Comments

on

Environmental Impact Report

for the

Phillips 66 Propane Recovery Project

Rodeo, California

Prepared
for
Shute, Mihaly & Weinberger LLP on behalf of
Rodeo Citizens Association

November 15, 2013

Prepared by
Phyllis Fox, Ph.D., PE
Consulting Engineer
745 White Pine Ave.
Rockledge, FL 32955

I. INTRODUCTION

The Phillips 66 San Francisco Refinery, located at 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 natural gas" or LNG) to export for sale (Project). I was asked by Shute, Mihaly & Weinberger to review the Draft Environmental Impact Report (DEIR)[1] for this Project, related files of the Bay Area Air Quality Management District (BAAQMD), and select responses to comments in the Final Environmental Impact Report (FEIR).[2] Based on this review, I was asked to evaluate the accuracy of the DEIR/FEIR Project Description and their analysis of the Project's air quality impacts.

My evaluation, presented below, indicates the Project would result in significant unmitigated air quality and public health impacts. The DEIR and FEIR significantly underestimate the amount of criteria pollutants and greenhouse gas emissions that would be emitted by the Project. Emissions of nitrogen oxides (NOx) and reactive organic gases (ROG) will exceed both daily and annual CEQA significance thresholds. These emissions plus certain hazardous air pollutants (HAPs) emissions that were not disclosed in the DEIR will cause significant unmitigated air quality and public health impacts.

The DEIR's Project description is incomplete. First, it fails to disclose the baseline crude slate, which determines the CEQA baseline emissions from all processing units within the Refinery. Second, it fails to disclose other directly related projects at the Phillips 66 Santa Maria Facility, which is linked by pipeline to the Rodeo Refinery. These directly related projects result in significant cumulative impacts that were not evaluated. Third, it fails to disclose related changes at the Rodeo Refinery itself, including a significant drop in refinery fuel gas heat content, which requires physical modifications to 19 process heaters. Finally, the Project description omits all of the key chemical composition data required to assess impacts and vet the DEIR's no significant impact conclusions.

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; 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 professional engineer (chemical, environmental) in five states, including California; a Board Certified Environmental Engineer, certified in Air Pollution Control by the

[1] Contra Costa County Department of Conservation and Development, Phillips 66 Propane Recovery Project, Draft Environmental Impact Report, June 2013 (DEIR).

[2] Contra Costa County Department of Conservation and Development, Phillips 66 Propane Recovery Project, Final Environmental Impact Report, November 2013 (FEIR).

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 EIRs, Negative Declarations (NDs), and Mitigated Negative Declarations (MNDs) for all California refineries as well as various other permitting actions for tar sands refinery upgrades in Indiana, Louisiana, Michigan, Ohio, South Dakota, Utah, and Texas and 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 Facility.

My work has been cited in two published CEQA opinions: (1) *Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners* (2001) 91 Cal.App.4th 1344 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 narrowly involves modifications to the Rodeo Refinery "to recover for sale propane and additional butane from refinery fuel gas and other process streams." DEIR, pp. 3-2, 3-5. However, the DEIR fails to disclose changes elsewhere that are required to produce all of the propane and butane that would be recovered.

The components of the Project evaluated in the DEIR include an LPG Recovery Unit, Fuel Gas Hydrotreating, Propane Storage, Railcar Loading Modification, and certain ancillary facilities. DEIR, Table 3-1 & Sec. 3.4. I reviewed the BAAQMD file for this Project and other currently pending and related projects. Based on this review, in my opinion, sufficient propane and butane could not be recovered from the current crude slate to support the Project's propane/butane production goals. Changes in the amount and type of feedstock would be required to achieve the propane and butane recovery goals.

The Refinery currently recovers up to 9,000 BPD of butane in the summer for sale.[3] DEIR, p. 3-17. The Project would increase butane recovery by 3,800 BPD and also recover 4,200 BPD of propane. The total butane and propane recovery after the Project has been implemented would be limited by permit conditions to a maximum daily of 14,500 BPD and 5,292,550 barrels per 12 consecutive months. 6/28/13 Response Letter,[4] p. 5, Response to Comment #5. It is unclear whether this is 14,500 BPD in addition to the existing 9,000 BPD or a total of 14,500 BPD, including current baseline

[3] Butane sold as LPG has the disadvantage of a fairly high boiling point and thus is not desirable as a fuel during the winter when stored outdoors in areas that have temperatures below freezing.

[4] Letter from Don Bristol, Phillips, to Brian Lusher, BAAQMD, Re: Response to Incomplete Letter 5/21/13 Application #25199, June 28, 2013 (6/28/13 Response Letter).

butane recovery.[5] The DEIR, for example, clearly states that the Project would recover 3,800 BPD of "additional butane." DEIR, p. 3-23. This should have been clarified in the FEIR, but was not. Regardless, this is a large amount butane and propane for a refinery that processes very heavy crudes configured as shown in DEIR Figure 3-4 . Thus, other modifications, not disclosed in the DEIR, are required to fully implement this Project.

The average feedstock to the Refinery over the period 2007 to 2011 was 116,800 BPD and ranged from 110,000 BPD to 128,000 BPD, or nearly up to its reported capacity of 130,000 BPD. DEIR Project Description,[6] Table 1. Thus, the proposed butane plus propane recovery Project would convert about 12% of the baseline feedstock to butane and propane, assuming a total of 14,500 BPD. If one assumes the Project would recover 14,500 BPD additional, plus the existing 9,000 BPD, 20% of the feedstock would be converted. Further, about 16% of the product output of the Refinery, estimated as 89,400 BPD over the period 2007 to 2011 (DEIR Project Description, Table 4), would be propane and butane.

These high percentages are not consistent with my experience, particularly for the mainly heavy crudes and semi-refined products from heavy crudes processed at this Refinery, which have much lower amounts of these low-boiling products.[7] The DEIR and other documents I consulted contain no information that would allow me to directly estimate the amount of propane and butane that could be recovered from baseline feedstock such as:

- composition of the Refinery fuel gas and other gas stream from which propane and butane would be recovered, e.g., gas chromatographic analyses;
- distillation curves and composition data for the crude, semi-refined feedstock inputs from elsewhere, and other internal streams that would routed to the subject Project;
- relative amount of crude and semi-refined feedstock;
- material balance or outputs of refinery models.

These high values for propane/butane recovery suggest that the feedstock input will be modified in conjunction with the Project. Yet the DEIR lacks the data or calculations that support the foundational assumption that 100% of the propane/butane can be recovered from the baseline refinery fuel gas.

The FEIR asserts that "the actual amount of propane and butane currently available for recovery (determined using measured flow data and lab analysis of propane and butane content) is approximately 4,200 bpd of propane and 9,300 bpd of butane." FEIR, p. 3.2-130. However, none of this data is in the record. We do not know, for

[5] The 4/30/13 Response Letter, p. 4, Response to Comment #6 states "The throughput [14,500 BPD] includes butane that is currently being recovered as well as the butane and propane that will be recovered as part of this project."

[6] Phillips 66, Rodeo Propane Recovery Project Description, August 2012.

[7] Oil Transportation Information at http://www.oil-transport.info/crudedata/crudeoildata/crudeoildata.html

example, if the amount "currently available" is the amount being processed in the CEQA baseline, or the amount that will be available for processing in the future, after the Project is implemented, based on other changes at other related Phillips 66 facilities, such as at Phillips 66's Santa Maria Facility or Ferndale Refinery.

A crude throughput expansion project, for example, was recently approved at the Phillips 66 Santa Maria Facility, which is linked by pipeline to the Rodeo Refinery. This project is further discussed below. In summary, the DEIR for the Santa Maria Facility (referred to as SMF DEIR/FEIR in these Comments) clearly states that partially refined products from this increase in crude will be sent to the Rodeo Refinery for further processing. As explained below, these partially refined products are feedstocks to the Propane/Butane Recovery Project. The Santa Maria crude throughput increase project is not operational yet. Thus, there is solid evidence that there will be increases in the input to the Propane/Butane Project from related projects elsewhere in the Phillips 66 system that are not part of the instant CEQA baseline. Thus, the amount "currently available" likely includes future increases in production that have not been disclosed in the Propane/Butane Project DEIR or FEIR. Thus, cumulative impacts of these two projects should have been evaluated and the increase in emissions from processing the increase in semi-refined products from Santa Maria at Rodeo should have been included in the emission calculations.

