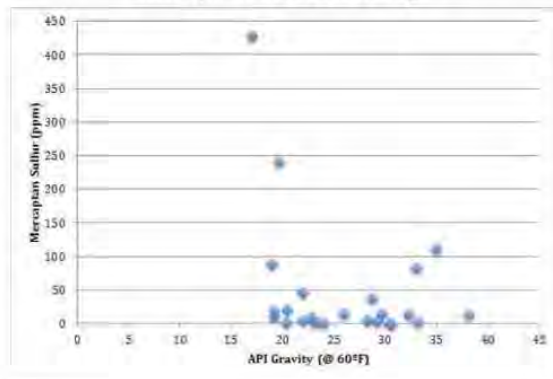
when handling Arab light or Cold Lake crude oils, none would be expected if crude oils containing the upper ranges of hydrogen sulfide or mercaptans cited are managed in the proposed crude oil storage tanks and associated equipment.

**Comment G1-78.113**

Sulfur compounds also include many that are toxic. However, the health risk assessment only evaluated hydrogen sulfide and omitted many other highly toxic sulfur compounds, such as the mercaptans. Mercaptans, which are both toxic and highly odiferous, is a good example of why total sulfur cannot be relied on to assure a crude switch will not result in environmental impacts. Figures 1 and 2, using mercaptan data from Tesoro Logistic's Marine Terminal Agreement,<sup>25</sup> show that there is no relationship between API gravity or sulfur content and the concentration of mercaptans.

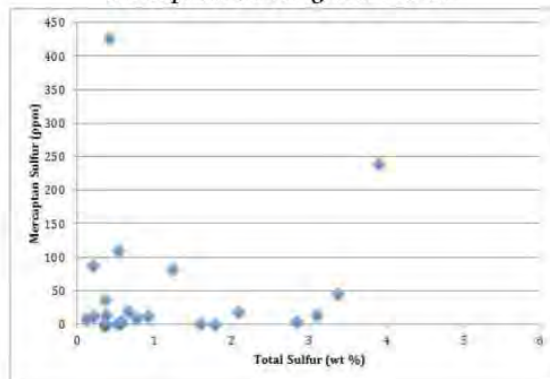
G1-78.113

**Figure 1.  
Mercaptans vs. API Gravity<sup>26</sup>**



G1-78.113  
cont'd.

**Figure 2.  
Mercaptans vs. Weight % Sulfur<sup>27</sup>**



G1-78.113  
cont'd.

<sup>25</sup> Long Beach Berth Access, Use and Throughput Agreement (Marine Terminal Agreement), Annex D; Available at: <http://www.sec.gov/Archives/edgar/data/1507615/000119312512392849/d412286dex105.htm>.

<sup>26</sup> Marine Terminal Agreement, Annex D.

<sup>27</sup> *Ibid.*

**Response G1-78.113**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.113.

As explained in response G1-78.111, the list of toxic sulfur compounds specified by OEHHA that require evaluation in health risk assessments, including cancer, chronic, and acute health risks, do not include mercaptans; only hydrogen sulfide is listed. The DEIR appropriately evaluated potential impacts from hydrogen sulfide.

The comment accurately states that there is not a direct relationship between API gravity and mercaptans in crude oils. However, since mercaptans are included in the sulfur species that make up the total sulfur content of crude oils, there is a relationship between total sulfur and mercaptan content of crude oil. It may not be possible to predict mercaptan content based on total sulfur content of crude oil, but that does not have an impact on the adequacy of the DEIR analysis, because the DEIR analyzed the appropriate toxic sulfur compound, hydrogen sulfide (see Response G1-78.111).

Response G1-78.112 addresses the fact that crude oils currently managed by the Refinery have the same levels of mercaptans referenced in the comment and odor complaints from mercaptans have not been received during storage and transfer operations. Because crude oil storage and transfer operations are tightly regulated to control tank and fugitive emissions, any potential odors from the new and replacement storage tanks are expected to be controlled.

**Comment G1-78.114**

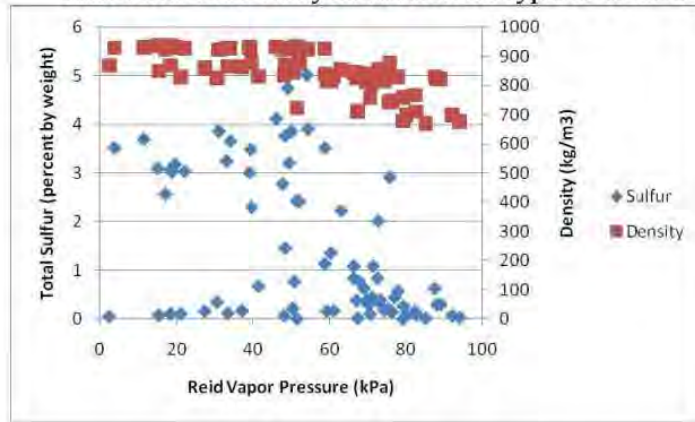
*d. API Gravity and Sulfur Do Not Address the Impacts Due to Vapor Pressure Changes*

Vapor pressure is important because it determines the amount of VOC and TAC emissions from sources such as marine terminal unloading, tanks, and fugitive components, e.g., pumps, valves, flanges. However, as discussed below, it is not related to either API gravity or sulfur content of the crude.

The DEIR’s consultant, Dr. McGovern, demonstrated there is no relationship between vapor pressure (expressed as RVP) and crude gravity (expressed as API Gravity).<sup>28</sup> This is further substantiated by my analysis of data published by Enbridge, summarized here in Figure 3. The Enbridge data covering 76 different types of crude oil show that crude oil attributes of sulfur content and density are completely independent of vapor pressure (and thus VOC and TACs).

G1-78.114

**Figure 3. Reid Vapor Pressure Compared to Total Sulfur and Density for 76 Different Types of Crude Oil<sup>29</sup>**



G1-78.114  
cont'd.

However, in spite of the lack of a relationship, Dr. McGovern concludes that “there is no valid reason to believe that the crudes that arrive after the LARIC project will be higher volatility than those currently processed.”<sup>30</sup> This is wrong. The vapor pressure used to estimate VOC emissions from the tanks are much higher than the tanks they will replace or supplement. As demonstrated in Comment II.A.2.d, the Project will increase the throughput of 11 psi crude by a factor of 8 at Wilmington and by a factor of 7 at Carson. Further, the Marine Terminal Agreement, Annex D, indicates that the new tank vapor pressure limits are substantially higher than any crude oil imported at the terminal in the baseline.

<sup>28</sup> DEIR, Appendix F, Figure 7.

<sup>29</sup> Enbridge Pipelines Inc., 2013 Crude Characteristics, Available at: <http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf>.

<sup>30</sup> DEIR, Appendix F, p. F-25.

**Response G1-78.114**

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.114.

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

The fact that the DEIR analysis used a crude oil vapor pressure approaching the SCAQMD Rule 463 TVP limit of 11 psia to estimate potential emissions from the new and replacement storage tanks does not mean that the proposed project was designed to, or would in fact facilitate a switch to crude oils approaching 11 psia TVP. Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. The DEIR used a crude oil vapor pressure approaching the maximum vapor pressure allowable by SCAQMD Rule 463 (TVP limit of 11 psia) as the basis of the emission calculations as a conservative worst-case assumption to allow flexibility to store any crude oils allowed by local regulations. It is common practice for refineries to maintain flexible operating permits by matching permit limitations to regulatory limits. It does not follow that all crude oil stored will have a TVP of 11 psia.

Concentrations of TACs from crude oils in new and replacement storage tanks and fugitive emissions associated with the proposed project were based on a worst-case hybrid analysis of the toxic content of crude oils currently and potentially processed at the Refinery, including Bakken and Canadian crude oil. The hybrid speciation was prepared by selecting the highest concentration of each toxic compound from the entire speciated data set of all the crude oils analyzed.

Responses G1-78.126 and G1-78.128 address the fact that numerous storage tanks at the Refinery have the capability to store high vapor pressure crude oils and that many storage tanks do not have throughput capacity limitations. Section 2.5.4.1 of the DEIR discusses existing crude oil refining limitations, including the amount of light ends that can be processed in distillation columns (pages 2-17 and 2-18). While crude oil API gravity and vapor pressure may not be directly correlated, vapor pressure is also a limiting factor that is analyzed as part of the Refinery crude oil blend evaluation. Additional crude oil evaluations conducted include Linear Program modeling, as described on page 2-16 of the DEIR, and Tesoro's crude oil assay software, as described in Response G1-78.150. These evaluations ensure that the vapor pressure

of crude oil blends will not change even after implementation of the proposed project, and that it remains within the Refinery’s existing operating envelope.

As explained in detail in Response G1-78.153, Annex D to the Marine Terminal Agreement was included as a requirement of a Tesoro Logistics customer to specify crude oils that Tesoro must accommodate as part of the customer’s Berth Access Agreement, which is the contract for Tesoro to provide marine terminal services to the customer. Annex D does not represent an actual or allowable list of crude oils managed by the Long Beach Marine Terminal during baseline or any other years.

**Comment G1-78.115**

The admitted absence of any relationship between vapor pressure and API gravity is substantial evidence that running a crude slate with an API gravity and sulfur content that falls within the historic ranges will not prevent environmental impacts from a crude slate change due to higher crude vapor pressure.

G1-78.115

**Response G1-78.115**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery’s operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery’s crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, such as vapor pressure, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro’s future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.115.

Response G1-78.114 describes additional crude oil blend evaluations conducted by the Refinery that will ensure that the vapor pressure of crude oil blends will not change even after implementation of the proposed project, and that it remains within the Refinery’s existing operating envelope. In order to evaluate worst-case emissions impacts, emissions from the new and replacement storage tanks were calculated at crude oil vapor pressure approaching the Rule 463 maximum TVP allowed by SCAQMD rules. Therefore, no additional environmental impacts are expected.

**Comment G1-78.116**

The vapor pressure of crude determines to a large extent the amount of VOC and TAC emissions that are emitted when it is transported, stored, and refined. Thus, a crude slate may have identical sulfur content and API gravity, but would result in dramatically different VOC and TAC emissions if vapor pressures differed. The high vapor pressure limit for the proposed new storage tanks, which is much higher than crudes that were unloaded and stored in the baseline, presages a change in crude slate that will include more light volatile crudes than in the baseline, thus increasing VOC and TAC emissions.

G1-78.116

G1-78.116  
cont'd.

**Response G1-78.116**

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.116.

Comment G1-78.114 and G1-78.116 are largely duplicative and are addressed in Response G1-78.114. The proposed project does not include any modifications that would enable the Refinery to process a higher TVP crude oil blend. Any such changes would require equipment and permit modifications, which are not part of the proposed project.

**Comment G1-78.117**

Vapor pressure is measured in pounds per square inch (psi) and is typically reported as either True Vapor Pressure (TVP) or Reid Vapor Pressure (RVP).<sup>31</sup> The TVP is usually higher than RVP for light gassy shale crudes. Vapor pressure is an indirect measure of the evaporation rate of volatile compounds in the crude oil, with higher vapor pressures indicating greater losses of VOC and TACs from evaporation. The DEIR neglected to disclose the well-known relationship between the vapor pressure of a crude oil and the amount of emissions released from equipment containing the crude.<sup>32</sup>

G1-78.117

<sup>31</sup> Measured by American Society for Testing and Materials Method ASTM D323-08, Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method) is used to determine the vapor pressure at 100 F with initial boiling point above 32 F.

<sup>32</sup> See AP-42, Section 7.1: Organic Liquid Storage Tanks.

**Response G1-78.117**

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.117.

Comment G1-78.114 and G1-78.117 are largely duplicative and are addressed in Response G1-78.114. The proposed project does not include any modifications that would enable the Refinery to process a higher TVP crude oil blend. The vapor pressure of crude oil blends will not change and will remain within the Refinery's existing operating envelope. Therefore, there will be no impact on Refinery processing emissions if a higher TVP crude oil is included in the crude oil blend that is refined. While TVP and RVP both describe the volatility of a material, they are not directly comparable. TVP is the vapor pressure of a liquid at the actual storage



temperature. RVP is the vapor pressure at specified standard conditions. Depending on the actual storage conditions, TVP may be higher or lower than RVP. The crude oil storage and associated piping emissions for the new and replacement crude oil storage tanks were conservatively analyzed based on crude oil properties approaching 11 psia TVP in the hottest month of the year to ensure the Refinery complies with SCAQMD Rule 463.

In Attachment D, Response to comments G1-78.114 & 115, Dr. McGovern notes that understanding the difference between true vapor pressure and Reid vapor pressure is essential to the science of evaluating environmental impacts.<sup>141</sup> In the Response to comment G1-78.117, Dr. McGovern then explains that the DEIR used the EPA approved procedures in AP-42, Section 7.1, to calculate the emissions from the equipment containing the crude oil. AP-42 is a public document that inherently contains the relationship between the vapor pressure of a crude oil and the emissions released from crude oil containing equipment. As also noted by Dr. McGovern, there are approved procedures in AP-42 for adjusting vapor pressure to actual ambient temperatures that are encountered in storage tanks, which is necessary to accurately project emissions from equipment containing crude oil.

SCAQMD Rule 1173, fugitive emissions, requires stringent monitoring of leak rates from fugitive sources. The Refinery process units currently have fugitive sources in liquid and vapor hydrocarbon service, as they will after completion of the proposed project. Emissions from new and modified Refinery equipment were evaluated in DEIR by conservatively assuming maximum allowable SCAQMD Rule 1173 leak rates and crude oil vapor pressure approaching the Rule 463 maximum TVP limit of 11 psia in the storage tank calculations. Therefore, emissions from Refinery storage tanks and fugitive sources associated with the proposed project have been appropriately evaluated (see Table 4.2-4). The DEIR estimates of VOCs and TACs for the new and replacement storage tanks and fugitive emissions are based on conservative assumptions; including crude oil vapor pressure approaching the Rule 463 limit of 11 psia TVP for material stored, in order to evaluate the worst-case potential emissions. Not all crude oil that will be stored or transferred is expected to have a TVP limit approaching 11 psia.

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<sup>141</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comments G1-78.114 and G1-78.115.

### Comment G1-78.118

The volatility and chemical speciation information for individual crudes, required to evaluate a crude switch, from ANS, foreign imports and California crudes to a Bakken/tar sands or other blend, is completely absent from the DEIR. Vapor pressure and crude TAC speciation information are not confidential and are routinely included in public documents to support tank and fugitive emission calculations. Further, crude assay data is widely reported.<sup>33</sup> See, for example, the Tesoro VET Application<sup>34</sup> and VET DEIS.<sup>35</sup>

G1-78.118

<sup>33</sup> Jeff Thompson, Public Crude Assay Websites, February 24, 2011. [http://www.coqa-inc.org/docs/default-source/meeting-presentations/20110224\\_Thompson\\_Jeff.pdf](http://www.coqa-inc.org/docs/default-source/meeting-presentations/20110224_Thompson_Jeff.pdf).

<sup>34</sup> Tesoro Savage, Application for Site Certification Agreement (VET Application), vol. 1, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf> and vol. 2, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20II%20-%20Appendices/EFSEC%202013-01%20Compiled%20Volume%20II.pdf>.

<sup>35</sup> VET DEIS, Appendix J.

### Response G1-78.118

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

As explained in Response G1-78.114, the new and replacement storage tanks and fugitive emission calculations were based on crude oil vapor pressure approaching the Rule 463 allowable vapor pressure (TVP limit of 11 psia). The vapor pressure and speciated TAC data that was used in the evaluation is provided in the U.S. EPA TANKS 4.0.9d model results that are presented in the Appendix B-3of the DEIR. The DEIR used the worst-case hybrid speciation for TACs in the U.S. EPA TANKS model, which provides accurate TAC emissions data.

As explained in Response G1-87.117, there will be no impact on Refinery processing emissions if a higher TVP crude oil is included in the crude oil blend that is refined.

**Comment G1-78.119**

*e. API Gravity and Sulfur Do Not Address Thermal Radiation Hazards*

The thermal radiation hazards from hydrocarbon pool and other types of fires, which were evaluated in the DEIR, depend on a number of parameters not related to API gravity and sulfur, including the composition of the hydrocarbon mixture. The DEIR did not disclose any of its assumptions as to the composition of materials involved in accidents,<sup>36</sup> preventing any meaningful review.

G1-78.119

<sup>36</sup> DEIR, Appendix C.

**Response G1-78.119**

The hazards analysis that was conducted for process units in the DEIR is based on heat and material balances, which are trade secret Refinery process unit information (see Master Response 217).<sup>142</sup> If the information was not confidential, i.e. the speciated composition of a worst-case crude oil used in the storage tank emission calculations, it was provided in the DEIR.

**Comment G1-78.120**

*f. API Gravity and Sulfur Do Not Address Parameter Creep*

The rationale that sulfur levels and API gravity of the crude slate would stay within a narrow range ignores the possibility of gradual creep within that range that could still be significant. This recently occurred at the Chevron Richmond Refinery. This refinery gradually changed crude slates, while staying within its established crude unit design basis for total weight percent sulfur of the blended feed to the crude unit.<sup>37</sup> This change increased corrosion rates in the 4-sidecut line, which led to a catastrophic pipe failure in the #4 Crude Unit on August 6, 2012. This accident sent 15,000 people from the surrounding area for medical treatment due to the release and resulting fire that created huge black clouds of pollution over the surrounding community.<sup>38</sup>

G1-78.120

These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Los Angeles Refinery crude slate, even if the range of sulfur and gravity of the crudes remain the same. These crudes have a significant concentrations of sulfur in the heavy components of the crude coupled with high total acid number (TAN) and high solids, which aggravate corrosion. Avoiding these impacts would require significant upgrades in metallurgy, which are not proposed. The gas oil and vacuum resid piping, for example, may not be able to withstand naphthenic acid or sulfidation corrosion from tar sands crudes, leading to catastrophic releases.<sup>39</sup> Catastrophic releases of air pollution from these types of accidents were not considered in the DEIR.<sup>40</sup>

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<sup>142</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.119.

<sup>37</sup> US Chemical Safety and Hazard Investigation Board, Chevron Richmond Refinery Pipe Rupture and Fire, August 6, 2012, p.34 ("While Chevron stayed under its established crude unit design basis for total wt. % sulfur of the blended feed to the crude unit, the sulfur composition significantly increased over time. This increase in sulfur composition likely increased corrosion rates in the 4-sidecut line.").

<sup>38</sup> U.S. Chemical Safety and Hazard Investigation Board, Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012, Draft for Public Release, April 15, 2013, Available at: <http://www.csb.gov/chevron-refinery-fire/>.

<sup>39</sup> See, for example, K. Turini, J. Turner, A. Chu, and S. Vaidyanathan, Processing Heavy Crudes in Existing Refineries. In: Proceedings of the AIChE Spring Meeting, Chicago, IL, American Institute of Chemical Engineers, New York, NY, Available at: <http://www.aiche-fpd.org/listing/112.pdf>.

<sup>40</sup> DEIR, Appx. C.

### Response G1-78.120

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery. Future changes in the Refinery's crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils. Thus, if and to the extent any future changes in the Refinery's crude oil slate could result in small changes to the weight and sulfur content of crude oil blends processed, while remaining within the operating envelope, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

See Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.120.

In addition, Section 2.5.4.1 of the DEIR describes the overall Refinery constraints that limit the crude oil blend quality. There is limited ability for the Refinery crude oil blend quality to change (parameter creep as described in the comment) within the operating envelope (see Section 2.5.4.2 and the graphs on pages 2-21 and 2-22 of the DEIR). There are data points that show operation throughout the ranges of the operating envelope. Appendix F of the DEIR pages F-17, F-21, and F-22 address the fact that there is limited ability for "parameter creep" and that any minor changes in crude oil blend quality would have insignificant impacts on operation and potential environmental impacts. Note that "parameter creep" is not expected as a result of the proposed project. As explained in Section 2.5.3 and pages 2-17 and 2-18 of the DEIR and Responses G1-78.150, G1-78.170, and G1-78.172, additional crude oil evaluations are performed prior to mixing individual crude oils into the blend to be processed by the Refinery. The evaluations are performed in order to ensure the suitability of crude oils processed by the Refinery and include restrictions in blending models to address potential corrosive compounds.

As stated in Response G1-78.111, an emergency incident that occurred in 2012 at the Chevron Richmond Refinery is not relevant to the proposed project. The Chevron incident was caused by improper metallurgy in the section of piping that consequently failed from sulfidic corrosion and caused the incident. See also Attachment D, Response to comment G1-78.120, where Dr. McGovern opines that the increase in sulfur in the Richmond refinery was not a result of

“creep” but was a step change that most likely was the result of specific equipment modifications. While the CSB report also addresses contributing factors to the Chevron incident, metallurgy and line integrity were the critical factors that led to the incident. As noted in the Executive Summary, Section 1.4.1, Technical Findings of the CSB Report “Sulfidation corrosion can cause thinning to the point of pipe failure when not properly monitored and controlled.”

As with all major incidents at U.S. refineries, findings/lessons learned from the Chevron incident have been made available to the refining industry. The Refinery has evaluated similar processes for the potential issues that caused the Chevron incident and confirmed that those conditions do not exist at the Refinery. As recommended on page 112 of the CSB Final Report on the Chevron Richmond fire, a 100 percent component inspection has been conducted at the Refinery Crude Units, and Tesoro has verified that the Crude Units do not contain carbon steel piping components with less than 0.10 weight percent silicon. Response G1-78.111 also describes Tesoro’s ongoing inspection program that ensures the continued integrity of Refinery equipment and piping.

The comments claim that “These types of accidents can be reasonably expected to result from incorporating tar sands crudes into the Los Angeles Refinery crude slate, even if the range of sulfur and gravity of the crudes remain the same.” is not supported by data. If Tesoro were to increase the amount of Canadian crude oils processed in the refinery, these crude oils have a lower TAN than the heavy California crude oils they are likely to replace, as was discussed in Appendix F of the DEIR (page F-24).<sup>143</sup>

**Comment G1-78.121**

*g. API Gravity and Sulfur Do Not Address Chemical Composition Of Individual Crudes*

Bakken and tar sands crudes, the most likely crude slate additions (Comments II.B, II.C), have unique chemical and physical characteristics that distinguish them from currently refined crudes. These unique chemical and physical characteristics are not related to API gravity and sulfur. Thus, blending these crudes to the same API gravity and sulfur range will not guarantee that no environmental impacts will occur.

Difference in the chemical and physical properties of individual crudes in the future slate may result in significant environmental impacts not identified in the DEIR, including significant risk of upset, air quality, odor, and public health impacts.

G1-78.121

G1-78.121  
cont’d.

**Response G1-78.121**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and

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<sup>143</sup> See also Attachment D, Dr. McGovern's Response to Comment Letter 78, Response to Comment G1-78.119.

availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery's operating "envelope" of weight and sulfur content. If and to the extent any future changes in the Refinery's crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

The responses listed in Table 78.94-1 address in further detail the claims that Bakken and heavy Canadian crude oils have unique chemical characteristics, which they do not. In fact, Bakken and other light crude oils and heavy Canadian and other heavy crude oils currently processed by the Refinery are all similar to each other. As explained in the DEIR page 2-14 and Responses G1-78.150, G1-78.170, G1-78.172, and G1-78.174, additional crude oil evaluations are performed prior to mixing individual crude oils into the blend to be processed by the Refinery. These evaluations include the Linear Programming model, blending models, crude oil assay software, and TAN and other corrosion limitation evaluations. The crude oil blend processed by the Refinery will not change as a result of the proposed project. As explained in Response G1-78.109 and G1-78.122, potential impacts of storing additional crude oil in the new and replacement crude oil storage tanks have been fully analyzed in the DEIR using worst-case crude oil properties.

In Attachment D, Response to comment G1-78.121, Dr. McGovern confirms the primary objectives of the proposed project: 1) to improve the overall energy and operational efficiency of the Refinery through integration; 2) to comply with federally mandated Tier 3 gasoline specifications; and, 3) to reduce NO<sub>x</sub>, SO<sub>x</sub>, and GHG emissions from the Refinery. Dr. McGovern also confirms the conservative, worst-case impacts analysis that was performed in the DEIR.

**Comment G1-78.122**

Before discussing these differences in crude slate composition, I will review the information supporting a crude switch. As discussed below, the foreseeable switch from ANS and other current components of Tesoro’s crude slate to a Bakken crude, a tar sands crude, or a Bakken-tar sands-other crude mix, is a feedstock change that should have been explicitly identified and evaluated in the DEIR. These new crudes are chemically and physically different from the current crude slate in ways that are not captured by exclusive consideration of crude slate sulfur content, API gravity, and other refinery blending parameters. These differences can result in significant environmental impacts that were not evaluated or disclosed in the DEIR.

These differences – in both chemical and physical characteristics other than API gravity and sulfur content – fluctuate independent of sulfur content and API gravity and will result in significant impacts that have not been considered in the DEIR. These impacts include, for example,

- significant increases in VOC emissions, contributing to existing violations of ozone ambient air quality standards;
- significant increases in TAC emissions, resulting in significant health impacts; significant increases in malodorous sulfur compounds, resulting in significant odor impacts;
- significant increases in combustion emissions, contributing to existing violations of ambient air quality standards;
- significant increases in corrosive sulfur compounds, leading to increased risk of accident; and significant increases in flammability and thus the potential for more dangerous accidents involving the 52% increase in terminal storage tank capacity and unloading operations.

The DEIR fails to consider these significant impacts by raising irrelevant issues.

Thus, regardless of what crude might be imported, there are potentially significant environmental impacts that are due to characteristics of the new crude oil that are not captured by total sulfur and API gravity. These impacts have not been analyzed by the DEIR, which thus fails as an informational document.

G1-78.122

**Response G1-78.122**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery’s operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery’s crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, those changes would be (1) independent of the proposed



project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

The comment summarizes comments made elsewhere in the letter. As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend. However, the other main point of the comment—that Bakken, heavy Canadian (tar sands) or “other” crude oils are chemically and physically different than the crude oils currently processed by the Refinery—is not true. A detailed list of the responses to these claims is provided in Table 78.94-1.

The DEIR has fully disclosed and analyzed operational changes associated with proposed project, which include the transfer and storage of crude oil to new and replacement crude oil storage tanks. In order to ensure that emission estimates were conservatively high, the maximum TVP allowable by SCAQMD regulations was assumed as a basis for tank and fugitive emission calculations. A worst-case hybrid of TACs, including benzene, was used to calculate TACs, as detailed in Response G1-78.157.

See Response G1-78.160 for a detailed discussion of several recent evaluations that have been performed and conclude that Bakken is typical of other light crude oils and within the norm with respect to its volatility and hazard characteristics. Light crude oils are typically classified as flammable. In fact, because of its purported volatility, concerns were raised in the media as to whether Bakken crude oil was properly classified as a Class 3 hazardous material, which generally refers to a flammable or combustible liquid that does not meet the regulatory classification requirements for other hazardous characteristics, such as toxicity, corrosivity, radioactivity or explosiveness. However, those concerns have since been resolved by repeated analysis and testing that demonstrates Bakken crude oil to be a Class 3 hazardous material, similar to other light sweet crude oils. After considering this information, the PHMSA Deputy Administrator testified to Congress that Bakken crude oil is accurately classified as a Hazard Class 3 Flammable Liquid.<sup>144</sup>

The hazards associated with the new and replacement crude oil storage tanks are fully addressed in the DEIR. The potential increased corrosion associated with different crude oil properties as claimed in the comment is not an issue at the Refinery for three reasons:

- (1) The properties of the crude oils cited throughout the comment letter are not significantly different than many crude oils currently processed by the Refinery as explained in the responses listed in Table 78.94-1;

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<sup>144</sup> Written statement of Timothy P. Butters Before the Subcommittees on Energy and Oversight Committee on Science, Space and Technology, U.S. House of Representatives at page 12 (Sept. 9, 2014).

- (2) As explained in Response G1-78.111, crude oils are blended prior to being processed by the Refinery, so the properties of individual crude oils are not relevant to potential Refinery processing impacts. Crude oil blending takes into consideration the Refinery sulfur removal capacity, product specifications, sulfur reactivity and corrosivity as related to individual process unit limits and permit limitations; and,
- (3) Significant corrosion does not typically occur at ambient storage conditions, and if it occurs, it would occur at high temperatures.<sup>145</sup> Crude oil is received, stored, and blended at ambient temperatures.

**Comment G1-78.123**

**B. The Project Will Facilitate The Import Of Bakken Crude Oils**

The Project is designed to facilitate a crude switch. The precise nature of the switch and the resulting increase in emissions cannot be determined without access to information omitted from the DEIR and claimed as CBI -- baseline storage tank contents, throughputs, and vapor pressure data.<sup>41</sup> This information was redacted from emission reports for all tanks at Carson, Wilmington, and the marine terminals.<sup>42</sup> Baseline storage tank contents, throughput, and vapor pressure data are required to estimate emissions of VOCs from storage tanks in the baseline. In my experience, these data are routinely supplied to support emission calculations. In the absence of this data, I develop an alternate method to demonstrate that the Project will facilitate a crude switch by relying on permitted tank contents and vapor pressure limits.

G1-78.123

Substantial evidence indicates that the Project involves a crude switch, including: (1) the vapor pressure of the proposed new storage tanks supports Bakken crude oil or another similar light crude oil; (2) the Material Safety Data Sheet (MSDS) for "crude oil, light sweet" submitted with the initial tank applications is consistent with Bakken crude oil; (3) Tesoro has significant holdings in the Bakken formation, which makes these crudes economically attractive; (4) Tesoro and Savage are building the VET rail-to-marine terminal to export Bakken and other crudes to Tesoro's California refineries; and (5) Tesoro itself has repeatedly stated in many fora that it intends to change its crude slate and import Bakken crude oil to its Los Angeles Refinery. As Bakken was not refined in the baseline (Comment II.D.1), this is a per se switch in crude slate. Each of these factors is discussed below.

<sup>41</sup> Letter from Lisa Ramos, SCAQMD, to Rachael Koss, ABJC, Ref.: Control No. 86120, June 3, 2016, Attaching Declaration Against Furnishing Document and/or Data, Prepared by June Christman, Tesoro, and Addendum to Declaration: Itemization of Documents/Portions Thereof Claimed Exempt from Production, June 2, 2016.

<sup>42</sup> Letter from Lisa Ramos, Public Records Coordinator, SCAQMD, to Rachael Koss, Adams Broadwell Joseph and Cardozo, Ref.: Control No. 86120, Completion Letter, June 3, 2016 and attached files.

**Response G1-78.123**

The comment incorrectly concludes that the proposed project was designed to facilitate a switch to a new slate of crude oils. The facts are as follows:

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<sup>145</sup> Written statement of Timothy P. Butters Before the Subcommittees on Energy and Oversight Committee on Science, Space and Technology, U.S. House of Representatives at page 12 (Sept. 9, 2014).

1. The new and replacement crude oil storage tanks are being permitted at SCAQMD Rule 463 limits to allow flexibility to store any crude oils allowed by local regulations. It is common practice for refineries to maintain flexible operating permits by matching permit limitations to regulatory limits;
2. The Light Sweet Crude Oil SDS submitted with the initial tank applications is generic, was developed to represent a wide range of light crude oils and does not simply include data on Bakken, Basrah, or any other light crude oil;
3. Tesoro has facilities throughout the Western United States, including two refineries, the Mandan Refinery and the Dickinson Refinery, and pipelines in the Bakken formation area located in the mid-continent. Tesoro is a refining and marketing company that does not own or invest in crude oil production fields. Tesoro owns infrastructure and facilities to transfer and process crude oil produced by others. None of this indicates a crude oil switch at the Los Angeles Refinery;
4. The Vancouver Energy Project is an independent project that is under separate environmental review and that will proceed with or without the proposed project and does not indicate that the proposed project will increase the use of Bakken crude oil; and,
5. Statements made by Tesoro regarding sourcing “advantaged crude oils” as used by Tesoro, including Bakken, are typically made with regard to its West Coast system, which includes the Kenai Refinery in Alaska, the Anacortes Refinery in Washington, and the two California refineries in Martinez and Los Angeles<sup>146</sup>, not specifically the Los Angeles Refinery.

