From: Charles Davidson. Hercules CA charlesdavidson@me.com

To: Murry Wilson; San Luis Opispo County, Environmental Resource Specialist, County Planning and Building Department
p66-railspur-comments@co.slo.ca.us

Subject: Phillips 66 Santa Maria Refinery Company Rail Spur Extension Project Recirculated Draft Environmental Impact Report (RDEIR) – SCH# 2013071028

Re: Phillips 66 Rodeo and Santa Maria Refineries' Expansion of Combined Production Capacity, Tar Sands Refining Capability and Propane Production

The first major problem with Phillips 66's Santa Maria Railroad Spur Extension Project RDEIR, is that it is a piecemealed project since the Santa Maria Refinery is connected by a 200-mile pipeline to the San Francisco Refinery in Rodeo. In turn, the Rodeo Refinery accept heavy gas oil derived from semi-refined Santa Maria heavy crude feedstock and then completes the refining processes in order to make higher-valued products, such as gasoline, diesel and jet fuel. Project EIR piecemealing is illegal in California under CEQA. DAC- 1

A second major problem with Phillips 66's Santa Maria Refinery *Railroad Spur Extension Project* REIR is that it fails to disclose the fact that the refineries' *most* likely source of crude oil would be a type of high-sulfur, extra heavy crude oil derived from Canadian Tar Sands, called bitumen. To confirm, Phillips' REIR states that light, low sulfur "sweet" Bakken North Dakota crude would *absolutely not* be the primary type of crude carried by rail into Santa Maria. The combined Santa Maria-Rodeo Refinery Projects dependence on bitumen refining would make it, cumulatively, a high greenhouse gas-producing project that is also capable of emitting increased levels of DAC-02

toxic pollutants.

When making gasoline, a marked decrease in crude oil quality is no small matter for the health and safety of communities, refinery workers and the planet.

On behalf of the Crocket Community Foundation, Communities for a Better Environment (CBE) senior scientist presented compelling evidence in his commentary to Phillips' Rodeo Refinery Propane Recovery Project EIR that Phillip's delayed coking of heavy crudes produces more propane and butane than can be recovered from simple distillation. This proposed increase in combined propane and butane production to over 11% of the refineries crude capacity and is several-fold higher compared to simple distillation. DAC-02

On behalf of the Rodeo Citizens Association, the refinery engineer and scientist working for Shute, Mihaly and Weinberger, attorneys-at-law, noted that the Rodeo U200 Delayed Coker Unit is central to the Propane Recovery Project. The Rodeo coker will directly receive, via their 200-mile pipeline, semi-refined, heavy crude from Phillips' Santa Maria Refinery for upgrading into product. CBE asserts that the project's dependence on propane and butane sales revenue would lock the refinery into coking of low-quality crude feeds and foreclose future, cleaner options. In fact, Phillips has already signed a long-term multi-100-million dollar propane contract with the Chinese-owned hydrocarbon exporter, SinoPec.

Conoco-Phillips is the largest importer in Canadian Tar Sands bitumen crude oil into the U.S., while Phillips' Chairman and CEO Greg Garland notes that within the next few years, 100 percent of their crude will be advantaged crude that "sells at a discount relative to crude oils tied to the global benchmark ... [and] include[s] heavy crude from

Canada'.

Furthermore, the Phillips 66 refinery's Nelson Complexity Factor of 13.6, is one of the highest in the world, indicating that this refinery is designed to refine the very heaviest crudes in order to maximizing the production of the highest valued products, such as gasoline.

In addition to the planned 10 percent increase in Santa Maria crude throughput, that was not mentioned in the Rodeo Draft EIR, this 11.2 percent refinery product expansion in Phillips total refinery output, is dependent on a new source of refinery energy. Specifically, Phillips' planned, nearly complete switching to an external natural gas energy supply, instead of using propane and butane for refinery process gases, would increase natural gas usage by 225%, mostly for generating heat and also the 20 percent more refinery hydrogen now needed to help liquify bitumen and remove the inordinate amounts of sulfur from Tar Sands.