As the cited flow data and lab analysis are asserted to establish the Project baseline and is part of the Project description (i.e., it determined the design basis of the Project), it must be provided for public review. This is particularly critical here as the claimed recovery of propane and butane from the baseline feedstock is very high for the type and amount of crude that the FEIR asserts is currently refined and the existing Refinery configuration. As noted above, other projects currently proposed by Phillips 66 could increase the recoverable propane and butane, making up the deficit.

The San Francisco Refinery (SFR) consists of two facilities linked by a 200-mile pipeline. The Santa Maria Facility (SMF) is located in Arroyo Grande, in San Luis Obispo County, while the Rodeo Refinery (referred to as "the Refinery" in these Comments) is located in Rodeo in the San Francisco Bay Area. The SMF mainly processes heavy, high sulfur crude oil and sends semi-refined liquid products, e.g., gas oil, to the Rodeo Refinery. SMF DEIR,[8] pp. ES-2, 1-1 and Table 2-3. The Refinery DEIR does not disclose the existence of this related facility but it is acknowledged in the FEIR. FEIR, Master Response 2.2.

The subject DEIR addresses changes at just the Rodeo Refinery to increase butane and propane production, once the proper amount of the right feedstocks arrive. As discussed above, the DEIR is silent on the composition and relative amounts of feedstock (heavy crude, semi-refined products received from SMF) and the FEIR adds no additional information. Additional feedstock containing recoverable propane and butane is required.

[8] 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.

Additional feedstock could be produced by proposed modifications at the Santa Maria Facility to increase its production of semi-refined feedstock (gas oil and naphtha), to send to the Rodeo Refinery. Phillips 66 proposed to increase the production of semi-refined products at the Santa Maria Refinery specifically to send to the Rodeo Refinery. SMF DEIR, p. ES-4. This throughput increase would necessarily be included in the streams from which propane and butane would be recovered, as explained below. Another related Phillips 66 project (rail spur extension required to import increased amounts of crude to support the throughput expansion) at the Santa Maria Facility is currently undergoing CEQA review. The SMF Rail Spur DEIR is expected to be released soon. My commentary here is based on the Rail Spur Land Use Application. SMF Rail Spur Land Use Ap.[9] These two projects provide the missing links in the butane/propane supply chain at the Rodeo Refinery.

The Santa Maria throughput increase project would increase ". . .the volume of products leaving the SMF for the Rodeo Refinery via pipeline." SMF DEIR, pp. ES-4, 2-25. The products are not specifically identified in this statement, but are noted elsewhere as gas oil and naphtha. SMF FEIR, pp. 2-11, 2-17. These semi-refined products would contain a significant amount of butane and propane[10] and would be further processed at the Rodeo Refinery to generate additional butane and propane, as explained further below. DEIR, Figs. 3-4 and 3-6.

The SMF DEIR for the throughput increase project included a clarifying statement as to the products that would be sent to Rodeo, which was deleted in the FEIR: "an increased volume of products leaving the SMF for the Rodeo Refinery via pipeline (including semi-refined crude oil or a combination of semi-refined crude oil and previously refined gas/oil petroleum)." SMF DEIR,[11] p. 2-25. This omission is material as it indicates that more than semi-refined products from the SMR would be sent to the Rodeo Refinery. This omission suggests crudes could also be sent to the Rodeo Refinery. This clue, coupled with the rail spur extension project suggests that tar sands crudes, some of which are semi-refined, could additionally be sent to the Rodeo Refinery via rail import at Santa Maria. This issue is discussed below.

The SMF FEIR indicates the throughput of the Santa Maria Facility would increase from the permit level of 44,500 BPD (SMF FEIR, p. ES-4) by 10% to a maximum of 48,950 BPD or by 4,450 BPD. SMF FEIR, p. 1-1. However, the permit level is not the baseline for CEQA. The actual throughput for the last three years of available data is 40,275 BPD. Thus, the SMF throughput increase project would increase the throughput of the SMF by 8,675 BPD. This increase would be converted into semi-refined products in the SMF's distillation units and coker to yield gas oil and naptha, which would be sent to the Rodeo Refinery, where propane and butane would be separated, contributing to the propane/butane slated for recovery by the Rodeo Project.

---

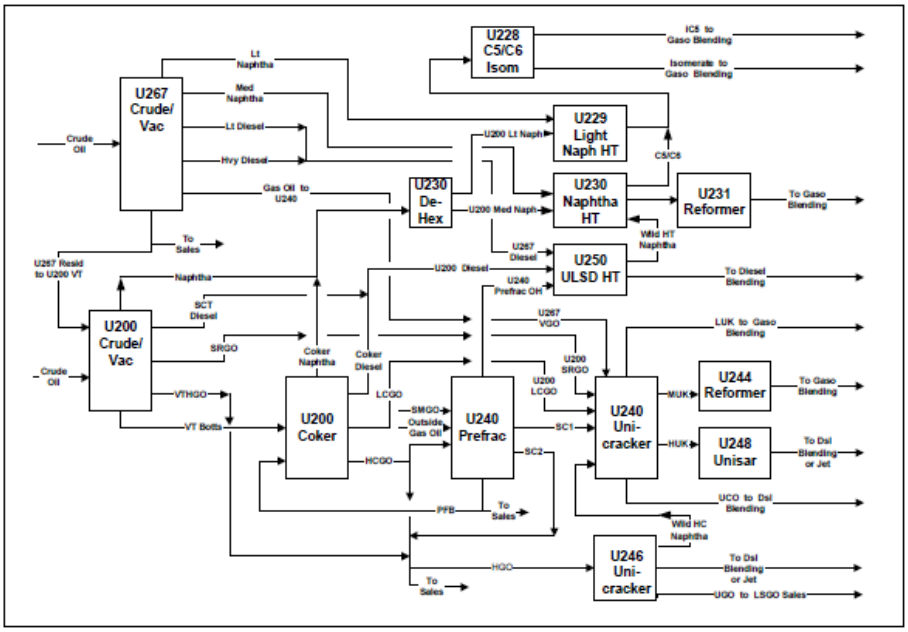
[9] Phillips 66 Company, Land Use Application, Santa Maria Refinery Rail Project, June 2013.

[10] See, e.g., MSDS for naphtha, available at: http://www.collectioncare.org/MSDS/naphthamsds.pdf .

[11] Marine Research Specialists, ConocoPhillips Santa Maria Refinery Throughput Increase Project, Public Draft Environmental Impact Report, August 2011.

This link is clearly shown in the Rodeo Refinery block flow diagrams in the subject Rodeo Refinery DEIR. The block flow diagram for the existing Rodeo Refinery, DEIR Figure 3-4, shows "SMGO" entering the Refinery at the U-240 Prefractionator unit (Prefrac unit). 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 DEIR figure is reproduced here as Figure 1 for ease of reference. The U-240 Prefrac unit separates Santa Maria gas oil and other gas oils into lighter hydrocarbon fractions that are currently blended into the Refinery Fuel Gas, shown in 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 Project.

Figure 1
Overall Existing Refinery Block Flow Diagram

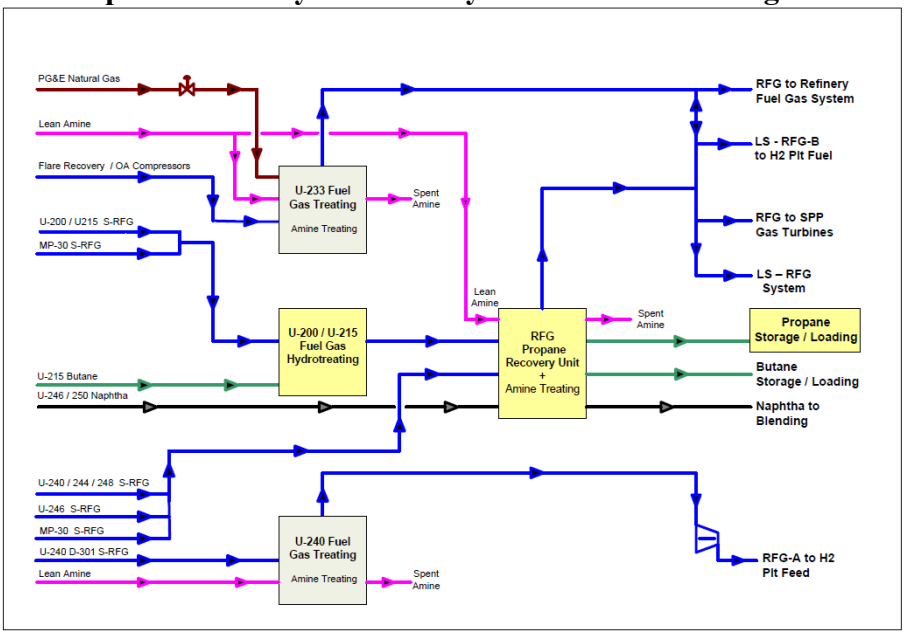


SOURCE: Phillips 66 Company

Phillips 66 Propane Recovery Project . 120546
Figure 3-4
Overall Block Flow Diagram of Refinery

Under the Project, 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 subject Project and is immediately adjacent to the Unit 240 Prefrac unit. DEIR, Table 3-2. Propane and butane are recovered in this unit. This new propane/butane extraction unit is shown in DEIR Figure 3-6, which is reproduced here as Figure 2 for ease of reference.

