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Via Email

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*Re: Review of Phillips 66 Company Rail Spur Extension and Crude Unloading Project
Final Environmental Impact Report and Vertical Coastal Access Project Assessment*

Dear Ms. Horton,

Per your request, I have reviewed the Final Environmental Impact Report ("Final EIR") and Responses to Comments ("RTCs") for the Rail Spur Extension and Crude Unloading Project ("Rail Spur Project" or "the Project") proposed by Phillips 66 Company ("Applicant") at its Santa Maria Refinery ("SMR" or "Refinery"). San Luis Obispo County ("County"), the lead agency for review under the California Environmental Quality Act ("CEQA"), published the Final EIR in December 2016.¹ The County previously issued a Draft Environmental Impact Report ("Draft EIR") in November 2013 and a Revised Draft Environmental Impact Report ("Revised Draft EIR") in October 2014, which I reviewed in my January 27, 2014 and November 20, 2014 comment letters to your firm.²³ Although the Final EIR resolves

¹ San Luis Obispo County, Phillips 66 Company Rail Spur Extension and Crude Unloading Project, Final Environmental Impact Report and Vertical Coastal Access Project Assessment, December 2015, SCH #2013071028;

<http://www.slocounty.ca.gov/planning/environmental/EnvironmentalNotices/railproject.htm#>.

² Petra Pless, Pless Environmental, Inc., Letter to Elizabeth Klebaner, Adams, Broadwell, Joseph and Cardozo, Re: Review of the Phillips 66 Company Rail Spur Extension Project Public Draft Environmental Impact Report and Vertical Coastal Access Project Assessment, January 27, 2014;

<http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/Comments+on+the+Draft+EIR/Organizations+and+Schools/Adams+Broadwell.pdf> (see Attachment 4).

³ Petra Pless, Pless Environmental, Inc., Letter to Laura Horton, Adams, Broadwell, Joseph and Cardozo, Re: Review of the Phillips 66 Company Rail Spur Extension Project Revised Public Draft Environmental Impact Report and Vertical Coastal Access Project Assessment, November 20, 2014;

http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/FEIR+Phillips+Rail+Spur+Project+Dec+2015/Response+To+Comments/3_Organizations+and+Schools/Adams+Broadwell+Jos
(cont'd)

some issues I addressed in my prior letters, other issues were not, or not adequately, addressed and remain problematic. Further, new issues were introduced by revisions to the Final EIR and the County's responses to comments on the Revised Draft EIR.

I also reviewed the report prepared by Planning Commission Staff for the February 4th and 5th Planning Commission hearing on the Final EIR for the Project ("Staff Report"),⁴ which recommended denial of the certification of the Final EIR because:

There are insufficient specific, overriding economic, legal, social, technological, or other benefits of the project that outweigh the significant effects on the environment, as would be required to approve the project pursuant to Public Resources Code section 21081. Additionally, due to federal preemption, implementation of mitigation measures to lessen the Class I impacts on the Mainline within San Luis Obispo County and the state are infeasible, as argued by the Applicant.⁵

I'd like to commend Staff for proposing denial of this severely impactful Project.

I also reviewed the Applicant's February 1, 2016 Letter to the County,⁶ which proposes adoption of the Reduced Rail Deliveries Alternative, which was analyzed as one of the alternatives to the Project in the Final EIR. This alternative would limit the number of train deliveries to the SMR to a maximum of three per week, with an annual maximum of 150 trains per year;⁷ in contrast, the Project, as proposed and analyzed as the preferred alternative in the Final EIR, limits train deliveries to a maximum of five trains per week and an annual maximum of 250 trains per year⁸. I note that, as of today, this letter has not been posted on the County's website for the Project and, thus, has not been available for general public review.⁹

[eph+Cardozo.pdf](#) (see Attachment 1).

⁴ San Luis Obispo County, Department of Planning and Building, Staff Report, Phillips 66 Company, File No. DRC2012-0095, February 4, 2016; <http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/Phillips+66+Staff+Report+2-4-2016.pdf>.

⁵ Staff Report, Exhibit C.