In fact, the proposed project does not include or support a crude oil switch that could have any impacts that have not been analyzed in the DEIR (see Master Response 4). The comment summarizes the conclusions reached in the comment letter Section B regarding the import of Bakken crude oil. The issues raised in the comment are addressed in more detail in subsequent comments and are responded to in detail in subsequent responses as noted in Table 78.123-1. Note that the Refinery already processes light crude oils, such as ANS with RVP above 7 psi, Saharan with RVP of 8.4 psi and other crude oils with RVPs in the range of 6 to 9 psi. These are within the RVP range of Bakken crude oil, which is 7 to 11 psi based on data from Tesoro’s Anacortes Refinery. While only small amounts of Bakken crude oil were processed at the Refinery in the baseline years, other similar light crude oils were processed during those years.

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<sup>146</sup> The reference to the “West Coast system” that appears in Tesoro’s corporate presentations and statements is a term that is used with varying meanings based on the context of the presentation or statement. Analyst day and earning statements presentations are given to an audience that routinely participates in the presentations and is familiar with Tesoro’s corporate structure and financial performance, as such, some of the references are not as explicit as would be to an uninformed audience. At times, it refers to Tesoro’s four west coast refineries, but it can also refer to those four refineries as well as Tesoro Logistics or distribution system to third-party clients on the west coast. Thus, awareness of the context surrounding the use of this phrase is always necessary to understand the speaker’s intended meaning, but the phrase is not used to refer only to the Los Angeles Refinery in isolation.

**APPENDIX G1: RESPONSE TO COMMENTS**

There would be no additional impacts, beyond those analyzed in the DEIR, if different light crude oil is processed at the Refinery.

**Table 78.123-1  
Topics Raised in Comments and Location of Responses**

Topic	Response	
	Master Response Number	Specific Response Number
Crude Oil Vapor Pressure	-	G1-78.124 – G1-78.133
Bakken Crude Oil Safety Data Sheet	-	G1-78.157
Tesoro's Holdings in the Bakken Formation	-	G1-78.139
Vancouver Energy Project	8	G1-78.141 – G1-78.145
Tesoro Statements on West Coast Crude Oil Supply	4	G1-78.133

Note: - = No Master Response prepared on this topic.

**Comment G1-78.124**

1. Tank Vapor Pressure Used in VOC Calculations Are Consistent with Bakken

The Project description is silent on the vapor pressure that was used to estimate VOC emissions and that would thus be permitted for all new and modified crude oil storage tanks that will service the marine terminal.<sup>43</sup> This information has to be dredged out of complex appendices to the main text, which effectively prevents non-expert members of the public from understanding this Project. This key information is buried in DEIR Appendix B-3, Air Emission Calculations and Health Risk Assessment, Attachment B, Storage Tank Emission Calculations.<sup>44</sup> The TANKS 409.9d output in Attachment B, which only a subject matter expert can interpret, indicates that the VOC emissions from all new and modified tanks were estimated assuming a Reid Vapor Pressure (RVP) of 10.5 psi.<sup>45</sup>

G1-78.124

G1-78.124  
cont'd.

<sup>43</sup> New and modified tanks listed in DEIR, Appendix B, Tables 1 and 2, pp. B-3-7 and B-3-8.

<sup>44</sup> DEIR, Appendix B, Attachment B-3, pdf 1110.

<sup>45</sup> DEIR, pdf 1113 (Carson CCT #1 to #6), 1174 (Tanks 300035, 300036), 1188 (Tank 80060), 1196 (Tank 80067), 1204 (Tank 80079).

**Response G1-78.124**

Appendix B-3 Attachment B of the DEIR, rather than the project description of the DEIR, contains all vapor pressure data necessary to support storage tank emissions calculations for the proposed project. This is consistent with CEQA Guideline § 15147 which states: “The information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public. Placement of highly technical and specialized analysis and data in the body of an EIR should be avoided through inclusion of supporting information and analyses as appendices to the main body of the EIR.

Appendices to the EIR may be prepared in volumes separate from the basic EIR document, but shall be readily available for public examination and shall be submitted to all clearinghouses which assist in public review.” The properties of crude oil are technical information appropriately contained in Appendix B-3 of the DEIR.

The manner in which data in the DEIR and associated appendices is presented is consistent with cases such as *San Franciscans for Reasonable Growth v. City & County of San Francisco* (1987) 193 Cal.App.3d 1544, 1549 and *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 540, which reject plaintiffs’ contentions that the DEIRs were deficient because the reports only summarized the technical information and included detailed technical data in the appendices.

The comment notes that the DEIR storage tank calculations were based on crude oil RVP of 10.5 psi. In order to comply with the SCAQMD storage limitations of 11 psia TVP, the RVP must be limited to 10.5 psi; (see Response G1-78.125).

**Comment G1-78.125**

It is well known in the industry that RVP underestimates the true vapor pressure of light gassy shale crude oils such as Bakken and other North American light shale crudes. The standard method used to measure RVP, ASTM D323 (Reid Vapor Pressure), results in large vapor losses if the sample is supersaturated, resulting in a much lower value for vapor pressure than the true value. The VOC emissions should have been calculated and the vapor pressure limit should be set on true vapor pressure, measured using ASTM D6377, at 100 F and a vapor-liquid ratio of 4:1. This method uses a pressurized cylinder for crudes that contain volatile light ends and avoids exposing the sample to the atmosphere.<sup>46</sup> The RVP method typically underestimates true vapor pressure by about 1 psi. Thus, actual vapor pressure of material that Tesoro plans to store in these tanks is likely closer to 11.5 psi, which is consistent with Bakken crude oil.<sup>47</sup>

G1-78.125

<sup>46</sup> Nia William, Reuters, Exclusive: TransCanada Toughens Pipeline Pressure Limits for Gassy Crude, Reuters, January 31, 2014; Available at: <http://www.reuters.com/article/us-transcanada-pipeline-vapor-pressure-idUSBREAO0UW20140131>. See also: John R. Auers and others, North Dakota Petroleum Council, The North Dakota Petroleum Council Study on Bakken Crude Properties, August 4, 2014, p. 16.

<sup>47</sup> The tanks would likely be permitted at a TVP of 11 psia as federal and SCAQMD regulations limit tank vapor pressure to 11 psia without special controls. However, as the vapor pressure limits in Tesoro’s Title V permits are not enforceable, any vapor pressure limit is meaningless.

**Response G1-78.125**

The proposed project is not designed to, and will not in fact, facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend (see Master Response 4; DEIR sections 2.7.1.3 and 4.1.2.1). Future changes in the Refinery’s crude oil slate, if any, will occur independently of the proposed project, and will be based on factors that cannot be predicted such as the relative cost and availability of different crude oils in the future. Regardless of future changes to the crude oil slate, if any, crude oil blends that are processed in the future will have to fit within the Refinery’s operating “envelope” of weight and sulfur content. If and to the extent any future changes in the Refinery’s crude oil slate could result in changes to the crude oil blends processed for properties other than weight and sulfur content, such as vapor pressure, those changes would be

(1) independent of the proposed project, and (2) entirely speculative, as there is no way to predict Tesoro's future crude oil slates. Additionally, as further described in Responses G1-78.150, G1-78.170, and G1-78.172, other crude oil properties are also evaluated and constrained to ensure that crude oil blends fit into the Refinery process equipment limitations.

There are numerous tanks in the Refinery, some with and many without vapor pressure limitations (see current Carson Operations Title V permit Sections D and H, Process 16, Systems 1-5 and current Wilmington Operations Title V permit Sections D and H, Process 16, Systems 1-7). Tesoro's Responsible Official, the Refinery Manager, is required to certify compliance with all Title V permit conditions, under penalty of perjury, semi-annually, including the vapor pressure limitations.

As shown in Appendix B-3 Attachment B of the DEIR, Tesoro utilized a maximum RVP of 10.5 psi to represent crude oils stored in the proposed new storage tanks. However, RVP is converted to TVP, which is the measure of vapor pressure of materials at actual storage temperature (not 100 °F), using U.S. EPA approved methodologies.<sup>147</sup> TVP, not RVP, is used to calculate emissions from storage tanks. It is inaccurate to assume that RVP underestimates TVP by about 1 psi; the proper calculations, based on liquid storage temperature, must be performed to convert RVP to TVP. Notably, an RVP of 10.5 psi, using U.S. EPA approved methods, results in a TVP approaching 11 psia during summer months at the Refinery. A TVP limit of 11 psia is the maximum allowed vapor pressure of SCAQMD Rule 463, U.S. EPA NSPS Kb and U.S. EPA MACT Standards CC for floating roof tanks. This maximum vapor pressure will be appropriately enforced through issuance of Title V permit conditions for the new and modified floating roof storage tanks associated with the project. As noted above, Tesoro's Responsible Official, the Refinery Manager, is required to certify compliance with all Title V permit conditions, under penalty of perjury, semi-annually, including the vapor pressure limitations.

Footnote 46 to the comment references two sources of information. The first source references Canada's intent to tighten vapor pressure monitoring requirements at Canadian crude oil production facilities. Crude oil production facilities remove light ends (low molecular weight, high vapor pressure gases) from crude oil in order to meet applicable requirements for transport. This information is beyond the scope of, and has no bearing on, the proposed project. The second source suggests that using analytical methods for RVP may underestimate the vapor pressure of the crude oil and suggests using analytical methods for TVP. As explained above, all calculations are done in the TANKS program (the industry-standard and regulatory standard program developed by the U.S. EPA that implements EPA AP-42 calculation methodology for storage tanks) using TVP and not RVP. This is consistent with the suggestions of the second source in Footnote 46 of the comment, so the vapor pressure is not underestimated.

Contrary to Footnote 47 of the comment, which suggests that vapor pressure limits in Tesoro's Title V permits are unenforceable, the SCAQMD can and does enforce vapor limits on storage tanks and Tesoro is expected to comply with these limits. It is true that permit conditions that were imposed in the past may not be as specific or as stringent as more recently imposed permit conditions. New storage tanks and modified storage tanks with emission increases of one pound

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<sup>147</sup> U.S. EPA AP-42 Figure 7.1-13a, <https://www3.epa.gov/ttn/chief/ap42/ch07/final/c07s01.pdf>.

## APPENDIX G1: RESPONSE TO COMMENTS

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or more are subject to SCAQMD Regulation XIII and permit revisions for these tanks will impose conditions limiting vapor pressure of material stored and throughput rate to ensure maximum emission potentials are not exceeded. In fact, some storage tanks that have not been subject to SCAQMD Regulation XIII do not have vapor pressure or throughput limitations at all. Condition B22.9, from the Carson Operations Title V permit Sections D and H, Process 16, System 1, is an example of a more recently imposed, enforceable permit condition:

### B22.9

The operator shall not use this equipment with materials having a(n) true vapor pressure of 0.1 psia or greater under actual operating conditions. Whenever there is a change in the product types, the operator shall determine the flash point of the organic material stored using ASTM Method D-93. Those materials having a flash point less than 100 degrees F as determined by this test will be considered as having a true vapor pressure of greater than 5 mm Hg (0.1 psi) absolute under actual storage conditions. The test must be conducted within five days of changing product types.

It should be noted that there are additional permit conditions that apply to tanks that store predominantly light products. For example, Condition K67.12 applies to Refinery storage tanks that store gasoline, naphtha and jet fuel. The rules specified in Condition K67.12 reference specific vapor pressure testing methods.<sup>148</sup>

### K67.12

The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s): Throughput and vapor pressure of stored liquid. Hydrocarbon concentration measurements done in the vapor space above the floating roof of the tank. Other records that may be required to comply with the applicable requirements of SCAQMD Rules 463, 1149, 1178, and 40CFR63 Subpart CC. Records shall be maintained and kept on file for at least five years and shall be made available to the Executive Officer or his authorized representative upon request.

In all cases, as indicated above, Tesoro's Refinery Manager, is required to certify compliance with all Title V permit conditions, under penalty of perjury, semi-annually, including the vapor pressure limitations.

### Comment G1-78.126

In comparison, there are very few existing tanks at either Wilmington or Carson that are permitted to store crude oil with a vapor pressure of 11 psi. Most existing crude oil "storage" (as opposed to "charging") tanks have vapor pressure limits that are lower than 11 psi,<sup>48</sup> indicating that Tesoro anticipates importing more volatile crude oils than were refined in the baseline. My calculations below indicate that the new tanks will increase 11 psi crude storage by a factor of 8 at Wilmington and by a factor of 7 at Carson, facilitating the import of Bakken and other similar light crude oils.

G1-78.126

<sup>48</sup> Carson Title V Permit, January 21, 2016; Wilmington Title V Permit, July 7, 2015.

<sup>148</sup> See for example, SCAQMD Rule 463(h)(3), (4) and (5).



**Response G1-78.126**

Storage tanks emissions are calculated and storage tanks are permitted based on the highest vapor pressure material anticipated to be stored in the tank. Storage tanks are permitted in this manner to 1) estimate VOC emissions in a way that estimates the maximum potential emissions, and 2) allow the tank to change service according to the operational requirements of the Refinery. At any given time, a storage tank usage may switch from a low vapor pressure material to a high vapor pressure material (within the imposed permit vapor pressure limit) and vice versa. Storage tank service may change at a given time in order to store materials from a tank that is being taken out of service for periodic maintenance and repair, to free up accessible tank space when marine vessels come in to deliver petroleum products, to accept intermediate products from other sources, and to accommodate other physical and operational needs of the Refinery.

Contrary to the comment, the Refinery's current Title V permit allows the storage of high and low vapor pressure crude oil in numerous fixed roof, internal floating roof and external floating roof storage tanks (see current Carson Operations Title V permit Sections D and H, Process 16, Systems 1-5 and current Wilmington Operations Title V permit Sections D and H, Process 16, Systems 1-7). It is common practice for refineries to maintain flexible operating permits by matching permit limitations to approach regulatory limits. Specifically, there are 60 storage tanks at Carson Operations capable of storing crude oil with TVP from 7 to 11 psia. At the Carson Crude Terminal, all 5 existing storage tanks are capable of storing crude with TVP up to 11 psia. There are 66 storage tanks at Wilmington Operations capable of storing crude oil with TVP from 7 to 11 psia. A review of the storage tank permits including descriptions, permit conditions, and lists of commodities capable of being stored in the various storage tanks reveals that many storage tanks with the appropriate level of VOC controls (external floating roof with dual seals or internal floating roof with seals or venting to vapor recovery) to store light crude oils do not have any vapor pressure restrictions. However, SCAQMD Rule 463 TVP limit of 11 psia still applies to these storage tanks.

Additionally, the Carson Crude Terminal receives and stores crude oil for Carson Operations. The storage tank permits at the Carson Crude Terminal allow the storage of high (11 psia TVP) and low vapor pressure crude oil in five external floating roof storage tanks (see current Carson permits G28162 through G28166). In fact, based on the permit review explained above, Carson Operations has approximately 5.3 million barrels of existing storage tank capacity available for storage of light crude oil with a TVP up to 11 psia. Wilmington Operations has approximately 3.7 million barrels of existing storage tank capacity available for storage of light crude oil with a TVP up to 11 psia. The Carson Crude Terminal has approximately 2.0 million barrels of existing storage tank capacity available for storage of light crude oil with a TVP up to 11 psia. The total existing crude oil storage capacity is 11.0 million barrels. Upon completion of the proposed project, the crude oil storage capacity will be 14.4 million barrels. This is contrary to the assessment in the comment of the current storage capability of light crude oil for the Refinery.

Further, as indicated in Sections 2.5.4.1, 2.9, 4.1.2, and Appendix F of the DEIR, among others, as well as in Master Response 4, the proposed project is not designed to facilitate the Refinery to process a different crude oil blend than is currently processed. Additionally, as indicated in

Master Response 6, the volume of available crude oil storage capacity alone has no bearing on Refinery crude oil processing capacity. Response G1-78.109 addresses the potential impacts of storing a crude oil with worst-case properties prior to blending for processing.

**Comment G1-78.127**

The DEIR asserts that the “tank replacement and modification project” is a separate project from the “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.”<sup>49</sup> However, the facts indicate otherwise. The goal of the Project is to increase the amount of gasoline or distillate that can be produced by 30,000 to 40,000 bbl/day. As explained in Comment II.B.3, this requires a lighter crude slate that yields more gasoline and distillate. As explained in Comment II.B.3, many Project components require an increase in lighter crude, including the shutdown of the Wilmington FCCU. At Wilmington, there are only three existing “storage” tanks<sup>50</sup> with vapor pressure limits of 11 psi<sup>51</sup> that could hold crude oil: tanks 13506, 13509, and 13512.<sup>52</sup> The total monthly permitted throughput of these three tanks is 376,248 bbl/mo.<sup>53</sup> The Project would add two 300,000 bbl tanks with vapor pressure limits of 11 psi that were assumed to have 60 turnovers per year in the TANKS 4.0.9d VOC analyses.<sup>54</sup> Thus, the Project would increase the amount of 11 psi crude oil throughput at Wilmington by a factor of 8.<sup>55</sup>

G1-78.127

G1-78.127  
cont'd.

<sup>49</sup> DEIR, p. 1-5, pdf 24.

<sup>50</sup> Other tanks permitted to store 11 psi vapor pressure material are not relevant. Tank 96059 is equipped with mixers and thus is likely a “charging” tank. Tank 125004 is permitted to only store naphtha.

<sup>51</sup> Wilmington Title V Permit, Tanks subject to condition B22.8 (TVP = 11 psi) at pdf 212.

<sup>52</sup> Wilmington Title V Permit, Tanks 13505 (pdf 85), 13509 (pdf 85), and 13512 (pdf 86).

<sup>53</sup> Wilmington Title V Permit, Tank 13506, Condition C1.26 (72,083 bbl/mo); Tank 13509, Condition C1.8 (152,083 bbl/mo); Tank 13512, Condition C1.8 (152,083 bbl/mo).

<sup>54</sup> DEIR, Attachment B, Appendix B-3, p. B-3-182, pdf 1173.

<sup>55</sup> Total annual existing potential 11 psi crude oil storage tank throughput at Wilmington = (72,083+ 152,083+152,082 bbl/mo)×12 = **4,514,988 bbl/yr**. Total annual 11 psi crude oil storage tank throughput added by the Project = 2 tanks × 300,000 bbl/tank × 60 turnovers/tank-yr = **36,000,000 bbl/yr**. Increase in 11 psi storage tank throughput = (36,000,000 bbl/yr)/(4,514,988 bbl/yr) = **7.97**. New Wilmington tanks 300035 and 300036 turnovers from DEIR, pdf 1173.

**Response G1-78.127**

To support the claim in the comment that the scope of the proposed project is different than that described in the DEIR, the citation to DEIR in Footnote 49 to the comment is taken out of context. The DEIR notes that the new and replacement storage tanks are proposed for a different purpose, to increase marine vessel offloading efficiency, that is not relied on for the core integration and compliance project elements. The project objectives were clearly defined in the DEIR (see Section 2.2 on pages 2-3 and 2-4 of the DEIR). The proposed project is not designed to increase gasoline/distillate production by 30,000 to 40,000 bbl/day nor is that a goal of the proposed project. Rather, the proposed project is designed to maintain the overall production volume of transportation fuels (see first bullet of Section 2.2 on page 2-3 of the DEIR) but allow the flexibility, depending on market demand, to produce 30,000 to 40,000 more bbl/day of distillate (jet fuel and diesel fuel), with a corresponding reduction in production of gasoline. In other words, the total production of gasoline, jet, and diesel fuel will be essentially the same before and after the proposed project modifications in that if more gasoline is produced, less distillate is produced and vice versa. This flexibility in product is independent of the type of

crude oil that is utilized by the Refinery, as it occurs downstream of the units that process crude oil and the crude oil processing units are not being modified, other than the DCU H-100 heater permit description change. The DEIR has analyzed the expected increase in crude oil processing of up to 6,000 bbl/day associated with the DCU H-100 heater permit description modification.

As explained in Section 2.2 of the DEIR, one of the primary objectives of the proposed project is to recover and upgrade distillate range material from FCCU feeds. In simple terms, this project focuses on distillate, which is essentially the middle portion of a barrel of crude oil. The proposed project does not rely on a lighter crude oil blend to yield gasoline or distillate. If that were the case, modifications such as additional distillation capacity would be needed in the Refinery Crude Units and permit revisions would be required to enable the distillation and recovery of additional light products (LPG and gasoline) from the Crude Units (see pages 2-17 and 2-18 of the DEIR). No such modifications are proposed. Many proposed project elements will be implemented to recover and then treat distillate recovered from FCCU gas oil feed, thereby reducing the volume of gas oil remaining to be processed in the Carson Operations FCCU. Combined with other integration project elements explained in Section 2.7 of the DEIR, the recovery and upgrade of distillate range material from FCCU feeds enables shutdown of the Wilmington Operations FCCU.

Contrary to the comment that new and modified storage tanks associated with the proposed project will allow the Refinery to increase the capacity of 11 psia crude oil at Carson and Wilmington Operations, the new and modified storage tanks will allow increased storage of crude oil, but this does not translate to an increase in Refinery processing capability beyond that analyzed in the DEIR (see Master Responses 6 and 7 and Response G1-78.126, which address existing and post-project crude oil storage capacity). The purpose of the new storage tanks is to improve marine vessel delivery efficiency as explained in Responses G1-78.176 and G1-78.180. As explained in Response G1-78.126, the permitted vapor pressure is the maximum allowed and is not representative of what will be stored in the storage tanks at all times. The crude oil stored in the storage tanks can have a vapor pressure less than the permit limit depending on the crude oil received at any given time. For impact analysis, the highest vapor pressure produces the greatest emissions, which were analyzed in the DEIR providing a conservative, worst-case analysis. Under SCAQMD Regulation XIII - New Source Review, the SCAQMD uses a 30-day average to establish throughput limits. Therefore, the permitted monthly throughput is used to establish the maximum emissions from a storage tank.

**Comment G1-78.128**

At Carson, there are only three "storage" tanks with vapor pressure limits of 11 psi<sup>56</sup> that could hold crude oil: tanks 6, 8, and 191.<sup>57</sup> The permitted total annual throughput of these three tanks is 20,650,000 bbl/yr. The Project would add five 500,000 bbl tanks with vapor pressure limits of 11 psi that were assumed to have 50.1 turnovers per year in the TANKS 4.0.9d VOC analyses.<sup>58</sup> Thus, the Project would increase the amount of 11 psi crude oil throughput at Carson by a factor of 7.<sup>59</sup>

G1-78.128

## APPENDIX G1: RESPONSE TO COMMENTS

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<sup>56</sup> Carson Title V Permit, Tanks 6 (pdf 190), 8 (pdf 19 ), and 191 (pdf 180).

<sup>57</sup> Carson Title V Permit, Tank 6, Condition C1.31, pdf 418 (1.825E+7 bbl/yr); Tank 8, Condition C1.31, pdf 418 (1.825E+7 bbl/yr); and Tank 191, Condition C1.69, pdf 440 (200,000 bbl/ mo).

<sup>58</sup> DEIR, Attachment B, Appendix B-3, p. Bp3-121, pdf 1112.

<sup>59</sup> Total annual existing potential 11 psi crude oil storage tank throughput at Carson =  $2 \times 1.825E+7$  bbl/yr +  $12 \times 200,000$  bbl/mo = **20,650,000 bbl/yr**. Total annual 11 psia crude oil storage tank throughput added by the project = 6 tanks  $\times$  500,000 bbl/tank  $\times$  51.10 turnovers/ tank-yr = **153,300,000 bbl/yr**. Increase in 11 psi storage tank throughput =  $(153,300,000 \text{ bbl/yr}) / (20,650,000 \text{ bbl/yr}) = 7.4$ . New Carson (DEFR) tank turnovers from DEIR, pdf 1112.

### Response G1-78.128

As explained in Response G1-87.126, both Carson and Wilmington Operations and the Carson Crude Terminal have numerous storage tanks that are permitted to store high vapor pressure crude oils. Specifically, there are 58 storage tanks at Carson Operations that could hold crude oil with a TVP of 11 psia. Many of the storage tanks do not have commodity or throughput permit restrictions and some storage tanks do not have vapor pressure permit limitations. Because there are no throughput limitations on many storage tanks that are appropriately controlled (with floating roofs or vapor recovery) to store crude oil, the permitted total annual throughput at the Carson Operations is not limited to 20,650,000 bbl/yr as the comment states. The fact that the new and modified storage tanks will allow the storage of crude oils up to 11 psia does not mean that the proposed project was designed to facilitate a switch to higher vapor pressure crude oils. It simply means that Tesoro will have the flexibility to store higher vapor pressure crude oil in any particular tank (see Master Responses 6 and 7).

### Comment G1-78.129

The three existing tanks at Wilmington (80060, 80067, 80079)<sup>60</sup> that would be modified by the Project to increase throughput all have internal heating coils, which means they stored low vapor pressure materials in the baseline.<sup>61</sup> As tank 80067 has a vapor pressure limit of 0.5 psi,<sup>62</sup> the Project would effectively increase the volatility of the material stored in this tank by a factor of 22 ( $11/0.5=22$ ). Similar increases are expected for the other two replaced tanks due to the presence of heating coils.

<sup>60</sup> DEIR, Attachment B, Appendix B-3, Table 1, p. B-3-8.

<sup>61</sup> Wilmington Title V Permit, July 7, 2015, pdf 90, 91, 115.

<sup>62</sup> Wilmington Title V Permit, July 7, 2015, pdf 91, Condition B22.1 at pdf 211 ("The operator shall not use this equipment with materials having a(n) true vapor pressure of 0.5 psia or greater under actual operating conditions.").

G1-78.129

### Response G1-78.129

Tanks 80060, 80067, and 80079 have heating coils that are typically only used when storing low API gravity commodities, which also tend to have low vapor pressure (TVP). This does not mean the tanks only stored low TVP crude oils. Note that Tank 80060 has a current TVP limit of 1.7 psia, not 0.5 psia, and that Tank 80079 does not currently have a vapor pressure limit. Therefore, the comment that the volatility of the material capable of being stored in all three tanks increases by a factor of 22 is incorrect and unsupported by facts. Also, for those storage tanks, the comments assuming low vapor pressure limitations of materials stored during the baseline and regarding the increased capability to store more volatile commodities as a result of the proposed project are not accurate. In general, storage tanks that will have modified permits

as part of the proposed project will be permitted to SCAQMD Rule 463 limits for operating flexibility. This does not mean that all storage tanks will store high TVP crude oils. However, to capture maximum potential impacts, the DEIR analyses used the maximum TVP as the basis for calculations and evaluations.

**Comment G1-78.130**

These changes in the amount of crude oil that can be stored at a vapor pressure of 11 psi suggest a crude switch from heavy crudes to lighter crudes such as Bakken. This significant change in the vapor pressure of crude to be stored in these new and modified tanks is also much higher than any crude allowed to be imported by the Marine Terminal Agreement, Annex D. These two facts are compelling evidence that the Project will facilitate a crude switch as the new storage tanks are part of the Project.<sup>63</sup> The future crude will most likely be Bakken, which is supported by several lines of evidence.

G1-78.130

<sup>62</sup> The DEIR argues that the storage tanks are not part of the project. However, without the ability to import significant amounts of light crude, facilitated by the new tanks, the Wilmington FCCU could not be shutdown, propane recovery would not be feasible, and other Project components would not be required.

**Response G1-78.130**

As explained in G1-78.126, the Refinery currently has numerous storage tanks that can store crude oil with a TVP limit of 11 psia, so the additional storage volume at the SCAQMD Rule 463 limit of 11 psia TVP in the proposed project is far less than claimed in the comment. The DEIR fully evaluates the potential impacts from the increased volume of crude oil that may be stored in the additional crude oil storage tanks. As demonstrated in Response G1-78.129, with the exception of the proposed storage tanks at the Carson Crude Terminal, the proposed project does not substantially increase the potential storage volume of high vapor pressure crude oil.

The comment references the [Long Beach] Marine Terminal Agreement, Annex D and claims that Annex D is a list of crude oil “allowed” to be imported by the Long Beach Marine Terminal. As further explained in Response G1-78.153, Annex D was included as a requirement of a Tesoro Logistics customer to specify crude oils that Tesoro must accommodate as part of the customer’s Berth Access Agreement, the contract for Tesoro to provide marine terminal services to the customer. For consistency, Annex D was carried over to agreements between Tesoro Logistics and Tesoro Refining and Marketing. Annex D does not represent an actual or allowable list of crude oils managed by the Long Beach Marine Terminal during baseline or any other years.

Contrary to Footnote 63 in the comment, the proposed project does not rely on importing significant amounts of light crude oil in order to shut down the Wilmington Operations FCCU or in order to recover propane from the overhead gases of the Wilmington Operations Hydrocracker Unit and the Carson Operations Naphtha Isomerization Unit. As described in Section 2.2 of the DEIR, one of the primary objectives of the proposed project is to recover and upgrade distillate range material from FCCU feeds. In simple terms, this project focuses on distillate, essentially the middle portion of a barrel of crude oil, and is not dependent on light crude oil. Many proposed project elements will be implemented to recover and then treat distillate recovered from FCCU gas oil feed, thereby reducing the volume of gas oil remaining to be processed in the

Carson Operations FCCU. Combined with other integration project elements explained in Section 2.7 of the DEIR, the recovery and upgrade of distillate range material from FCCU feeds enables shutdown of the Wilmington Operations FCCU. See Response G1-78.138 for a description of the propane recovery project elements.

**Comment G1-78.131**

Bakken crude oils are the only crude oils that I am aware in the market today that have a true vapor pressure 11+ psi. The Wall Street Journal, for example, analyzed data collected by Capline Pipeline, which tested crudes from 86 locations world-wide for vapor pressure. The Journal reported:<sup>64</sup>

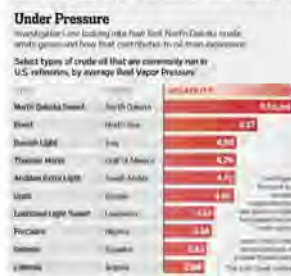
"[l]ight, sweet oil from the Bakken Shale had a far higher vapor pressure – making it much more likely to throw off combustible gases – than crude from dozens of other locations...According to the data, oil from North Dakota and the Eagle Ford Shale in Texas had vapor-pressure readings of over 8 pounds per square inch, although Bakken readings reached as high as 9.7 PSI. U.S. refinery Tesoro Corp. TSO +1.01%, a major transporter of Bakken crude to the West Coast, said it regularly has received oil from North Dakota with even more volatile pressure readings – up to 12 PSI. By comparison, Louisiana Light Sweet from the Gulf of Mexico, had vapor pressure of 3.33 PSI, according to the Capline data."

G1-78.131

This data, as summarized by the Wall Street Journal, is shown in Figure 4. This figure shows that all crude oils that are designated as "light" do not have the same vapor pressure and thus, the same environmental impacts when stored and transported. See also additional discussion of Bakken vapor pressure in Comment II.E.2.

The more volatile the crude, the higher the VOC, TACs, and GHG emissions, the higher the flammability, and the greater the consequences in the event of an accident. The only "light"<sup>65</sup> crude oil that Tesoro has admitted to refining at its California refineries in its filings with the U.S. Security and Exchange Commission is Basrah, an imported Iraqi light crude oil with a vapor pressure that is half that of Bakken. Thus, any claim that the Project will not facilitate a crude switch is clearly invalid. The vapor pressure of the crude oils stored in the new and modified tanks, 11+ psi, is clear and unrefutable evidence that the Project is designed to import a lighter crude than currently refined.

**Figure 4.**  
**Volatility (psi) of**  
**Some Commonly Refined Crude Oils<sup>66</sup>**



G1-78.131  
cont'd.

## APPENDIX G1: RESPONSE TO COMMENTS

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<sup>64</sup> Russell Gold, Analysis of Crude From North Dakota Raises Further Questions About Rail Transportation, Wall Street Journal, February 23, 2014.

<sup>65</sup> Basrah has an API gravity of 29.7 and thus, while very light, falls just below the “light” threshold of 32 used in the industry to classify crudes. Therefore, it is a very light “medium” crude under the usual classification scheme. However, Tesoro itself classifies it as “light” in its SEC filings (SEC 10-Q, Quarter Ending March 31, 2014).

<sup>66</sup> Wall Street Journal, February 23, 2014.

### Response G1-78.131

As explained in Response G1-78.125, TVP of 11 psia is the SCAQMD Rule 463 limit. Therefore, crude oil vapor pressure approaching 11 psia was used as the basis for storage tank calculations in the DEIR analysis to assess the maximum potential impacts.