Figure 2
Proposed Refinery Fuel Gas System Block Flow Diagram



SOURCE: Phillips 66 Company

Phillips 66 Propane Recovery Project . 120546
Figure 3-6
Proposed 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. DEIR, Fig. 3-5.) As Santa Maria Gas Oil (SMGO) is one of the inputs to Unit U-240, changes at the Santa Maria Facility would be transmitted directly to the Project via the U-240 Prefrac Unit.

This establishes a direct link between this Project and modifications at the Santa Maria Facility. This is the "nexus" to the larger project with the potential to change crude oil feedstocks.

The increase in throughput at the Santa Maria Facility would increase the amount of SMGO processed at Rodeo into propane and butane. The new rail spur at the Santa Maria Facility would enable tar sands crudes to be imported to and processed at Santa Maria and/or shipped directly to Rodeo. As discussed below, tar sands crudes imported by rail are blended with a diluent that is rich in butane and propane. Thus, both projects

proposed for the Santa Maria Facility will have a direct impact on the amount of propane and butane available for recovery at Rodeo, making up any deficit based on the Rodeo baseline crude slate. The baseline crude slate and feedstocks to the propane/butane recovery Project are not disclosed so this link and its impact on emissions would never be discovered and thus not mitigated.

Thus, there is both a direct pipeline link between the two facilities, an explicit statement that the SMF throughput project was developed to send more semi-refined product to the Rodeo Refinery, and a direct process link between those products and the input to the propane/butane recovery Project disclosed on the process flow diagrams for the Project. These three factors establish a nexus between the propane/butane Project and modifications at the Santa Maria Facility. Thus, these two projects are integrally related and should have been evaluated as a single project.

Additional propane/butane-rich feedstock could be obtained by importing certain classes of cost-advantaged tar sands crudes. These tar sands and other cost-advantaged crudes are cost advantaged because they are stranded, with no pipeline access and thus must be delivered by rail.[12] However, refineries are not equipped to take delivery of large amounts of crude by rail, which requires large unit trains that require significant infrastructure improvements.

Tar sands crudes are heavier and more viscous than the feedstock currently processed at either Rodeo or Santa Maria. These crudes are thus commonly blended with 25% to 30% diluent to facilitate transporting them by rail or pipeline. The blended crude is known as a "DilBit." The diluent is typically natural gas condensate, pentanes, or naphtha.[13] The diluent can be readily separated and recovered as propane/butane at Rodeo.

Cost-advantaged crude sells at a discount relative to crude oils tied to the global benchmark, North Sea Brent crude. Many of these cost-advantaged crudes are rich in fractions that would increase the yield of butane and propane[14] at the Rodeo Refinery. Based on analyses by one of Phillips' competitors, Western Canadian Select (WCS) was identified as one of the most cost-advantaged crude for direct rail import to California.[15]

---

[12] 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 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.

[13] 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.

[14] See, for example, 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.

[15] 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.

Western Canadian Select is a tar sands DilBit that contains 2% butane and 4.3% pentane.[16]

Cost-advantaged crudes could reach Rodeo by rail starting at the Phillips 66 Ferndale Marine Terminal and then barged down the Pacific coast to the Phillips 66 Rodeo Marine Terminal; by rail to Santa Maria and then by pipeline to Rodeo; or by rail or barge to the nearby Pittsburg terminal.[17] However, the Phillips 66 refineries are not equipped to accept large volumes of crude by rail. Thus, Phillips 66 is currently permitting projects to achieve both of these goals.[18]

An expansion of the Phillips 66 Marine Terminal at Rodeo was recently permitted to allow an increase of crude oil imported by ship by 20,500 BBP, from 30,682 BPD at present to 51,182 BPD.[19] Phillips 66 was recently issued a permit to construct a new crude rail unloading facility at its Ferndale Refinery in Washington to increase rail shipments of cheap Canadian tar sands crudes. This rail terminal would allow it to import tar sands crude by rail and barge them down the Pacific coast to Rodeo.[20] [21]

The Phillips 66 rail spur extension project at the Santa Maria Facility would allow the import of a "full range of competitively priced crude oil." Rail Spur Land Use Ap., Appx. A, pdf 18. Phillips has admitted that these "competitively priced crude oils" include Canadian tar sands crudes. These crudes would be processed at the Santa Maria Facility, which sends its semi-refined products to Rodeo. The SMF is permitted to process up to 49,950 BPD of crude. SMF FEIR, p. 1-1. The rail spur project would allow the import of 37,000 BPD of "competitively priced crude oils", or 74% of its throughput. Rail Project IS,[22] pp. 15, 22. This means that one of the feedstocks for the

---

[16] Crude Monitor, Western Canadian Select, Available at: http://www.crudemonitor.ca/crude.php?acr=WCS.

[17] Phillips 66 Delivers on Advantaged Crude Strategy, Available at: http://www.phillips66.com/EN/newsroom/feature-stories/Pages/AdvantagedCrude.aspx.

[18] Phillips 66 Delivers on Advantaged Crude Strategy, Available at: http://www.phillips66.com/EN/newsroom/feature-stories/Pages/AdvantagedCrude.aspx.

[19] Bay Area Air Quality Management District, CEQA Initial Study, Marine Terminal Offload Limit Revision Project, Phillips 66 Refinery, Rodeo, California, BAAQMD Permit Applications 22904, December 2012.

[20] Northwest Clean Air Agency, Order of Approval to Construct (OAC) 1152, Crude Unloading Facility, Phillips 66 Ferndale Refinery, June 7, 2013. See also: Thomson Reuters: "Phillips 66 Seeks Permit for Facility to Receive Crude by Rail", April 3, 2013, Available at: http://www.4-traders.com/PHILLIPS-66-10447684/news/Phillips-66-seeks-permit-for-facility-to-receive-crude-by-rail-16604359/.

[21] In addition, crude oil will either be received by or delivered to a new facility located in Pittsburg, California. The proposed WesPac Energy–Pittsburg Terminal (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, including Rodeo. WesPac RDEIR, p. 2.0-1. All products handled at the facility would be transported by rail, ship, barge, or pipeline. Id. The Terminal would operate with an average throughput of 242,000 barrels (BBLs)1 of crude oil or partially refined crude oil per day, and would have a maximum capacity throughput of 375,000 BBLs per day. Id., p. 2.0-2. The total annual throughput for the entire Terminal would be approximately 88,300,000 BBLs of crude oil and/or partially refined crude oil per year. *Id*.

propane/butane recovery Project would be significantly modified by the Santa Maria rail spur project to include tar sands crude, which would include propane/butane rich DilBits.

While the DEIR did not acknowledge the relationship between the subject Project and the rail spur extension project, the FEIR does mention the existence of the rail spur extension project at Santa Maria, but claims, with no support, that the crudes imported would be only from "domestic sources available in the marketplace." FEIR, p. 2-4. This contradicts the rail spur project description, which describes the project as allowing the import of a "full range of competitively priced crude oil," not just "domestic" sources. I am not aware of anything in the record for the Santa Maria rail spur extension project that would limit imported crude to just "domestic" sources. This contradicts not only the record in that case, but also public statements to the contrary by Phillips 66. Further, the FEIR does not evaluate the rail spur's environmental impacts at Rodeo, which are potentially significant, as discussed below and in Attachment 2 (my comments on Valero).