DAC-02

Tar Sands bitumen is mined, not drilled as with traditional oil production. Two of the largest man-made lakes in the world are tar sands tailing ponds in Alberta Canada, that are completely laden with toxic heavy metals. Tar Sands is unusually high in sulfur content and heavy by world crude oil standards, it requires up to three times the energy to refine into gasoline than traditional, average U.S. refinery feed and locally, it produces up to three times the greenhouse gases and other co-pollutants that would need to be mitigated.

As noted by the EPA in 2012, Phillips 66 is the most polluting refinery in California. Moreover, perhaps on account of the advent of Tar Sands generally coming into California since 2010. Recently, the EPA noted a 40% increase in water born refinery pollution, largely due to heavy metals.

Semi-solid Tar Sands crude or bitumen is commonly blended with 30 percent light weight diluent to facilitate transporting it by rail or pipeline and is called "DilBit." Much of

the DilBit diluent is lightest weight fractions of light shale oil that is recovered in Texas from “stabilized” crude and sent to Canada via a special pipeline. This diluent in DilBit would be recovered, in part, as propane and butane in Rodeo. DAC-02

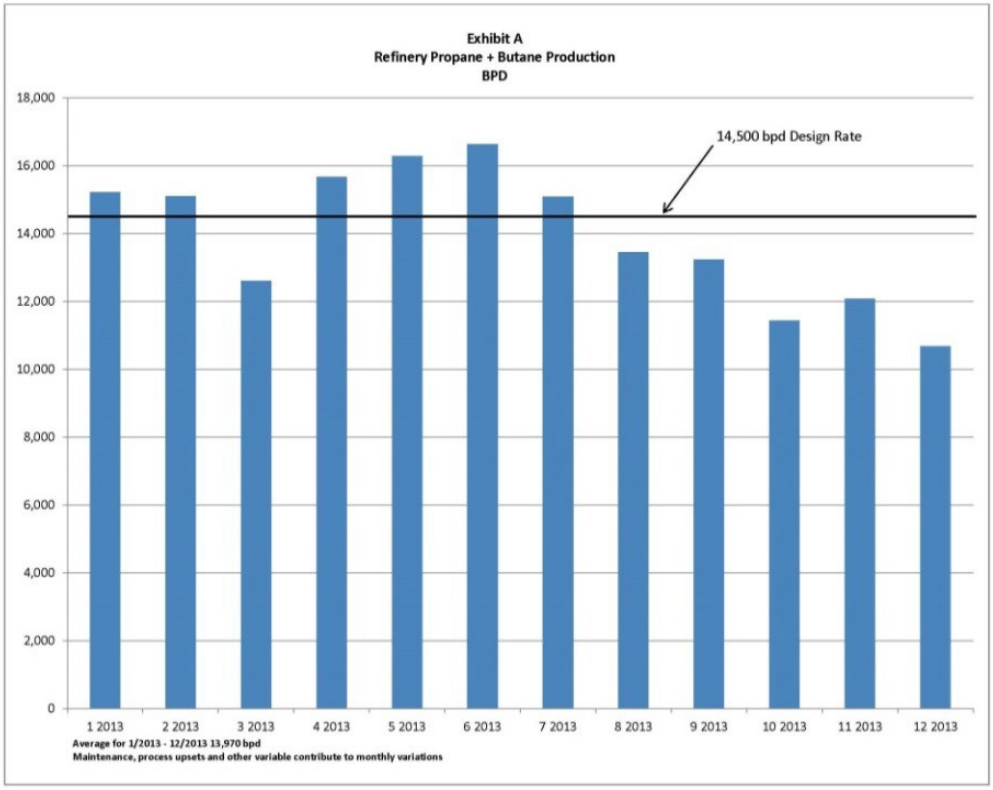
Lastly, propane has an expansive vapor pressure 600 times more than that of gasoline, a boiling point that is 300 degrees F lower than gasoline and a flammability flashpoint 250 degrees F. below that of gasoline, lending itself as an ideal source for a thermobaric explosion when mixed with air, in the case of a breach of containment, such as an earthquake on the nearby Hayward fault, that could potentially damage the pipes that connect the propane storage tanks to the rail yard that is on a liquifaction zone. DAC-03