⁶ Jocelyn Thompson, Allston & Bird, Letter to Members of the Planning Commission, San Luis Obispo County, Re: Phillips 66 Rail Spur Extension Project, February 1, 2013, with 22 attachments ("Phillips 66 2/1/2013 Letter to San Luis Obispo County"). (Exhibit 1)

⁷ Final EIR, p. 5-15.

⁸ Final EIR, p. 2-22.

⁹ San Luis Obispo County, Phillips 66 Company Rail Spur Extension Project; http://www.slocounty.ca.gov/planning/environmental/EnvironmentalNotices/Phillips_66_Company_Rail_Spur_Extension_Project.htm; accessed February 29, 2016.

Finally, the County provided two versions of the Final EIR, one that shows full track changes and one without (“clean version”); the two documents have different pagination throughout the Final EIR’s sections. In my letter, I intended to only cite to the clean version; however, I may have not been entirely successful. Therefore, should you be unable to locate a cited page number to the Final EIR in the clean version, please consult the file that shows full track changes. I apologize for any inconvenience this may cause.

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I.	The Final EIR’s Substantially Underestimates Emissions from Project Operational Activities and Fails to Correctly Characterize the Effect of Mitigation Measures	

The Final EIR presents substantially revised operational emissions for criteria pollutants and precursors, including the ozone precursors reactive organic gases (“ROG”) and nitrogen oxides (“NOx”), and diesel particulate matter (“DPM”), which is a toxic air contaminant contributing to increased cancer risks. These estimates, which are presented without explanation why yet another revision was necessary, substantially underestimate combustion emissions from locomotives as discussed below and, as discussed in Dr. Phyllis Fox’s forthcoming letter on the Final EIR, fails to account for fugitive emissions from railcars and underestimates emissions from other onsite emission sources.

A. Total Operational Emissions within San Luis Obispo County Presented by the Draft EIR, Revised Draft EIR, and Final EIR Are Successively and Substantially Lower

Tables 1a and 1b compare total *unmitigated* and *mitigated* Project operational emissions for ROG+NOx and diesel particulate matter within San Luis Obispo County presented by the Draft EIR, the Revised Draft EIR, and the Final EIR to the SLOCAPCD's significance thresholds (significant emissions are **bolded**).

Table 1a:
Unmitigated Project operational emissions of ROG+NOx and DPM within San Luis Obispo County presented by Draft EIR, Revised Draft EIR, and Final EIR compared to SLOCAPCD significance thresholds (significant emissions bolded)

Pollutant	SLOCAPCD Thresholds	Draft EIR ^a	Revised Draft EIR ^b	Final EIR ^c
ROG+NOx				
Peak daily (lbs/day)	25	869.85	771.72	621.4
Annual (tons/year)	25	71.09	64.25	52.3
DPM				
Peak daily (lbs/day)	1.25	33.90	30.45	24.2

a From: Draft EIR, Table 4.3.14

b From: Revised Draft EIR, Table 4.3.15

c From: Final EIR, Table 4.3.15

Table 1b:
Mitigated Project operational emissions of ROG+NOx and DPM within San Luis Obispo County presented by Draft EIR, Revised Draft EIR, and Final EIR compared to SLOCAPCD significance thresholds (significant emissions bolded)

Pollutant	SLOCAPCD Thresholds	Draft EIR ^a	Revised Draft EIR ^b	Final EIR ^c
ROG+NOx				
Peak daily (lbs/day)	25	-	93.36	78.9
Annual (tons/year)	25	-	9.52	8.2
DPM				
Peak daily (lbs/day)	1.25	-	1.90	1.60

a The Draft EIR did not present mitigated operational ROG+NOx and DPM emissions within San Luis Obispo County

b From: Revised Draft EIR, Table 4.3.17

c From: Final EIR, Table 4.3.17

As shown, the presented emission estimates within San Luis Obispo County became successively and substantially lower with each iteration of the EIR. The Final EIR provides no explanation for this trend; in fact, the Final EIR does not even mention why and how the emissions presented in the Revised Draft EIR were revised again.