In a September 2013 presentation, Greg Garland, Chairman and CEO of Phillips 66, stated Phillips 66 plans to import "cost advantaged" crude from Canada to its refineries in California as illustrated in Figure 3. Garland stated: "Our real challenge that we have or opportunity that we have is to get advantaged crudes to the East Coast and West Coast. So we're working that in terms of moving Canadian crudes down into California or building rail facilities. We're looking at rail to barge to ship, down to the West Coast refineries...."[23]

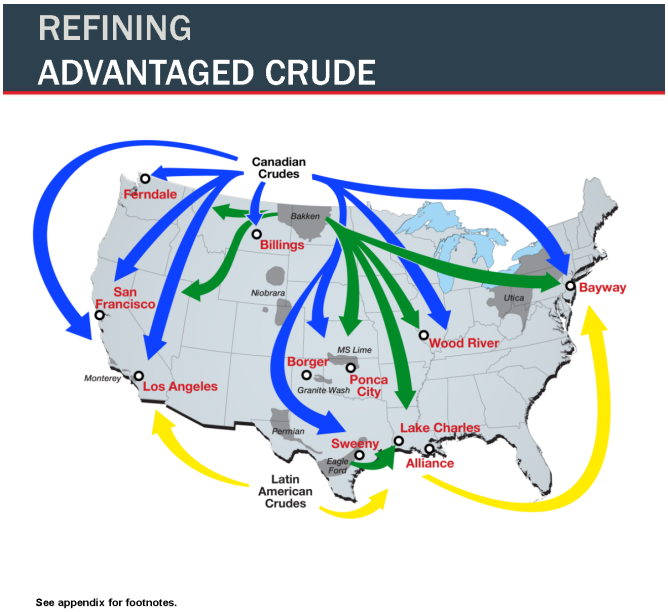
In a May 2013 presentation, Phillips EVP Tim Taylor stated in response to a question on bringing heavy Canadian crude oil into California that "Today, we are doing some barge movements down the coast into California on heavy Canadian. You can look in the Northwest to do that. So that's an option that we're going to continue to use and we're looking at expanding that opportunity with some of the logistics things we're putting in place. We're also continuing to move crude by rail in smaller amounts into California and looking at projects really to increase that as well."[24]

[22] Arcadis, Applicant's Reference CEQA IS, Santa Maria Refinery Rail Project, June 2013 (Rail Project IS").

[23] September 12, 2013 Transcript, pdf 7: Available at: http://www.phillips66.com/EN/investor/presentations_ccalls/Documents/Barclays_091213_Final.pdf

[24] May 31, 2013 Transcript, pdf 13, Available at: http://www.phillips66.com/EN/investor/presentations_ccalls/Documents/PSX-Transcript-2013-05-01.pdf

Figure 3[25]



III. THE PROJECT DESCRIPTION IS INCOMPLETE

The information included in the DEIR is not adequate to identify and assess all of the impacts of the Project. There are two major classes of omissions.

First, the DEIR did not disclose that the Project would occur at a refinery that is linked by pipeline to a separate facility, the Santa Maria Facility, that will supply part of the feedstock proposed to be recovered as propane/butane. The FEIR acknowledges this link in response to comments. FEIR, Master Response 2.2, However, the FEIR continues to ignore the environmental impacts resulting from the link between modifications currently under way or proposed at the Santa Maria Facility and this Project. The link is established above in Comment II.

The failure to disclose this link, via Santa Maria gas oil which is converted into propane and butane at Rodeo by the Project, is a serious omission. The changes proposed and underway at the Santa Maria Facility will increase both the amount and composition of the feedstocks recovered as propane and butane at the Rodeo Refinery. These changes in feedstock amount and composition would result in significant air quality and public health impacts at Rodeo.

The FEIR asserts that "a company's purchase of raw materials is a business activity and not a CEQA project or action that would require a discretionary permit or approval by the County." FEIR, p. 3.2-118. This is incorrect. The chemical composition of the raw materials that are processed by a refinery directly affect the amount and composition of emissions from that refinery. The amount and composition of sulfur in

[25] Greg Garlands, Phillips 66, Barclays Conference, pdf 24, Available at: http://www.phillips66.com/EN/investor/presentations_ccalls/Documents/barclays2013_finalv2.pdf.

the crude slate, for example, ultimately determines the amount of SO2 that will be emitted from every fired source in the refinery and the amount of odiferous hydrogen sulfide and mercaptans that will be emitted from tanks, pumps, valves, and fittings. The composition of the crude slate establishes the CEQA baseline against which impacts must be measured.

In particular, the feedstocks that could arrive at the Rodeo Refinery for recovery as propane and butane may include tar sands crudes blended with diluents or "DilBits." These DilBits contain significant amounts of hazardous air pollutants, such as benzene, a potent carcinogen. These would be emitted at many fugitive components in the Refinery, including compressors, pumps, valves, fittings, and tanks, in greater amounts than from baseline feedstock.

These increased emissions would result in significant public health and air quality impacts not addressed in the DEIR nor the FEIR. These include significant increases in volatile organic compounds (VOCs) emissions not otherwise included in the emission estimates; hazardous air pollutants, including benzene, which could cause significant health impacts; and highly odiferous sulfur compounds that would individually and cumulatively cause malodors, degrade ambient air quality, increase the incidence of accidental releases, and adversely affect the health of workers and residents around the Refinery. Further, the high acid levels in these crudes and their semi-refined products would accelerate corrosion of refinery components, contributing to equipment failure and increased accidental releases.

Second, the DEIR failed to disclose that the Project would reduce the heat content of the refinery fuel gas from 1340 Btu/scf (British thermal unit per Standard Cubic Feet) (BAAQMD Permit Ap., p. 10) to 1050 MMBtu (one million Btu) (5/13/13 BAAQMD Notes). This is a 30% drop in the heat content of the fuel for all refinery fuel gas-fired sources within the Rodeo Refinery. Notes in the BAAQMD's files indicates that this will require replacing the burners in at least 19 process heaters. 5/13/13 BAAQMD Notes.

The DEIR did not disclose this dramatic decline in fuel gas heat content or the related changes in equipment that would be required to burn the altered refinery fuel gas. The FEIR concedes a decline in heat content in response to comments but fails to disclose the magnitude of the decline. However, the FEIR asserts with no analysis that "removal of propane and butane from the system and replacing it with natural gas would not affect the performance of combustion devices at the Refinery." FEIR, p. 3.2-130. The affected combustion units and burner configurations were not identified and baseline emissions were not disclosed. Thus, there is no basis for this claim.

The FEIR argues that the types of changes that would be made to heaters are considered by the BAAQMD to be an "alteration" rather than a "modification" as there would be no emission increase. FEIR, p. 3.2-130. However, the BAAQMD definition of "alteration" is irrelevant for purposes of CEQA. The EIR must identify the change in emissions from the affected combustion units and burner configurations.

A large drop in fuel heat content can affect the combustion efficiency of all combustion sources, including heaters, boilers, and turbines. A related concern is a

concomitant drop in flame temperature. The Project basically involves replacing propane and butane that are currently part of the Refinery Fuel Gas (RFG) with natural gas. Propane and butane burn with a hotter flame than natural gas.[26] These two effects, a large drop in heat content and a lower flame temperature, would result in an increase in the emission of products of incomplete combustion, including hazardous air pollutants, carbon monoxide, and reactive organic gases from all fuel gas fired combustion sources. None of these pollutants are routinely monitored, e.g., with continuous emission monitoring systems, and some are not monitored at all (HAPs). Thus, the increases would not even be detected until after the fact. The DEIR and FEIR did not disclose the flame temperature issue. Further, only 19 process heaters would receive upgraded burners. The FEIR is silent on the impacts that would result from the lower heat content fuel and lower resulting flame temperature at other combustion sources that will not be upgraded.

The DEIR should be revised to include a complete description of the Project and an analysis of all of the environmental effects of these changes.

IV. PROJECT EMISSIONS ARE UNDERESTIMATED AND SIGNIFICANT

The DEIR underestimated the increase in greenhouse gas (GHG) emissions and criteria pollutant emissions (NOx, ROG, PM2.5/PM10) that would result from the Project. If the EIR had accurately estimated the Project's emissions, it would have determined that the Project will result in significant unmitigated air quality impacts from emissions of GHGs, NOx, and ROG. The DEIR also failed to estimate the increase in carbon monoxide emissions that would result from the Project.