The comment contradicts other statements regarding the fact that the Refinery has already processed Bakken crude oil. The comment states that the “only” light crude oil Tesoro has processed is Basrah. Comments G1-78.102 and G1-78.136 acknowledge that the Refinery has already processed Bakken crude oil. In fact, the Refinery has processed Bakken crude oil and other light crude oil, and is already capable of importing, storing, and processing Bakken crude oil within its crude oil blends. As explained in Response G1-78.123, the Refinery has processed other crude oils with RVPs in the range of 6 to 9 psi, as well as crude oils within the RVP range of Bakken crude oil, which is from 8 to 11 psi. Master Response 4 addresses the variability over time and many different types and countries of origin of crude oil processed by the Refinery.

The comment implies that if Tesoro processed other light crude oils in the past, they should have been included in its quarterly SEC filings. SEC filings are financial in nature and are not intended to disclose details of operation at the Refinery. As such, they are not required to contain a complete list of all the crude oils processed at the Refinery. In fact, the 10Q statement referenced in Footnote 65 of the comment states: “Our California Refineries run significant amounts of light crude oil from....” Other 2015 SEC filings include ANS and Basrah in the category of “significant amounts of light crude oils processed by Tesoro’s California refineries.” Additionally, as explained in Master Response 2, the crude oils processed by the Refinery are trade secret information.

See Response G1-78.126 for a response to the comment that the permitted storage tank vapor pressure levels are “clear and irrefutable evidence” that the proposed project is designed to import lighter crude oils.

### Comment G1-78.132

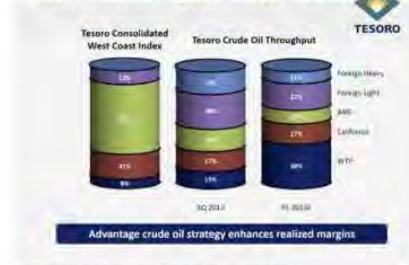
The vapor pressure (RVP) used to calculate VOC emissions from new and modified storage tanks (RVP=10 psi, TVP=11+ psi) is a design parameter that is consistent with Tesoro’s widely reported plans to reduce operating costs at its Los Angeles Refinery by replacing a portion of its crude slate with certain cost-advantaged

G1-78.132



North American crudes, labeled “WTI,” which includes all grades of North American crude other than those identified in Figure 5.

Figure 5.  
Tesoro Cost-Advantaged Crude Strategy<sup>67</sup>  
West Coast Refining System Opportunity



G1-78.132  
cont'd.

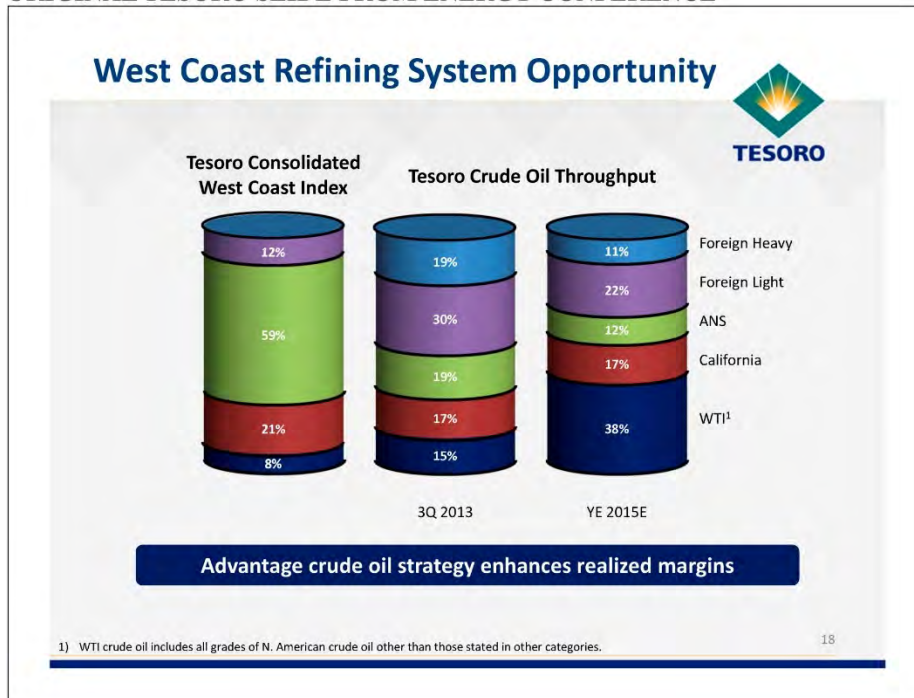
<sup>67</sup> Tesoro, Transformation through Distinctive Performance, Simmons Energy Conference, February 27, 2014 (2/27/14 Tesoro Presentation), p. 18, Exhibit 2.

### Response G1-78.132

The comment takes one slide from a presentation given by Tesoro at an energy conference, adds a new title and takes it out of context to support the contention that the vapor pressure used to calculate VOC storage tank emissions is consistent with corporate plans to replace the current crude oil slate with cost “advantaged crude oils”. However, the original slide from the presentation had nothing to do with vapor pressure (see Figure 78.132-1). Rather, it indicated in very general terms the possible changes in crude oils used throughout Tesoro’s West Coast refineries. The claims regarding vapor pressure in the comment are not supported by either the original slide, nor the slide retitled in the comment. As stated in the DEIR at page 2-16, in 2014 alone, the Refinery processed over 30 different crude oils with varying vapor pressures. The vapor pressure used to calculate VOC emissions in the DEIR was based upon the vapor pressure of the crude oil with the highest emissions, so as to estimate a worst case scenario.<sup>149</sup>

<sup>149</sup> Note the title, “Tesoro Cost-Advantaged Crude Strategy” was added by the commenter and does not appear in the original slide. The full unmodified presentation is included in Attachment I of this Appendix.

ORIGINAL TESORO SLIDE FROM ENERGY CONFERENCE



MODIFIED FIGURE 5 IN COMMENT G1-78.132

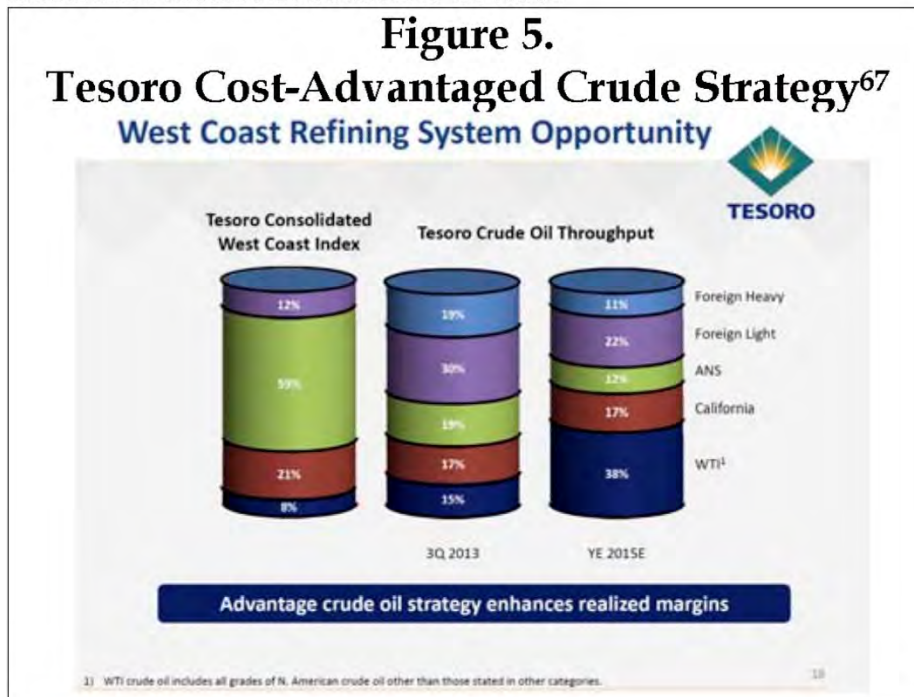


Figure 78.132-1

West Coast Refining System Opportunity Slide Comparison

The slide does not represent the changes to Tesoro's Los Angeles Refinery; rather, it predicted changes to the West Coast system, which includes the Kenai Refinery in Alaska, the Anacortes Refinery in Washington, and the two California refineries in Martinez and Los Angeles.<sup>150</sup> It is also important to note that the vapor pressure used to calculate VOC emissions from new and modified storage tanks is the maximum vapor pressure allowed by SCAQMD Rule 463. While it is expected that crude oils of various vapor pressures may be stored in any of the storage tanks at any given time, the storage tanks are being permitted to allow maximum flexibility of the types of crude oils that may be stored in the storage tanks. By utilizing the maximum vapor pressure, the emissions analysis reflects a worst-case scenario, and would account for the storage of light crude oils, including Bakken crude oils with vapor pressures below the permitted limit (up to 11 psia).

The comment implies that all crude oils from various regions have the same properties and, in particular, WTI crude oils would all have the vapor pressure at which the calculations were made. This is not true. The Bakken region, for example, is vast and the crude oil properties vary based on the exact location from which the crude oil is taken. While generally lighter than crude oils from other parts of the world, the exact vapor pressure of Bakken crude oil varies. The crude oils from the Bakken region also fall within the vapor pressure range of other crude oils processed at the Refinery within the baseline period and currently.

Further, and most importantly, even if more Bakken crude oil or Canadian crude oils are used at the Refinery, they would need to be blended with other crude oils to fit within Refinery specifications (see page 2-16 of the DEIR). Thus, such changes would not have an impact on emissions from process equipment at the Refinery. See Master Response 4 for further information.

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<sup>150</sup> The reference to the "West Coast system" that appears in Tesoro's corporate presentations and statements is a term that is used with varying meanings based on the context of the presentation or statement. Analyst day and earning statements presentations are given to an audience that routinely participates in the presentations and is familiar with Tesoro's corporate structure and financial performance, as such, some of the references are not as explicit as would be to an uninformed audience. At times, it refers to Tesoro's four west coast refineries, but it can also refer to those four refineries as well as Tesoro Logistics or distribution system to third-party clients on the west coast. Thus, awareness of the context surrounding the use of this phrase is always necessary to understand the speaker's intended meaning, but the phrase is not used to refer only to the Los Angeles Refinery in isolation.

**Comment G1-78.133**

As illustrated in Figure 5, cost-advantaged North American crudes, such as Bakken and tar sands (WTI in Figure 5), would increase from 15% in 2013 to 38% in 2015, replacing Alaska North Slope, foreign imports, and California supplies.<sup>68</sup> The President and CEO of Tesoro, Greg Goff, stated in the first quarter 2014 earnings call in responses to questions:<sup>69</sup>

**“Paul Y. Cheng - Barclays Capital - Analyst**

Okay. In Carson, I think before being acquired by you guys, that they were running largely you said<sup>70</sup> ANS, maybe 100,000 barrel per day. And then maybe another 100,000 of the Iraqi Basra<sup>71</sup>. Is the crude slate changed now? Or that is essentially secured by the same crude slate as in the past?

**Gregory J. Goff - Tesoro Corporation - President & CEO**

Basically the same. We are running some different crudes there, but not material differences at this point in time. It is in our plans to do that. Basically what you

described, is the bulk of the crude supply the two sources what is happens in the Los Angeles refinery today.

**Paul Y. Cheng - Barclays Capital - Analyst**

Right. Greg, how quickly that you think you may start to be able to change the crude slate to do that?<sup>72</sup>

**Gregory J. Goff - Tesoro Corporation - President & CEO**

The first thing, our intention at the Port of Vancouver to be able to do that.

**Paul Y. Cheng - Barclays Capital - Analyst**

You have to wait until the Savage terminal's<sup>73</sup> up and running before you can actually do that?

**Gregory J. Goff - Tesoro Corporation - President & CEO**

That would allow us to move the most significant volume right now if we do that. We are looking at other things on an ongoing basis to be able to move crudes there. But we have a number of things that we're looking at, but that is the primary way that we want to be able to improve crude supply cost at the Los Angeles facility.

**Paul Y. Cheng - Barclays Capital - Analyst**

When the Savage that if we assume that you will get the permit and it's actually become a reality sometime in 2015. Given you have said in your system, if you run smoothly you can process up to 200,000 barrels per day of the light oil, is there any reason that you will not take 100% of the Savage crude --<sup>74</sup> into your own system?

Seems like even after you expand into 280,000 barrel per day, including heavy oil and light oil, you will have more than sufficient capacity, refining capacity, to absorb it. Is there any kind of arrangement with your partner that will stop you in<sup>75</sup> taking the entire shipment for yourself?

**Gregory J. Goff - Tesoro Corporation - President & CEO**

There is no restrictions on how much we choose to move to Vancouver, Washington and then supply our West Coast system. We will balance it with the financial commitments and our overall supply strategy with continued sources of crudes of how much we ultimately decide to take.

G1-78.133

G1-78.133  
cont'd.

We have said so far we have committed to take the first 50,000 barrels a day. And the partnerships work through the rest of the supply for that facility, we will be engaged in doing that.

But I think at the same time, Paul, we need to look at the dynamics of the pricing of other types of crude, as we do that. I think goes back to Jeff's question earlier, that there may be some other impacts on crude. But we'll see how that impacts and determine how much crude we take out to our West Coast system."

In its most recent earning conference call, Tesoro reiterated its plans to import crudes from the VET to the Los Angeles Refinery in response to a question on the connection between the integrated Los Angeles Refinery and the VET:

**Gregory J. Goff - Tesoro Corporation - President & CEO**

"We have said that once Vancouver Energy is up and operating, we'll use crude oil into the facility to supply our west coast operations but there's no connection to the permits."<sup>76</sup>

G1-78.133  
cont'd.

<sup>68</sup> 2/27/14 Tesoro Presentation, p. 18, Exhibit 2.

<sup>69</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014 (Q1 2014 Tesoro Earnings Call), Barclay Capital questions at pp. 12-13, Exhibit 4b. There are some discrepancies between the Thomson Reuters transcript and the original webcast. The recording of the original webcast is attached in Exhibit 4a.

<sup>70</sup> "you said" mistranscribed as "essential".

<sup>71</sup> "Basra" mistranscribed as "basket".

<sup>72</sup> "slate to do that" mistranscribed as "slated to buy it?"

<sup>73</sup> "Savage terminal" mistranscribed as "terminal".

<sup>74</sup> Mistranscribed as "Savage water"; recording unclear, but meaning in context is "Savagecrude".

<sup>75</sup> "you in" mistranscribed as "unions".

<sup>76</sup> Tesoro, 2016 Tesoro Corporation Earnings Conference Call Recording, May 5, 2016, 41:39 - 41:50 minutes, Exhibit 5a; Available at: <http://edge.media-server.com/m/p/56vao56c>; Thomson Reuters Streetevents Edited Transcript, TSO - Q1 2016 Tesoro Corporation Earnings Conference Call, May 5, 2016, Exhibit 5b, p. 14.

## Response G1-78.133

As stated in Response G1-78.132, the West Coast system that Mr. Goff refers to in the quotes from earnings calls cited in the comment is not synonymous with the Los Angeles Refinery, as the comment concludes. Additionally, the conversation between Paul Cheng of Barclay's Capital and Mr. Goff on May 1, 2014 regarding a statement about possible destinations for Vancouver Energy Project crude oil mentioned the Los Angeles Refinery. While the conversation is specific to the Los Angeles Refinery at one point, Mr. Goff elaborated on the source, potential destinations, volumes, and dynamics of refinery crude oil sourcing in subsequent statements. Thus, the conversation was not solely focused on the Los Angeles Refinery, but more broadly discussed the expected operation of the Vancouver Energy Project, once approved. Further, while Mr. Goff states that the Vancouver Energy Project will allow a change in crude oil slate, the individual crude oils that are supplied to the Refinery, Mr. Goff never states that the Vancouver Energy Project would enable the Refinery to run a different crude oil blend, nor does he mention any intention to do so.

As explained in Response G1-78.132, the "West Coast System" includes four separate refineries, and the general statements of Mr. Goff do not provide any support for the conclusion that the comment reaches that the Vancouver Energy Project will replace California crude oils with

Bakken and heavy Canadian crude oils. In fact, full review of the quotes in Comment G1-78.133 (see page 25 of the comment letter) indicates that Mr. Goff states that the types of crude oils that will be supplied to the West Coast will be dependent upon the “dynamics of the pricing of other types of crude.” He concludes that the amount of crude oil taken into the West Coast system depends on “other impacts on crude.” While the West Coast system includes the Los Angeles Refinery, and Tesoro has committed to accept 50,000 bbl/day into the West Coast system; the exact refinery or refineries that will be receiving portions of this volume is undetermined. As explained in the DEIR and Master Response 4, if the crude oil from the Vancouver Energy Project is routed to the Los Angeles Refinery, the crude oil will need to be blended with other crude oils in order to fit within the Refinery's current operating constraints, so there will be no impacts from processing different crude oil. All potential impacts of storing crude oil in the proposed project tanks and transferring unblended crude oils in the associated piping have been evaluated in the DEIR assuming worst-case crude oil properties (see Responses G1-78.109 and G1-78.157). Any routing of crude oil through the Vancouver Energy Project is not a result of the proposed project, and could occur with or without the proposed project (see Master Response 8).

Note also that the statement in Comment G1-78.133 of Mr. Goff is taken out-of-context to suggest that the Vancouver Energy Project and the Refinery are linked. The CEO was responding to a question about whether the Vancouver Energy Project and the proposed project were connected and his response rejected that concept:

Q- Sam Margolin – Cowen and Company – Analyst:

“I'm sorry if I misheard this; this might have been two separate ideas, but did you say there is some integration between the Vancouver Rail Project and the Los Angeles integration? Is there a permanent change in crude play that you are targeting that makes the EBITDA target work or was that two points that I just combined in my head?”

A- Greg Goff:

“Yes [acknowledging the question]. No, we made no comments about that whatsoever. We have said that once Vancouver Energy is up and operating, we will use crude oil into the facilities to supply our West Coast operations, but there is no connection to the permit.”<sup>151</sup>

Thus, Tesoro expresses its intent that the proposed project and the Vancouver Energy Project are independent. The proposed project, once approved, will go forward whether or not the Vancouver Energy Project is approved. Furthermore, the potential impacts of the Vancouver Energy Project, including those related to transportation, were analyzed in the Vancouver Energy Project DEIS (see Master Response 8).

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<sup>151</sup> Thompson Reuters Streetevents Edited Transcript TSO- Q1 2016 Tesoro Corp Earnings Call May 05, 2016 / 12:30PM GMT, at page 14.



**Comment G1-78.134**

2. Bakken Material Safety Data Sheets (MSDSs) Were Submitted with the Tank Applications

The MSDS for “light sweet crude oil” submitted with the initial permit applications for the new Wilmington tanks<sup>77</sup> is identical to the MSDS submitted by Tesoro in support of its proposed Vancouver Export Terminal, which proposes to import Bakken crude oil from its substantial holdings. Based on public statements by Tesoro, some of this crude oil, at least 50,000 bbl/day, would be shipped to the Los Angeles Refinery.<sup>78</sup> This demonstrates that Bakken will be transported to marine terminals that service the Los Angeles Refinery.

<sup>77</sup> SCAQMD Application 545745, November 30, 2012, pdf 77, Material Safety Data Sheet, Crude Oil, Light Sweet; See also revised Application 545745, March 7, 2013, pdf 96 and Application 556835, October 3, 2013, pdf 12.

<sup>78</sup> While Tesoro has included a MSDS for “Bakken Crude Oil” from Enbridge Pipelines Inc. in some filings, this MSDS is not representative of the Bakken crude oils that would be imported by Tesoro at the VET. The light ends are stripped from crude oil shipped by pipeline, reducing the crude vapor pressure and concentration of volatile organic compounds such as benzene. See, e.g., Reuters, Exclusive: TransCanada Toughens Pipeline Pressure Limits for Gassy Crude, January 31, 2014 (Crude vapor pressure on pipelines lowered to 69 kPa-a or 10 psia); Available at <http://www.reuters.com/article/us-transcanada-pipeline-vapor-pressure-idUSBREA0U0UW20140131>.

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**Response G1-78.134**

The Refinery already purchases, stores, and processes Bakken and other light crude oils with similar RVPs. Some of the other light crude oils currently processed include ANS with RVP above 7 psi, Saharan with RVP of 8.4 psi and other crude oils with RVPs in the range of 6 to 9 psi. These are within the RVP range of Bakken crude oil, which is 8 to 11 psi based on data of Bakken crude oil received at the Anacortes Refinery (see response G1-78.160). There would be no additional impacts, beyond those analyzed in the DEIR (i.e. at the storage tanks), if different light crude oil is processed at the Refinery.

As disclosed in the DEIR, the Refinery can process various crude oils including light sweet crude oil in its crude oil blend. In order to evaluate the worst case potential impacts associated with the proposed project, the highest vapor pressure allowable by SCAQMD Rule 463 was assumed to be stored in the six new crude oil storage tanks. Therefore, the Safety Data Sheet (SDS, formerly called a Material Safety Data Sheet (MSDS)) submitted with the SCAQMD permit applications (AN 545645 and AN 545646) is for generic “light sweet crude oil,” not specifically Bakken as the comment claims. When a permit application is submitted for a storage tank, the project proponent submits several SDS and other information regarding various properties of materials that represent the variety of materials that may be stored in the storage tank.

As explained in Master Response 8 and Response G1-78.133, the comment made by Tesoro regarding committing to accepting 50,000 bbl/day of crude oil through the Vancouver Energy Project was a commitment to accept 50,000 bbl/day of crude oil to the West Coast system, which consists of the Los Angeles Refinery as well as 3 other refineries. Tesoro never stated where in the West Coast system the crude oil might be utilized, other than to say that that will be determined later based on economic considerations.



Footnote 78 references a Reuters article that reported that TransCanada changed the vapor pressures on its main U.S. oil export pipeline from 103 kiloPascals (kPa) to 69 kPa (15 psi to 10 psi). The footnote does not provide any support for the opinion that “at least 50,000 bbl/day, would be shipped to the Los Angeles Refinery.” In fact, it indicates that crude oil transported into the United States would be limited to a vapor pressure of about 10 psi in the TransCanada pipeline. TransCanada operates natural gas and other liquid pipelines between Canada and the north, central and east coast portions of the United States and is the proponent of the Keystone Pacific pipeline. Additionally, any crude oil that may be transported to the Refinery by the Vancouver Energy Project would not be transported by pipeline. TransCanada operates no pipelines in California; therefore, the reference to the Reuters article<sup>152</sup> is not applicable to the proposed project or DEIR.

### Comment G1-78.135

#### 3. The Project Is Designed to Import Bakken Crudes

The DEIR asserts that “[t]he Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and no modifications are being proposed in the Tesoro Refinery Integration and Compliance Project that would increase the ability of the Refinery to process Bakken crude oil.”<sup>79</sup> However, this directly contradicts the opinion of Tesoro’s CEO who has characterized Bakken as “the right supply source” for the Los Angeles Refinery.<sup>80</sup>

First, numerous Tesoro presentations and quarterly earnings calls document Tesoro’s plans to import Bakken crude oil to the Los Angeles Refinery from the VET as preliminary investigations demonstrated that it increases yields of valuable gasoline and diesel products. Tesoro stated in its December 10, 2013 Analyst and Investor Presentation: “Los Angeles, which is the largest of our West Coast facilities, will potentially see an increase of 125,000 to 130,000 barrels a day of advantaged crude.”<sup>81</sup>

<sup>79</sup> DEIR, p. 4-6.

<sup>80</sup> Q1 2014 Earnings Call Transcript, Exhibit 4b, p. 18.

<sup>81</sup> Thomson Reuters Streetevents Edited Transcript, TSO – Tesoro Analyst and Investor Presentation, December 10, 2013 (12/10/13 Analyst and Investor Presentation), p. 11, Exhibit 6.

G1-78.135

### Response G1-78.135

The comment misquotes Mr. Goff as stating that Bakken Crude is the right source for *the Los Angeles Refinery*. In fact, Mr. Goff was responding to a question regarding the Tesoro Anacortes Refinery in the State of Washington. On a Tesoro Earnings conference call on May 1, 2014, Doug Leggate of B of A Merrill Lynch asked: “Great. Final one for me is, Bakken differentials obviously tightened up fairly aggressively in the first quarter...What does that do to your economics around Anacortes?. . . Do you continue to see that as economic under the current market?” Mr. Goff replied, “Yes, absolutely. Where the differentials that you tied to the market today it is still the right supply source for the refinery.”<sup>153</sup> There is no mention of the Los

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<sup>152</sup> Reuters article Exclusive: TransCanada toughens pipeline pressure limits for gassy crude, January 31, 2104, <http://www.reuters.com/article/us-transcanada-pipeline-vapor-pressure-idUSBREA0U0UW20140131>.

<sup>153</sup> Thomson Reuters Streetevents Edited Transcript, Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, 12:30 PM GMT.

Angeles Refinery in either the question or response; the discussion only references the Anacortes Refinery.

Further, while Tesoro's Senior Vice President of Strategy and Business Development at the time, Mr. Keith Casey, mentions a potential to bring 125,000 to 130,000 barrels a day of North American “advantaged crude oils” to the Los Angeles Refinery during the December 10, 2013 Analyst and Investor Presentation cited in the comment, this statement is discussing the Vancouver Energy Project, and is unrelated to the proposed project. It should be noted that crude oil that is advantaged today may not be advantaged in the future, due to the constantly changing crude oil market. See Section 4.1.2.5 of the DEIR and Master Response 8 that explain that the Vancouver Energy Project is not part of the proposed project. In fact, a reference to the proposed project in the December 10, 2013 transcript describes its purpose as: “This project, which includes the decommissioning of Wilmington's fluid catalytic cracking unit, is expected to increase our flexibility as it pertains to gasoline and diesel mix, and reduce CO<sub>2</sub> emissions by 500,000 tons per year.”<sup>154</sup> A careful review of other comments made during the presentation regarding the proposed project shows that they are entirely consistent with the proposed project objectives and description disclosed in the DEIR (see for example pages 9, 10, and 18 of the transcript). The transcript describes the proposed project as well as other Tesoro ongoing independent projects and strategies that are not linked to one another.

Additionally, the comment mistakenly equates the ability of the Refinery to replace the currently processed light crude oils with other more “advantaged” light crude oils, with the ability to replace currently processed *heavy* crude oils with “advantaged” light crude oil, thus changing the crude oil blend in a way that could impact emissions. The replacement of crude oils based on market pricing is something that continually happens at all refineries without any physical modifications, as long as refineries can blend the crude oils to fit the refinery specifications. As explained correctly on pages 2-14 through 2-20 of the DEIR, the proposed project does not make any substantial modifications to the crude processing units at the front end of the Refinery, and therefore is not designed to change the type of crude oil blend that is processed. Any change in the crude oil slate would occur independent of the proposed project. If the Refinery were to utilize more Bakken crude oil, it would be accomplished by replacing another light crude oil, and the Refinery would have to find another cost-effective crude oil to blend with the Bakken crude oil, so that the blended crude oil fits within the constraints of the Refinery (see page 2-16 of the DEIR, Master Response 4, and Response G1-78.133).

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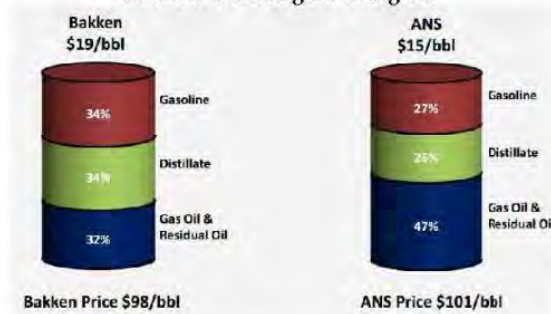
<sup>154</sup> Tesoro Analyst and Investor Presentation, December 10, 2013.

Comment G1-78.136

Bakken blends could replace California crudes, foreign imports and ANS, as shown in Figures 6 and 7. Bakken is attractive as an alternative to ANS and California crudes as it yields more gasoline and distillate.<sup>82</sup> Figure 6, for example, shows that a barrel of Bakken crude yields 34% gasoline when refined, while the same barrel of ANS yields only 27% gasoline. Similarly, a barrel of Bakken yields 34% distillate while a barrel of ANS yields only 26% distillate. Gasoline, jet fuel, and diesel are the more valuable products from refining crude. Thus, Bakken and similar light crudes are the most likely crudes to be imported and stored in the new tanks,<sup>83,84</sup> explaining the need for a high vapor pressure limit for the new tanks. See Comment II.A.2.d.

G1-78.136

Figure 6.  
Bakken Crude Yields More Gasoline and Distillate and Provides Higher Margins<sup>85</sup>



G1-78.136  
cont'd.

Figure 7.  
Improved Refinery Yields vs. Other Benchmarks<sup>86</sup>



## APPENDIX G1: RESPONSE TO COMMENTS

In the second quarter 2014 earnings call, for example, the CEO of Tesoro explained:<sup>87</sup>

“During maintenance activity at the Anacortes refinery in the quarter, we were able to move some barrels of Bakken down to our Los Angeles refinery and realized refinery values relative to ANS<sup>88</sup> similar to those that we experienced at Anacortes.

We are integrating the refined products logistics between the two refineries, and are now moving finished barrels from Wilmington into the new Carson logistics system.”

In its December 2015 Analyst and Investor Day earnings call, Tesoro remained optimistic about supplying Bakken crude to its California refineries:<sup>89</sup>

“When you think about formalizing competitive advantage and fully integrating our value chain, that is really what the Los Angeles Integration and Compliance Project is about. And when we think about creating value, we are not just thinking about advantaged crude oils in front of our refineries, but we're thinking about how that supply to the west coast of advantaged crude oils can change the shape of the crude oil supply/demand dynamics for the west coast. And that's what we are trying to accomplish through Vancouver Energy.”

The DEIR, on the other hand, incorrectly asserts that the “Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and no modifications are being proposed...that would increase the ability of the Refinery to process Bakken crude oil.”<sup>90</sup> This is wrong. The Refinery currently does not have sufficient tankage to store large quantities of these light crudes during unloading as much heavier crudes were imported in the baseline.<sup>91</sup> In fact, the Project is designed to facilitate unloading, storing, and refining much lighter crudes than processed in the baseline due to their yield advantage and cost advantage.

<sup>87</sup> Tesoro, Deutsche Bank Energy Conference, January 9, 2014 (1/19/14 Tesoro Presentation), p. 16, Exhibit 16 (“Bakken crude oil yields 14% to 16% more gasoline and distillate than ANS”).

<sup>88</sup> Thomson Reuters Streetevents Edited Transcript, TSO – Tesoro Corporation 2015 Analyst and Investor Day, December 9, 2015 (Tesoro 12/9/15 Analyst and Investor Day Transcript), Exhibit 7b, p. 26 (“From Bakken to the west coast, there's a couple things that have – there's one thing that hasn't changed. And the yield advantage that we get off of Bakken in our west coast system has stayed the same. So we still get that \$3 to \$5, as [Danny] said, we've talked about now since we started moving Bakken to the west coast. That is still there.”) and p. 42 (“it's the crude supply and the advantage, the real advantage of being able to get Bakken crude there is in the yield.”) See also Webcast in Exhibit 7a.

<sup>89</sup> See also Thomson Reuters Streetevents Edited Transcript, TSO – Q3 2015 Tesoro Corp Earnings Call, October 29, 2015 (Tesoro Q3 2015 Earnings Call Transcript), Exhibit 8, p. 8 (“However, as we look out over time, even in a lower price environment, we still see economic value to be able to move Bakken to the West Coast and achieve the benefits that we have always stated, which primarily are driven by the yield improvements in the refineries, as long as you can competitively price the crude in there.”).

<sup>90</sup> Tesoro, Driven to Create Value, Analyst and Investor Day, December 9, 2014, Exhibit 9, p. 30.

<sup>91</sup> CLR Implementation: The Bakken, Slides, p. 48, October 7, 2012, Exhibit 10. CLR (Continental Resources) is one of the largest Bakken crude producers. Kern County is in California's San Joaquin Valley. The Kern County crudes shown in this figure is a San Joaquin Valley crude, included in the general classification of San Joaquin Valley or California crudes discussed elsewhere in these comments.

<sup>87</sup> Q2 2014 Earnings Call Transcript, July 31, 2014, p. 5, Exhibit 11.

<sup>88</sup> “ANS” mistranscribed as “A&S”.

<sup>89</sup> Tesoro 12/9/15 Analyst and Investor Day Transcript, p. 10, Exhibit 7b.

<sup>90</sup> DEIR, p. 4-5; DEIR Section 2.5.4.1; DEIR, Appx. F.

<sup>91</sup> Marine Terminal Agreement, Annex D, RVP column.

G1-78.136  
cont'd.