DAC-01	The refining of the different crude slate associated with this project would not produce different GHG emissions at the SMR than the normal range of crude oils refined at the SMR. Note that some Canadian crude oils are currently being processed at the SMR, transported by rail to Bakersfield, then by truck to the SMPS. GHG emissions are attributable to removal of the heavier ends, such as at the SMR, and associated with the cracking and formulation of lighter ends, such as gasoline, at the Rodeo Refinery. This latter activity would be within the range of normal activities at each refinery. The additional GHG emissions associated with mining the tar sands, such as steaming or excavations, would occur no matter the destination of the crude oil, whether the crude oil is destined for the SMR, or other locations within the U.S. The Rodeo Refinery and the SMR refinery are located in separate basins/Districts and emissions at both locations should not be added together to determine impacts, even if the projects were combined into one CEQA analysis. Changes to the Rodeo Refinery, such as increased flaring, etc, are not anticipated with the refining of the different crude slate. The "dirtier" crude would be partially processed at SMR, removing most of the heavier ends of the crude at the SMR, and refining at Rodeo would be within the range of historical crude oil refined at Rodeo. Therefore, operations at Rodeo would not change with the change in crude slate from historical operations and the project is not piecemealing under CEQA.
DAC-02	The RDEIR states that GHG emissions associated with crude oil transportation by rail would produce significant and unavoidable impacts. Emissions can be offset through the use of emissions offsets, as are available from a number of different sources for GHG. However, as indicated in Section 4.3, Air Quality and Greenhouse Gases, of the RDEIR, it is uncertain if Air Districts could require GHG offsets due to Federal preemption and the impacts associated with the GHG emissions would remain significant and unavoidable. The refining of the different crude slate associated with this project would not produce different GHG emissions at the SMR than the normal range of crude oils refined at the SMR. GHG emissions are attributable to removal of the heavier ends, such as at the SMR, and associated with the cracking and formulation of lighter ends, such as gasoline, at the Rodeo Refinery. These activities would be within the range of normal activities at each refinery. The main difference in GHG emissions occurs at the extraction point, where extracting the tar sands generally produces substantially higher GHG per bbl of crude oil than conventional methods, depending on the level of associated gas and the use of that gas. Some fields in California for example, extract the crude oil and just burn the associated gas in flares, which actually can produce a higher GHG intensity than even Canadian Tar Sands crude oils. The additional GHG emissions associated with mining the tar sands would occur no matter the destination of the crude oil, whether the crude oil is destined for the SMR, or other locations within the U.S. Current CARB requirements (LCFS) already

	require refineries to disclose the carbon intensities of the crude oil they refine. The RDEIR examined changes in emissions associated with a change of slate, as indicated in Section 4.3.4.2, Air Quality and Greenhouse Gases, which states" For the SMR, key crude slate parameters that could impact air emissions include the percent of BTEX, vacuum resid, sulfur and metals in the crude oil. " The BTEX was analyzed in the health risk assessment to determine the increased health risk. Increased sulfur was assessed as to the increased sulfur truck trips that would be required. None of the other components would alter the emissions at the refinery as the heavy metals would not be emitted into the air from the SMR. Note that as the API gravity would be similar, the emissions of volatile components (ROG) from fugitive emissions would be similar with the change in crude slate. BTEX levels of Canadian tar sands crude oil are similar to other heavy crude oil processed by the SMR and the RDEIR demonstrates that any increases in BTEX would generate a nominal increase in health risk. See Response to CBE-21 and CBE-23. The metals in the tar sands oil would not be volatilized at the SMR or along transportation routes and would therefore not contribute to increases in air-based health risk. The Canadian tar sands are not as "explosive" as Bakken crude oil and present similar risks to the rail transportation of heavy crudes that currently occur within California and through SLOC. The Rodeo Refinery (SFR) produces gases as a byproduct of the refining process, and these gases are used as fuel in various refinery processes (referred to as "refinery fuel gas" or "RFG"). Currently, the propane and part of the butane generated at the SFR is used as RFG. Instead of using the propane and butane as fuel at the SFR, the Propane Recovery Project will allow Phillips 66 to recover, store, and ship propane and additional butane via rail to outside customers. Therefore, the primary project objective is to recover liquid petroleum gases ("LPGs" *i.e.*, propane and butane) that already exist in the RFG. The Propane Recovery Project will not cause or require an increase in the amount of recoverable LPG present in the RFG; it will simply allow recovery of the LPGs that already are present in the RFG. The Propane Recovery Project is designed to remove up to 14,500 barrels of LPGs per day. Data regarding actual LPG content of the RFG is consistent with the design basis for the project. The figure below shows that, for the twelve month period from January through December 2013, the average LPGs in the Rodeo RFG was 13,970 barrels per day. The equipment design is a limiting factor on the amount of propane and butane that can be captured and stored, regardless of how much propane and butane can be produced by the SFR in the future or what type of crude oil is processed. Phillips 66 specified this design basis in the application to the Bay Area Air