IV.A. Greenhouse Gas Emissions (GHG) Are Underestimated

The DEIR estimated that the Project would decrease GHG emissions by 325,978 metric tons per year (MT/yr). DEIR, Table 4.8-3. The increases in GHG emissions from a new boiler (67,133 MT/yr), additional natural gas combustion (592,761 MT/yr), and other miscellaneous sources (7,372 MT/yr) are assumed to be offset by removing 14,500 BPD of butane and propane from the fuel gas system and replacing it with natural gas, which emits less GHG (-759,244 MT/yr) and the shutdown of Plant 4 Hydrogen Plant and B-401 Process Heater (-234,000 MT/yr). These reductions are not supported and are incorrect. When the errors discussed below are corrected, GHG emissions exceed the significance threshold of 10,000 MT/yr for stationary sources and 1,100 MT/yr for other types of projects (DEIR, p. 4.8-13). Thus, they are a significant unmitigated impact of the Project.

[26] Flame Temperatures of Some Common Gases, Available at; http://www.engineeringtoolbox.com/flame-temperatures-gases-d_422.html.

1. Reduction: Removing Butane and Propane from Fuel Gas

The Project would remove 14,500 BPD of butane and propane from the refinery fuel gas system and replace it with natural gas. As propane and butane generate more GHG emissions when burned than natural gas, this results in a net decrease in GHG emissions at the Refinery of 166,483 MT/yr (592,761 -759,244 = -166,483 MT/yr). DEIR, Table 4.8-3.

However, a reduction would only occur if the propane/butane are not used as fuel, which is their usual end use. The DEIR fails to disclose the use of the removed butane and propane. This undisclosed use could result in indirect impacts that were not considered in the DEIR. Butane and propane, for example, are fuels, often called liquefied petroleum gas or LPG. They are also feedstocks to various chemical processes. Either use would result in GHG emissions.

First, some, perhaps all, of the recovered butane and propane could be sold within California for use as fuel, where CEQA clearly applies to 100% of the resulting GHG emissions. If sold as fuel to customers in California, the resulting emissions are indirect emissions from the Project and must be included in the Project GHG emission inventory. Correspondence in the BAAQMD file indicates that ". . . some past (and current) butane deliveries have included local industrial customers within Contra Costa and Alameda counties." 4/30/13 Phillips Response Letter,[27] p. 10, Response to Comment #15. Thus, absent a condition of certification prohibiting the sale of propane and butane for any use in California that would generate GHG, 100% of the GHG emissions from burning propane and butane, the most likely end use, must be included in the EIR's GHG impact analysis. This one modification results in an increase in GHG emissions of 433,266 MT/yr from the Project.[28] This is a significant unmitigated impact of the Project.

Second, even assuming 100% of the propane and butane were burned or otherwise used outside of California in a manner that generated GHG, these emissions would still result in significant adverse impacts on California as GHG is a global pollutant, widely acknowledged to affect climate change worldwide, regardless of release point. The GHG emissions released in neighboring states, for example, would contribute to sea level rise along the California coast; loss in California's snow pack, leading to floods and droughts; and more high ozone days in California. DEIR, pp. 4.8-1/2.

Under this view, the Project is exporting its significant GHG impact to neighboring states, where it continues to impact global climate and thus California. Therefore, regardless of where the propane and butane are actually used, the environmental consequences of its use are the same and must be considered.

Thus, the DEIR implicitly assumes that the propane and butane removed from the refinery fuel gas will not be used in a manner that generates GHG and ignores the impacts of this use.

---

[27] Letter from Don Bristol, Phillips 66, to Brian Lusher, BAAQMD, Re: Response to Incomplete Letter 3/1/13, April 30, 2013 (4/30/13 Phillips Response Letter).

[28] Revised GHG emissions based on DEIR Table 4.8-3: -325,978 + 759,244 = **433,266 MT/yr**.

2. Relative Proportions of Propane and Butane

The GHG emissions were estimated assuming the production of 4,200 BPD of propane and 3,800 BPD of butane. Butane generates about 6% more GHG than propane per gallon burned. GHG Supplement, Nov. 2012, p. 4. In correspondence with the BAAQMD, Phillips has requested a lump-sum limit of 14,500 BPD (6/28/13 Phillips Response Letter, p. 5, Response to Comment #6), which would allow them to produce 100% butane, increasing GHG emissions compared to those estimated in the DEIR.

3. Reduction: Hydrogen Plant and Heater Shutdown

The GHG emission calculation additionally assumes a net reduction of 234,000 MT/yr from the shutdown of the Plant 4 Hydrogen Plant and the Unit 240 Process Heater B-401. DEIR, p. 4.3-13 and Table 4.8-3. The DEIR asserts that the GHG reduction corresponds to the 3-year average baseline GHG emissions from these units and cited ERM 2013. DEIR, p. 4.8-12. However, the DEIR references indicate that ERM 2013 is the BAAQMD Authority to Construct Application. DEIR, p. 9-8. I reviewed this document. It does not contain any support for the claimed reductions from shutting down these units. I was unable to find any support for these reductions in any of the documents that I reviewed and thus was unable to confirm whether they were correctly calculated. Regardless, the subject units were reportedly shutdown in 2011, which is part of the CEQA baseline. Thus, these reductions cannot be claimed as mitigation for Project increases.

My inability to find any support for these GHG emissions is consistent with comments filed by BAAQMD staff on the DEIR. They were also unable to find any support for the claimed GHG reductions from decommissioning a process heater and hydrogen plant. The BAAQMD further expressed concern that "emission from Unit 240 [the shutdown process heaters] may have shifted to other existing equipment due to increased operating demand." Increased heat demand, for example, would result from recovering butane and propane for the Project and upgrading additional semi-refined materials from the Santa Maria Facility. Further, the DEIR and the record supporting it do not contain any evidence that the emission reductions are permanent, real, and quantifiable.[29]

The FEIR responded to the BAAQMD's comments, asserting that the "GHG-related offsets that would be associated with the B-401 process heater are presented in the DEIR for informational purposes only and are not required to reduce the GHG emissions impact to a less-than-significant level." FEIR, p. 3.1-24. However, this is true only when considered in isolation, without acknowledging the increase in GHG emissions from burning the propane and butane removed from the refinery fuel gas. Further, this FEIR response also fails to provide any support for the GHG reductions from these shutdown unit.

[29] Letter from Jean Roggenkamp, BAAQMD, to Lashun Cross, CCC Dept. of Conservation and Development, Re: Phillips 66 Company Propane Recovery Project DEIR, August 6, 2013.

If the GHG reductions from both the Plant 4 Hydrogen Plant and B-401 Process Heater Shutdown are removed from the GHG inventory in DEIR Table 4.8-3 and the increase in emissions from burning the propane and butane are added, the net increase in GHG emissions based on DEIR Table 4.8-3 would be 1.3 million MT/yr (-325,978+234,000 + 759,244 = 1,319,222 MT/yr). These emissions exceed the CEQA significance threshold by a vast amount and are highly significant.

IV.B. Criteria Pollutant Emissions Are Underestimated

The DEIR estimated daily and annual Project operational emissions for nitrogen oxides (NOx), sulfur dioxide (SO2), particulate matter (PM10 and PM2.5), and reactive organic gases (ROG). DEIR, Tables 4.3-6 and 4.3-7. The resulting emissions were compared to the BAAQMD's daily and annual CEQA significance thresholds for NOx, PM10, PM2.5, and ROG. No significance threshold was proposed for SO2 and carbon monoxide (CO) was omitted from DEIR's analyses completely.

The emissions that were estimated in the DEIR and remain unchanged in the FEIR are underestimated for two reasons, discussed below. When the errors in the emission calculations are corrected, the resulting increases in daily and annual NOx and ROG emissions exceed both the daily and annual CEQA significance thresholds. These are significant air quality impacts that were not identified or mitigated in the DEIR or FEIR.

1. Relies on Invalid NOx Emission Reductions

The DEIR's daily and annual NOx emission analysis relies on NOx emission reductions from shutting down Process Heater B-401. DEIR, Tables 4.3-6 and 4.3-7. These reductions occurred in 2011, during the CEQA baseline. Therefore, they are part of the baseline and not available to offset Project NOx increases. The increase in the DEIR's estimate of both daily (99.2 lb/day >54 lb/day) and annual NOx emissions (13.9 ton/yr > 10 ton/yr) exceed CEQA significance thresholds without these Process Heater B-401 reductions and are thus significant unmitigated impacts of the Project.