Because of the complexity of estimating emissions from the various sources contributing to total Project emissions (*see* the 267-page Appendix B.1) and the interconnected effects on resulting health risks, the Final EIR should have provided an adequate discussion of the revisions it incorporated to facilitate reviewers' understanding of the changes compared to the Revised Draft EIR. The Final EIR provides no such discussion and the reviewer is left to tease out the changes from the underlying calculations provided in Appendix B.1, a herculean task given the complexity of the interconnected formulas across multiple spreadsheets which, in turn, provide the input data for modeling of ambient concentrations of air pollutants and resulting health risks. Your company requested the supporting spreadsheets and health risk modeling files in electronic format on January 14, 2016¹⁰ but only received the requested information late in the day on February 3, 2016, the day before the Planning Commission hearing on the Final EIR;¹¹ the general public was not provided with this information. Review of these spreadsheets and modeling files confirmed my findings, which are discussed below. I note that the provided spreadsheets are not the same versions as those presented in Appendix B.1 and contain a number of errors, which were apparently corrected for the Final EIR.¹²

B. The Final EIR Underreports Estimates for Total Operational Emissions within San Luis Obispo County

The Final EIR presents substantially revised estimates for total (onsite at the SMR and offsite) *unmitigated* and *mitigated* peak daily and annual emissions from Project operational activities within San Luis Obispo County ("SLOC") in Tables 4.3.14 and 4.3.16, respectively, and compares them to the CEQA thresholds of significance developed by the San Luis Obispo County Air Pollution Control District ("SLOCAPCD") in Tables 4.3.15 and 4.3.17, respectively.

Because the estimates presented in the Final EIR for operational emissions will be the basis for determining the quantity of emission reductions required to mitigate Project emissions to below the SLOCAPCD's thresholds of significance per Mitigation Measure AQ-3, it is imperative that they are accurate. Unfortunately, this is not the case. Upon closer inspection of the underlying calculations, a number of issues related to

¹⁰ Laura Horton, Adams Broadwell Joseph & Cardozo, Letter to San Luis Obispo County Staff, Re: Public Records Act Request - Phillips 66 Company Rail Spur Extension Project SCH # 2013071028, January 14, 2016.

¹¹ Whitney McDonald, Deputy County Counsel SLO County, Letter to Adams Broadwell Joseph & Cardozo, Re: Public Records Act Requests Dated January 12 and 14, 2016, Re Phillips 66 Company Rail Spur Extension Project, (Letter Dated January 29, 2016 but not received until February 3, 2016).

¹² These errors include, for example, an incorrect reference to the South Coast AQMD instead of the intended reference to the San Luis Obispo APCD in the spreadsheet 'Summary of Operational Emissions.'

locomotive emissions emerge that invalidate the Final EIR’s presentation of Project operational emissions within San Luis Obispo County and its findings with respect to impacts on air quality and health risks.

Review of the underlying calculations presented in Final EIR, Appendix B.1, shows that the Final EIR’s main text (Section 4.3) substantially underreports *offsite* unmitigated and mitigated locomotive emissions generated within San Luis Obispo County and, thus, underreports *total* unmitigated and mitigated Project emissions generated within San Luis Obispo County. I have excerpted the summary table for *unmitigated* operational emission within San Luis Obispo County presented in the Final EIR, Table 4.3.14, for reference below; the red arrows in Table 2 point to reported unmitigated *offsite* locomotive emissions within San Luis Obispo County.

Table 2:
Excerpted Table 4.3.1 from Final EIR
summarizing unmitigated peak daily and annual locomotive emissions
within San Luis Obispo County