Quality Management District for an authority to construct the Propane Recovery Project, and it has been translated into an enforceable condition included in the draft permit prepared by the air district. Therefore, the amount of propane and butane to be extracted once the Propane Recovery Project is operational will be constrained by the physical design of the equipment and the permit limits.

Most of the LPG produced at the SFR does not arrive as propane and butane in crude oil or in the semi-refined products received from the Santa Maria Refinery (SMR). Rather, the vast majority of LPG produced at the SFR is created through the refining process itself. As explained above, the design capacity of the Rodeo Propane Recovery Project was sized to recover LPGs that are currently being produced and burned as part of the refinery fuel gas at the SFR. No changes in the crude delivery system, type of crude or operations at the SMR are needed in order to fully utilize the propane recovery unit in Rodeo.



The commenters observe that there is very little butane or propane in the crude oil delivered to the Santa Maria and Rodeo Refineries. This statement is correct. However, they then conclude that, without a change to LPG-rich crudes, vast increases in the crude runs would be needed to obtain the volumes of LPG that the Rodeo Propane Recovery Project aims to recover. This

	conclusion is incorrect. The commenters have overlooked the fact that the refining process at the SFR itself accounts for 90% of the propane and butane currently produced and proposed to be recovered by the Rodeo Propane Recovery Project. As described at pages 3-8 to 3-9 of the Recirculated Draft Environmental Impact Report for the Propane Recovery Project, the refining process incorporates four primary functions: separation, conversion, purification and blending. Crude oil and other incoming feed streams contain mixtures of various hydrocarbon compounds that can be separated using distillation and fractionation in the first step of the refining process. At the SFR, a small amount of butane and propane is separated from the crude oil in these first stage processes. However, butane and propane are also created from other hydrocarbon compounds during the conversion phase of the refining process. Overall approximately ten percent of the LPG (combined butane and propane) arrives as identifiable fractions of the crude oil, and the balance of approximately ninety percent is created in the refining processes (cracking units). Since LPG in the crude oil accounts for only a very small fraction (approximately ten percent) of the total LPG produced at the SFR, a change in crude oil LPG content in Santa Maria or in Rodeo would have very little effect on the volume of LPG available for recovery at Rodeo. As discussed in the Recirculated Draft Environmental Impact Report for the Propane Recovery Project Section 3.4.2.1, and shown in Figure 3-7, the proposed Project's design basis was derived from data taken at the Refinery in August, 2011. In the same section, the RDEIR for the Propane Recovery Project also provides an update to substantiate this 2011 design basis with the most recent full year (2013) of RFG data from the Refinery in Figure 3-8. This figure shows that for 2013 an average of 13,970 barrels per day (BPD) of propane and butane were available and that monthly this quantity of propane and butane varies. Note that between the 2011 design basis and the 2013 data, no change to crude feedstocks, such as those of concern to commenters, had been made. These data provide the substantial evidence to support the independent utility of this Project and further support that the RDEIR has not inappropriately piecemealed or segmented this Project. Phillips 66 applied for a modification to the SMR's County Land Use Permit in 2008 to increase the refinery's daily throughput limit from 44,000 barrels per day to approximately 48,000 barrels per day. The sequence of design and permitting activities for the various projects demonstrates that the Throughput Increase Project did not create a need for the Rodeo Propane Recovery Project. The Throughput Increase Project was approved by San Luis Obispo County in 2013, and the Propane Recovery Project was sized according to SFR data in August 2011. This data was gathered two years before the Throughput Increase Project was approved, demonstrating that sufficient LPGs are present in the Rodeo RFG to justify the Propane Recovery Project without