2. Excludes Locomotive Emissions Outside of the BAAQMD

Notwithstanding the use of invalid NOx offsets, the increase in NOx emissions are even higher than disclosed in the DEIR. The locomotives used to transport recovered propane and butane from the Refinery to market are the major source of NOx emissions (>70% of total Project emissions) and an important contributor to ROG emissions (8%). DEIR, Tables 4.3-6 and 4.3-7. These emissions were underestimated by only counting emissions released within the boundary of the BAAQMD, rather than the entire distance the locomotives will travel within California. DEIR, p. 4.3-20. CEQA covers at least all emissions released within the State and in some cases, emissions released outside of the State that impact in-State values.

The total rail track length within the BAAQMD used to calculate locomotive emissions in DEIR Tables 4.3-6 and 4.3-7 was 67 miles one way (AQS Attach. 1,[30] pdf 15) based on 50% of the trains using the Union Pacific route and 50% using the BNSF route. The total track length to the California-Arizona border used to calculate GHG emissions is 659 miles one way, based on the same 50/50 assumption. DEIR, p. 4.8-16 and AQS Attach. 1, pdf 15.

I revised the locomotive linehaul emissions for NOx and ROG using the total track length within California, but otherwise using all of the DEIR's assumptions. The results of my calculations are shown in Table 1. The criteria pollutant emissions from locomotive linehaul (which is only part of the total locomotive emissions) are significantly higher than disclosed in the DEIR, as shown in Table 1. This increase alone is sufficient to tip NOx emissions over the BAAQMD daily and annual significance thresholds, even assuming the invalid boiler NOx emission offsets.

Table 1
Revised Locomotive Linehaul Emissions

	DEIR[31] (lb/day)	Rev.[32] (lb/day)	Sig. Criteria (lb/day)	DEIR[31] (ton/yr)	Rev.[32] (ton/yr)	Sig. Criteria (ton/yr)
NOx	76.03	**580**	54	9.84	**72**	10
ROG	3.63	**27**	54	0.47	3.5	10

Note: **bold** indicates a revised locomotive linehaul emission rate that exceed the significance threshold all by itself, without considering increases from any other sources.

These revised emissions combined with all other claimed emission increases and decreases as reported in the DEIR, Tables 4.3-6 and 4.3-7, exceed the BAAQMD significance thresholds for both daily and annual NOx and ROG emissions, as explained below.

The net increase in daily NOx emissions, including the revised locomotive linehaul emissions of 580 lb/day and the invalid NOx offsets, is 541 lb/day.[33] These emissions exceed the NOx daily significance threshold of 54 lb/day by a factor of ten. DEIR, Table 4.3-6.

Similarly, the net increase in annual NOx emissions, including the revised locomotive linehaul emissions of 72 ton/yr and the invalid NOx offsets, is 66 ton/yr.[34]

[30] Phillips 66, Rodeo Propane Recovery Project, Air Quality Supplement, Attachment 1, Criteria Pollutant and GHG Emissions, November 2012 (AQS Attach. 1).

[31] AQS Attach. 1, pdf 1.

[32] From AQS Attach. 1, pdf 19 (lb/day) and pdf 20 (ton/yr): Linehaul emissions within California = small line haul from Richmond terminal to refinery + large linehaul from California border to Richmond terminal. For NOx in lbs/day: 18.97 + 57.06(659/67) = **580.2 lb/day** or **72.7 ton/yr**. For ROG: 0.97 +2.65(659/67) = **27.1 lb/day** or **3.47 ton/yr**.

[33] Total revised daily NOx emissions : 20.4 + (79.0-76.03) + 580 - 62.3 = **541.1 lb/day.**

[34] Total revised annual NOx emissions : 3.7 + (10.2-9.84) + 72.7 - 10.8 = **65.96 ton/yr.**

This exceeds the NOx annual significance threshold by a factor of six. DEIR, Table 4.3-6.

The DEIR indicates the shutdown of Process Heater B-401 reduced daily NOx emissions by 244 lb/day (DEIR, Table 4.3-4). The DEIR also indicates the shutdown of Process Heater B-401 reduced annual NOx emissions by 44 ton/yr. DEIR, Table 4.3-4. However, even assuming 100% of these shutdown emissions were available for the Project, they would not be adequate to offset the daily increases in linehaul NOx emissions as calculated in Table 1. Regardless, 100% of Process Heater B-401 NOx reductions are not available as some of them (33.16 ton/yr) were used to offset NOx emission increases of the Marine Terminal Offload Limit Project. Marine Terminal IS, Table 3.3-2.

The DEIR suggests by omission that more NOx offsets are available than were relied on in Tables 4.3-6 and 4.3-7 by presenting the full boiler shutdown amount without disclosing that most had already been used. The FEIR clarifies that the balance of the NOx reductions from the Process Heater B-401 shutdown, not relied on in Tables 4.3-6 and 4.3-7, were used to offset increases associated with the Marine Terminal Project. FEIR, pp. 3.1-24/25. They are not available to offset the additional increase in NOx emissions resulting from the increase in locomotive linehaul emissions as calculated in Table 1, assuming the full transit distance within California. Thus, the revised increase in daily and annual NOx emissions are a significant unmitigated air quality impact when the correct travel distance of locomotives is used to estimate emissions.

The increase in daily ROG emissions from all Project sources, including the revised locomotive linehaul emissions, is 70.4 lb/day,[35] which exceeds the ROG daily significance threshold of 54 lb/day by 30%. Similarly, the increase in annual ROG emissions from all Project sources, including the revised locomotive linehaul emissions is 11.4 ton/yr,[36] which exceeds the ROG annual significance threshold of 10 ton/yr. Thus, daily and annual ROG emissions from the Project are significant unmitigated air quality impacts that were not disclosed in the DEIR when the correct travel distance of locomotives is used to estimate emissions.

Finally, even if emissions were based only on the track length within the BAAQMD, rather than the entire State, the Project would still exceed the NOx daily significance threshold if the actual UP track length going south out of the District (90 miles) was used in the calculations, rather than the average of the UP and BNSF track lengths (67 miles). The distance to the eastern boundary of the District is 44 miles and to the southern boundary, 90 miles. The 67 miles used in the DEIR's linehaul emission calculations is the average of these two (90+44/2 = 67). 6/28/13 Phillips Response Letter, p. 12, Response to Comment #15. However, nothing in the EIR would prevent 100% of the trains from using the UP track going south out of the District. The daily NOx emission increase, assuming the UP track length of 90 miles within the District would be 57 lb/day, which exceeds the CEQA significance threshold of 54 lb/day.[37]

[35] Total revised daily ROG emissions : 18.1 + 25.1 + (3.8-3.63) + 27 = **70.4 lb/day.**

[36] Total revised annual ROG emissions : 3.3 + 4.6 + (0.5-0.47) + 3.5 = **11.4 ton/yr.**

3. Underestimates Steam Boiler Emissions

The DEIR emission estimates assumed a new 140 MMBtu/hr boiler would be required to supply steam for the Project. The net emission calculations in Comment IV.B.2 that correct the linehaul underestimate assume this new boiler. However, during BAAQMD permitting, Phillips 66 removed the new 140 MMBtu/hr boiler and revised the emissions to assume steam demand would be met by using surplus low pressure steam, improving efficiency of existing steam consumers, and by increasing high pressure steam production at the Steam Power Plant. This resulted in a reduction in emissions from supplying steam, compared to emissions claimed in the DEIR. 4/30/13 Phillips Response Letter, p. 4, Response to Comment #7.

However, these changes disclosed in the BAAQMD permitting file are small, compared to increases from other Project components in the DEIR, and thus do not materially affect any of the conclusions in Comment IV.B.2. Further, as discussed below in Comment IV.C.3, the NOx emissions from supplying steam at the Steam Power Plant are actually significantly higher than claimed in the Phillips permitting application (15.6 ton/yr compared to only 3.7 ton/yr assumed in the DEIR). See Comment IV.C.3. These revised emissions alone are sufficient by themselves to exceed the BAAQMD NOx annual significance threshold.