Table 4.3.14 Operational Emissions within SLOC, Peak Day and Annual

Source	Peak Day Emissions, lbs/day					
	ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Fugitive Dust	-	-	-	-	1.32	0.20
Fugitives	4.00	-	-	-	-	-
Canister	2.24	-	-	-	-	-
Locomotives Onsite	24.18	21.18	214.05	2.92	8.15	7.90
Locomotives Offsite within SLOC	28.00	34.13	346.64	1.60	16.00	15.52
Vehicles (autos and trucks and additional sulfur trucks)	0.12	1.65	2.11	0.00	0.07	0.07
<i>Total Emissions at the SMR</i>	<i>30.43</i>	<i>21.18</i>	<i>214.05</i>	<i>2.92</i>	<i>9.47</i>	<i>8.10</i>
<i>Total Emissions within SLOC</i>	<i>58.55</i>	<i>56.97</i>	<i>562.80</i>	<i>4.52</i>	<i>25.54</i>	<i>23.68</i>
Source	Annual Emissions, tons/year					
	ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Fugitive Dust	-	-	-	-	0.17	0.03
Fugitives	0.73	-	-	-	-	-
Canister	0.28	-	-	-	-	-
Locomotives Onsite	1.30	2.65	20.25	0.36	0.56	0.54
Locomotives Offsite within SLOC	1.30	4.27	28.26	0.20	0.87	0.84
Vehicles (autos and trucks and additional sulfur trucks)	0.01	0.19	0.15	0.00	0.01	0.00
<i>Total Emissions at the SMR</i>	<i>2.31</i>	<i>2.65</i>	<i>20.25</i>	<i>0.36</i>	<i>0.73</i>	<i>0.56</i>
<i>Total Emissions within SLOC</i>	<i>3.63</i>	<i>7.10</i>	<i>48.66</i>	<i>0.56</i>	<i>1.60</i>	<i>1.41</i>

Review of the underlying calculations in Appendix B.1 shows that the Final EIR’s summary table, Table 4.3.14, considerably underreports total unmitigated Project operational emissions within San Luis Obispo County because it fails to incorporate emissions from all *offsite* locomotive modes of operation. The following excerpt from the underlying calculations in the Final EIR’s Appendix B.1 in Table 3 shows estimates for the various locomotive modes of operation (line haul, switching, and idling) that are generated *onsite* and *offsite*.

Table 3:
Excerpt from Appendix B.1 'Locomotive Emissions,' p. B.1-9,
for unmitigated locomotive emissions within San Luis Obispo County

Source	Peak Day Emissions, lbs/day						Annual Emissions, tons/year or MT/yr for GHG										
	ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	CH ₄	N ₂ O	MTCO ₂ E	
Within SLOC																	
Line Haul	28.01	34.14	346.74	1.60	16.00	15.52	1.30	4.27	28.27	0.20	0.87	0.84	1,472.40	0.12	0.04	1,486.45	
Line Haul SM/SLO	5.34	6.51	66.12	0.31	3.05	2.96	0.25	0.81	5.39	0.04	0.17	0.16	439.20	0.03	0.01	443.39	
Switching	25.23	20.89	198.66	0.69	8.22	7.97	1.14	2.61	17.21	0.09	0.49	0.47	761.30	0.06	0.02	768.56	
Idling	2.62	3.33	44.33	2.33	1.12	1.09	0.33	0.42	5.54	0.29	0.14	0.14	149.67	0.01	0.00	151.09	
Total	61.20	64.88	655.85	4.92	28.40	27.55	3.02	8.11	56.42	0.62	1.66	1.61	2,822.56	0.22	0.07	2,849.50	
Onsite Rail	24.18	21.18	214.05	2.92	8.15	7.90	1.30	2.65	20.25	0.36	0.56	0.54	800.08	0.06	0.02	807.72	

The following explains which *onsite* and *offsite* emissions are accounted for in the various terms in the "Source" column reported in Table 3 contributing to the total locomotive emissions within San Luis Obispo County (**Total**) based on the calculations in Appendix B.1:

Line Haul: includes *offsite* emissions generated by three 4,300-horsepower haul locomotives hauling a 80-tank car unit train¹³ along the 134.1-mile roundtrip distance between the Refinery boundary and the San Luis Obispo County boundary.¹⁴

Line Haul SM/SLO: includes *offsite* emissions generated by the two additional 4,300-horsepower haul locomotives per 80-tank car unit train required for the approximately 30-mile roundtrip distance between the City of Santa Margarita and the City of San Luis Obispo over Cuesta Grade.^{15,16}

Switching: includes *onsite* and *offsite* emissions generated by two 4,300-horsepower haul locomotives needed to move around the 80 tank cars per unit train including positioning the loaded tank cars in 10-car strings on track 1 and 2 at the unloading rack and reassembling the train with unloaded tank cars as well as emissions generated by the third locomotive not needed for switching while traveling before being disconnected from the loaded train and after being reconnected to the unloaded train;¹⁷ the EIR assumes that about 85.4 percent of the switching emissions occur *onsite*.¹⁸

¹³ A unit train consists of the same kind of cars and carries only one type of cargo; in contrast, a manifest train is a freight train with a mixture of car types and cargos.