### Response G1-78.136

The comment pieces together several unrelated statements from Tesoro regarding its Anacortes Refinery, not the Los Angeles Refinery, to reach a conclusion that that Bakken blends could replace California crude oils, foreign imports, and ANS at the Los Angeles Refinery. The slides, and the references cited in the comment as support for the comments, are taken from four different presentations and do not support the final conclusion that “Bakken and similar light crude oils are the most likely crude oils to be imported and stored in the new tanks, explaining the need for a high vapor pressure limit for the new tanks.” As explained below, the referenced statements were not made in connection with the slides and were not meant to explain the slides.

Footnote 82 of the comment used to support the conclusion that “Bakken is attractive as an alternative to ANS and California crude oils as it yields more gasoline and distillate” is a slide taken from a Tesoro presentation regarding yields at Tesoro's Anacortes Refinery.<sup>155</sup> Not all refineries are configured the same and they are not designed to process the same crude oils or crude oil blends. Tesoro's Anacortes Refinery does not have a DCU that converts residuum to light products and therefore is designed to process a lighter crude oil blend than the Los Angeles Refinery. Thus, the yield at the Anacortes Refinery would not be the same as the yield at the Los Angeles Refinery.

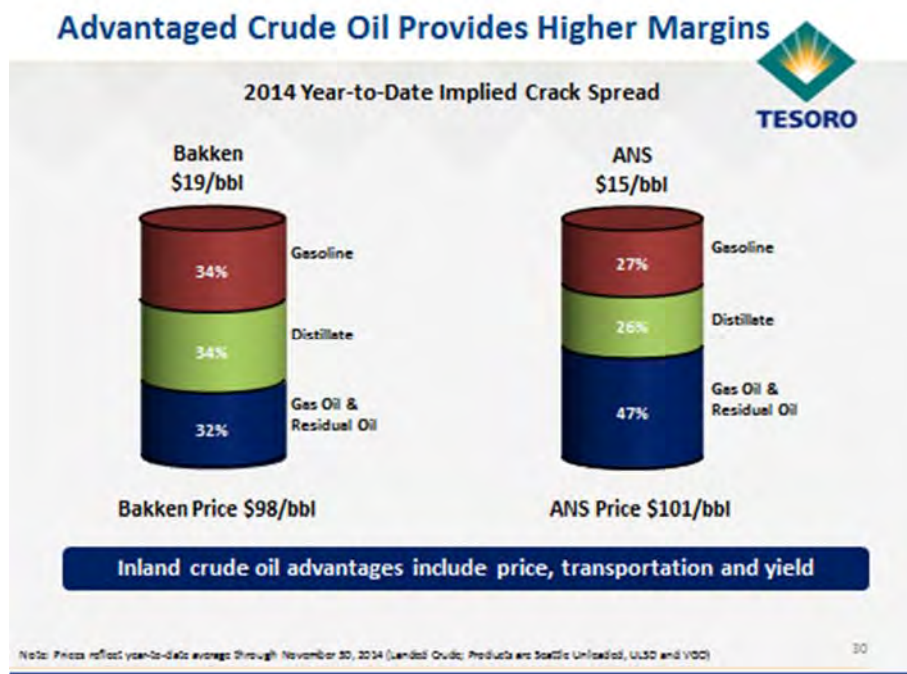
The comment modifies the slide, comment Figure 6, from the slide used by Tesoro in its presentation. As shown in Figure 78.136-1, the original title to the slide states “Advantaged Crude Oil Provides Higher Margins,” with a subtitle of “2014 Year-to-Date Implied Crack Spread” and a bottom subtitle of “Inland crude oil advantages include price, transportation and yield.” The comment changed this to “Bakken crude yields more gasoline and distillate and provides higher margins.” The slide represents a simple distillation yield of Bakken and ANS and not the Los Angeles Refinery's specific yields given its process unit configuration. While the Anacortes Refinery, to which this slide refers<sup>156</sup>, does not have a DCU, the Los Angeles Refinery has DCUs that convert residual oil and FCCUs that convert gas oil to produce gasoline and distillate. Therefore, the yield in this slide is not representative of processing at the Los Angeles Refinery. See also Master Response 4 and Comment G1-78.150, which support the need to blend the crude oils to mimic the properties of ANS, which is the crude oil that the Refinery has processed in large volumes. And finally, a footnote that states “Note: Prices reflect year-to-date average through November 30, 2014 (Landed Crude; Products are Seattle Unleaded, ULSD and VGO).” Seattle products are produced at the Anacortes Refinery. There is a distinct

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<sup>155</sup> Page 16 of the Deutsche Bank Energy Conference presentation dated January 9, 2014, cited in the comment footnote 82, is a slide entitled “Anacortes Yield Comparison.”

<sup>156</sup> The slide referenced in the comment is a slightly different version of the slide used at the Deutsche Bank Conference that includes the Anacortes Yield Comparison and ads cost information. This slide included below at Figure 78.136-1, was used in the Tesoro Analyst and Investor Presentation given on December 10, 2013. Mr. Casey states about the slide, “This chart exemplifies our history with our Anacortes. Advantaged crude is not just about transportation. As I spoke earlier, the crude quality, or, what we call it, relative refining value, is another key component of the advantaged. And this is, again, representing our experience in Anacortes. The clean product yields from Bakken crude oil are 14% to 16% improved relative to ANS, which translated to \$3 to \$5 per barrel yield advantage.” Thomson Reuters Streetevents Edited Transcript, TSO- Tesoro Analyst and Investor Presentation, December 10, 2013, 2:00 PM GMT.

absence of any reference to California gasoline in the analysis. Thus, this slide in its original form (see Figure 78.136-1) does not pertain to the Los Angeles Refinery, but rather applies to the Anacortes Refinery.



**Figure 78.136-1  
Actual Tesoro Presentation Slide**

Figure 7 of the comment compares product yields from Bakken (a light, sweet crude oil) to California Kern County crude oils (heavy, sour crude oil). These differences in yields are known and it is unreasonable to expect a light, sweet crude oil to be substituted for a heavy, sour crude oil. The DEIR correctly explains that the Los Angeles Refinery has limited ability to process Bakken and other light, sweet crude oils.

The reference for the comment Figure 7 is not complete, thus the accuracy or context cannot be verified. However, this figure appears to be similar to a figure in a presentation found on the internet at: [http://media.corporate-ir.net/media\\_files/irol/19/197380/IC2012Presentation\\_09OCT2012.pdf](http://media.corporate-ir.net/media_files/irol/19/197380/IC2012Presentation_09OCT2012.pdf). There is no context to or description of the intent of this presentation as found on the internet, nor is it a slide produced by Tesoro, so it is difficult to determine the purpose of this slide. However, the presentation appears to contain general information about Bakken crude oils, and is not specific to any information regarding the proposed project.

The comment refers to additional statements by Mr. Goff, (see Footnote 83 of the comment) to support the conclusion that "Bakken and similar light crudes are the most likely crudes to be imported and stored in the proposed new storage tanks." Again, the statement at page 42 of the

referenced transcript begins with a question regarding specific Tesoro projects at other refineries unrelated to the proposed project.

Unidentified Audience Member: Just on the theme of integration, does Vancouver energy underpin any of the other Pacific Northwest capital projects, the isomerization unit and the MX? Do you need those light crude volumes into those units to produce--?

Here the reference was to the Pacific Northwest, not Los Angeles, and thus this statement does not support the comment's conclusion.

Footnote 84 of the comment references, another quote from the Tesoro CEO that is a statement made in response to a question regarding the use of Bakken at the Anacortes Refinery, not the Los Angeles Refinery.

Question: "Okay. Thanks for that clarification. Then thinking about Tesoro being one of the larger runners of Bakken, how do you think about Bakken volumes potentially declining? The impact on the system? Whether it still makes sense to be running Bakken at Anacortes given spreads so tight with Brent? How do you see that affecting the system going forward?"<sup>157</sup>

Therefore, this quote likewise does not support the comment's conclusion that Bakken crude oil will be stored in the storage tanks at the Los Angeles Refinery.

The quote cited in the comment, that Bakken crude oil was diverted to the Los Angeles Refinery during maintenance at the Anacortes Refinery, is correct and further confirms that Bakken crude oil has been processed at the Los Angeles Refinery. Regardless of whether Bakken crude oil provides higher margins or whether Tesoro's Vancouver Energy Project, if completed, could deliver some of the Refinery's crude oil, the delivery of Bakken crude oil would not have an impact on emissions at the Refinery. As explained in Sections 2.5.4.1 through 2.5.4.3 of the DEIR, crude oils must be blended to fit the design parameters and operational constraints of the Refinery. Also see Master Responses 4 and 6, Response G1-78.133 regarding the impacts of any potential increase in Bakken crude oil in the crude oil blend that is processed at the Refinery. It is important to note that the Vancouver Energy Project is independent of the proposed project and undergoing full environmental review in the State of Washington. Thus, any routing of crude oil through the Vancouver Energy Project will not be a result of the proposed project.

The comment implies that the lack of current use of Bakken crude oil at the Refinery is based on the lack of storage capacity. In fact, the existing storage tanks at the Carson Crude Terminal have the capability of storing high vapor pressure crude oil, have done so in the past, and will do so in the future. The additional storage capacity enables the offloading of marine vessels in a single visit, regardless of the point of origin of the crude oil. The comment does not provide evidence that the proposed project is designed to "facilitate unloading, storing, and refining much lighter crude oils than processed in the baseline due to their yield advantage and cost

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<sup>157</sup> Thomson Reuters Streetevents Edited Transcript, Q3 2015 Tesoro Corp Earnings Call, October 29, 2015, 12:30 PM GMT, at page 8.



advantage” beyond conclusory statements and mischaracterized or out-of-context corporate quotations and presentation materials. As stated above, both Section 2.5 of the DEIR and Master Response 4 explain why crude oils must be blended to fit the design parameters and operational constraints of the Refinery and the ultimate mix of oils processed will vary with market conditions. As previously explained, some Bakken crude oil has been processed in the Refinery's crude oil blend during the baseline period.

There is also reference to other statements made by Mr. Goff, (see Footnote 89 of the comment) to support the conclusion that the proposed project is designed to accommodate a change in the crude oil blend processed by the Refinery. The statements describe two separate and distinct projects; the proposed project and the Vancouver Energy Project. There are also statements regarding the Vancouver Energy Project supplying the West Coast with “advantaged crude oil”, as that term is used by Tesoro. The statements do not link the two projects (see Declaration of Douglas Miller<sup>158</sup>). None of the corporate statements cited state or even imply the conclusions in the comment that the proposed project is designed to accommodate a change in the crude oil blend processed by the Refinery. The DEIR summarizes the objectives of the proposed project in Section 2.2.

#### Comment G1-78.137

*Second*, many of the Project changes are designed to facilitate a shift to Bakken crude, from the 3.66 million barrels of 10.5 psi storage capacity to the shutdown of the Wilmington FCCU. The heart of the Integration Project is the shutdown of the Wilmington FCCU. Fluid catalytic cracking is typically done to reduce the molecular weight of the heavy fractions of crude oil to lighter fractions. The FCCU converts heavy gas oil from crude distillation and other heavy streams to light gases, petrochemical feedstocks, gasoline blendstocks, and diesel blendstocks.<sup>92</sup> The FCCU was required to process the heavy feedstock in the baseline years. However, shifting from the heavy crudes refined at Wilmington (and Carson) in the baseline, to a Bakken blend, eliminates the need for the Wilmington FCCU because distillation of Bakken and other light crudes at the front end of a refinery yields much greater amounts of these lighter blendstocks and much smaller amounts of heavy feedstocks that require cracking.

<sup>92</sup> See, e.g., DEIR, Figure 2-8.

G1-78.137

G1-78.137  
cont'd.

#### Response G1-78.137

The shutdown of the Wilmington Operations FCCU is, as stated in the DEIR, part of Tesoro's integration of the Carson and Wilmington Operations and is intended to improve the Refinery's operational efficiency and reduce local emissions (see DEIR page 2-28). Refinery units are being modified to accommodate the FCCU shutdown and so that the same overall volume of finished fuels will be produced using less energy-intensive processes and producing lower emissions than the current operation with the Wilmington Operations FCCU (see DEIR, Appendix A page A-61).

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<sup>158</sup> See Attachment C, Declaration of Douglas Miller, Vice President, California Value Chain Strategy of Tesoro Companies, Inc.

As documented in the DEIR, the ability to process heavier or lighter crude oils occurs at the beginning of the refining process. The crude oil enters the Crude Unit first, where separation occurs via simple distillation. The heavier fraction is sent to the DCU, and the amount of heavy crude oil, including heavy Canadian (tar sands) crude oil that can be processed is limited by the capacity of the DCU to break the heavy molecules. This capacity is not changing as a result of the proposed project. The ability to process lighter crude oils is limited by the size of the fractionation or distillation column in the Crude Unit. The existing distillation column is not being modified or replaced, thus the Refinery's ability to process more light crude oil is not changing. If the Refinery were to process more heavy or more light crude oils than the system is designed to handle, it would limit the total amount of crude oil that could be processed, thus reducing product yield and making that mode of operation economically inviable (see DEIR pages 2-14 through 2-20). The processing constraints on the Refinery require it to optimize the crude oil blend to produce the maximum amount of product to meet market demands.

The FCCU is located downstream of the Crude Unit and processes already separated intermediate feedstock derived from the crude oil. The proposed project contains modifications to other units to make up for eliminating the processing of gas oil intermediate feedstock in the Wilmington Operations FCCU, such as the capacity increases at the Hydrocracking Units (HCUs) (see Sections 2.7.1.2 and 2.7.2.4 of the DEIR), to ensure that overall product yield is not reduced in the Refinery as a whole (see pages 2-35 and 2-36 of the DEIR). The processing that was accomplished in the baseline years will still be completed, but in different units.

### Comment G1-78.138

Further, the increased yields of lighter fractions from refining Bakken and possibly other light crudes requires increases in the throughput of downstream units that process lighter fractions from distillation, including the reformer, isomerization, and hydrotreating units.<sup>93</sup> The Project includes increases in the throughput of these units. The CRU-3 fractionation section will be modified to enable recovery of propane from the refinery fuel gas.<sup>94</sup> The naphtha isomerization unit will be modified to recover propane and heavier material from the off-gas, enabling additional product sales.<sup>95</sup> The increased amounts of propane that will be recovered originate from lighter crudes that are rich in propane. Dr. McGovern suggests that more naphtha cannot be refined due to limited lifting capability of the crude unit.<sup>96</sup> However, the Project increases the firing rate of the No. 51 Vacuum Unit at Carson from 300 to 360 MMBtu/hr, which would increase the lifting capability in this unit. Further, hydrotreating Units 1, 2, and 4 will be modified to handle increased yields of lighter products, consistent with refining a lighter crude slate.<sup>97</sup> Similar modifications are proposed at Tesoro's Anacortes Refinery to accommodate Bakken crude oil.<sup>98</sup>

G1-78.138

<sup>93</sup> See, e.g., K.J. Bryden and others, Processing Shale Oils in FCC: Challenges and Opportunities, Hydrocarbon Processing, September 1, 2013; Available at: <http://www.hydrocarbonprocessing.com/Article/3250397/Processing-shale-oils-in-FCC-Challenges-and-opportunities.html>.

<sup>94</sup> DEIR, p. 1-12.

<sup>95</sup> DEIR, p. 1-16.

<sup>96</sup> DEIR, p. F-11/12.

<sup>97</sup> DEIR, pp. 2-37/38.

<sup>98</sup> Anacortes Upgrade, Clean Products Upgrade Project Fact Sheet, Available at: <http://anacortesupgradeproject.com/docs/anacortes-upgrades-fact-sheet.pdf>.

**Response G1-78.138**

The proposed project does not include any modifications that could enable the processing of a lighter crude oil blend. The physical constraints that limit the processing of unblended light crude oils such as Bakken crude oil are explained in the DEIR on pages 2-14 through 2-20. The DEIR also explains the modifications that would need to occur in order to process such light crude oils if they are not blended, none of which are contemplated by the proposed project.

The comment claims that the proposed project is designed to accommodate lighter Bakken and other crude oils are incorrect for the following reasons:

1. As stated in DEIR Section 2.7.1.4, "... the CRU-3 fractionation section will be modified to enable recovery of Hydrocracker propane from the Refinery fuel gas system." The CRU-3 fractionation section is located downstream of the Crude Unit. CRU-3 does not process crude oil, nor does it remove light ends, such as propane, from crude oil. The proposed modifications are to recover propane that is currently produced in the Hydrocracker and sent to the Refinery fuel gas system via the CRU-3 fractionation section. Any incremental fuel needs of Refinery fuel gas system due to the recovery of this propane will be made up with clean burning natural gas. The incremental natural gas usage associated with the proposed was determined to be less than significant (see Appendix A, page A-61 of the DEIR). The fact that the propane is being recovered from the Hydrocracker via CRU-3, which are cracking and reforming conversion units, and not the Crude (distillation) Unit, demonstrates that the propane is not being recovered from simple distillation of naturally occurring propane or light ends in crude oil. Feed to the HCU is distillate, not light ends from the Crude Unit (see DEIR Figure 2-10). If the objective of this propane recovery project element was to recover lighter fractions from distillation of lighter crude oil, it would need to be implemented in the Crude Unit for reasons explained in Response G1-78.137, which it is not. The recovery of HCU propane is not in any way linked to processing lighter crude oil; it is designed to recover existing propane for sale.
2. As stated in Section 2.7.2.7 of the DEIR, "... the Naphtha Isomerization Unit will be modified to recover propane and heavier material from the unit offgas." First, the statement in the comment that throughput will be increased in the Isomerization Unit is incorrect and not supported by any facts, including statements or information in the DEIR. The proposed modifications are to recover propane that is currently produced in the Naphtha Isomerization Unit and sent to the Refinery fuel gas system. Any incremental fuel needs of Refinery fuel gas system due to the recovery of this propane will be made up with clean burning natural gas. The incremental natural gas usage associated with the proposed was determined to be less than significant (see Appendix A, page A-61 of the DEIR). The Naphtha Isomerization Unit is located downstream of the Crude Unit. The Naphtha Isomerization Unit does not process crude oil, nor does it remove light ends, such as propane, from crude oil. There is no capacity increase associated with the propane recovery, since modifications are only in the Isomerization Unit offgas or overhead system, not the Unit feed system. Therefore, modifications cannot be associated with recovering additional lighter fractions from distillation of

lighter crude oil. The fact that the propane and heavier material is being recovered from the Naphtha Isomerization Unit, which is a conversion unit and not the Crude (distillation) Unit, demonstrates that the propane and heavier material is not being recovered from simple distillation of naturally occurring propane or light ends in crude oil. The recovery of Naphtha Isomerization Unit propane is not in any way linked to processing lighter crude oil; it is designed to recover existing propane for sale. The propane is generated in the Naphtha Isomerization Unit during the isomerization<sup>159</sup> process; it is not recovered from the distillation of crude oil.

Note that the proposed propane recovery projects at Carson and Wilmington Operations (Items 1 and 2 above) are economically justified based on the price differential between propane and natural gas, not on a change in the crude oil blend processed by the Refinery. Propane has more energy and costs more than natural gas. Since propane and natural gas (which is mostly methane) have different energy values, the pricing for these commodities needs to be converted to barrels of equivalent (BOE) fuel to accurately compare the price differentials. Table 78.138-1 summarizes 2014 and 2015 pricing and the BOE spread for propane and natural gas using publicly available data.

**Table 78.138-1  
Natural Gas and Propane Pricing**

	Natural Gas Price <sup>a</sup>	Propane Price <sup>b</sup>	BOE Spread (Value of Propane Above Natural Gas)
2014 Average	\$4.37/mmBtu	\$1.04/gallon	\$26.93/bbl
2015 Average	\$2.62/mmBtu	\$0.46/gallon	\$9.20/bbl

a Henry hub nat gas pricing; <https://www.eia.gov/dnav/ng/hist/rngwhhdA.htm>.

b Mt Belvieu propane pricing; [https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=eer\\_epllpa\\_pf4\\_y44mb\\_dpg&f=a](https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=eer_epllpa_pf4_y44mb_dpg&f=a).

- No. 51 Vacuum Unit modifications are not in any way associated with naphtha recovery or lifting of naphtha from the Crude Unit as the comment suggests. The No. 51 Vacuum Unit is downstream of the Refinery Crude Unit and therefore cannot increase the lifting capability of the Crude Units. Increasing the lifting capability of the Crude Units would entail major modifications to the distillation towers, which are not part of the proposed project. The No. 51 Vacuum Unit processes residuum that remains after crude oil has been distilled to remove all the light ends that will separate in an atmospheric distillation column. As explained in Section 2.7.2.1 of the DEIR, “The Vacuum Unit is a separation process that uses distillation conducted under vacuum (less than atmospheric pressure) to lower the boiling temperature of a liquid and allow removal of light hydrocarbons without thermal cracking.” Since naphtha and other light ends have already been recovered in the crude unit atmospheric distillation column, the “light hydrocarbons” referred to in this discussion of the Vacuum Unit means the remaining distillate in the

<sup>159</sup> Isomerization is the rearrangement of straight-chain hydrocarbon molecules to form branch chain products (see DEIR Chapter 8).

residuum. As also stated in Section 2.7.2.1 of the DEIR, “The No. 51 Vacuum Unit will be modified to allow increased distillate yield, or diesel production, which will require reducing vacuum gas oil production by up to 8,000 bbl/day.” The modifications to the No. 51 Vacuum Unit are entirely consistent with Tesoro’s proposed project objective (see DEIR page 2-3) of “Recovering and upgrading distillate range material from FCCU feeds. Tesoro proposes to achieve this objective by modifying 51 Vacuum Unit, and the HCU at Carson Operations, and the Hydrotreater Unit 4 (HTU-4) and HCU 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.” The modifications of No. 51 Vacuum Unit would not in any way enable the processing lighter crude oil.

4. Wilmington Operations HTU-1, -2 & -4 modifications are part of the proposed project specifically for the reasons stated on pages 2-37 and 2-38 of the DEIR. HTU-1 will be modified to enable it to additionally hydrotreat FCCU gasoline or jet fuel, as required in order to meet the objective of meeting U.S. EPA Tier 3 low sulfur gasoline specifications and also to add the flexibility of meeting another project objective of increasing finished distillate fuel production, jet fuel in this case. The modifications to HTU-2 are piping modifications to segregate the feed systems of HTU-1 and HTU-2. The piping modifications will allow Unit feed to go to either HTU-1 or HTU-2 instead of to both HTU-1 and HTU-2 at the same time. While HTU-1 capacity would be increased, this is to enable additional hydrotreating of previously untreated gasoline to meet the new lower sulfur requirements that will apply to all the gasoline produced by the Refinery. Currently, the low sulfur requirements are neither required nor met for all of the gasoline produced by the Refinery. HTU-4 modifications are proposed to enable the Unit to operate either as it does today, to hydrotreat gas oil, or to hydrotreat high sulfur diesel to produce ultra-low sulfur diesel. The statement in the comment that throughput will be increased in the Isomerization Unit is incorrect and not supported by any statements or information in the DEIR. Note that hydrotreated gas oil from HTU-4 will be sent to the Carson Operations FCCU since the Wilmington Operations FCCU will be shut down. All of the modifications are necessary and consistent with meeting new federal gasoline compliance requirements and Tesoro’s commitment and project objective to maintain its overall production capability of transportation fuels. The modifications are designed to provide redundancy to minimize motor fuels production disruptions during both planned and unplanned unit outages by providing some flexibility in hydrotreating capabilities to produce finished distillate, or diesel and jet fuel. The modifications HTU-1, -2, and -4 of are not in any way linked to processing lighter crude oil.

Additionally, the comment provides no information on how any modifications at the Anacortes Refinery are similar to the proposed project. The Anacortes Clean Products Upgrade Project is not designed to accommodate processing Bakken crude oil, and the Anacortes Project Fact Sheet that is referenced does not mention processing of Bakken crude oil, as the comment represents. The purpose of the Anacortes Refinery hydrotreater upgrades referenced by the comment is to hydrotreat gasoline to meet U.S. EPA Tier 3 low sulfur standards. This purpose is stated in the Anacortes Project fact sheet cited in the comment: “The Naphtha Hydrotreater (NHT) will be



expanded to increase capacity and upgraded to reduce the sulfur content in gasoline.” The NHT capacity will be increased to hydrotreat more of the gasoline blendstock that is currently produced in order for the Anacortes Refinery to comply with the Tier 3 standards.

**Comment G1-78.139**

4. Bakken Crude Can Be Imported By Marine Vessel Even if the VET Is Not Built

There are currently several existing and proposed rail-to-marine terminals in the Pacific Northwest that could supply small amounts of Bakken to the Los Angeles Refinery. However, the most likely source, given the volumes contemplated, is the proposed VET. This Terminal would transport Bakken and tar sands crudes to the VET and then by marine vessel to Tesoro refineries on the west coast. Most of the imported crude would likely be Bakken as Tesoro has substantial holdings in the Bakken reserves (the High Plains System, Great Northern Midstream, and related trucking operations in the Bakken Shale/Williston Basin area of North Dakota and Montana).<sup>99</sup> These imports would replace crude currently delivered by pipeline from California sources and by marine vessel from the Alaska North Slope and various foreign sources. The VET is assumed to export 80% Bakken crude and 20% other crudes, including Canadian tar sands.<sup>100,101</sup>

The Bakken and tar sands crudes have unique chemical and physical properties, compared to crudes refined in the baseline. Further, the portion of these imports that would replace pipeline deliveries would result in an increase in marine vessel emissions, which were not estimated in the DEIR.

While Tesoro is optimistic that the VET will be permitted,<sup>102</sup> should the VET not be permitted, there are other currently operating or soon to operate terminals that could supply some of the Bakken crudes.<sup>103</sup> These other crude-by-rail-to-marine transload terminals include 178,000 bbl/day of existing capacity and 71,000 bbl/day of proposed capacity:<sup>104</sup>

Targa (Tacoma, WA; existing/operating):	40,000 bbl/day <sup>105</sup>
Arc Logistics (Portland, OR; existing/operating):	18,000 bbl/day <sup>106</sup>
Global (Clatskanie, OR; existing/repurposing):	120,000 bbl/day <sup>107</sup>
Westway (Grays Harbor, WA; in permitting):	49,000 bbl/day <sup>108</sup>
NuStar (Vancouver, WA; in permitting):	22,000 bbl/day <sup>109</sup>

<sup>99</sup> See, for example, Tesoro 12/9/15 Analyst and Investor Day Transcript, Exhibit 7b, pp. 14, 15, 23 and U.S. Securities and Exchange Commission, Form 10-K, Tesoro Corporation, Fiscal Year Ended December 31, 2013, p. 12.

<sup>100</sup> Tesoro Savage, Application for Site Certification Agreement (Vancouver Application), vol. 1, August 29, 2013, Available at: <http://www.efsec.wa.gov/Tesoro%20Savage/Application/EFSEC%202013-01%20Volume%20I/EFSEC%202013-01%20-%20Compiled%20PDF%20Volume%20I.pdf>.

<sup>101</sup> 2/27/14 Tesoro Presentation, pp. 13-18, Exhibit 2; Kristen Hays and Erwin Seba, Update 1 - Tesoro Delivering First Bakken Crude Unit Train to California, Reuters, September 11, 2013, Available at: <http://www.reuters.com/article/2013/09/11/tesoro-rail-crude-idUSL2N0H70U420130911>.

<sup>102</sup> Q1 2016 Tesoro Earnings Call, May 5, 2016, Recording (Exhibit 5a) and Transcript, pp. 5, 7 (Exhibit 5b).

<sup>103</sup> Q1 2015 Tesoro Earnings Call Transcript, May 8, 2015, p. 16, Exhibit 17 (Goff: “Yes, I think there are some alternatives. . .So the other opportunities that we’re also looking at and we’ve always looked at are much smaller in scale.”).

<sup>104</sup> The capacities listed for each terminal are intended to be representative and are sometimes approximated. Various sources sometimes report higher or lower capacities for terminals. See sources below and those provided in footnotes for each of the five specific terminals.

G1-78.139

G1-78.139  
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## APPENDIX G1: RESPONSE TO COMMENTS

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WA State, Department of Ecology, Washington 2014 Marine and Rail Oil Transportation Study, March 1, 2015, Available at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1508010.html>; Eric de Place, The Northwest's Pipeline on Rails, Sightline Institute, Updated July 2015, Available at: <http://www.sightline.org/download/48374/>.

<sup>106</sup> City of Tacoma Planning and Development Services Department, "Notice of Land Use Decision", December 5, 2013, Available at: <http://tacomapermits.org/wp-content/uploads/2013/06/40000203722D.pdf>.

<sup>106</sup> Arc Logistics (website), Operations, Portland Terminal; Available at: <http://arxlp.com/terminal/portland-terminal/>; U.S. Securities and Exchange Commission, Form 10-K, Arc Logistics Partners LP, Fiscal Year Ended December 31, 2015, pp. 10, 81, Available at: <http://investors.arxlp.com/secfilingID=1564590-16-14592&CIK=1583744>.

<sup>107</sup> The Clatskanie terminal is permitted to transload both crude and ethanol, and it had been shipping Bakken crude to refineries in both California and Washington. The market for crude by rail is now contracting, and this terminal has recently stopped handling crude. Tanks are being cleaned, and port facilities upgraded to handle Panamax tankers. The Clatskanie terminal will then reopen to handle only ethanol. But the Clatskanie terminal can be shifted back to crude service as market conditions warrant.

Rory Carroll, Oregon approves permit for Global Partners crude oil railport, August 20, 2014, Reuters, Available at: <http://www.reuters.com/article/global-partners-crude-railway-idUSL2N0CQ2S120140820>; U.S. Securities and Exchange Commission, Form 10-K, Global Partners LP, Fiscal Year Ended December 31, 2014, pp. 50, F-69; Available at: <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NTczNjk5fENoaWxkSUQ9Mjc2MTYyfFR5cGU9MQ==&t=1>; WA State, Department of Ecology (2014), pp. 46, 94; Rory Carroll, California getting more Bakken crude by barge than rail, October 23, 2014, Reuters, Available at: <http://www.reuters.com/article/us-california-bakken-barge-idUSKCN0C17L20141023>; Q4 2015 Global Partners Earnings Call Transcript, February 29, 2016; Available at: <http://seekingalpha.com/article/3941066-global-partners-glp-ceo-eric-slifka-q4-2015-results-earnings-call-transcript?part=single>.

<sup>108</sup> City of Hoquiam and Washington State Department of Ecology, Westway Expansion Project Draft Environmental Impact Statement, August 2015, especially pp. 2-8, 6-14; Available at: [http://www.ecy.wa.gov/geographic/graysharbor/docs/wwVol1\\_Chapters\\_PublicDEIS\\_complete\\_web.pdf](http://www.ecy.wa.gov/geographic/graysharbor/docs/wwVol1_Chapters_PublicDEIS_complete_web.pdf).

<sup>109</sup> Southwest Clean Air Agency, "Air Discharge Permit ADP07-2710R3," April 21, 2014, p. 17; Available at: <http://www.swcleanair.org/permits/Final/07-2710R3TSD.PDF>; Stephanie Rice, "Vancouver council will not make NuStar decision," The Columbian, January 12, 2015, Available at: <http://www.columbian.com/news/2015/jan/12/vancouver-council-will-not-make-nustar-decision>; Hearing Examiner Decision on SEPA Appeal, October 5, 2015, pp. 10, 13; Available at: [http://www.cityofvancouver.us/sites/default/files/fileattachments/community\\_and\\_economic\\_development/page/12901/prj-145874\\_nustar\\_appeal\\_decision.pdf](http://www.cityofvancouver.us/sites/default/files/fileattachments/community_and_economic_development/page/12901/prj-145874_nustar_appeal_decision.pdf).

### Response G1-78.139

The comment correctly asserts that other options to the Vancouver Energy Project exist that would enable Tesoro to bring Bakken crude oils to the Refinery. As explained in Section 4.1.2.5 of the DEIR, the Vancouver Energy Project is wholly independent from the proposed project and is undergoing separate environmental review by the Washington State EFSEC.

The Vancouver Energy Project is proposed to transport crude oil to any West Coast refinery, not just Tesoro refineries and not just the Los Angeles Refinery. As explained in Master Response 8, the source of the crude oil that is transported through the Vancouver Energy Project will be determined by the customers of that project. The Vancouver Energy Project is designed to transport the crude oils that customers purchase: the project will not source the crude oil. The EIS for that project lists possible sources of the crude oil.