regard to the Santa Maria Throughput Increase Project. The size of the Propane Recovery Project is not related to and is completely independent from SMR's throughput ability and permit limits, including the approved modification to the County Land Use Permit allowing a daily increase from 44,000 barrels to 48,000 barrels.

As discussed in the Project Description (Chapter 2.0) the SMR currently processes a range of crude oils from different sources, and the crudes vary from time to time. In addition, the refinery often blends crudes from multiple sources prior to processing. A comparison of crude oils and their characteristics demonstrates that the crudes likely to be received by unit train would be comparable to those currently or recently processed at the SMR. The SMR is not requesting any changes or modifications to its crude unit or other processing units that would allow it to process any crude types that it can't be process currently.

The table below presents a reasonable representation of the LPG content of the crude oils that would be delivered by rail. This shows that the level of LPG in the crudes that would be delivered by rail would have similar or lower levels of LPG then the typical crude blend that is currently processed at the SMR. Most of the propane and butane in the crude that is processed at the SMR ends up in the refinery fuel gas. This is no different than what was discussed above for the SFR. The table below shows the typical composition of the refinery fuel gas for the SMR.

LPG Content of Current and Potential Future Crude Oils at the Santa Maria Refinery

Property	Unit of Measure	Current SMR Operations		Potential Crude by Rail Sources	
		Typical Crude Blend	Range of Major Crude Sources	Access Western Blend	Peace River Heavy
LPG Content	Volume %	0.9	0-1.0	0.73	0.89

1. Range of major crudes represent the major sources of current crudes to the refinery and include a number of OCS, local onshore, and trucked crude sources.
2. Both potential crudes by rail are Canadian.
3. LPG-Liquid Petroleum Gases, which includes Propane and Butane.
4. Access Western Blend five year average from http://www.crudemonitor.ca/crude.php?acr=AWB
5. Peace River Heavy five year average from http://www.crudemonitor.ca/crude.php?acr=PH
6. Current SMR Operations data from Phillips 66, 2015.

Composition of Refinery Fuel Gas at the SMR

Component/ Property	Value
Heating Value	1,498.3 BTU/scf
Hydrogen	9.03 mole %
Methane	47.15 mole %
Ethane	17.59 mole %
Propane	11.13 mole %
Propylene	3.88 mole %
Butane	7.68 mole %

Source: Phillips 66, 2015.

This table shows that the majority of the propane and butane in the crude oil ends up in the refinery fuel gas and not in the gas oils and naphtha shipped to the SFR via pipeline.

The comment asserts that the Rail Spur Project will result in a change to Canadian heavy diluted crude at the SMR, which in turn will overload the existing Rodeo LPG recovery systems and, therefore, the Rodeo Propane Recovery Project is required to support the Santa Maria Rail Spur Project. These conclusions are incorrect. As noted above, the crude by rail project at the SMR is not expected to result in crude blends with LPG content outside the range of historical and existing crudes. In addition, the coker and hydrocracker feed rates are currently operating at or near their permitted capacities as specified in the Title V Operating Permit, and the proposed crude by rail project does not propose to change the capacities of these units.

Based upon the substantial evidence presented above, the proposed crude by rail project at the SMR is not a driver in the Propane Recovery Project at the SFR, and therefore, the projects are not being piecemealed.

DAC-03	Please see Response to DAC-02. The proposed project will not result in the pipeline transportation of propane.