IV.C. Other Emissions from The Project Are Omitted

The DEIR estimated emissions from new equipment that would be added by the Project plus certain associated mobile source emissions, including a new boiler, tanks and piping, locomotives, and truck and commuter trips. The locomotive emissions are discussed in Comment IV.B.2. DEIR, Tables 4.3-6 & 4.3-7, p. 4.3-21.

The equipment required to recover propane and butane from the refinery fuel gases and to remove sulfur from the recovered products requires various inputs to operate. This results in increases in emissions above the CEQA baseline that were not included in the DEIR's analysis. These include: (1) use of the recovered propane and butane elsewhere in California; (2) electricity; (3) hydrogen; (4) emissions from increased sulfur removal; and (4) certain increases in emissions from generating steam at the existing Steam Plant to support the Project. Each omitted emission source is discussed below.

The BAAQMD files indicate that Phillips conceded there would be an increase in the throughput of the Air Liquide Hydrogen Plant and an increase in the Sulfur Recovery Units, but in both cases, less than the permitted levels.[38] However, for purposes of CEQA

[37] From AQS Attach. 1, pdf 19 (lb/day): Linehaul emissions within California = small line haul from Richmond terminal to refinery + large linehaul from boundary of BAAQMD to Richmond terminal. Linehaul emissions for NOx in lbs/day: 18.97 + 57.06(90/67) = **95.6 lb/day.** The net increase = 20.4 + (79.0-76.03) + 95.6 - 62.3 = or **56.7 lb/day** > 54 lb/day.

[38] Phillips 66 Propane Recovery Project Issues, BAAQMD Notes; Letter from Don Bristol, Phillips 66, to Brian Lusher, BAAQMD, Re: Response to Incomplete Letter 3/1/13, April 30, 2013, pp. 3 (Response to Comment #4) and 6 (Response to Comment #8).

compliance, the permitted levels are not material, but rather the increase relative to a historic baseline. These emissions were not included in the Project totals.

1. Propane/Butane Combustion In California

The DEIR failed to include criteria pollutant emissions from burning or otherwise using the recovered propane/butane anywhere. The recovered propane/butane is being produced to meet commercial-grade standards with less than 5 ppm hydrogen sulfide (H_2S). 6/28/13 Phillips Response Letter, p. 2. Commercial-grade propane is used as a fuel.[39] Thus, it is reasonably foreseeable that the produced propane/butane would be used as fuel, increasing criteria pollutant and GHG emissions.

The BAAQMD permitting file further discloses that Phillips currently sells butane from the Rodeo Refinery in California. 4/30/13 Phillips Response Letter. Thus, emissions from the use of propane/butane as a fuel within California are a reasonably foreseeable impact caused by the Project and must be evaluated. 14 Cal Code Regs. §§15064(d)(3) and 15358(a)(2).

There is nothing in the DEIR or FEIR that would prohibit Phillips from selling 100% of the recovered propane/butane for new uses as a fuel anywhere, including within California. Thus, unless the County imposes a condition requiring that 100% of the propane/butane is sold outside of the jurisdiction of CEQA or for non-combustion, non-emitting uses, the FEIR must include criteria pollutant emissions from its use and mitigate the resulting impacts, which are significant as demonstrated below.

I estimated the criteria pollutant emissions from combusting 100% of the Project's propane/butane in boilers within California. The results of my calculations are summarized in Table 2.

[39] See, e.g., Tesoro Safety Data Sheet, Propane - Commercial Grade, Available at: http://www.tsocorp.com/stellent/groups/corpcomm/documents/tsocorp_documents/msdspropane.pdf.

Table 2
Emissions from Combusting Propane/Butane
Within California

	Emission Factor	Emissions	
	(lb/10^3 gal)	(lb/day)	(ton/yr)
PROPANE			
Total PM	0.7	123	22.5
N0x	13	2,293	418.5
CO	7.5	1,323	241.4
ROG	0.8	141	25.8
BUTANE			
Total PM	0.8	128	23.3
N0x	15	2,394	436.9
CO	8.4	1,341	244.7
ROG	0.9	144	26.2
Emission factors from AP-42, Table 1.5-1.			
Propane: 4,200 BPD; Butane: 3,800 BPD			
ROG = TOC - CH_4.			

These emissions are compared with significance thresholds established in the DEIR for evaluating the operational air quality impacts of the Project (DEIR, p. 4.3-14) in Table 3. This comparison shows that the emissions from burning recovered propane and butane exceed significance thresholds for NOx, PM10, and ROG by a large margin and thus must either be mitigated or the EIR must prohibit the sale of recovered propane/butane within California for fuel. The emissions of CO are also large and significant, but the DEIR failed to establish a significance threshold for this pollutant.

Table 3
Comparison of Emissions from Combusting Propane/Butane
Within California With Significance Criteria

	TOTAL EMISSIONS		SIGNIFICANCE CRITERIA	
	(lb/day)	(ton/yr)	(lb/day)	(ton/yr)
Total PM	251	45.8	82	15
N02	4,687	855.4	54	10
CO	2,664	486.1		
ROG	285	52.0	54	10
Assumes 100% of PM from combustion is PM10				
DEIR, p. 4.314				

2. Increase In Hydrogen

The hydrotreater that will be installed as part of the Project requires hydrogen to react with sulfur and convert it into forms that can be removed. The DEIR claims that the amount of hydrogen present in the existing gas streams is adequate to supply the increased hydrogen. DEIR, p. 3-25.

The BAAQMD questioned this assumption and asked Phillips to accept a permit condition stating no hydrogen would be used at the new hydrotreater. Phillips declined and admitted that ". . . there are short periods when hydrogen from a hydrogen plant will need to be supplied. These periods would typically be during startup of the hydrotreater catalyst system." 4/30/13 Phillips Response Letter, p. 3, Response to Comment #4. Phillips has not quantified the amount of additional hydrogen that will be required nor the resulting emissions. Hydrogen plants include a furnace and vents that are significant sources of criteria pollutant and GHG emissions, including specifically, the hydrogen plant that would supply this Project.[40] The EIR must quantify all of the emissions that would be generated as a result of the Project.

3. Increase in Steam

The DEIR disclosed that steam would be provided by either a new 140 MMBtu/hr steam boiler or by the existing Steam Power Plant (SPP). DEIR, pp. ES-5, 3-7, 3-20. The DEIR included emissions only for the new 140 MMBtu/hr boiler. DEIR, Tables 4.3-6 and 4.3-7. Since the DEIR was released, Phillips has elected to use the existing SPP to generate the required steam. The NOx emissions from the existing SPP are higher than those disclosed in the DEIR, as explained below.

Correspondence in the BAAQMD file indicates steam demand will be met by using surplus low pressure steam currently vented, improving steam generation efficiency, and by increasing high pressure steam production at the SPP. The increase in high pressure steam would be provided by increasing the firing rate of natural gas in the duct burners by 45 MMBtu/hr. It is unclear whether additional fuel would also have to be fired in the associated gas turbines.

The emissions included in the BAAQMD permit files (which vary from the emissions identified in the DEIR) are based only on increasing the firing rate of natural gas in the duct burners by 45 MMBtu/hr, and assume very low (and unsupported) emission factors. The emission factor used for NOx, for example, is 0.017 lb/MMBtu (4.5 ppm @ 15% O_2). 4/30/13 Phillips Response Letter, pp. 5-6, Response to Comment #7.

Based on my experience permitting many similar projects with duct burners, they typically emit much more NOx than assumed in the 4/30/13 Phillips calculations (4/30/13 Phillips Response Letter, pp. 5-6). Duct burner emissions are low only if they are located in a heat recovery steam generator equipped with modern selective catalytic reduction to control NOx. No such arrangement is described in the DEIR (Sec. 3.3.2.9)

[40] Air Liquide, Hydrogen Plant Project, Application for Authority to Construct and Major Facility Review Permit, Rodeo, California, October 2005.

or the original 1985 BAAQMD engineering evaluation.[41] The subject gas turbines/duct burners are permitted to emit 83 lb/hr when firing 1048 MMBtu/hr for all turbine/duct burners combined.[42] This corresponds to a NOx emission factor of 0.079 lb/MMBtu (83/1048 = 0.079). This NOx emission factor is nearly five times higher than the one used in Phillips' duct burner NOx emission calculations.