The Vancouver Energy Project has been delayed through the public process and none of these other options have been utilized extensively by the Refinery, primarily because the current economics of utilizing Bakken crude oil in Los Angeles are not favorable. And, whether the Refinery sources some crude oil—even Bakken crude oil—from the Vancouver Energy Project



or from other western terminals will have no impact on whether the Refinery processes more light crude oil as compared to the existing crude oil slate, due to enduring processing and permitting constraints at the Refinery<sup>160</sup> (see Master Responses 4 and 6 and Responses G1-78.135 and G1-78.136). Additionally, claims that Bakken and heavy Canadian crude oils have unique chemical and physical properties are not supported by evidence, see Table 78.94-1 for reference to specific responses to detailed comments on crude oil properties.

The comment asserts the Bakken crude oil is preferred over California crude oil received by pipeline. However, the references cited in the footnotes to the comment do not support this claim. It should be noted that footnote 101 in the comment refers to an article regarding delivery of Bakken crude oil to Tesoro's Martinez, California Refinery, it is not related to the Los Angeles Refinery or the proposed project. California crude oil is competitively priced with other crude oils such that it is attractive for local refiners to purchase (see Figure 78.178-2 and Declaration of Douglas Miller<sup>161</sup>). Therefore, the comment's claim is incorrect and unsupported by evidence. The change in marine vessel deliveries associated with the proposed project has been properly evaluated in Section 4.2.2.2.2 of the DEIR (see Responses G1-78.178 and G1-78.186).

#### Comment G1-78.140

In addition to the terminals listed above, various other crude-by-rail-to-marine transload terminals have been proposed in the Pacific Northwest. Currently, these other projects are on hold, notably due to current lack of market demand. But if there is a future market for additional transload terminals in the Pacific Northwest, notably if VET is not permitted, existing and proposed terminals may operate to provide Bakken and other North American crudes to California and specifically to the Tesoro Los Angeles refinery.

Bakken and tar sands crudes also can be supplied to California via terminals at Washington refineries. Tesoro can and has sent Bakken crude to its Los Angeles refinery via its Anacortes (Washington) refinery crude-by-rail and marine terminals<sup>110</sup> as well as the Plains crude-by-rail terminal in Bakersfield.

<sup>110</sup> The Anacortes refinery has a 50,000 bbl/day crude-by-rail unit train unloading terminal, as well as a marine terminal that can load crude onto marine vessels. Thus, crude by rail into Anacortes can be shipped out by marine vessel, notably when the refinery there does not need all of the crude that can be supplied by rail. As discussed above, during maintenance at the Anacortes refinery in early 2014, Tesoro sent Bakken crude to its Los Angeles refinery. Tesoro Q2 2014 Earnings Call Transcript; Tesoro, "Tesoro Corporation Closes the Sale of the Anacortes Rail Unloading Facility to Tesoro Logistics," November 15, 2012; Available at <http://phx.corporate-ir.net/phoenix.zhtml?c=242247&p=irol-newsArticle&ID=1759179>.

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<sup>160</sup> Footnote 99 to the comment cites to two documents, one of which references some of the holdings of Tesoro Logistics in 2013, including terminal and trucking operations in the Bakken region. The other is general financial information on the corporation. The US Securities and Exchange Commission, Form 10K, Tesoro Corporation, for the Fiscal Year Ended December 31, 2013, referenced in the comment also states on page 16, "our North Dakota Refinery is the only refinery in the state...This region processes crude oil from the Bakken Formation and imports crude oil from Canada. Neither of these documents reach any conclusion that Bakken is the most likely crude oil to be imported in to the Refinery, and therefore, do not support the conclusion in the comment that Bakken crude oil would be the most likely crude oil imported to the Refinery.

<sup>161</sup> See Attachment C, Declaration of Douglas Miller, Vice President, California Value Chain Strategy of Tesoro Companies, Inc.

### Response G1-78.140

See Response G1-78.139, as the comment repeats Comment G1-78.139. SCAQMD acknowledges that the Refinery currently has the ability to import and process Bakken crude oil in the crude oil blend.

### Comment G1-78.141

The DEIR asserts that the VET is an independent project undergoing separate environmental review in the state of Washington that has not been and may not be approved. Tesoro, however, is more optimistic, stating "...we're very confident that the movement of Bakken crude oil to the West Coast will continue to make sense overtime. So we don't see any change there, and our commitment to Vancouver Energy hasn't wavered from the very first day."<sup>111</sup>

The DEIR asserts that the VET and the Los Angeles Refinery Integration Project are independent as neither relies on the other. The DEIR further asserts that the new crude oil tanks will be installed regardless of the fate of the VET.<sup>112</sup> However, they are clearly related.

First, the majority of the exports from the VET are headed to Los Angeles to replace more expensive and/or declining supplies from the Alaska North Slope, California,<sup>113</sup> and foreign exports. Tesoro has publicly stated in many fora that it plans to import Bakken crudes from the VET to its Los Angeles refinery, inextricably linking them. The CEO of Tesoro, Greg Goff, has indicated that the Los Angeles Refinery can take the entire shipment from the VET. There are "no restrictions on how much we ... take."<sup>114</sup> The DEIR even admits that ANS is no "readily" longer available so blending will be used to create a crude with similar properties.<sup>115</sup> The VET proposal is designed to supply these blendstocks and will primarily handle Bakken and tar sands crudes.

G1-78.141

G1-78.141  
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<sup>111</sup> Tesoro Q2 2015 Earnings Call August 6, 2015 Transcript, p. 22, Exhibit 18.

<sup>112</sup> DEIR, pp. 4-5/6.

<sup>113</sup> See VET DEIS, p. 2-73 ("Crude oil handled by the proposed Facility [VET] would be loaded onto marine vessels for transfer to terminals and refineries in California...to replace declining crude oil supplies from California and Alaska.")

<sup>114</sup> Q1 2014 Tesoro Earnings Call Transcript, Gregory Goff (Tesoro) response to Paul Cheng (Barclays Capital) questions, Exhibit 4b, p. 13.

<sup>115</sup> DEIR, p. 2-16.

### Response G1-78.141

As acknowledged in Comments G1-78.139 and G1-78.140, there are other available options to bring Bakken crude oil to the Los Angeles Refinery, thus, there is no interdependent link between the proposed project and Vancouver Energy Project.

The reference to a quotation by Tesoro's CEO is again misrepresented in the comment. The CEO did not say that the Los Angeles Refinery can handle the entire shipment of crude oil from the Vancouver Energy Project. The quote in its entirety is: "There are no restrictions on how much we choose to move to Vancouver, Washington and then supply our *West Coast* system. We will balance it with the financial commitments and our overall supply strategy with

continued sources of crude of how much we ultimately decide to take.”<sup>162</sup> (*Emphasis added.*) The CEO then continues to state that Tesoro is committed to take 50,000 bbl/day into its *West Coast* system. Similarly, the comment and reference Footnote 113 specifically deleted a portion of the statement in the Vancouver Energy Project DEIS referring to other west coast states in addition to California. The DEIS statement in its entirety is: “Crude oil handled by the proposed facility would be loaded onto marine vessels for transfer to terminals and refineries in California, Washington, Alaska, and Hawaii seeking to replace declining crude oil supplies from California and Alaska.” See Master Response 8 and Response G1-78.134 regarding the Vancouver Energy Project. Note that other Tesoro West Coast Refineries may be better suited to receive Bakken crude oil, such as Anacortes or Kenai Refineries, because they do not have coker units that enable further processing of the residuum left from the initial distillation of heavy crude oils in the crude and vacuum units. See Master Response 4 that describes that the Refinery currently blends crude oils and that there will be no significant change in the crude oil blend as a result of this project. Further page 2-16 of the DEIR additionally states that the Carson Operations currently blends crude oils to have properties similar to ANS crude oil. The proposed project does not change this.

**Comment G1-78.142**

*Second*, the Project is designed to allow an increase in gasoline and diesel production, consistent with refining Bakken crudes. Tesoro variously indicates the Project provides 30 to 40 thousand barrels per day of product flexibility<sup>116</sup> and offers several benefits including “yield flexibility of between 30 to 40 thousand barrels per day of gasoline and distillate.”<sup>117</sup> The Project includes modifications that accommodate an increase in the production of gasoline and diesel, including modifications to the Wilmington HCU (15% increase in heater fired duty), Wilmington Hydrotreater Units 1 and 2 (7,000 bbl/day increase in FCCU gasoline); and Carson No. 51 Vacuum unit (increases distillate yields and 20% increase in diesel heater firing duty); and Carson hydrocracker (10% increase in distillate yield), among others.<sup>118</sup>

In fact, increasing gasoline and diesel production appear to be a primary (and hidden) goal of the Project. The DEIR frames these changes as allowing more flexible operation. However, they would also allow an increase in production of gasoline and diesel by refining Bakken crude oils. The DEIR admits the Project would allow an increase in the production of Tier 3 gasoline, but never states that production of non-Tier 3 gasoline that is currently shipped out of state would be curtailed as a result of the Project. Thus, it is reasonable to assume that total refinery gasoline and diesel production will increase, while heavier refined products would decrease, which can be accomplished by replacing ANS, foreign exports, and California crude oil with Bakken crude oil or a blend of Bakken crude oil and tar sands.

The DEIR must be modified to include material mass balances for the baseline and post Project periods that identify all refinery inputs and outputs to properly estimate and disclose changes in crude oil throughput as a result of the Project. The DEIR claims that the only effect of the Project is a 6,000 bbl/day increase in crude oil throughput. This is questionable given the nature of the proposed modifications and various reports that the throughput of the combined facility is 380,000 bbl/day,<sup>119</sup> rather than the 363,000 bbl/day reported in the DEIR. According to Tesoro’s Form 10K, the refinery achieved the 363,000 bbl/day target in 2015, BEFORE implementation of the Integration Project.

G1-78.142

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<sup>162</sup> Thomson Reuters Streetevents Edited Transcript, Q1 2014 Tesoro Corporation Earnings Conference Call, May 1, 2014, 12:30 PM GMT at page 13.

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<sup>116</sup> Tesoro, 2014 Analyst and Investor Day Presentation, December 10, 2013, Exhibit 13, p. 38 (“Provides 30-40 MBD product flexibility”).

<sup>117</sup> Q1 2016 Tesoro Earnings Call, May 5, 2016, Recording (15:16 minutes, Exhibit 5a) and Transcript (p. 5, Exhibit 5b).

<sup>118</sup> DEIR, pdf 29, 30, 31, 33, 34.

<sup>119</sup> U.S. Securities and Exchange Commission, Form 10K, Tesoro Corporation, For the Fiscal Year Ended December 31, 2015 (2015 Tesoro Form 10K), p. 5; Available at: <http://services.corporate-ir.net/SEC.Enhanced/SecCapsule.aspx?c=79122&fid=14232456>.

### Response G1-78.142

The comment does not reflect the proposed project design. As explained in the DEIR, the proposed project is designed to improve product flexibility, not crude oil flexibility. See Master Response 4 that further explains that the project will not enable a change in crude oil blend processed at the Refinery, except to the extent that changes to the DCU H-100 heater may allow the processing of a slightly heavier crude oil blend (see FEIR sections 2.7.1.3 and 4.1.2.1 and Master Response 4). The proposed project does not increase overall Refinery production or yield, which will remain the same post-project.

The proposed project includes elements that are designed to enable production of the same quantity of finished fuels it currently produces after the Wilmington Operations FCCU is shut down. As noted in the references to Tesoro statements provided in the comment, the proposed project allows the Refinery to swing between gasoline production and distillate production by 30,000 to 40,000 bbl/day. Both of the references address yield or product flexibility, and do not in any way suggest an increase in production. Thus, if the market demands more diesel, the Refinery will reduce gasoline production by up to 40,000 bbl/day, and increase diesel production by up to 40,000 bbl/day. The modifications explained in the comment as increasing gasoline yield include those modifications to recover and upgrade distillates from FCCU feeds by modifying 51 Vacuum Unit and the HCUs at the Refinery that are being made to make up for the loss of production of gasoline due to the shutdown of the Wilmington Operations FCCU. The modifications do not increase the total product yield (see Section 2.2, page 2-3 of the DEIR).

The comment also misstates the federal requirements for the production of Tier 3 gasoline.<sup>163</sup> After January 1, 2017, gasoline sold within the United States must meet Tier 3 requirements of less than or equal to 10 ppm sulfur as the average for each company’s total gasoline pool. Thus, the gasoline that is currently being sold in states like Nevada and Arizona will have to be replaced with Tier 3 compliant gasoline. The Refinery Tier 3 modifications described in the DEIR are required to enable Tesoro’s entire gasoline production to be Tier 3 compliant. As explained on pages 2-2 and 2-3 of the DEIR, the amount of gasoline produced by the Refinery will be maintained and will not increase.

The only potential crude oil capacity increase from the proposed project, as fully disclosed and analyzed in the DEIR, will come from the change in permit description for the DCU H-100 heater, which is up to 6,000 bbl/day. See Master Response 6. The comment’s calculations of

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<sup>163</sup> 40 CFR Section 80.1603 (Subpart O).

increased yield fail to account for the loss of production from the shutdown of the Wilmington Operations FCCU, and thus result in a non-existent increase in product yield.

The comment also notes the difference between the current Refinery capacity of 380,000 bbl/day reported in Tesoro's SEC Form 10K and the capacity of 363,000 bbl/day listed in the DEIR. The Refinery capacity is not a "target" as the comment describes. As explained in more detail in Master Response 5, the 10K reported capacity of 380,000 bbl/day has been demonstrated and actually achieved by the Refinery already. The current Refinery capacity of 380,000 bbl/day has been noted in the Final EIR.

### Comment G1-78.143

*Third*, Tesoro Logistics has announced it plans to expand the capacity of its marine terminals,<sup>120</sup> which would be facilitated by the proposed new tanks and pipelines described in the DEIR, but erroneously asserted not to be part of the Project.<sup>121</sup> In its May 1, 2014 earnings call, Philip Anderson, President of Tesoro Logistics LP stated:

"We have two of our terminals are (sic) being expanded to handle additional capacity, and those expansions will come online this summer. And that will allow us to bump up volumes either very late in the second quarter or early in the third quarter."<sup>122</sup>

Elsewhere in the same conference call, Mr. Anderson responded to a question from RBC Capital Markets further identifying which terminals would be expanded and by how much:

"Our marine facility down there [referring to Tesoro terminals in Long Beach], 121, which is the large T-Berth<sup>123</sup> in Long Beach, stays pretty full. We have our legacy to Long Beach terminal [Marine Terminal] that is adjacent to our newly acquired, what we call, T-2 in Long Beach. And between T-2 and our legacy Long Beach terminal, we probably have an additional 100,000 plus barrels per day of throughput capacity."<sup>124</sup>

G1-78.143

<sup>120</sup> Tesoro Logistics, 2012 Citi MLP/Midstream Infrastructure Conference, August 2012 (August 2012 Tesoro Logistics Presentation), pp. 12-13, Exhibit 24; 1/9/14 Tesoro Presentation, p. 24, Exhibit 16.

<sup>121</sup> DEIR, pp. 4-5/6.

<sup>122</sup> Thomson Reuters Streetevents Edited Transcript, TLLP - Q1 2014 Tesoro Logistics LP Earnings Conference Call, May 1, 2014 (5/1/14 Q1 2014 Tesoro Logistics Earnings Call Transcript), p. 6, Exhibit 25.

<sup>123</sup> "T-Berth" mistranscribed as "de-berth".

<sup>124</sup> 5/1/14 Q1 2014 Tesoro Logistics Earnings Call Transcript, p. 7, Exhibit 25.

### Response G1-78.143

The DEIR described the increase in offloading capacity at the marine terminals and the increase in storage capacity for crude oils (see Sections 2.7.1.9 and 2.7.2.11 of the DEIR). The purpose of those modifications is to allow larger vessels to fully unload the crude oil deliveries in one visit. This will improve unloading efficiency and reduce costs since vessels would no longer need to partially unload, then go out to anchor while running their engines, and then return to the terminal when more storage capacity is available to complete unloading. The impacts of these modifications have been fully analyzed in the DEIR, although the emission reductions from the

reduction in marine vessel hoteling and transport emissions were not credited in the DEIR, so the analysis in the DEIR conservatively provides a worst-case estimate of post-project marine terminal emissions.

Note that the quotation “We have two of our terminals are (sic) being expanded to handle additional capacity . . .” is taken out of context. This statement is referencing increased capacity at Tesoro Logistics product (gasoline and diesel) distribution terminals, not the marine terminals that handle crude oil.<sup>164,165</sup> The product distribution terminals are being expanded in order to reduce reliance on and costs of using third-party product distribution facilities. Tesoro Logistics’ product terminals are not in any way associated with the proposed project.

The next quotation referenced in Comment G1-78.143 does refer to the marine terminals: “Our marine terminal down there, 121, which is the large [corrected T-berth] in Long Beach, stays pretty full. We have our legacy Long Beach Terminal, we probably have an additional 100,000 plus bbl/day of throughput capacity.”<sup>166</sup> The statement, “we probably have an additional 100,000 plus bbl/day of throughput capacity” refers to the existing excess capacity at the two marine terminals and not an expansion plan.

#### Comment G1-78.144

In the baseline, Terminal 121 supplied Carson. Further, the 100,000 bbl/day of unused throughput capacity is consistent with similar estimates published elsewhere. This other analysis reported Berths 76-78 [Tesoro legacy Marine Terminal] had 43,000 bbl/day and Berths 84-87 [newly acquired T-2] had 59,000 bbl/day of unused capacity, for a total of 102,000 bbl/day.<sup>125</sup> Thus, with no physical modifications to the marine terminals, the Project, by removing storage and unloading constraints, would allow an increase in the currently unused throughput. Increased marine imports, for example, could replace California crudes currently imported by pipeline. The DEIR failed to include emission increases from increases in marine imports.

G1-78.144

More modifications are planned to capture additional throughput increases, allowed by the Project’s increase in tank and pipeline throughput. In a recent earning call, the President of Tesoro Logistics, Phillip Anderson, stated: “The remainder of the organic growth is focused primarily in our Southern California assets, where we’re expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. Once we have that, we’ll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate.”<sup>126</sup> A project is currently pending at the POLB, the Berths 84-87 Tesoro Facility Improvements project.<sup>127</sup> The “Berths 84-87 Tesoro Facility Improvements, Phase 2 is shown as on hold with a completion date of May 12, 2017,<sup>128</sup> in lock step with the Project. The SCAQMD should address whether these modifications are related to the Project.

G1-78.144  
cont’d.

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<sup>164</sup> Thomson Reuters Streetevents Edited Transcript, TLLP- Q1 2014 Tesoro Logistics LP Earnings Conference Call, May 1, 2014, at page 6.

<sup>165</sup> See Attachment G, Declaration of Holly Kranzmann, Vice President, Logistics Development-West Coast, of Tesoro Logistics.

<sup>166</sup> Thomson Reuters Streetevents Edited Transcript, TLLP- Q1 2014 Tesoro Logistics LP Earnings Conference Call, May 1, 2014, at page 7.



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<sup>125</sup> Pacific L.A. Marine Terminal SEIR/DSEIR, Appx. D1, pp. D1-20/21; Available at [https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix\\_D1\\_Throughput\\_Projection\\_Vessel\\_Mix\\_Methodology.pdf](https://www.portoflosangeles.org/EIR/PacificLAMarine/SEIR/Appendix_D1_Throughput_Projection_Vessel_Mix_Methodology.pdf); see also LARIC DEIR, pp. 2-25/26/27 for description of marine terminals associated with the Tesoro Los Angeles Refinery.

<sup>126</sup> Tesoro Logistics Earnings Call Transcript, February 6, 2014, Exhibit 3.

<sup>127</sup> G.J. Cardamonte, Port of Long Beach 2012 Capital Program Update, September 2012, pdf 37 (“Berths 84-87 Tesoro Facility Improvements”), Available at: [http://www.cmaasc.org/pdfs/092012\\_portoflb.pdf](http://www.cmaasc.org/pdfs/092012_portoflb.pdf). See also: <http://www.polb.com/civica/filebank/blobdload.asp?BlobID=11974>.

<sup>128</sup> Port of Long Beach, Master Schedule Construction Only, May 11, 2016, p. 2; Available at: <http://www.polb.com/civica/filebank/blobdload.asp?BlobID=13008>.

### Response G1-78.144

It is important to distinguish between an increase in crude oil offloading and storage capacity and an increase in Refinery crude oil processing capacity. These terms should not be used interchangeably to avoid confusion. There are no contemplated increases in Refinery crude oil capacity beyond the 6,000 bbl/day analyzed in the DEIR. The additional marine vessel deliveries to provide the potential additional 6,000 bbl/day of crude oil were analyzed in the DEIR (see DEIR pages 4-26 through 4-29 and Response G1-78.176). The ability to offload a large marine vessel in one port call is separate and distinct from the Refinery’s ability to process crude oil. Crude oil storage capacity can increase, but based on permitting limits and physical constraints of the Refinery there will nonetheless be no associated increase in the Refinery crude oil processing capacity. The ability for a large vessel to unload in one port call reduces Tesoro’s costs and ship emissions.

In addition, the quotation of the President of Tesoro Logistics, Philip Anderson, is taken out-of-context and, in part, actually pertains to operations other than Southern California:

“The remainder of the organic growth is focused primarily in our Southern California assets, where we’re expanding a couple of the terminals, and adding additive and blending systems to those terminals to enable some of the higher throughputs that we expect to bring into those terminals over time. [*comment omitted*: At this point, we do not have an estimate on Phase II of the open season, pending receipt of the volume expectations from potential shippers.] Once we have that, we’ll determine the right size of pipes and pumps to put in to enable those volumes and finalize an engineering estimate.”

As indicated in Response G1-78.143, the first part of the statement references increased capacity at Tesoro Logistics’ product distribution terminals, not the marine terminals that handle crude oil. After the crude oils have been refined, the final product (gasoline, diesel, etc.) is sent to product distribution terminals and from there goes to customers. At the terminals, various additives (like detergents) are blended into the refined product. Thus, because Mr. Anderson refers to additive blending, these statements are in regard to this blending that occurs at the product terminals. Additives are added at the end of the process, not to crude oils before they are processed. The product distribution terminals are being expanded in order to reduce reliance on



## APPENDIX G1: RESPONSE TO COMMENTS

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and costs of using third-party product distribution facilities.<sup>167</sup> Tesoro Logistics' product distribution terminals are not in any way associated with the proposed project.

Finally, the comment references a project at the Port of Long Beach (POLB). The objective of the project is to comply with State Lands Commission requirements to update the infrastructure at Berths 84-86 at the Long Beach Marine Terminal to the most recent standards, including seismic upgrades and spill prevention improvements.<sup>168</sup> Tesoro is working alongside the POLB to complete this project, which is undergoing its own CEQA review process and is not related to the objectives or components of the proposed project.

### Comment G1-78.145

The relationship between the Applicant's Los Angeles Refinery and the VET is graphically illustrated in Figure 8 from a Tesoro presentation. This figure shows crude moving from the Bakken region by rail to the VET and then by ship to the Los Angeles Refinery. The Project is an initial phase of the Applicant's larger plan to import significant amounts of Bakken crude to the Los Angeles Refinery via Tesoro's VET to terminals in the POLB. However, a switch to other cost-advantaged crudes cannot be ruled out, as discussed elsewhere in these Comments.

Finally, the DEIR asserts that the Los Angeles Refinery has limited ability to process Bakken crude oil and other light sweet crude oils, and that no modifications are being proposed in the Project that would increase the ability of the Refinery to process Bakken crude oil.<sup>129</sup> These assertions are either contrary to information disclosed by

G1-78.145

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<sup>167</sup> See Attachment G, Declaration of Holly Kranzmann, Vice President, Logistics Development-West Coast, of Tesoro Logistics.

<sup>168</sup> California State Lands Commission Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS), 24 CCR Part 2, Chapter 31F.

Tesoro in other fora or they are demonstrably false. As documented elsewhere in these comments, the Refinery has already run some Bakken crude, which demonstrated that it is ideal for the refinery, increasing yields of gasoline and distillate. Further, the Project includes modifications to increase yields of gasoline and distillate, consistent with refining Bakken crude oils.

Figure 8.  
 Cost-Advantaged Crude Transportation Options  
 1/9/14 Tesoro Presentation, p. 19<sup>130</sup>  
 (Legend)<sup>131</sup>



G1-78.145  
 cont'd.

Thus, the 11 psi TVP vapor pressure limit for new tanks, coupled with identical crude composition data reported in MSDSs for the SCAQMD permit tank applications and the VET Application establish that the Project is designed to facilitate the crude switch that is widely reported by Tesoro and Tesoro Logistics.

<sup>129</sup> DEIR, Section 2.5.4.1 and Appx. F.

<sup>130</sup> 1/9/14 Tesoro Presentation, p. 19, Exhibit 16.

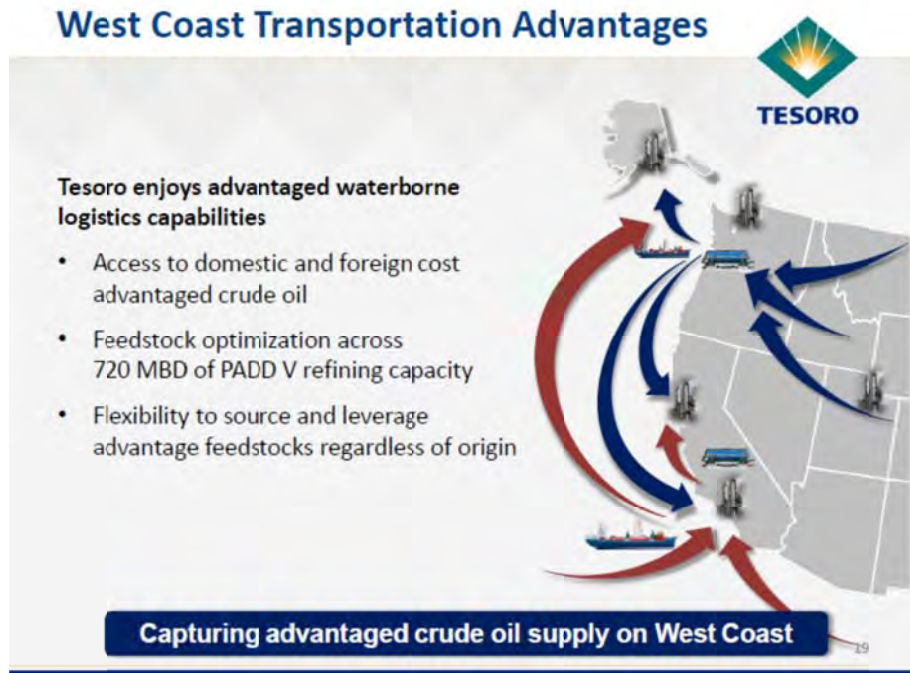
<sup>131</sup> 12/10/13 Tesoro Analyst and Investor Presentation Transcript, p. 13, Exhibit 6: "The blue arrows represent Tesoro's ability to move advantaged North American crude from the production fields to the Port of Vancouver... and then through the entire West Coast system. The red arrows represent our waterborne domestic and foreign capabilities."

### Response G1-78.145

The slide referenced in Figure 8 of Comment G1-78.145 has been modified from its original form to remove some of the language from the original slide as well as replace the slide's heading. In its original, unmodified form, the slide depicts the various modes of waterborne transportation available to areas of the West Coast, including "Access to domestic and foreign cost advantaged crude oil." The slide generally depicts the Refinery receiving crude oil from Vancouver and other sources, and Vancouver supplying crude oil up and down the West Coast. Note that this slide is based upon predictions of future activity for the benefit of investors and is based on the assumption that the Vancouver Energy Project will be approved.<sup>169</sup> This slide does

<sup>169</sup> The presentation is preceded by a slide explaining that the presentation uses forward looking statements. "Although we believe the assumptions upon which these forward-looking statements are based are reasonable,

not provide any support for the assertion that the proposed project and the Vancouver Energy Project are linked such that they comprise the same project; rather, it merely depicts that Vancouver could be one potential source of crude oil for the Refinery and other West Coast refineries. The original slide is presented in its unmodified form in Figure 78.145-1. The slide does not present any information indicating that the proposed project will facilitate the use of crude oil from the proposed Vancouver Energy Project. See Master Response 8 and Response G1-78.134 regarding the Vancouver Energy Project. See Master Responses 4 and 6 regarding the constraints on processing Bakken crude oil.



**Figure 78.145-1**  
**Actual Tesoro Presentation Slide**

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any of these assumptions could prove to be inaccurate and the forward-looking statements based on these assumptions could be incorrect."

**Comment G1-78.146**

**C. The Project Will Facilitate the Import of Tar Sands Crudes**

The publicly available information, including the assumed vapor pressure for the new tanks (RVP = 10.5 psi; TVP=11+ psi), propane recovery, shutdown of the Wilmington FCCU, and other processing changes suggest that large amounts of Bakken or other light crude oils will be incorporated into the crude slate. However, the Project description and prior, piecemealed projects, suggest the Project is also building in maximum flexibility to allow other cost-advantaged crudes such as tar sands, given the Los Angeles Refinery’s configuration, the Project design, the VET product mix and public statements by Tesoro.

First, the VET, which will supply the majority of the new crudes, is designed to heat 25% to 33% of crude unloaded from trains. Only the heavier Canadian tar sands crudes could require heating.<sup>132</sup> Assuming an average maximum VET throughput of 300,000 bbl/day, that would imply the ability to deliver up to 75,000 to 100,000 bbl/day of heavier tar sands crudes requiring heating. The lower end might actually not be that low (or rarely would) as it is based on limitations of steam supply to 1 to 1.5 unit train per day of out of 4. Some of this tar sands could end up at the Los Angeles Refinery, as it is somewhat similar to California heavy crudes currently refined there. The heavy VET tar sands crudes that could require heating are unlikely to go to Tesoro’s Anacortes or Kenai refineries as they do not have a coker.<sup>133</sup>

<sup>132</sup> Some other crudes being handled by the VET, such as Uinta Basin waxy crude, could require heating, but heavier tar sands crudes would be the predominant type of crudes that could require heating at the VET. But even for heavier tar sands crudes, heating requirements might be limited (especially in summer, when ambient temperatures are higher at the VET and along the rail routings from tar sands to the VET). Thus, heavier tar sands crudes comprise more than 33% of the crudes handled by the VET, especially in summer.

<sup>133</sup> Further, Tesoro Anacortes already has access to heavy tar sands crude via pipeline, as well as an onsite refinery unit train unloading terminal. Thus, Tesoro Anacortes is unlikely to receive substantial amounts of heavier tar sands crude via the VET.

G1-78.146

**Response G1-78.146**

See Responses G1-78.134 and G1-78.138 that are responsive to the restated claims in the comment that the proposed project will enable the processing of Bakken and other light crude oils. The comment then claims that the proposed project will enable the processing of [Canadian] tar sands crude oils. Although the comment refers to “tar sands” crude oil, Comment G1-78.164 correctly acknowledges that tar sands heavy crude oil “...must be diluted or thinned with a lighter hydrocarbon stream to reduce viscosity and density to be transported.” See Response G1-78.137 regarding the ability to process heavy Canadian dilbit (tar sands) crude oils.

Further, the comment provides no support for the conclusion that heavier Canadian crude oils would be routed to the Refinery. Instead, the comment provides an unsupported opinion that the heavy Canadian crude oils are unlikely to go to the Anacortes or Kenai Refineries. However, as explained in the Section 4.1.2.5 of the DEIR, the Vancouver Energy Project is designed to deliver crude oil to any West Coast refinery, not just Tesoro refineries. See also Master Response 8 regarding the Vancouver Energy Project. As explained above in Response G1-78.141, Tesoro’s West Coast system is only committed to taking part of the crude oil from the Vancouver Energy Project. The remaining crude oil would go to other refineries. As the comment states, the heavier tar sands crude oils require heating. That is not just at refineries, but throughout the entire transportation system. There are no permits to add heated storage tanks to

**APPENDIX G1: RESPONSE TO COMMENTS**

accommodate the storage of such heavy crude oil at the Refinery, and the comment does not provide any evidence to support that conclusion.

In any event, the properties of dilbit crude oils are similar to other conventional crude oils processed by the Refinery. As noted in Table 78.146-1, dilbit crude oils are typical of other heavy, sour crude oils in composition and therefore are like other crude oils processed by the Refinery.

**Table 78.146-1**  
**Crude Oil Properties**

<b>Crude Name:</b>	<b>Unit</b>	<b>Exxon Cold Lake Dilbit Blend</b>	<b>Exxon Kearn Dilbit Blend</b>	<b>Castilla</b>	<b>Basrah</b>
<b>Crude ID:</b>		<b>CLAKBL13</b>	<b>KRLBS14Z</b>		
<b>Whole Crude Balance</b>					
Cut Yield (Vol%)	LV%	100	100	100	100
Neutralization or TAN No.	mg KOH/g	0.84	1.84	0.06	0.08
API Gravity	API	19.7	20.3	18.5	31.0
Sulfur	WT%	3.77	3.80	2.00	2.88
Mercaptan Sulfur	ppm	58	72	11	13
Nitrogen	ppm	3862.22	2810.5	4080	1390.6
Viscosity @ 68 °F (20 C)	cSt	441.7	237.3	378.5	25
Viscosity @ 104 °F (40 C)	cSt	120.7	81.7	151.9	10.6
<b>Cut Yields (Vol%) Summary</b>					
LtEnds (<60 °F)	LV%	0.83	0.79	--	2.90
LVN (60-165 °F)	LV%	11.78	15.49	6.06 <sup>(1)</sup>	5.87
HVN (165-330 °F)	LV%	7.72	4.34	14.01	13.59
Kerosene (330-480 °F)	LV%	4.76	2.64	5.61	16.39
Diesel (480-650 °F)	LV%	10.31	10.17	14.74	14.73
VGO (650-1000 °F)	LV%	29.21	33.31	25.50	26.86
Vacresid (1000-1499 °F)	LV%	35.39	33.26	33.71	19.66
<b>TOTAL</b>	<b>LV%</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Source: ExxonMobil, Worldwide Operations, Crude Trading, Crude Oils by Region

[http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude\\_oil\\_coldlake\\_assay\\_pdf.pdf](http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude_oil_coldlake_assay_pdf.pdf)

[http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude\\_oil\\_kearl\\_assay\\_pdf.pdf](http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude_oil_kearl_assay_pdf.pdf)

Recope data, <https://www.recope.go.cr/wp-content/uploads/2012/11/Attachment-5-CASTI190.xls>

Tesoro Proprietary Assay Software Program.

Notes: LV% = liquid volume present; mg KOH/g = milligrams potassium hydroxide per gram; WT% = weight percent; ppm = parts per million; cSt = centistokes; LtEnds = light liquid boiling below 60 °F; LVN = Light Vacuum Naphtha boiling range of 60-165 °F; HVN = Heavy Vacuum Naphtha boiling range of 165-330 °F; Kerosene = Kerosene boiling range of 330-480 °F; Diesel = Diesel boiling range of 480-650 °F; VGO = Vacuum Gas Oil boiling range of 650-1000 °F; and Vacresid = Vacuum Residue boiling range of 1000-1499 °F.

<sup>(1)</sup> LtEnds and LVN are not differentiated in the Castilla crude assay.

**Comment G1-78.147**

*Second*, the Marine Terminal Agreement, Annex D, lists crudes that could be accepted at the Marine Terminal in the baseline. These included two Canadian tar sands crudes, Cold Lake and Wabasca.<sup>134</sup>

<sup>134</sup> Marine Terminal Agreement, Annex D.

G1-78.147

**Response G1-78.147**

The comment misunderstands the purpose of Annex D in the [Long Beach] Marine Terminal agreements. Annex D was included as a requirement of a Tesoro Logistics customer to specify crude oils that Tesoro must accommodate as part of the customer's Berth Access Agreement. For consistency, Annex D was carried over to agreements between Tesoro Logistics and Tesoro Refining and Marketing. Annex D does not represent an actual list of crude oils managed by the Long Beach Marine Terminal during baseline or any other years. However, as explained in the DEIR, the Refinery has limitations on the amount of a heavy crude oil, such as Cold Lake crude oil, it can process and the project does not include modifications, other than that analyzed in the DEIR, that would enable the Refinery to process more heavy crude oils. (see DEIR at page 2-19.) See Master Response 4 for additional description that the project will not enable a change in the crude oils processed.

**Comment G1-78.148**

*Third*, some of the Applicant's recently completed and planned projects to integrate the Carson and Wilmington Operations are required to facilitate the refining of increased amounts of heavy sour crudes, such as tar sands, at the Wilmington Operations. In fact, these already completed projects suggest that the Integration Project is piecemealed. Tesoro has been making modifications at both Wilmington and Carson that were completed prior to the release of the Integration DEIR, but which are required to implement the Integration Project.

A new vacuum distillation unit started up at Wilmington in 2012, which will help maximize gasoline, diesel and jet fuel production by increasing the amount of vacuum gas oil.<sup>135</sup> This will require increased coking, perhaps explaining the need for a 10% increase in the maximum fired duty of the coker heater (H-100).<sup>136</sup>

The hydrogen plant at Wilmington was recommissioned to produce an additional 15 MMSCF/day of hydrogen. This removed constraints for the hydrocracker and hydrotreaters at both facilities, allowing them to refine increased amounts of heavy crudes, such as tar sands.<sup>137</sup>

The Wilmington sulfur recovery unit was "debottlenecked," increasing its capacity by 10 ton/day.<sup>138</sup> This increased capacity would be required to run significant amounts of high sulfur tar sands crudes.

A blending system was also installed at Carson to mix light and heavy crudes to eliminate metallurgy (e.g., corrosion due to high TAN tar sands crudes) or yield constraints (e.g., reductions in yield due to system design).<sup>139</sup> This increased throughput volumes<sup>140</sup> and facilitated the processing of a range of tar sands crudes.

G1-78.148

G1-78.148  
cont'd.



All of these projects at the Los Angeles Refinery, and especially the Wilmington Operations, allow the Refinery to process increased amounts of tar sands crudes compared to the baseline, when very little tar sands was refined. Thus, these precedent projects in conjunction with the Integration Projects would allow an increase in the amount of tar sands that could be refined.

G1-78.148  
cont'

<sup>135</sup> Aaron Clark and Dan Murtaugh, Tesoro Wilmington Refinery Begins Operating New Vacuum Tower, Bloomberg, November 26, 2012; Available at: <http://www.bloomberg.com/news/articles/2012-11-26/tesoro-wilmington-refinery-begins-operating-new-vacuum-tower>.

<sup>136</sup> DEIR, pp. 1-11/12 (heater H-100 duty increased from 252 to 302.4 MMBtu/hr).

<sup>137</sup> 12/10/13 Tesoro Analyst and Investor Presentation Transcript, Exhibit 6, p. 10 (“The processing projects focus on removing feedstock constraints; fully utilizing the assets; improving our conversion capabilities, and subsequently, our yield. You know a great example of this that we’ve already achieved is the recommissioning of the hydrogen plant at Wilmington, which now is producing 15 million standard cubic feet per day of hydrogen, which then removes the constraints for the hydrocrackers and the hydrotreaters at both the facilities. It took us about \$4 million to bring that system back online.”)

<sup>138</sup> Tesoro Corporation Earnings Conference Call, May 1, 2014, Goff remarks on California synergies at 9:27 to 10:13 minutes, attached as Exhibit 4a (“We were able to debottleneck the sulfur recovery unit and increase production capacity by 10 tons per day.”); Q1 2014 Tesoro Corporation Earnings Conference Call Transcript, May 1, 2014, p. 4, Exhibit 4b (Mistranscribed as: “We were able fleet stock that disposal recovery unit and increase production capacity by 10 tons per day. This modification allows us to increase crude flexibility and refining and capture further energy.”)

<sup>139</sup> 12/10/13 Tesoro Analyst and Investor Presentation Transcript, Exhibit 6, pp. 10, 28, 29, and May 1, 2014, Q1 2014 Tesoro Earnings Conference Call, Goff remarks on California synergies (Webcast, Exhibit 4a, at 9:27 to 10:13 minutes; Transcript, Exhibit 4b, p. 4).

<sup>140</sup> U.S. Securities and Exchange Commission, Form 10-K, Tesoro Corporation, Fiscal Year Ended December 31, 2015; Available at: <http://phx.corporate-ir.net/ExternalFile?item=UGFyZW50SUQ9NjMwOTIwfENoaWxkSUQ9MzZMIMjk3fFR5cGU9MQ==&t=1>; (2015 Tesoro Form 10-K), p. 30 (“...Los Angeles improvements including...Crude blending capabilities at the Carson crude terminal that resulted in higher throughput volume.”).

## Response G1-78.148

The comment includes unsupported assumptions and conclusions regarding Tesoro’s operations claiming that Tesoro has “piecemealed” projects in order to process more “tar sands” crude oil. The comment lists “modifications” that were planned or occurred at the Carson and Wilmington Operations prior to the acquisition of the BP Carson Refinery on July 1, 2013, and before Tesoro could design the proposed project, as projects that were piecemealed with the proposed project. The comment states, without supporting facts or substantial evidence, that the “modifications” could accommodate tar sands crude oils.

The Refinery has, is, and will continue to process heavy and light crude oils, regardless of where they originate. The Refinery has processed Cold Lake and Kearl heavy Canadian dilbit (tar sands) crude oils; THUMS and San Joaquin Valley heavy Californian crude oils; Oriente, Castilla, and Napo heavy South/Central American crude oils; and, many other crude oils from around the world (see Master Response 4). A description of each of the activities referenced in the comment is provided below. Note that in two of the four activities cited, there were no physical modifications made to any Refinery equipment in order to complete the activities.

As summarized here and explained in detail below, the facts regarding the comment’s four cited activities do not support an inference that the activities were either associated with the proposed project or made in order to process heavier crude oils. Replacing an old distillation column in the existing Wilmington Operations Vacuum Unit occurred more than six months before acquisition of the BP Carson Operations. The Title V permit was modified to accommodate the



column replacement and CEQA review associated with the permit modification did not trigger completion of a CEQA document. The column replacement involved no increased coking capacity or other operational changes. Resuming operation of the Wilmington Operations Hydrogen Plant occurred to address continued reliability issues with Tesoro's third-party hydrogen supplier, and required no Title V permit modifications or CEQA review. The SRP "debottlenecking" was simply a performance test that BP ran at its Carson Operations prior to the acquisition, and because no modifications were made to equipment during or after this testing, it required no agency approvals, Title V permit modifications or CEQA review. Lastly, installation of the Carson Crude Terminal "blending system" involved piping connections to an existing manifold that occurred prior to the BP Carson Operations acquisition, was not a project requiring CEQA review, and did not impact the Refinery's crude oil operating envelope in any way.

First, the comment points to the start-up of a new vacuum distillation unit at the Wilmington Operations in 2012. The comment cites a news article that incorrectly references a "new vacuum distillation unit" starting up at Wilmington Operations. Actually, a distillation column was replaced in the existing Wilmington Operations Vacuum Unit in November 2012. The new column replaced an existing column that had been in service for over forty years. The new column provided increased separation of gas oil from the atmospheric resid fed to the Vacuum Unit. Better separation of gas oil improves feed quality to the FCCU, which results longer catalyst life, improving reliability, and reducing operating costs. The replacement permit was evaluated for CEQA applicability and did not require preparation of a CEQA document because there were not any substantial emissions increases associated with the replacement. The start-up of this replacement column occurred well before the acquisition of the BP Carson Operations in July 2013. Therefore, this activity could not be a part of the proposed project or some larger project the Tesoro Refinery planned. The comment additionally suggests, again without basis, that since the vacuum column increases vacuum gas oil production, this will require increased coking. No description for this assertion is provided, and additional coking capacity is not part of the proposed project. Vacuum gas oil is FCCU feed, not DCU feed (see Figure 2-10 of the DEIR); therefore, the comment has no factual basis. The comment additionally tries to tie this assertion to the increase in fired duty of the DCU H-100 heater by stating that "perhaps" this could explain the connection. The DCU coking process is downstream of the vacuum tower in the Refinery process configuration. Therefore an increase in the firing rate of the heater in a downstream unit does not impact the upstream Vacuum Unit capacity.

As clearly explained in the DEIR (Section 2.7.1.3, page 2-37), the planned increase in the permit-described fired duty of the DCU H-100 heater was begun independently before the proposed project was planned. No physical modifications will be made to the DCU H-100 heater. The application was filed well in advance of the application for the proposed project but, to be conservative, the DCU H-100 heater permit modification was included in the proposed project so that a full analysis of impacts of both projects was evaluated. Additionally, the permit modification to increase the rated duty would only accommodate up to 6,000 bbl/day increase in Refinery crude oil capacity (approximately a two percent increase) or a smaller amount of additional heavy crude to be refined (see Section 2.7.1.3, page 2-37 of the DEIR and Master Response 6).

The comment additionally concludes, without any description or support, that resuming operation of the Wilmington Hydrogen Plant would allow the Refinery to refine increased amounts of heavy crude oils. Resuming operation of the Wilmington Operations Hydrogen Plant involved equipment maintenance to restore equipment to its original operational state. The Hydrogen Plant resumed operation due to continuing reliability issues with Tesoro's third-party hydrogen supplier. The Hydrogen Plant resumed operation in October 2013; however, maintenance planning to resume operation of the Hydrogen Plant began in early 2013, well before the acquisition of the BP Carson Operations in July 2013. Therefore, this activity could not be a part of the proposed project or some larger project the Tesoro Refinery planned. The Hydrogen Plant is an existing unit that resumed operation enabling Tesoro to increase production flexibility and keep critical downstream Hydrotreating and Hydrocracking Units operating, particularly when third-party Hydrogen Units shut down unexpectedly. But, as explained in Response G1-78.171, the Refinery uses all available hydrogen and remains hydrogen limited. The Hydrogen Plant was an existing facility that had operated in the past, and did not need additional permitting or any modifications to resume operation. It was in operation during the baseline period (as noted in the comment), and therefore was part of the baseline and not part of the proposed project.

To clarify, both Carson and Wilmington Operations have SRPs, but the stand-alone SRP located in the City of Carson is for the Wilmington Operations (see DEIR Figure 2-17). The Carson Operations SRP is located within the Carson Operations. The Carson Operations (not Wilmington Operations as stated in the comment) SRP sulfur production capacity was demonstrated in early 2013 by BP, well before the acquisition of the BP Carson Operations in July 2013. Therefore, this activity could not be a part of the proposed project or some larger project the Tesoro Refinery planned. The SRP debottleneck and ten tons/day of sulfur capacity increase referenced in the May 1, 2014 Tesoro Corporation Earnings Conference Call actually refers to a performance evaluation that BP conducted on the SRP. In April 2013, prior to Tesoro's acquisition of Carson Operations, BP performed a test to evaluate the physical constraints on the Carson SRP. The test demonstrated that the capacity was actually ten tons/day more than previously attributed to the SRP. No modifications were performed to demonstrate the capacity and none of the processing equipment was modified in any way. Maintenance activities were performed to improve the span of the existing instrumentation to enable the existing equipment to routinely operate at its existing capacity. The demonstration did not require any agency approvals or permits, and therefore was not a "project" pursuant to CEQA. The demonstration performed by BP occurred in April 2013 and is appropriately part of the baseline.

The Carson Crude Terminal blending system was placed into operation by BP in March 2013, well before Tesoro acquired the BP Carson Operations in July 2013. Therefore, this activity could not be a part of the proposed project or some larger project that the Refinery planned. The Carson Crude Terminal "blending system" involved piping connections into an existing manifold. This activity did not require any agency approvals or permits, and therefore is not a "project" pursuant to CEQA. The blending system improved the crude oil blending capabilities of Carson Crude Terminal and the Refinery, allowing for more precise blending within the Refinery's operating envelope.

None of the projects listed would facilitate the Refinery processing significant additional amounts of heavy Canadian crude oils. Also see Comment G1-78.150: “tar sands crude could be blended with Bakken crude to create an ANS lookalike crude...The resulting mix has the same API gravity and slightly higher sulfur than ANS and virtually identical distillation yields.” While Comment G1-78.150 over-simplifies the blending process, as noted in Response G1-78.150, the concept is correct. It is this blending process that, if correct amounts of tar sands and Bakken crude oils, or any other combination of heavy and light crude oils that can likewise be blended, would enable a crude oil blend to be processed through the Refinery. This is what is occurring today with the over 30 different crude oils that are blended to mimic ANS and are processed through the Refinery and what occurred during the baseline period (see Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94) .

### Comment G1-78.149

*Fourth*, the Refinery started receiving tar sands crudes via the Plains Bakersfield crude-by-rail terminal in December 2014. In a December 2015 presentation, Tesoro announced its intention to import 25,000 bbl/day of heavy tar sands crude to its California refineries:<sup>141</sup>

**“CJ Warner – Tesoro Corp. - EVP for Strategy & Business Development**  
One is bring a 25,000 barrels a day more heavy crude oil to California refineries. This is a rail opportunity. We are in the process of realizing it, and we're actually already producing or processing 9,000 barrels a day through this route in our LA refineries.”

In Feb 2015, Greg Goff, CEO and Chairman of Tesoro, explained in response to a question from Citigroup<sup>142</sup>:

**“Faisal Khan - Citigroup - Analyst**

Okay, understood. And then on WCS and Bakken and moving those volumes into the West Coast, understanding that at the Vancouver facility that process is still ongoing, is there a desire to increase the amount of WCS you're reeling in right now to California? I know you're maxed out at roughly 20,000 a day, but is there ability for you to expand the facilities that Plains has at Bakersfield and move more WCS into Central California?

**Greg Goff - Tesoro Corporation - Chairman & CEO**

The movement just started in December of the Canadian heavy that we're moving into Bakersfield, as you said. And then that will ramp up as the facility comes up. So we'll take our full share that we've contractually committed to, to moving the Canadian crude into our refineries.

**Faisal Khan - Citigroup - Analyst**

And is that still economic in the current environment to do that?

**Greg Goff - Tesoro Corporation - Chairman & CEO**

You know, I haven't looked at it. I haven't looked at in the last a little bit. Those things bounce around a lot. You just have to look and see where they are over time. I don't know, Faisal, at this current time right now.”

Thus, starting in Dec 2014, Tesoro was apparently moving some Western Canadian Select (WCS) into Bakersfield and on to its refineries, including Los Angeles.

G1-78.149

G1-78.149  
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<sup>143</sup> Tesoro, Driven to Create Value, Analyst and Investor Day Slides, December 9, 2014, p. 32, Exhibit 9 (“Provide reliable and cost advantaged access to feedstocks - 25 MBD heavy crude oil to California refineries...”) and Thomson Reuters Streetevents Edited Transcript, TSO - Tesoro Corporation and Tesoro Logistics LP Analyst and Investor Day Transcript, December 9, 2014, p. 13, Exhibit 15.

<sup>142</sup> Thomson Reuters Streetevents Edited Transcript, TSO - Q4 2014 Tesoro Corp. Earnings Call, February 12, 2015 (Q4 2015 Earnings Call), pp. 22-23, Exhibit 19.

### Response G1-78.149

In 2014, Tesoro imported a small amount of heavy Canadian crude oil to its California refineries through Bakersfield, and Tesoro’s CEO acknowledged that the economics of moving the crude oil to California had not been recently evaluated. Any such movement would not be as a result of this proposed project. Since movement of heavy Canadian crude oil already occurred through Bakersfield, clearly this is an existing capability that occurred independent of the proposed project. Moreover, the response to the question from Citigroup refers to Central California, not Los Angeles.

### Comment G1-78.150

Finally, tar sands crudes could be blended with Bakken to create an ANS look-alike crude using 55% Bakken and 45% Western Canadian Select at a cost potentially less than the ANS market price. The resulting mix has the same API gravity and slightly higher sulfur than ANS, and virtually identical distillation yields.<sup>143</sup> However, some refineries do not have sufficient storage or blending capacity.<sup>144</sup> The significant increase in storage tank capacity and the installation of blending facilities at the Carson terminal suggest that blending is an undisclosed part of the Project. Thus, the DEIR must disclose the assumed crude slate and evaluate the impacts of importing and processing both a lighter crude oil, such as Bakken and tar sands crudes, which span the range of likely impacts.

Tar sands crudes would face stronger opposition in California than Bakken due to the well-known environmental impacts from producing and refining them.<sup>145</sup> Thus, they are frequently disguised in project proposals by referring only to broad general classes of crudes, e.g., light and heavy or “North American sourced crudes.”

Tar sands crudes cannot be eliminated based on the record. Their refining is facilitated by the Project, and public statements made by Tesoro confirm its intent to import increased amounts of tar sands crudes to its Los Angeles Refinery. Thus, the DEIR should have identified them and disclosed the environmental impacts that would be associated with refining them. While a small amount of these crudes were run in the baseline, the Project would allow a substantial increase in these crudes from the VET and were the VET not permitted, from other rail-to-marine terminals or the Plains Bakersfield Terminal.

G1-78.150

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## APPENDIX G1: RESPONSE TO COMMENTS

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<sup>143</sup> John R. Auers and John Mayes, North American Production Boom Pushes Crude Blending, Oil & Gas Journal, May 6, 2013, Exhibit 32. See also DEIR, Appx. F, p. F-23 and VET DEIS, p. 5-51 (“For example, blending Canadian derived dilbit crude oil with the Bakken crude oil would create a feed blend for refining that would be similar to Alaskan North Slope crude oils that have generally been used in PADD 5 refineries.”).

<sup>144</sup> Auers and Mayes 2013 (“While this type of blending can be successfully conducted within a refinery, some refineries do not have sufficient storage or blending capacity.”)

<sup>145</sup> EIP, Tar Sands: Feeding U.S. Refinery Expansions with Dirty Fuel, June 2008, Available at: [http://environmentalintegrity.org/pdf/publications/Tar\\_Sand\\_Report.pdf](http://environmentalintegrity.org/pdf/publications/Tar_Sand_Report.pdf). See also: Jan Austen, Pollution from Canadian Oil Sands Vapor Is Substantial, Study Finds, May 25, 2016, New York Times; Available at: [http://www.nytimes.com/2016/05/26/business/energy-environment/pollution-from-canadian-oil-sands-vapor-is-substantial-study-finds.html?ref=business&\\_r=0](http://www.nytimes.com/2016/05/26/business/energy-environment/pollution-from-canadian-oil-sands-vapor-is-substantial-study-finds.html?ref=business&_r=0) and J. Liggio and others, Oil Sands Operations as a Large Source of Secondary Organic Aerosols, Nature, 2016; Available at: [http://www.nytimes.com/2016/05/26/business/energy-environment/pollution-from-canadian-oil-sands-vapor-is-substantial-study-finds.html?ref=business&\\_r=0](http://www.nytimes.com/2016/05/26/business/energy-environment/pollution-from-canadian-oil-sands-vapor-is-substantial-study-finds.html?ref=business&_r=0).

### Response G1-78.150

The import of Bakken and heavy Canadian crude oil would require blending with other crude oils, to meet the specifications of ANS and to process the crude oil through the Refinery. This is currently occurring and is the case with or without the proposed project now and in the future. The DEIR discussed the crude oil characteristics considered when blending crude oils on page 2-16.

While it is true that some of the properties of a blend of 55 percent Bakken and 45 percent Western Canadian Select (WCS) or Cold Lake heavy Canadian crude oils will approximate an ANS crude oil look-alike, a closer evaluation of the blend properties and distillation cut quality reveals that a straight blend of Bakken and WCS or Cold Lake heavy Canadian crude oil is not suited for processing at the Refinery. As illustrated in Table 78.150-1, which is based on Tesoro’s proprietary crude oil assay software program and shows the properties of these crude oil blends, some physical properties of these crude oil blends are similar to ANS crude oil. However, there are significant differences in sulfur and nitrogen content between the crude oil blends and ANS crude oil that require additional crude oils to be added to make a blend that would be suitable for processing at the Refinery.

The actual distillation cut quality (quality of the intermediate feedstocks that are separated from crude oil) changes depending on the crude oil blend. As shown in Table 78.150-2, the 55/45 blends of Bakken and heavy Canadian Crude oils would have worse cut quality than ANS, particularly for kerosene, vacuum gas oil (VGO), swing VGO (VGOswing), and vacuum residue (Vacresid). Kerosene would have a 1,000 percent difference in nitrogen content between the suggested Bakken and heavy Canadian crude oil blends and ANS. This would impact distillate hydrotreater operation and throughput, which could only be remedied by including additional crude oils to the Refinery blend or reducing crude oil capacity. The difference in sulfur content in VGO and VGO swing from Canadian blends and ANS would impact operational throughput. The Vacresid from the suggested Bakken and heavy Canadian crude oil blends would have significantly higher sulfur and metals content when compared to ANS. The vacuum residue qualities in particular would preclude the Refinery from using these blends and ANS interchangeably since there would be negative impacts to DCU operations and coke quality. Coke quality specifications would not be met with the increased sulfur and metals content in the

**APPENDIX G1: RESPONSE TO COMMENTS**

vacuum residue, which could only be remedied by including additional crude oils to the Refinery blend.

Therefore, additional crude oils would need to be added to make a blend that would be suitable for processing at the Refinery. As a result of this necessary blending of crude oils to meet current and continuing Refinery constraints, there will be no additional emissions impacts caused by the proposed project other than those fully described and analyzed in the DEIR.

**Table 78.150-1  
Crude Oil Blend Properties**

<b>Crude Name:</b>		<b>BakkenWCS Blend</b>	<b>BakkenColdLake Blend</b>	<b>Alaska North Slope '13</b>
<b>Crude ID:</b>	<b>Unit</b>	<b>BakkenWCS</b>	<b>BakkenColdLake</b>	<b>ANSPL_320</b>
<b>Whole Crude Balance</b>				
Cut Yield (Vol%)	LV%	100	100	100
Cut Yield (Wgt%)	WT%	100	100	100
API Gravity	API	32.0	33.2	32.9
Sulfur	WT%	1.75	1.847	0.93
Mercaptan Sulfur	ppm	2	11	12
Nitrogen	ppm	1557	1482.4	1715.9
Viscosity @ 60 F (15.5 C)	cSt	23.3	14.9	12.2
Viscosity @ 100 F (38 C)	cSt	11.4	8.6	6.5
<b>Cut Yields (Vol%) Summary</b>				
LtEnds (<40 °F)	LV%	1.5	1.5	2.7
LVN (40-180 °F)	LV%	11.0	12.2	9.7
HVN (180-325 °F)	LV%	15.4	15.3	14.5
Kerosene (325-510 °F)	LV%	16.8	16.3	16.8
Diesel (510-675 °F)	LV%	14.9	14.4	14.3
VGO (675-950 °F)	LV%	18.3	17.7	20.4
VGOswing (950-1020 °F)	LV%	3.5	3.7	4.4
Vacresid (1020+ °F)	LV%	18.6	18.8	17.1
<b>TOTAL</b>	<b>LV%</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Tesoro Proprietary Assay Software Program.

Notes: BakkenWCS is a blend of 55% Bakken and 45% Western Canadian Select crude oils.

BakkenColdLake is a blend of 55% Bakken and 45% Cold Lake crude oils.

LV% = liquid volume present; WT% = weight percent; ppm = parts per million; cSt = centistokes

LtEnds = light liquids boiling below 40 °F; LVN = Light Vacuum Naphtha boiling range of 40-180 °F;

HVN = Heavy Vacuum Naphtha boiling range of 180-325 °F; Kerosene = Kerosene boiling range of 325-

510 °F; Diesel = Diesel boiling range of 510- 675 °F; VGO = Vacuum Gas Oil boiling range of 675-950 °F;

VGOswing = VGO boiling range of 950-1020 °F that can be either VGO of Vacresid; and Vacresid =

Vacuum Residue boiling at 1020 °F or greater.

**Table 78.150-2**  
**Crude Oil Blend Intermediates Feedstock Properties**

<b>Crude Name:</b>		<b>BakkenWCS Blend</b>	<b>BakkenColdLake Blend</b>	<b>Alaska North Slope '13</b>
<b>Crude ID:</b>	<b>Unit</b>	<b>BakkenWCS</b>	<b>BakkenColdLake</b>	<b>ANSPL_320</b>
<b>Kero</b>				
API Gravity	API	43.7	42.1	40.5
Sulfur	WT%	0.1	0.2	0.1
Mercaptan Sulfur	ppm	1	2	7
Nitrogen	ppm	23	29	2
<b>VGO</b>				
API Gravity	API	20.4	20.0	21.6
Sulfur	WT%	1.8	1.9	1.2
Nitrogen	ppm	943	1025	1055
Neut or TAN No.	mgKOH/g	0.7	0.8	0.2
<b>VGOswing</b>				
API Gravity	API	16.6	15.6	16.5
Sulfur	WT%	2.2	2.4	1.6
<b>Vacresid</b>				
API Gravity	API	3.9	3.1	6.5
Sulfur	WT%	5.0	5.3	2.4
Nitrogen	ppm	5659	5092	6621
Asphaltenes	WT%	13.1	16.3	8.7
Vanadium	ppm	318	352	121
Nickel	ppm	123	126	50

Source: Tesoro Proprietary Assay Software Program.

Notes: BakkenWCS is a blend of 55% Bakken and 45% Western Canadian Select crude oils.

BakkenColdLake is a blend of 55% Bakken and 45% Cold Lake crude oils.

LV% = liquid volume present; WT% = weight percent; ppm = parts per million; cSt = centistokes

LtEnds = light liquids boiling below 40 °F; LVN = Light Vacuum Naphtha boiling range of 40-180 °F;

HVN = Heavy Vacuum Naphtha boiling range of 180-325 °F; Kerosene = Kerosene boiling range of 325-

510 °F; Diesel = Diesel boiling range of 510- 675 °F; VGO = Vacuum Gas Oil boiling range of 675-950 °F;

VGOswing = VGO boiling range of 950-1020 °F that can be either VGO of Vacresid; and Vacresid = Vacuum Residue boiling at 1020 °F or greater.



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D. The Los Angeles Refinery Did Not Refine Significant Amounts of Bakken And Tar Sands Crude Oil In The Baseline

Publicly available information indicates that neither Wilmington nor Carson processed significant amounts of Bakken and other North American cost-advantaged crude oils in the baseline. As documented elsewhere in these comments, the Project will facilitate the import of these crudes, and Tesoro has publicly stated in many fora that it plans to import them. The Project includes modifications specifically designed to accommodate a crude switch. Thus, the DEIR must evaluate the impacts associated with substituting Bakken and/or tar sands for California, ANS and foreign-imported crudes refined in the baseline, because this change is facilitated by the Project's modifications to storage tanks and refinery processing equipment.

1. Baseline Amounts of Bakken Crudes

In its 10-Q reports to the U.S. Securities & Exchange Commission, Tesoro reported that only its Alaska, North Dakota, and Washington refineries were running Bakken crude:

- For the quarter ended September 30, 2012: "We supply our North Dakota refinery exclusively with Bakken crude oil and our Washington refinery with Canadian Light Sweet crude oil."
- For the quarter ending March 31, 2013: "We supply our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Canadian Light Sweet and Bakken crude oil and our Utah refinery with light sweet crude oil from Wyoming and Montana as well as Uinta Basin waxy crude oil... Our California refineries run a significant amount of South American heavy crude oil and San Joaquin Valley Heavy ("SJVH"), which continued to be priced at a discount to Brent during the first quarter of 2013. During the first quarter of 2013, we supplied our Alaska refinery primarily with Alaska North Slope crude oil ("ANS")."<sup>146</sup>
- For the quarter ending March 31, 2014: "We supplied our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Bakken and Canadian Light Sweet crude oil and our Utah refinery with light sweet crude oil from Wyoming and Colorado as well as Uinta Basin waxy crude oil... Our California refineries run a significant amount of South American heavy crude oil ("Oriente") and San Joaquin Valley Heavy () and light crude oil from Iran ("Basrah")."<sup>147</sup>
- For the quarter ending March 31, 2015: "We supply our North Dakota refinery exclusively with Bakken crude oil, our Washington refinery primarily with Bakken and Canadian Light Sweet crude oil and our Utah refinery with light sweet crude oil from Wyoming and Colorado as well as Uinta Basin waxy crude oil... Our California refineries run a significant amount of South American heavy ("Oriente") and San Joaquin Valley Heavy (SJVH) crude oil and light crude oil from Iraq ("Basrah")."<sup>148</sup>

Thus, the 10-Q reports indicate that Tesoro was not refining Bakken at its California refineries in 2012 and 2013 and that Tesoro is not currently refining significant amounts of Bakken at its California refineries.

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<sup>146</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2013, p. 33. Available at: <https://www.sec.gov/Archives/edgar/data/50104/000005010413000029/a2013331-tsox10q.htm>, emphasis added.