Using this revised emission factor to estimate NOx emissions from increased steam demand yields 15.6 ton/yr NOx (0.079 x 45 x 8760/2000 = 15.6) or four times more than disclosed in the DEIR (3.7 ton/yr) for the new 140 MMBtu/hr boiler. The originally proposed new boiler evaluated in the DEIR should be more efficient and emit less NOx, etc. than the old SPP due to use of modern technology and current Best Available Control Technology (BACT) controls such as selective catalytic reduction (SCR). The NOx emissions from supplying just the steam for the hydrotreater exceed the NOx significance threshold of 10 ton/yr and are thus a significant undisclosed air quality impact of the Project.

4. Increase In Sulfur Removal

The Project will increase the throughput of the existing Sulfur Recovery Units (SRU) by about 135 ton/yr of sulfur. DEIR, Fig. 3-6; 5/13/13 BAAQMD Notes, p. 2; 6/28/13 Phillips Response Letter, pp. 6-8, Response to Comment #8. The Refinery uses the Claus process to convert acid gas to liquid sulfur, which is sold. This involves combusting acid gas, which would increase NOx, CO, VOC and other emissions. The resulting elemental sulfur is sold, which involves truck emissions. Thus, the increase in throughput of the SRU would be accompanied by increases in combustion emissions from the Claus unit and the trucks used to transport the recovered sulfur product to market. The resulting increase in emissions was not disclosed in the DEIR or FEIR. The information in the files I reviewed is not adequate to estimate these emissions. It did not include, for example, the increase in acid gases that would be processed by the Claus unit, the criteria pollutant emission factors for the Claus furnace, or the number of additional truck trips that would be required to transport the sulfur to market.

5. Increase In Electricity Generation

The Project will require 1.28 MW electricity or 10,900 MW-hour of electricity DEIR, pp. 3-23, 3-28. The generation of this electricity at off-site facilities will increase criteria pollutant and GHG emissions that were not included in the DEIR. The information in the files I reviewed did not include any emission factors in pounds of pollutant per megawatt hour, which are required to estimate these emissions.

6. Emissions from Changes in Feedstock Quality

The currently proposed rail spur project at the Santa Maria Facility would allow the import of DilBits. These are rich in the propane/butane fractions required to supply

[41] BAAQMD, Engineering Evaluation, Union Oil Company, Gas Turbine Cogeneration Facility, November 8, 1985.

[42] Phillips 66 LPG Recovery Project, Permit Limit Summary, BAAQMD.

the subject Project at the Rodeo Refinery. If said DilBits were routed directly to the Rodeo Refinery or if they were processed at Santa Maria to generate semi-refined products for Rodeo, which are feed for the propane/butane Project, this would result in public health impacts that were not disclosed in the DEIR.

DilBits contain large amounts of light material that distill below 149 C and are thus very volatile. This material 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 and their byproducts that are currently processed at the Rodeo Refinery.

The diluent is a low molecular weight organic material with a high vapor pressure that contains not only propane and butane that would be recovered by the Project, but also high levels of other VOCs, sulfur compounds, and hazardous air pollutants (HAPs). These would be emitted during unloading and would be present in emissions from tanks and fugitive components. The DEIR did not disclose the potential presence of diluent and made no attempt to estimate these diluent-derived emissions.

The composition of some typical diluents/condensates used in DilBits is reported on the website, www.crudemonitor.ca.[43] The DEIR does not identify the specific diluents that would be used by the Project or even that diluents would be present. The CrudeMonitor information indicates that diluent contains very high concentrations (based on 5-year averages, v/v basis of the hazardous air pollutants 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.[44] Similarly, the BTEX in synthetic crude oils (SCOs), which also could be imported via the Santa Maria rail spur project or the Ferndale Rail Terminal and barged to Rodeo, ranges

---

[43] 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.

[44] 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; Albian Heavy Synthetic (AHS) (DilSynBit) - http://www.crudemonitor.ca/crude.php?acr=AHS.

from 6,100 ppm to 14,100 ppm.[45] These are very high concentrations that were not considered in the DEIR or FEIR. These levels are high enough to result in significant worker and public health impacts.

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 could result in significant odor and nuisance impacts. Mercaptans can be detected at concentrations substantially lower than will be present in emissions from the tanks and fugitive emission, including pumps, valves, flanges, and connectors.[46] In fact, mercaptans are added to natural gas in very tiny amounts so that the gas can be smelled to facilitate detecting leaks.

Thus, recovering propane and butane from semi-refined products generated from these tar sands crudes or from directly refining these crudes would emit VOCs, HAPs, and malodorous sulfur compounds, not found in comparable levels in conventional crudes currently handled at the Refinery. There are no restrictions on the feedstock composition nor any requirements to monitor emissions for these HAPs from tanks and leaking equipment where DilBit-blended and other light crude fraction would be handled.

7. CO Emissions Were Not Estimated

The Project would significantly increase emissions of carbon monoxide (CO), a criteria pollutant. Carbon monoxide is emitted from all combustion sources, including locomotives, trucks and commuter auto trips, steam generation, and combustion of the recovered propane and butane at fired sources. The DEIR is silent on CO emissions from the entire Project.

IV.D. Decrease in SO_2 Emissions Is Not Supported

The DEIR claims that the Project would reduce SO2 emissions by at least 50%, resulting in an SO2 emission decrease of at least 180 ton/yr. DEIR, pp. ES-2, 3-5, 4.3-19. The emission inventory in Table 4.3-7 takes credit for a reduction in SO2 emission of 172.4 ton/yr. DEIR, Table 4.3-7. The BAAQMD Permit Application made a similar claim. However, there it claimed a reduction of 174.7 ton/yr, of which 7.61 ton/yr was proposed to offset Project SO2 increases and the balance would be banked as Emission Reduction Credits. BAAQMD Permit Ap., p. 17. However, Phillips subsequently withdrew its banking application, casting doubt on its claim of a SO2 reduction.

---

[45] 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 Albian 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.

[46] 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.

Thus, there is no support, in either the DEIR record or the BAAQMD permitting record, for the claimed reduction in SO2 emissions. Emission reductions used to offset emission increases must be permanent, real, and quantifiable. There is no evidence that the claimed SO2 emission reductions meet any of these criteria. In fact, claimed reductions could be a myth if the Refinery feedstock is modified to include a larger proportion of higher sulfur tar sands crudes than currently refined. Such crudes could reach the Refinery via the related Santa Maria rail spur project or the Ferndale rail terminal by barge down the Pacific coast.

V. CUMULATIVE AIR QUALITY IMPACT ANALYSIS IS INADEQUATE

The DEIR included only the Marine Terminal project, the temporary boiler, and an SO2 transfer proposal in the list of cumulative projects. DEIR, Sec. 5.4.3.3. However, the DEIR and FEIR fail to disclose the cumulative impacts that would result from other currently proposed projects that would affect the amount and composition of feedstock refined at Rodeo, compared to CEQA baseline feedstock. Changes in baseline feedstock as explained in these comment, i.e., tar sands crudes such as DilBits, and increased amounts of semi-refined materials from the Santa Maria Facility, would increase emissions of all criteria pollutants and hazardous air pollutants at most all emission sources in the Refinery.

First, as discussed in Comment II, two projects are proposed at the Santa Maria Facility that would directly impact Rodeo. These would send increased amounts of gas oil and naphtha to Rodeo for processing, increasing emissions from many refining units compared to the CEQA baseline. A rail spur is also proposed for Santa Maria that would allow the import of tar sands crudes. These tar sands crudes would change the chemical composition of Rodeo feedstocks, as described in Comment IV.C.6 and Attachment 2. These feedstocks, for example, would increase emissions of hazardous air pollutants from tanks, compressors, pumps, valves and flanges throughout the Refinery. They would also increase NOx and SO2 emissions from fired sources throughout the Refinery, relative to the CEQA baseline.

Second, as also discussed in Comment II, Phillip 66's Ferndale Refinery is permitted to construct a rail terminal, which will facilitate barging tar sands crude to the Rodeo Marine Terminal. The Rodeo Marine Terminal was recently permitted to import increased amounts of crude. This would also change the chemical composition of Rodeo feedstocks, as described in Comment IV.C.6 and Attachment 2, compared to the CEQA baseline feedstock.

These directly related projects will cumulatively increase air emissions above the CEQA baseline. They must all be evaluated together in a revised DEIR to determine cumulative air quality impacts.

547289.1