<sup>147</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2014, p. 28. Available at: <https://www.sec.gov/Archives/edgar/data/50104/000005010414000024/tso10q-20140331.htm>, emphasis added.

<sup>148</sup> U.S. Securities and Exchange Commission, Tesoro Corporation Form 10-Q, For the Quarterly Period Ended March 31, 2015, p. 35. Available at: <http://www.sec.gov/Archives/edgar/data/50104/000005010415000019/a2015331-tsox10q.htm>, emphasis added.

### Response G1-78.151

The comment correctly points out that the Refinery did not process a significant amount of Bakken or heavy Canadian crude oil in the baseline period. However, this is not relevant to the analysis in the DEIR. As correctly concluded in Comment G1-78.150, these crude oils would need to be blended with other crude oils to create a crude oil blend that would be capable of being processed through the Refinery. This practice is what has occurred with the Bakken, heavy Canadian and many other heavy and light crude oils that were processed in the baseline period. The Refinery cannot process either Bakken or heavy Canadian or any other crude oil without blending it to meet the operating envelope of the Refinery.

Note, however, that the citations provided in the comment to support the claim that “only the Alaska, North Dakota and Washington refineries were running Bakken crude” do not include all of the crude oils run at all of the refineries, with the exception of the North Dakota Refinery that runs exclusively Bakken crude oil. Rather, the citations list either the primary or significant amounts of crude oils run at the refineries. These are financial statements that are meant to support the financial implications of some of the crude oils that were run in large volumes at the six refineries owned and operated by Tesoro. These citations do not support the conclusion reached in the comment.

There is no evidence that the primary crude oil sources for the Refinery will change in the future. Since crude oil pricing fluctuates with complex market conditions, it is not possible to accurately predict where crude oil will be sourced for the Refinery in the future. Additionally, since the crude oil sources identified in the comment are delivered via marine vessels, the proposed project will improve efficiency and provide a benefit regardless of the type of crude oil delivered by marine vessel, including Basrah and Oriente crude oils. Note that currently 80 to 90 percent of crude oil processed by the Refinery is delivered by marine vessel. As explained in Response G1-78.178, because California crude oil is competitively priced and supply has stabilized in recent years, these pipeline receipts are expected to continue and marine vessel deliveries are expected to remain in this range after implementation of the proposed project.

As stated in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4 and Response G1-78.94, the proposed project does not support the import of any particular crude oil.

**Comment G1-78.152**

The CEO of Tesoro, Greg Goff, stated that Tesoro shipped 5,000 to 7,000 bbl/day of Bakken into California in the first quarter of 2014 and the Bakken supply is limited to 10,000 bbl/day due to logistic constraints.<sup>149</sup> These numbers are consistent with known rail imports of Bakken to Tesoro's Martinez refinery,<sup>150</sup> and further indicate the Los Angeles Refinery is not currently, nor has it historically refined Bakken crudes.

G1-78.152

Tesoro's own statements in its earnings calls indicate that Bakken was not being refined at Los Angeles in the baseline. In the first quarter 2014 earnings call Mr. Goff stated that the crude slate of the Los Angeles Refinery has not changed materially since the acquisition of Carson (in 2013) and is largely ANS and Basrah. He confirmed that the crude slate will change in the future and the VET is the "primary way that we want to be able to improve crude supply cost at the Los Angeles facility."<sup>151</sup>

G1-78.152  
cont'd.

<sup>149</sup> May 1, 2014 Q1 2014 Tesoro Earnings Call Webcast, Exhibit 4a, Goff (Tesoro) response to Cheng (Barclays) questions at 28:10 – 28:47 min; Transcript, Exhibit 4b, p. 12.

<sup>150</sup> Q3 2013 Tesoro Earnings Conference Call, November 7, 2013 Transcript, Exhibit 20, Greg Goff statements at p. 4 ("We also started taking up to 3 unit trains a month of Bakken crude oil into our Martinez refinery... we have the capacity to deliver nearly 350,000 barrels per month of Bakken crude oil into our Martinez, California refinery.") and at p. 12 ("...we can deliver three unit trains per month into the Martinez or Golden Eagle refinery as well as some additional manifest cars that we do, which allows us to maximize the use of the facilities. As a result of that, it's 350,000 barrels per month at the present time.).

<sup>151</sup> Q1 2014 Tesoro Corporation Earnings Conference Call Webcast, May 1, 2014, Tesoro (Goff) response to Cheng (Barclays) questions at 28:54 – 30:19 min, Exhibit 4a; Transcript in Exhibit 4b, p. 12.

**Response G1-78.152**

Whether the Refinery has processed large amounts of Bakken or heavy Canadian crude oil is unrelated to the analysis of the impacts of the proposed project because the crude oils processed by the Refinery continually change and must be blended to meet the operational constraints of the Refinery. However, the comment that the Refinery has not refined Bakken crude is incorrect, and the references provided do not support the conclusion. While the crude oil blend processed by the Refinery has not changed and will not be changed by the proposed project (except to the extent that changes to the DCU H-100 heater may allow the processing of a slightly heavier crude oil blend), it is important to note that the slate of crude oils purchased by the Refinery is constantly changing over time (see Master Response 4).

Bakken crude oil was processed during the baseline monitoring period. It has also been more recently processed by the Refinery, as noted in Comment G1-78.140. Moreover, light crude oils with properties similar to Bakken crude oil were processed during the baseline and continue to be processed at the Refinery (see Table 78.152-1).

**Table 78.152-1  
Light Crude Assay Comparison**

Property	Unit	Crude Oil		
		Bakken	Arab Light	Basrah Light
API Gravity	Degrees	44.8	33.7	31.0
Sulfur	Weight %	0.08	1.86	2.88
Mercaptans	ppm	0	171	13
<b>Distillation Yield:</b>	Volume %			
Light Ends	<40 °F	1.5	1.2	2.9
Naphtha	40-325 °F	34.8	21.9	19.5
Kerosene	325-510 °F	23.4	19.1	16.4
Diesel	510-675 °F	16.9	16.1	14.7
Vacuum Gas Oil	675-950 °F	18.1	25.5	26.8
Vacuum Residue	1000+ °F	5.3	16.2	19.7
Total		100.0	100.0	100.0
<b>Selected Properties:</b>				
Light Naphtha Octane	(R+M)/2	66	68	78
Diesel Cetane		53.4	53.4	54

Source: Tesoro Proprietary Assay Software Program.

Notes: ppm = parts per million Lt Ends = light liquids boiling below 40 °F; Naphtha boiling range of 40-325 °F; Kerosene = Kerosene boiling range of 325-510 °F; Diesel = Diesel boiling range of 510-675 °F; VGO = Vacuum Gas Oil boiling range of 675-950 °F; and Vacresid = Vacuum Residue boiling at 1000 °F or greater.

**Comment G1-78.153**

The Marine Terminal Agreement, Annex D, lists crudes that could be accepted at the Wilmington Marine Terminal (Berths 84-86) in the baseline, prior to 2013. These do not include Bakken crude or any crude with a vapor pressure as high as Bakken.<sup>152</sup> The RVPs of crudes that could be accepted range from 1.0 to 6.3 psi and include tar sands crudes (Cold Lake, Wabasca). In fact, this Agreement stipulates a Reid Vapor Pressure limit of 6 psi or less for crudes imported at the Marine Terminal, which excludes the much higher RVP Bakken crudes. This Agreement was amended in December 2013 to eliminate all restrictions,<sup>153</sup> presaging plans to start importing Bakken and other light crudes.

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<sup>152</sup> Marine Terminal Agreement, Sec. 7.0 and Annex D.

<sup>153</sup> Amended and Restated Long Beach Berth Access, Use and Throughput Agreement, December 6, 2013, Available at:

<http://www.sec.gov/Archives/edgar/data/50104/000119312513465459/d638208dex109.htm>

### Response G1-78.153

Annex D to the Berth Access, Use and Throughput Agreement was included as a requirement of a Tesoro Logistics customer to specify crude oils that Tesoro must accommodate as part of the customer's Berth Access Agreement. For consistency, Annex D was carried over to agreements between Tesoro Logistics and Tesoro Refining and Marketing.<sup>170</sup> Annex D does not represent an actual or allowable list of crude oils managed by the Long Beach Marine Terminal during baseline or any other years.

There is an RVP range of "6 psi or less" listed in *Section 7.0 Product Specification Limits of Annex B: Vessel Nomination and Scheduling Guidelines*. Note that Section 7.0 begins with the statement "Operator reserves the right to revise, amend and/or supplement these specifications at any time." Since it is a specification, not a limitation, and it can be changed at any time, 6 psi is not an actual limitation on crude oil RVP that can be imported at the Marine Terminal. Note that Annex D remains part of a lease agreement between Tesoro and its customer today. However, the agreements between Tesoro Refining and Marketing and Tesoro Logistics have been amended and re-stated including but not limited to the elimination of unessential requirements such as Annex D and the product specification limits of Annex B. The amendments to the Marine Terminal agreements are unrelated to the proposed project, and were adopted to simplify the agreements. Accordingly, these agreements do not limit the types of crude oils that may be accommodated and do not reflect the Refinery's actual crude oil use.

### Comment G1-78.154

One of the characteristics of Bakken crudes, as discussed elsewhere in these Comments is a very high vapor pressure, similar to gasoline.<sup>154</sup> The only non-Bakken light crude identified as a feedstock to Tesoro's California refineries reported in its Form 10-Q reports is Basrah, which has a RVP of 3 to 6 psi. While it is possible that small amounts of Bakken (and tar sands) has been imported to Wilmington via Anacortes<sup>155</sup> or by manifest rail car to third party terminals, a method admitted to have been used for a cost-advantaged, tight shale, mid-continent Permian crude<sup>156</sup> and tar sands crude, this is unlikely to have occurred in large amounts. Further, it is unlikely that these crudes would have been imported in significant amounts prior to 2012 as transportation out of their area of origin was constrained due to lack of pipeline and rail terminals.

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cont'd.

<sup>154</sup> Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: <http://www.tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/1ab/20140306/LP1482013.asp> Enbridge Pipelines Inc., 2013 Crude Characteristics (U.S. High Sweet - Clearbrook and Lewiston are Bakken crudes), Available at: <http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/2013%20Crude%20Characteristics.pdf>.

<sup>155</sup> Kristen Hays, UPDATE 2 - Tesoro Lifts Volumes of Bakken Rail Project, August 2, 2012, Reuters (CEO Goff of Tesoro is quoted as saying: Tesoro "may consider moving crude oil to California" once the Anacortes rail operation is running smoothly at 50,000 bpd.) Available at: <http://www.reuters.com/article/2012/08/02/tesoro-bakken-idUSL2E8J276M20120802>.

<sup>156</sup> Q1 2014 Tesoro Corporation Earnings Conference Call Webcast, May 1, 2014, Exhibit 4a, Tesoro (Goff) response to Cheng (Barclays) questions from at 27:26 to 27:48 min and Transcript in Exhibit 4b, p. 11.

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<sup>170</sup> See Attachment G, Declaration of Holly Kranzmann, Vice President, Tesoro Logistics Development-West Coast.

**Response G1-78.154**

The comment, stating that it is “unlikely” that significant amounts of heavy Canadian crude oil were imported during the baseline or previously is speculative and not supported by substantial evidence. While Bakken and heavy Canadian crude oils have been processed, they have not been run in significant amounts, but this point is immaterial to the DEIR analysis. Since no physical modifications will be made at the Refinery that would accommodate the processing of a significantly different crude oil blend, such as an unblended Bakken crude oil, there will be no impact on Refinery processing emissions other than emissions from the additional 6,000 bbl/day capacity analyzed in the DEIR.

The discussion of Basrah crude oil in the comment is inaccurate. The RVP of Basrah crude oils varies, since some Basrah is light and some is heavy. The Basrah light crude oil that has been processed at the Refinery typically has a RVP in the range of 6 to 7 psi, which is also the range of some of the Bakken crude oil.<sup>171</sup> The comment appears to be utilizing the RVP of a heavy Basrah crude oil, not the light Basrah crude oil that is processed at the Refinery. Note that the Refinery also processes other light crude oils, such as ANS with RVP above 7 psi, Saharan with RVP of 8.4 psi, and other crude oils with RVPs in the range of 6 to 9 psi (data from Tesoro’s confidential crude oil assay database). These are within the RVP range of Bakken crude oil. There would be no additional impacts, beyond those analyzed in the DEIR, if different light crude oil is processed at the Refinery (see Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94).

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<sup>171</sup> The North Dakota Petroleum Council Study on Bakken Crude Properties, Bakken Crude Characterization Task Force, Prepared by Turner, Mason & Company, August 4, 2014, at page3-4. The vapor pressure of Bakken crude oil was determined to be within the range of 11.5 to 11.8 utilizing the ASTM methodology. Reid Vapor Pressure (RVP) is slightly lower. Other studies listed compare Bakken crude to other comparable light crude oils such as Eagle Ford and Brent. The vapor pressure of Bakken falls slightly below these other commonly used crude oils. Bakken RVP was listed as 7.83.



**Comment G1-78.155**

2. Baseline Amounts of Tar Sands Crudes

In 2012, the Wilmington Refinery reportedly ran 1,000 bbl of tar sands crude, less than 2% of its throughput.<sup>157</sup> The U.S. Energy Information and Administration (US EIA) data on foreign crude imports indicates that both the Wilmington and Carson Operations have imported small amounts of tar sands crudes.<sup>158</sup> See Table 1. Additional amounts may have been imported via third-party terminals, such as the Plains Bakersfield Terminal, which might not be reported by EIA as being delivered to Carson or Wilmington. However, EIA data indicates very little Canadian crudes going to third-party terminals in California, Oregon, and Washington.

**Table 1.  
Canadian Crude Imports<sup>159</sup>**

Year	Imports (bbl/day)	
	Wilmington	Carson
2012	1,000	1,000
2013	0	900
2014	700	0
2015	0	0

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<sup>157</sup> Oil Change International, Refinery Report, Available at: <http://refineryreport.org/refineries-list.php>.

<sup>158</sup> U.S., EIA Data, Tesoro Corp. Crude Oil Imports, Port City: Los Angeles, CA, Port Code 2704. Available at: <http://www.eia.gov/petroleum/imports/companylevel/>.

<sup>159</sup> The imports to Wilmington were all heavy sour. The imports to Carson were all heavy sour in 2013 and heavy sour, medium, and light sour in 2012. See Exhibit 21.

**Response G1-78.155**

No significant amount of heavy Canadian crude oils was processed at the Refinery during the baseline period. However, as explained in Response G1-78.146 and illustrated in Table 78.146-1, other crude oils with similar properties were refined during the baseline. As with Bakken or any other crude oil, the heavy Canadian crude oil would need to be blended to meet the characteristics necessary to be processed at the Refinery, thus having no impact on emissions from the processing of crude oil compared to the baseline. Any pre-blending impacts were included as part of the new and replacement storage tanks evaluations (see Response G1-78.122).

**Comment G1-78.156**

**E. Bakken Crudes Have Unique Environmental Impacts that Must be Disclosed and Analyzed in the DEIR**

Bakken crude is a "light" (i.e., very volatile) crude with a high API gravity (>40°) and very low sulfur content that is not similar to the current crude feedstock consisting of heavy California crudes, ANS, and imported foreign crudes. When refined, it yields very little residuum (coker feed) and large amounts of gasoline. Figures 6 and 7. The current Tesoro Los Angeles crude slate, which is similar to the ANS and Kern County

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crude<sup>160</sup> shown in Figure 7, consists of heavier, higher sulfur crude. When refined, it yields large amounts of residuum, which must be processed in the cokers and FCCUs to extract lighter products amenable to conversion into gasoline, diesel, jet fuel, and distillates, the high value refinery products.

These unique characteristics of Bakken crudes, for example, include high volatility, high flammability,<sup>161</sup> and elevated concentrations of TACs and VOC. These unique characteristics vary independently of API gravity and sulfur content. Thus, blending crude slates to satisfy refining goals would not assure that environmental impacts not related to blending metrics would not occur. The unique chemical and physical characteristics of each crude, as it relates to potential environmental impacts,<sup>160</sup> Kern County is in California's San Joaquin Valley. Kern County crude oil is a San Joaquin Valley crude, similar to other heavy California crudes refined in the baseline.<sup>161</sup> Flammable crude oils will ignite when they are mixed with air in certain concentration ranges. The lowest temperature at which they produce sufficient vapor to support combustion is called the "flash point".

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cont'd.

### Response G1-78.156

The comment summarizes the conclusions reached in Section II.E of the comment letter. Responses G1-78.157, G1-78.158, and G1-78.159 provide detailed responses to Section II.E.

G1-78.157 summarizes the conservative assumptions made to analyze potential storage tank impacts including the maximum vapor pressure allowable by SCAQMD rules and permits, and a hybrid of the worst-case VOC and TAC content of crude oils expected to be stored in the storage tanks, including Bakken and heavy Canadian crude oils. Response G1-78.160 explains that hazards are also based on worst-case properties, assuming flammable crude oil and vapor pressure of 11 psia TVP.

As explained in Master Response 4, the crude oils that are utilized at the Refinery are blended to mimic the characteristics of ANS, which the Refinery was designed to process. See Response G1-78.150. Each individual crude oil is not processed separately and, therefore, need not be evaluated independently once it is blended (see Response G1-78.122, which addresses pre-blending impacts). Since the crude oil will be blended, there will be no additional processing impacts. The purpose of blending is to meld the individual properties of the crude oils that are in the blend, such that the mixture takes on the properties that will match the constraints of the Refinery. For instance, if a crude oil is too acidic to process in the Refinery, the Refinery may add a less acidic crude oil, so as to reduce the acidity of the mixture. The mixture would not have two or more distinct acid contents. Since the crude oil blend properties are not changing, there will be no impacts from the processing of different crude oils. The potential impacts of importing, transferring, and storing additional crude oil in new storage tanks was conservatively analyzed in the DEIR using worst-case data. Master Response 4 describes the approach taken to analyze the worst-case properties of crude oil using a hybrid approach.

Contrary to Footnote 161, crude oil vapors will not ignite when mixed with air in the absence of an ignition source<sup>172</sup> since the auto-ignition temperature is above 550° F.

**Comment G1-78.157**

1. Elevated Toxic Air Contaminants

Various publicly available information indicates that the chemical composition of Bakken and other light crudes is highly variable, from well to well. The health risk assessment should have evaluated an upper bound, but rather assumed a conventional crude with low concentrations of TACs.

The MSDSs for light sweet crude oil included with the application for the new storage tanks<sup>162</sup> reported much higher TACs than included in the health risk assessment,<sup>163</sup> as follows:

- Benzene: MSDS: 5% - 7% HRA: **0.2%**
- Ethylbenzene: MSDS: 5% - 7% HRA: **0.13%**
- Toluene: MSDS: 5% - 7% HRA: **0.38%**
- Xylenes: MSDS: 5% - 7% HRA **0.13%**.

Thus, these HAPs were underestimated by factors of 11 (xylene) to 54 (ethylbenzene), which thus underestimated chronic, acute, and cancer (benzene) health impacts by significant amounts. The precise amount cannot be determined as the DEIR failed to disclose the contribution to risk by chemical, as is customary in health risk assessment. My revision to the cancer risk assessment, to take into consideration the higher concentration of benzene in imported crude oils indicates that cancer risks are significant all three evaluated receptors.

The Tank Applications reported benzene concentrations of 5% to 7% for light sweet crude oil, presumably Bakken crude oil.<sup>164</sup> The DEIR's analysis of health impacts, on the other hand, assumed a very low benzene concentration (0.2 wt.%) in crude oil,<sup>165</sup> consistent with default assumptions in the TANKS program, which are not relevant. Benzene is a potent carcinogen that contributes most of the Project's cancer risk from storage tanks. The major source of benzene emissions is the new tanks and associated fugitive components. Thus, the DEIR underestimated health impacts due to its failure to consider the specific impacts of a change in crude slate.

<sup>162</sup> Tank Application, October 3, 2013, pdf 13.

<sup>163</sup> The concentration of these chemicals in the crude oil included in the HRA are reported in DEIR Appendix B-3, Table A-19, p. B-3-11, pdf 1102.

<sup>164</sup> Tank Application, October 3, 2013, pdf 13.

<sup>165</sup> DEIR, pdf 1102, Table A-19, Column RS197, crude oil.

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<sup>172</sup> National Fire Protection Association, All About Fire, <http://www.nfpa.org/news-and-research/news-and-media/press-room/reporters-guide-to-fire-and-nfpa/all-about-fire#tri>.

**Response G1-78.157**

The comment that the DEIR underestimates TAC emissions and health impacts is incorrect. Master Response 4 explains that the proposed project does not enable the Refinery to process a significantly different or additional crude oil blend, such as a blend containing predominantly Bakken crude oil as suggested by the comment. The vapor pressure of crude oil is relevant to calculation of VOCs and TACs from storage tanks and fugitive emissions. It is for this reason that crude oil vapor pressure approaching the maximum vapor pressure allowable by SCAQMD Rule 463 (TVP limit of 11 psia) was used as the basis of the emission calculations for VOCs and TACs for the new and replacement storage tanks and fugitive emissions in the DEIR.

The comment suggests that the maximum benzene, ethylbenzene, toluene and xylene (BTEX) contents listed in the Safety Data Sheet (SDS, formerly called a Material Safety Data Sheet (MSDS)) should be the basis of the TAC estimates used in the health risk assessment (HRA). The SDS information submitted with permit applications in 2013 were not used for the HRAs since SDSs do not typically contain sufficiently detailed toxics information and may not contain the level of data accuracy appropriate for use in an HRA. The SDS for light sweet crude oil that was included in the 2013 permit applications does not represent a crude oil that actually exists or is processed by the Refinery; it contains generic data that is intended to protect workers from potential workplace hazards. As such, SDSs are designed to present maximum potential hazards that could result from direct exposure to materials under work conditions and may be simplified and conservatively estimate high levels of certain representative toxic chemicals since they do not usually contain a detailed breakdown of the same toxic chemicals evaluated in HRAs. Because SDSs are designed to protect worker safety, they tend to be over-inclusive and overstate certain properties of the materials they represent. Thus, when more detailed speciated toxics data is available, SDS information is not used for HRA analyses. The detailed requirements for SDS content are available from the Hazard Communication Regulations (29CFR1910.1200, available at: [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=10099](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099)). For mixtures, manufacturers need not speciate every chemical and there are de minimis levels for carcinogens (0.1 percent) and toxics (1.0 percent). Therefore, SDSs will not list all chemical species present in a mixture and groupings of chemicals are allowed (i.e. total sulfides, versus listing out all various sulfide components). SDSs also use a range for the chemical concentration. HRAs require more detailed information on the toxic content of mixtures such as crude oils. Thus using the five to seven percent concentration ranges for BTEX suggested in the comment would not be using accurate or “best available” data.

In order to perform the most accurate HRA, speciated toxics data from actual laboratory analyses is preferred. The speciated data will include all the toxic air contaminants that are detected even at low concentrations in laboratory analyses and the data is more accurate than the conservative ranges shown in SDSs. While SDS data can be used, as it was in the original Wilmington Operations storage tank applications, detailed speciated data is preferable. When the Wilmington Operations storage tanks were incorporated into the proposed project and analyzed in the DEIR, the emissions were recalculated to use the more accurate speciated data and to be consistent with the Carson Crude Terminal storage tanks speciation data. BTEX concentrations of crude oils in new and replacement storage tanks and fugitive emissions associated with the proposed project were based on a worst-case hybrid analysis of the toxic content of crude oils

currently and potentially processed at the Refinery, including Bakken and Canadian crude oil. The hybrid speciation was prepared by selecting the highest concentration of each toxic compound from the entire speciated data set of all the crude oils analyzed. The BTEX concentrations were not based on low toxic “conventional crude” oil or default TANKS values as assumed in the comment (see DEIR Appendix B-3 pages B-3-110 through B-3-112, which lists the speciation used for storage tank emissions calculations). The new and replacement crude oil storage tanks and associated fugitive components use the Carson Crude Terminal (“CCT”) speciation from Appendix B-3 with the higher BTEX concentrations noted in Table 78.157-1. Specifically, the CCT benzene concentration of 0.472 percent is the highest benzene content listed in the speciated data of crude oils analyzed.

**Table 78.157-1**

**Crude Oil BTEX Fugitive Emission Factors used to Estimate Emissions**

TAC	Speciation (weight percent)	
	CCT	RS197
Benzene	0.47200	0.19908
Toluene	0.27500	0.13140
Ethylbenzene	0.84800	0.38463
Xylene (mixed)	1.18000	0.63467

Note: CCT speciation used for unblended storage and fugitive components, RS197 used for blended storage and fugitive components.

For existing fugitive components in the Refinery processes that would contain the blend of crude oil processed by the Refinery, the speciation for Refinery Stream 197 (“RS-197”) crude oil was used. RS197 is similar to the speciation noted in the comment with the exception that the comment cited an incorrect Xylene concentration. The worst-case hybrid speciation was based on speciated data from the following sources: 1) toxic chemical crude concentrations historically utilized for AER and TRI reporting, 2) Crude Monitor.CA (<http://www.crudemonitor.ca/report.php?acr=AWB>), 3) Transportation Safety Board of Canada (<http://www.bst-tsb.gc.ca/eng/lab/rail/2013/lp1482013/LP1482013.asp>), 4) High Production Volume (HPV) Chemical Challenge Program, Crude Oil Category, Category Assessment Document, submitted to the U.S. EPA by the American Petroleum Institute Petroleum HPV Testing Group, January 14, 2011 (<http://www.petroleumhpv.org/petroleum-substances-and-categories/~media/0DA0EA3771174E9DB6F5B43B73857842.ashx>).

The comment mischaracterizes the SDS attached to storage tank permit applications submitted prior to the project (circa October 2013) as the “reported” benzene concentration for light sweet crude oil. The SDS was attached to the storage tank applications for informational purposes; but the HRA associated with the applications was based on correct speciated toxics data that is consistent with the data analyzed in the DEIR (see Appendix B, pages B-3-110 through B-3-112).

**Comment G1-78.158**

The DEIR's reported cancer risk ranges from 2.1 cases in a million at the nearest sensitive receptor up to 9.2 in a million at the nearest off-site worker.<sup>166</sup> The cancer significance threshold is 10 in one million. The DEIR failed to disclose the contribution to cancer risk for any carcinogen except diesel particulate matter (DPM). Rather, it lumps everything but DPM into a category called "other TACs," which includes benzene.<sup>167</sup>

Health risk assessments typically summarize TAPs and their corresponding contribution to health risks (cancer, chronic, acute) by pollutant. This facilitates confirming and understanding the source and accuracy of the resulting risk calculations and informs the public of what they are exposed to and its consequences. This information is missing from the DEIR. Rather, it is buried in complex HARP modelling files and a dense collection of emission spreadsheets (which are not listed individually in the table of contents or summarized in one place by pollutant and source) to understand the risk calculations.

The HARP files do not disclose the source (e.g., tanks, heaters) of the emissions, i.e., pounds per year of pollutant by source. This critical information is buried in a maze of separate tables in DEIR Appendix B-3, with no overall emission summary table or table of contents. Reviewing the jumbled TAP emissions and HARP modeling files is beyond the skill level of the majority of affected members of the public and requires highly specialized expertise and more time than allotted for the review of the DEIR. The absence of health risk (cancer, acute, and chronic) information by pollutant significantly hinders the ability to review the reasonableness of the health risk assessment. Thus, the DEIR fails as an informational document.

<sup>166</sup> DEIR, Appx. B-4, Table 10, pdf 1619.

<sup>167</sup> DEIR, Appx. B-4, Table 12, pdf 1624.

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**Response G1-78.158**

The comment correctly states that all toxic emissions information, including toxic risk, is provided in Appendix B-3 and B-4 of the DEIR. However, the SCAQMD disagrees with the suggestion that the absence of health risk information by pollutant significantly hinders the ability to evaluate the reasonableness of the health risk assessment. The DEIR provides all relevant information needed to evaluate health risks associated with this proposed project (see Section 4.2.2.5 and Appendix B-4 of the DEIR). SCAQMD technical staff evaluated cancer risk using the OEHHA Guidelines and SCAQMD-approved methods, and determined that it was below the ten in one million CEQA significance threshold. Additionally, CARB, the agency that oversees the Air Toxics "Hot Spots" Program and has technical expertise in health risk assessments, was provided the opportunity to review and comment and did not submit comments on the DEIR.

The CEQA HRA significance thresholds for carcinogenic, chronic, and acute health hazards are used to evaluate the overall combined risk for all sources and pollutants associated with the proposed project. Pollutant-specific contributions, while required under regulatory programs such as the Air Toxics "Hot Spots" Program to provide insight into chemical usage throughout the State, are not needed for project level CEQA analysis where the significance threshold is an overall threshold not a pollutant-specific threshold. In response to the comment, the contribution to the risk by chemical has been added to the HRA presented in Appendix B-4. The information

**APPENDIX G1: RESPONSE TO COMMENTS**

does not change the conclusions reached in the DEIR and is for informational purposes only. A summary of technical data, maps, plot plans, diagrams, etc. is provided in Section 4.2.2.5 of the DEIR, while highly technical and specialized analysis are provided in the appendices consistent with CEQA Guideline § 15147 (see detailed discussion of CEQA Guideline § 15147 in Response G1-78.124).

**Comment G1-78.159**

The DEIR's summary table shows that the majority of the cancer risk at the nearest residential receptor (MEIR) and nearest sensitive receptor is primarily due to "other TACs", which contribute 97% of the risk at each. The HARP modeling files indicate that benzene contributes 33% of the cancer risk at the MEIR and 42% as the MEIW. Table 2.

**Table 2. Contribution of Benzene to Cancer Risk.<sup>168</sup>**

Receptor	UTM Easting	UTM Northing	Receptor #	Project Cancer Risk (per million)	Project Benzene Cancer Risk (per million)	Benzene % of Total Impacts
MEIR	383700	3741400	2978	3.64	1.22	33.41
MEIW	386006	3742921	5659	9.19	0.03	0.37
Sensitive	386721	3739987	7	2.09	0.88	42.25

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The benzene emission calculations in Appendix B-3 indicate that over 98% of the benzene emissions are from the tanks and fugitives sources that handle crude oil. Thus, if the risk due to just benzene, as summarized in Table 2, is adjusted to use the upper bound benzene concentration in Bakken crude (7%), rather than the assumed value of 0.2%, the benzene cancer risk would increase to 43 in a million for the MEIR,<sup>169</sup> to 1.05 in a million for the MEIW,<sup>170</sup> and to 31 in a million for the sensitive receptor.<sup>171</sup> Table 3 indicates that the total cancer risk at these three receptors would increase to 45 in one

million at the MEIR,<sup>172</sup> to 10.2 in one million at the MEIW,<sup>173</sup> and to 32 in one million at the sensitive receptor.<sup>174</sup>

Table 3: Revised Cancer Risk  
(Increased Cases in One Million)

	DEIR Cancer Risk	Revised Benzene Risk	Revised Cancer Risk	Significant?
MEIR	3.64	43	45	Yes
MEIW	9.19	1.05	10.2	Yes
Sensitive	2.09	31	32	Yes

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cont'd.

Thus, if the upper bound benzene concentration for Bakken crude oil (or the light crude oil listed in the MSDS submitted with the tank application) had been used in the health risk assessment, the cancer risk at all three receptors would be significant. The cancer risk at the MEIR and the sensitive receptor are significantly higher than the significance threshold of 10 in one million. Thus, the DEIR has failed to identify a significant health impact by failing to take into consideration crude quality.

The DEIR should be revised to include similar calculations for other crude oil TACs that were underestimated and the revised document recirculated for public review to fully disclose impacts to the surrounding community.

<sup>166</sup> The benzene cancer risk is calculated from the provided HARP files by subtracting the baseline results from post-project results for each receptor, using the following files: **MEIR:** PostResCancer30YrCancerRisk.csv and BaseResCancer30YrCancerRisk.csv, **MEIW:** PostWorkerCancer25YrCancerRisk.csv, and BaseWorkerCancer25YrCancerRisk.csv, and **Sensitive:** PostSensCancer30YrCancerRisk.csv and BaseSensCancer30YrCancerRisk.csv.

<sup>169</sup> Cancer risk due to benzene at MEIR = (1.22)(7/0.2) = 42.7 in one million.

<sup>170</sup> Cancer risk due to benzene at MEIW = (0.03)(7/0.2) = 1.05 in one million.

<sup>171</sup> Cancer risk due to benzene at sensitive receptor (0.88)(7/0.2) = 30.8 in one million.

<sup>172</sup> Total cancer risk at MEIR = 3.64 - 1.22 + 42.7 = 45 in one million.

<sup>173</sup> Total cancer risk at MEIW = 9.19 - 0.03 + 1.05 = 10.2 in one million.

<sup>174</sup> Total cancer risk at sensitive receptor = 2.09 - 0.88 + 30.8 = 32 in one million.

### Response G1-78.159

The projected cancer risk values listed in the comment are based on a claim made in the comment regarding benzene concentration in Bakken crude oil. This claim is incorrect because it uses the SDS information for a generic light sweet crude oil. Additionally, the comment claims that 7 percent is the “upper bound benzene content in Bakken crude [oil]”. A review of publicly available crude assay data (Crude Monitor.CA (<http://www.crudemonitor.ca/report.php?acr=AWB>)) reveals that Bakken crude oil benzene content does not exceed 0.4 percent. As stated in Response G1-78.157, the information from the SDS is generic and is designed to protect worker safety.

The DEIR for the proposed project analyzed emissions from crude oil using the worst-case hybrid analysis of the toxic content of crude oils currently and potentially processed at the Refinery, including Bakken and Canadian crude oil. The worst-case benzene concentration used



for the storage tanks and fugitive emissions associated with the storage tanks was 0.472 percent, not 0.2 percent as suggested in the comment (see Appendix B-3 pages B-3-110 through B-3-112 of the DEIR, which lists the speciation used for storage tank emissions calculations). The DEIR conservatively assessed potential health risks from the proposed project.

**Comment G1-78.160**

2. Elevated Vapor Pressure

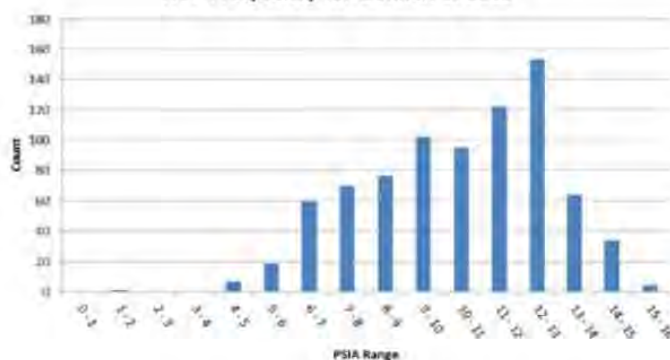
The amount of TACs and VOC released from storage tanks and fugitive components and the probability and consequences of accidents further depend upon the vapor pressure of the crude oil. Bakken crude oils are more volatile than crudes refined in the baseline.<sup>175</sup> See discussion of vapor pressure in Comments II.B.1 and II.E.2.

This data, summarized in Figure 9, shows that Bakken crude oils vary substantially in vapor pressure and thus would have a wide range of environmental impacts when stored and transported. The more volatile the crude, the higher the VOC, TACs, and methane (a potent greenhouse gas) emissions, the higher the flammability, and the greater the potential consequences in the event of an accident.

Other data<sup>176</sup> indicate that the RVP of Bakken crude oil can be substantially higher than the value reported in Capline Pipeline data. In fact, this data shows that a significant portion of the tested Bakken crude had a RVP greater than 13. Further, a study of Bakken crudes involved in the Lac-Mégantic accident by the Transportation Safety Board of Canada (TSBC)<sup>177</sup> concluded that the volatility and flammability of Bakken crudes were more similar to gasoline than to crude oil, distinguishing Bakken crudes from other light crudes currently refined at the Los Angeles Refinery, e.g., Bashrah.

G1-78.160

Figure 9.<sup>178</sup>  
RVP Frequency for Bakken Crudes



G1-78.160  
cont'd.

Bakken and other light crude oils taken straight from the well typically contain large amounts of natural gas liquids (NGLs), known as light ends or condensate.<sup>179</sup> These include C2 to C5 hydrocarbons: methane, propane, butane, ethane, and pentane.

These are the components most likely to volatilize, burn, or explode in an accident. These light ends have the effect of increasing a crude's vapor pressure, lowering its flash point and lowering its initial boiling point, all of which result in increased environmental risks. These direct-well crudes are called "live" crude oils. The high concentration of light ends makes them highly flammable, more likely to form fire balls and boiling liquid expanding vapor explosions (BLEVES) in accidents. The failure to recognize this resulted in a significant underestimate of VOC and TAC emissions and hazards in the DEIR.

G1-78.160  
cont'd.

<sup>175</sup> See Terminal Agreement, Annex D and crude oil tank vapor pressure limits in Title V permits.

<sup>176</sup> A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, submitted by the American Fuel & Petrochemical Manufacturers, May 2014, p. 5; Exhibit 33.

<sup>177</sup> Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: <http://www.bst-tsb.gc.ca/eng/lab/rail/2013/lp1482013/LP1482013.asp>.

<sup>178</sup> Exhibit 33, p. 19.

<sup>179</sup> Dangerous Goods Transport Consulting, Inc., 2014.

### Response G1-78.160

As noted in the comment, TAC and VOC emissions are dependent on vapor pressure of crude oil. For this reason, emission calculations for the new and replacement storage tanks and fugitive emissions in the DEIR were performed using crude oil vapor pressure approaching the maximum allowable true vapor pressure SCAQMD Rule 463 TVP limit of 11 psia. The impacts analyzed in the DEIR will be the basis of an enforceable permit limit for the new and replacement storage tanks. Hazard impacts in the DEIR were also assessed using this same assumption of vapor pressure for the crude oils, representing a worst-case analysis due the volatility of the material stored and transferred.

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend. The entire basis for the comment, that the proposed project enables a change in the crude oil blend processed at the Refinery, is incorrect. However, numerous misstatements and generalizations regarding Bakken crude oil are made in the comment that should be addressed and corrected.

The comment claims that Bakken crude oil properties are variable, but Bakken crude oil properties are actually fairly consistent. Variability of properties may occur for other shale oil such as Eagle Ford where API gravity runs from below 40 to over 70 API. But Bakken crude oil is remarkably consistent typically running from approximately 39 to approximately 46 API, with most crude oil running 42 to 44 API. See Table 1 in the article at: <http://www.turnermason.com/index.php/ndpc-releases-bakken-crude/>. While API gravity cannot be used to accurately predict crude oil vapor pressure values, crude oils with higher API gravity generally also have higher vapor pressure.<sup>173</sup> The consistent API values of Bakken crude oil are indicative of a light crude oil with a high vapor pressure.

There are several recent evaluations that conclude that Bakken crude oil is typical of other light crude oils. This is actually the conclusion of the article cited by the comment in footnote 176: A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, submitted by the American Fuel and Petrochemical Manufacturers, May 2014. While the comment only referenced the RVP data from page 4 of the report, the Executive Summary, includes the following statements: “At the request of the Department of Transportation (DOT) the American Fuel and Petrochemical Manufacturers (AFPM) conducted a

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<sup>173</sup> Data for API gravity and vapor pressure in Capline pipeline crude oil assays available at <http://www.caplinepipeline.com/reports1.aspx>.

survey of its members to address questions posed by DOT and developed this report of its findings. In addition to obtaining responses to the questions DOT raised, as part of this survey, AFPM also collected data stemming from analysis of approximately 1400 samples of Bakken crude oil to understand its properties. Comparison of assay data on Bakken crude oil with data from non-Bakken crude oils indicates that Bakken crude oil is within the norm with respect to hazard characteristics of a light crude oil. The information provided confirms that Bakken crude oil does not pose risks significantly different than other crude oils or other flammable liquids authorized for rail transport.”

There have been previous volatility issues associated with the transport of Bakken crude oil. However, regulations have since been adopted that require a reduction in volatility of Bakken crude oil that is transported. For example, in December 2014, the Industrial Commission of North Dakota issued an order regarding conditioning of Bakken crude oil and limiting the RVP of crude oil provided for transport to 13.7 RVP. Thus, Bakken crude oil transported to the West Coast will be pipeline quality (i.e., qualified for safe transport) and will not have as high a vapor pressure as the Bakken crude oil produced at the wellhead. As with other U. S. crude oil production operations, the order adopted by the State of North Dakota will require that crude oil production facilities remove a significant portion of the light ends (ethane, propane, butane and pentane) prior to offering the crude oil for shipment to refineries for processing.

Because of Bakken crude oil’s purported volatility, concerns were raised in the media as to whether Bakken crude oil was properly classified as a Class 3 hazardous material under U.S. DOT regulations. A Class 3 hazardous material is generally a flammable or combustible liquid that does not meet the regulatory classification requirements for other hazardous characteristics, such as toxicity, corrosivity, radioactivity or explosiveness. However, those concerns have since been resolved by repeated analysis and testing that demonstrates Bakken crude oil to be a Class 3 hazardous material, similar to other light sweet crude oils. After considering the information, the PHMSA Deputy Administrator testified to Congress that Bakken crude oil is accurately classified as a Hazard Class 3 Flammable Liquid.<sup>174</sup> This is consistent with the sampling and testing Tesoro has completed on Bakken crude oil.

Tesoro has also conducted monthly sampling and analysis of its Anacortes Refinery Bakken storage tank which is regulated to remain below 11.1 psia TVP. TVP is calculated based on the actual storage tank temperature and RVP analysis is run at 100 °F. The TVP of Bakken crude oil stored in the storage tank ranged from 8 to 11 psia, the average RVP for the storage tank was 9.54 psia and the average TVP was 6.39 psia. The actual storage tank TVP is under the TVP limit of 11.1 psia at the Anacortes Refinery.

Additionally, as acknowledged in Comment G1.78-161, the State of North Dakota recently adopted an order limiting the vapor pressure of crude oil provided for transport to 13.7 psi RVP. Thus, Bakken crude oil transported to the West Coast will be pipeline quality (i.e., qualified for safe transport) and will not have as high a vapor pressure as the Bakken crude oil produced at the wellhead. As with other U. S. crude oil production operations, the order adopted by the State of

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<sup>174</sup> Written statement of Timothy P. Butters Before the Subcommittees on Energy and Oversight Committee on Science, Space and Technology, U.S. House of Representatives at page 12 (Sept. 9, 2014).

North Dakota will require that crude oil production facilities remove a significant portion of the light ends (ethane, propane, butane and pentane) prior to offering the crude oil for shipment to refineries for processing.

**Comment G1-78.161**

In most petroleum-producing regions, light ends are removed before they are shipped using a stabilizer—a tall, cylindrical tower that uses heat to separate the light ends, which are then condensed and sent to a fractionator for processing. Crude stabilizers and NGL pipelines to send the recovered NGLs to market are ubiquitous in oil fields that produce light crude oils as crude pipeline specifications set pressure limits that force stripping of the NGLs. However, in the Bakken fields, this infrastructure is rare and most Bakken crude that is shipped by rail is shipped live. This distinguishes it from other light crudes, which are shipped dry, e.g., Eagle Ford crudes in Texas, where oil field infrastructure exists to process it and most of it is shipped by pipeline, which requires that NGLs be stripped.<sup>180</sup> While North Dakota has implemented regulations to control this issue, they have not been effective as they are not enforceable. As Tesoro has stated in other fora:

“Oil producers at the wellhead must condition the crude oil, not Shippers. The intent of the Order was to “improve the marketability and safe transportation of the crude oil” through wellhead conditioning of the crude oil to remove more light ends and essentially put a cap on vapor pressure (not volatility, per se). Then rail facilities are required to notify NDIC when discovering that any crude oil tendered for shipment violates federal safety standards – the rail facilities are not required to (and it is not feasible to) test all crude oil coming into or out of the facility for light end content, vapor pressure, or volatility.”<sup>181</sup>

G1-78.161

Other crudes that Bakken would replace, such as ANS and California crudes, are hard to ignite because they do not have as much combustible light ends. Most light crudes, including the imported foreign crudes currently processed, are stabilized. These stabilized crudes will not actively boil at ambient temperature and can be more safely shipped, stored, and refined.

Thus, while “light” (domestic) crude may replace other types of “light” (foreign imported) crude, there are major differences in composition that affect environmental impacts. Neither the DEIR, nor the VET (the most likely source of cost-advantaged crudes) imposes any condition(s) that require that NGLs be removed from received crudes to mitigate these impacts. Thus, the EIR’s analyses must assume that they will be present in the crude supply for the Project. Otherwise, the EIR must impose enforceable conditions that prohibit receipt of live crude oils at the marine terminals that support the Project.

G1-78.161  
cont’d.

<sup>180</sup> ‘Degassing’ North Dakota Crude Oil Before Shipping Among Safety Ideas, Insurance Journal, May 14, 2014, Available at: <http://www.insurancejournal.com/news/national/2014/05/14/329095.htm>.

<sup>181</sup> Tesoro Savage Vancouver Energy Distribution Terminal Facility Draft Environmental Impact Statement, November 2015, T-S Comments on the DEIS, January 22, 2016, p. 4-12, pdf 188, Exhibit 22a.

**Response G1-78.161**

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the crude oil blend processed by the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend. However, numerous



misstatements and generalizations regarding Bakken crude oil are made in the comment that should be addressed and corrected.

The comment states that crude oil from the Bakken Region is shipped without being stabilized. This statement is incorrect. In December 2014, the Industrial Commission of North Dakota issued an order regarding conditioning of Bakken crude oil and limiting the RVP of crude oil provided for transport to 13.7 RVP. The comment acknowledges that North Dakota has implemented regulations to address this issue but then states that the regulations are unenforceable without providing a basis for this claim. It is appropriate for an EIR to conduct its analysis relying on future compliance with lawful obligations, rather than speculating about violations.<sup>175</sup> Further, the evidence offered is not on-point. The comment quotes Tesoro's public comments that it is not feasible to test all crude oil coming into a facility as evidence that the regulations are unenforceable. Tesoro's comments specify, however, that compliance and enforcement of the regulations justifiably lies primarily with the crude oil producer, and secondarily with the rail facilities.

### Comment G1-78.162

#### 3. Emissions from Operating Problems

In addition, Bakken crudes, when blended with heavy crudes to meet crude slate requirements, have resulted in refinery operating issues, which require adjustments to operating procedures and result in increased emissions. These include higher paraffinic content that can result in waxy coatings on storage tanks, increasing tank cleaning emissions; greater development of sludges and solids when combining Bakken with non-Bakken crude oils, increasing tank cleaning emissions; elevated H<sub>2</sub>S, requiring operational changes to avoid potential increases in corrosion; fouling of the cold preheat train; desalter upsets; and fouling of hot preheater exchangers and furnaces; as well as corrosion.<sup>182</sup> These operating problems increase emissions. These operating problems and attendant emission increases were not disclosed in the DEIR.

G1-78.162

<sup>182</sup> Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>; Gordon Schremp, Trends in Sources of Crude Oil, 2014 IEPR Workshop, California Petroleum Overview & Background, June 25, 2014, p. 47; Available at: [http://www.energy.ca.gov/2014\\_energy/policy/documents/2014-06-25\\_workshop/presentations/01\\_Schremp\\_Final\\_2014-06-25.pdf](http://www.energy.ca.gov/2014_energy/policy/documents/2014-06-25_workshop/presentations/01_Schremp_Final_2014-06-25.pdf).

### Response G1-78.162

As explained in detail in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed by the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow processing of a slightly heavier crude oil blend. However, numerous misstatements and generalizations regarding Bakken crude oil are made in the comment that should be addressed and corrected.

<sup>175</sup> See *Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 906 (“[A] condition requiring compliance with regulations is a common and reasonable mitigation measure, and may be proper where it is reasonable to expect compliance.”)

The comment relies on the following article: <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html> for claims that Bakken crude oil has higher paraffinic content that will create a host of operating problems and increased emissions. The photos and discussions on wax deposition in the article, however, focus on Eagle Ford shale oils from Texas and Utica oils from Pennsylvania, not Bakken crude oil. These other shale oils are widely known in the industry as light crude oils containing wax crystals that can settle out of the oil because the oil has low viscosity and low density allowing the waxes to settle.

Bakken crude oil is not known to have these issues or associated operating problems. Tesoro's experience has been that waxy formations only occurred in Bakken crude oil during extremely cold winter temperatures, which would not occur in California. Even during periods of extremely cold weather, formation of waxes did not cause any Refinery operating problems or environmental impacts. Tesoro's experience is based on operations at its Anacortes, Washington and Mandan, North Dakota Refineries, where railcar unloading of Bakken crude oil occurs daily and cold weather is a frequent occurrence. Tesoro Logistics operates a Bakken gathering system of pipelines, storage terminals, a rail loading facility, plus trucking operations bringing Bakken crude from the production wells to the pipeline. Tesoro has not experienced unusual operational problems with waxy coatings. The cold winter of 2014/2015 caused some slowdowns in emptying rail cars. The rail cars are drained by gravity through hoses to a tank, during the cold winter, some waxy material drained slowly from the cars at the end of some discharges, but that re-dissolved into the crude oil when the ambient temperatures returned to normal. The comment is not relevant to the proposed project and the DEIR analysis provides an accurate analysis of potential project impacts.

### Comment G1-78.163

#### 4. Increased Risk of Accidents

The very high vapor pressure of some Bakken crudes, noted by Tesoro and others, can lead to serious problems in storage tanks. Large amount of light ends, all components lighter than pentane, can spontaneously start to boil and split the storage tank, sink the roof, and emit a flammable gas cloud.<sup>183</sup>

G1-78.163

<sup>183</sup> David Murray, Canadian Crude Oil Quality. Handle with Care!, Presented to the Canadian Heavy Oil Association, Edmonton Chapter, January 27, 2014; Available at: <http://www.ccqta.com/files/CHOA%20Presentation%20Jan%2027%202014%20V4%20r2.pdf>.

### Response G1-78.163

See Responses G1-78.160 and G1-78.161 that address these issues. SCAQMD Rule 463 requirements limit the vapor pressure of organic liquids to a TVP limit of 11 psia for storage tanks that typically store crude oils. With this vapor pressure limitation, crude oil cannot contain a "large amount of light ends" lighter than pentane. The potential storage tank impacts described in the comment could not occur due to SCAQMD restrictions on vapor pressure of stored organic liquids. The DEIR fully analyzed the impacts of storing organic liquids that comply with the SCAQMD limitations.

**Comment G1-78.164**

**F. Tar Sands Crudes Have Unique Environmental Impacts That Must Be Disclosed in the DEIR**

1. Impacts of Diluent

The majority of the tar sands crudes imported to Los Angeles will likely be DilBits, a blend of bitumen and diluent. The diluent is typically natural gas condensate, pentanes, or naphtha.<sup>184</sup> Tar sands crudes must be diluted or thinned with a lighter hydrocarbon stream to reduce viscosity and density to be transported.

Pure undiluted tar sands bitumen is unlikely as the Project description does not disclose any equipment or process modifications that would be necessary to handle pure bitumen, e.g., heated storage tanks. Undiluted bitumen would eliminate the diluent impacts discussed in this section, but would significantly increase the impacts from refining the heavy ends from increased use of utilities that increase combustion emissions. Setting aside undiluted bitumen, this leaves the question of the amount and type of diluent that would be mixed with the crude, which ultimately determines impacts.

The potential import of DilBits cannot be eliminated and is likely given the MSDSs submitted with the tank application.<sup>185</sup> The failure to disclose the potential import of tar sands crudes, which are chemically distinct from the current crude slate, is a significant omission as the emissions from handling and refining this material are different from the baseline crude slate. The emissions of some pollutants, VOCs and TAPs, for example, are large and will result in significant air quality, odor, and worker and public health impacts. The MSDS for sweet heavy crude oil, submitted with the Wilmington tank application, shows elevated concentrations of benzene (0.1% to 3%) compared to an assumed benzene concentration of 0.2 wt.% in crude oil<sup>186</sup> in the health risk assessment.<sup>187</sup> Thus, the HRA underestimated health risks from benzene in

<sup>184</sup> Gary R. Brierley, Visnja A. Gembicki, and Tim M. Cowan, *Changing Refinery Configurations for Heavy and Synthetic Crude Processing*, 2006 (Brierley et al 2006); Available at <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA07DE342-E9B1-402A-83F7-36B18DC3DD05%7D&documentTitle=5639138>.

<sup>185</sup> Wilmington Tank Application 556835, December 11, 2012, pdf 88, MSDS for Sweet Heavy Crude Oil.

<sup>186</sup> DEIR, pdf 1102, Table A-19. Column RS197, crude oil.

<sup>187</sup> Tank Application, October 3, 2013.

G1-78.164

**Response G1-78.164**

The comment has provided no evidence to support the claim that increased amounts tar sands or dilbit crude oil will be imported to the Refinery. As explained in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the slate of crude oils purchased by the Refinery or the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. Therefore, potential impacts from the processing of unblended diluent are not foreseeable and do not need to be addressed in the DEIR. In addition, Response G1-78.157 describes the DEIR analysis of emissions from new and replacement crude oil storage tanks. The analysis was performed using a worst-case hybrid analysis of the crude oils currently and potentially processed at the Refinery and was not based on information from a generic SDS submitted under Application Number 556835 because it uses more accurate, worst-case speciated data. Speciated data for heavy



Canadian dilbit (tar sands) crude oil was included in the hybrid analysis. It is also important to note that heavy Canadian dilbit (tar sands) crude oil was processed by the Refinery during the baseline period.

The assumption that Refinery emissions from processing dilbit crude oils will increase is not supported by data. Blended heavy Canadian dilbit crude oil behaves just like many other heavy crude oils. Dilbit crude oils are not chemically distinct from other crude oils, they contain the same or very similar molecules to those present in sweet crude oils or other heavy crude oil. The only data quoted in the comment is for benzene (0.1 to 3 percent) from an SDS. Benzene is normally present in all sweet and sour crude oils. SDSs for crude oils are often generalized to cover a category of crude oils rather than a specific crude oil grade (see Response G1-78.157 for additional information on how generic SDS information should not be relied on for detailed toxics analyses and HRAs). Response G1-78.157 also notes that the assumed benzene concentration is 0.47 percent for the new and replacement storage tanks and associated fugitive emissions in the HRA, not 0.2 percent stated in the comment. The CrudeMonitor.ca website referred to in Comment G1-78.167 publishes benzene levels for dilbit crude oils. Benzene typically runs less than 0.1 to approximately 0.2 percent in dilbit crude oils. This is similar to conventional crude oils – CrudeMonitor.ca posts 6-month average benzene contents for mixed sweet (0.25 percent), Light Sour Blend (0.25 percent), and Hardisty Light (0.04 percent) crude oils. Therefore, the benzene content of dilbit crude oils is similar to conventional crude oils.

### Comment G1-78.165

Heavy crude transported by rail from Canada to the VET will most likely be conventional pipeline-quality DilBits with 20% to 30% diluent as the VET is designed for pipeline grade crude oil. The mixture of diluent and bitumen does not behave the same as a conventional heavy crude, such as present in the current crude slate, because the distribution of hydrocarbons is very different. The blended lighter diluent generally evaporates readily when exposed to ambient conditions, leaving behind the heavy ends, the vacuum gas oil (VGO) and residuum.<sup>188</sup> Thus, when a DilBit is released accidentally, it will generally create a difficult to cleanup spill as the heavier bitumen will be left behind.<sup>189</sup> Further, in a storage tank, the diluent also can be rapidly evaporated and be emitted through tank openings, releasing high amounts of VOCs and TACs.

These conventional DilBits, which are the most likely tar sands crudes to be imported from the VET to Los Angeles over the long term, given the current economic outlook, are sometimes referred to as “dumbbell” or “barbell” crudes as the majority of the diluent is C<sub>5</sub> to C<sub>12</sub> and the majority of the bitumen is C<sub>30+</sub> boiling range material, with very little in between.<sup>190</sup> This means these crudes have a lot of material boiling at each end of the boiling point curve, but little in the middle. Thus, they yield very little middle distillate fuels, such as diesel, heating oil, kerosene, and jet fuel and more coke, than other heavy crudes. A typical DilBit, for example, will have 15% to 20% by weight light material, basically the added diluent, 10% to 15% middle distillate, and the balance, >75% is heavy residual material (vacuum gas oil and residue) exiting the distillation column. These characteristics distinguish DilBits from crudes currently refined at Carson and Wilmington. Thus, they could generate more coke than the current crude slate, which was not disclosed in the DEIR.

The large amount of light material that distills below 149 C is very volatile and can be emitted to the atmosphere from storage tanks and equipment leaks of fugitive components (pumps, compressors, valves, fittings) in much larger amounts than other heavy crudes that it would replace. A portion of this material will likely be recovered as propane by the Project.

G1-78.165

G1-78.165  
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<sup>188</sup> The residuum is the residue obtained from the oil after nondestructive distillation has removed all of the volatile materials. Residua are black, viscous materials. They may be liquid at room temperature (from the atmospheric distillation tower) or almost solid (generally vacuum residua), depending upon the nature of the crude oil.

<sup>189</sup> A Dilbit Primer: How It's Different from Conventional Oil, Inside Climate News. Available at: <http://insideclimatenews.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar-sands-Alberta-Kalamazoo-Keystone-XL-Enbridge?page=show>.

<sup>190</sup> Brierley et al. 2006.

## Response G1-78.165

As explained in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the slate of crude oils purchased by the Refinery or a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. However, numerous misstatements and generalizations regarding diluent and heavy crude oil are made in the comment that should be addressed and corrected.

The comment does not provide any support for the assumption that the Vancouver Energy Project will most-likely facilitate the transportation of pipeline-quality dilbit crude oil. The DEIS prepared for the Vancouver Energy Project analyzes the impact of transporting crude oils by train and ship.<sup>176</sup>

While dilbit crude oils may move through conventional pipelines and tanks during transportation to and processing at refineries, they do not behave differently in tanks than other crude oils because they must adhere to the same vapor pressure limits to which other crude oils must adhere. The yields of light molecules in dilbit crude oil are actually lower than many sweet crude oils (see Table 78.165-1, described below). The assertion that rapid evaporation happens through openings in crude oil storage tanks is flawed as crude oil storage tanks do not have 'openings' that allow rapid evaporation; and dilbit crude oils contain typical amounts of light components. Therefore, the fugitive emissions associated with the transfer and storage of dilbit crude oil are similar to other crude oils currently managed and the DEIR analyzed worst-case emissions associated with the new and replacement crude oil storage tanks (see Response G1-78.157). It is also important to note that heavy Canadian dilbit (tar sands) crude oil was processed by the Refinery during the baseline period.

Crudemonitor.ca also publishes yield data for crude oils. Table 78.165-1 presents a comparison of yield data (i.e., the percentage of intermediate products generated from refining a barrel of crude oil) from that website for Cold Lake dilbit and Mixed Sweet crude oils using what is labeled as "most recent sample," plus data from [www.bpcrudes.com](http://www.bpcrudes.com) for Basrah Light crude oil, a commonly processed sour crude oil run at numerous U.S. refineries.

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<sup>176</sup> See Tesoro Savage Vancouver Energy Distribution Terminal Facility Draft Environmental Impact Statement, November 2015, at ES-2; "The Applicant is proposing to construct and operate a Facility that would receive an average of 360,000 barrels (bbl) of crude oil per day by rail, temporarily store the oil onsite, and then load the oil onto marine vessels for transport to existing refineries primarily located on the West Coast of the United States."

**Table 78.165-1  
Typical Yield Percentages from Crude Oils**

Product	Product Type	Crude Oil Type		
		Mixed Sweet	Dilbit (Cold Lake)	Basrah Light
Naphtha (IBP – 300 °F)	Light	~30%	~18%	~15%
Middle Distillate (300 – 700 °F)	Intermediate	~ 30%	~22%	~35%
VGO (700 – 1,000 °F)	Intermediate	~25%	~25%	~25%
Residue (1,000 – FBP °F)	Heavy	~12%	~35%	~20%

IBP = Initial Boiling Point; FBP = Final Boiling Point

Source: crudemonitor.ca, www.bpcrudes.com (accessed July 12, 2016)

The data presented in Table 78.165-1 shows yield profiles for dilbit crude oils that are reasonably similar to other mixed or light crude oils. Still, if the dilbit crude oils were more extremely “dumbelled” (i.e., producing primarily light and heavy products with little intermediate product), refineries would simply blend them with other crude oils in order to produce a crude oil blend that is compatible with their crude oil processing capabilities. The crude oil blend processed by the Refinery would remain the same due to the processing constraints described in Master Response 4 and Response G1-78.94. The Refinery does not process straight dilbit crude oils and already operates at its coking (DCU) limits (see pages 2-17 and 2-18 in the DEIR).

The data presented in Table 78.165-1 also shows the dilbit crude oil component boiling below 149° C (~300° F) (naphtha) is typical of other crude oils processed at the Refinery. The naphtha component of dilbit crude oil is approximately 18 percent compared to approximately 15 percent for Basrah Light crude oil and approximately 30 percent for Mixed Sweet crude oil. The comment provides no data to support the incorrect assumption that dilbit crude oil provides propane for recovery by the proposed project.

**Comment G1-78.166**

The DEIR does not indicate whether other heavy crudes processed at the Refinery currently arrive with diluent. The EIA data summarized in Table 1 suggest very little tar sands DilBit has been refined at Los Angeles. Thus, the presence of diluent in marine-imported crudes is likely an important difference between the current heavy crude slates processed at the Refinery and the tar sands crudes that could replace them. This diluent will have impacts during marine vessel unloading as well from storage and charging tanks and at the refining units.

The diluent is a low molecular weight organic material with a high vapor pressure that contains high levels of VOCs, sulfur compounds, and TACs. These would be emitted during unloading, storage, and transport and would be present in emissions from the crude tank(s) and fugitive components from their entry into the Refinery with the crude until it is refined. The presence of diluent would increase the vapor pressure of the crude, substantially increasing VOC and TAC emissions from tanks and fugitive component leaks compared to those from displaced heavy crudes not blended with diluent.

G1-78.166

G1-78.166  
cont'd.

**Response G1-78.166**

As explained in Sections 2.5.3 and 2.5.4 and Appendix F of the DEIR, Master Response 4, and Response G1-78.94, the proposed project is not designed to facilitate a change in the slate of crude oils purchased by the Refinery or a change in the crude oil blend processed at the Refinery, except to the extent that the DCU H-100 heater permit revisions may allow the processing of a slightly heavier crude oil blend. However, numerous misstatements and generalizations regarding diluent and heavy crude oil are made in the comment that should be addressed and corrected. The comment infers that heavy Canadian dilbit (tar sands) crude oil was processed by the Refinery during the baseline period. It is true that heavy Canadian dilbit crude oil cargos have been offloaded, transferred, and stored at the Refinery as part of the baseline. While the relative amount of dilbit crude oil processed is small compared to the total amount of crude oil processed, heavy Canadian crude oil is not new to the Refinery.

The claim that dilbit crude oils will cause impacts when discharged from marine vessels is inaccurate. The yields and qualities of dilbit crude oils are typical of other crude oils moved by marine vessel (see Response G1-78.165). Cold Lake and Kearl heavy Canadian dilbit crude oils are in the range of 3.5 percent to 3.7 percent sulfur compared to Basrah and Arab Medium crude oils that are in the range of 2.5 percent to 3.0 percent sulfur.<sup>177</sup> These sulfur ranges are similar to that of dilbit and all of these crude oils are blended with other crude oils to meet the Refinery constraints as described in Section 2.5.4.1 of the DEIR. Cold Lake and Kearl heavy Canadian dilbit crude oils are currently processed by the Refinery. As explained in Response G1-78.157, speciated TAC emissions were evaluated using a hybrid worst-case speciation. Therefore, the DEIR adequately assessed the potential impacts of dilbit crude oils.

No data is provided in the comment to support the volatility claims. Dilbit crude oils are only 20 to 30 percent diluent as noted in Comment G1-78.165, and this does not support the claim that they are more volatile than conventional crude oil (see Table 78.165-1, which shows the dilbit crude oil component boiling below 300°F (naphtha range or light material) is typical of other crude oils processed at the Refinery). Dilbit crude oils are physically similar to conventional crude oils in regards to shipping and handling as noted above and in Response G1-78.165.

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<sup>177</sup> Crude Oil Assays for Cold Lake and Kearl available at [http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude\\_oil\\_coldlake\\_assay\\_pdf.pdf](http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude_oil_coldlake_assay_pdf.pdf) and [http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude\\_oil\\_kearl\\_assay\\_pdf.pdf](http://cdn.exxonmobil.com/~media/global/files/crude-oil-sales/crude_oil_kearl_assay_pdf.pdf) and Basrah and Arab Medium available at <http://www.caplinepipeline.com/reports1.aspx>.