¹⁴ Daily emissions based on 1 train per day calculated as: (3 locomotives) × (4,300 hp/locomotive) × (134.1-mile roundtrip distance) / (40 miles/hour) × (0.28 load factor) × (line haul emission factor in g/bhp-hr/engine) / (454 g/lb).

¹⁵ Final EIR, p. 2-23.

¹⁶ Daily emissions based on 1 train per day calculated as: (2 locomotives) × (4,300 hp/locomotive) × (30-mile roundtrip distance) / (20 miles/hour) × (0.18 load factor) × (line haul emission factor in g/bhp-hr/engine) / (454 g/lb).

¹⁷ Daily emissions based on 1 train per day calculated as: (4,300 hp/locomotive) × (0.206 switching load factor) × [(2 locomotives unloading) × (2.58 hours switching time/locomotive unloading)] +

(cont'd)

Idling: includes *onsite* emissions generated by two 4,300-horsepower haul locomotives while performing switching activities associated with unloading the tank cars and reassembling the train and emissions from the third 4,300-horsepower haul locomotive while being disconnected from the train.¹⁹

Onsite Rail: includes about 85.4 percent of the total switching emissions (see **Switching**) plus 100 percent of the idling emissions.

Thus, *offsite* locomotive emissions within San Luis Obispo County (see red arrows pointing to **Locomotives Offsite within SLOC** in Table 2 above) can be calculated as *total* locomotive emissions within San Luis Obispo County (**Total**) minus total *onsite* locomotive emissions at the Refinery (**Onsite Rail**). Table 4 below compares unmitigated *offsite* locomotive emissions within San Luis Obispo County presented in the Final EIR, Table 4.3.14 (see **Locomotives Offsite within SLOC** in Table 2 above) with unmitigated *offsite* locomotive emissions within San Luis Obispo County calculated based on the spreadsheet for locomotive emissions in Final EIR, Appendix B.1, (**Total - Onsite Rail**).

Table 4:
Unmitigated *offsite* locomotive emissions within San Luis Obispo County from Final EIR Table 4.3.14 and based on Final EIR, Appendix B.1 'Locomotive Emissions,' p. B.1-9

Row		Peak Daily Emissions (lbs/day)					
		ROG	CO	NOx	SO ₂	PM10	PM2.5
1	Final EIR, Table 4.3.14 (Locomotives Offsite)	28.00	34.13	346.64	1.60	16.00	15.52
2	Based on Final EIR, Appendix B.1, p. B.1-9 ^a	37.02	43.69	441.79	2.01	20.25	19.64
3	Amount underreported in Final EIR^b	9.02	9.56	95.16	0.41	4.25	4.13
4	Percent underreported in Final EIR^c	32.2%	28.0%	27.5%	25.3%	26.6%	26.6%
		Annual Emissions (tons/year)					
		ROG	CO	NOx	SO ₂	PM10	PM2.5
5	Final EIR, Table 4.3.14 (Locomotives Offsite)	1.30	4.27	28.26	0.20	0.87	0.84
6	Based on Final EIR, Appendix B.1, p. B.1-9 ^a	1.71	5.46	36.17	0.25	1.10	1.07
7	Amount underreported in Final EIR^b	0.41	1.20	7.91	0.05	0.24	0.23
8	Percent underreported in Final EIR^c	31.9%	28.0%	28.0%	25.3%	27.3%	27.3%

a Total unmitigated *offsite* rail emissions within SLOC calculated from Final EIR, Appx. B.1. 'Locomotive Emissions,' p. B.1-9, as (Total) - (Onsite Rail)

b Row 3: = Row - Row 1; Row 7 = Row 6 - Row 5

c Percent underreported in Final EIR = 1 - [(Final EIR, Table 4.3.14) / (Final EIR, Appx. B.1, p. B.1.9)]

(1 locomotive not unloading) × (0.69 hours/locomotive not unloading)] × (switching emission factor in g/bhp-hr/engine) / (454 g/lb).

¹⁸See Appendix B.1, p. B.1-9, 'Fraction of switching emissions onsite.' This fraction is calculated based on information presented in Appendix B.1, p. B.1-12 (spreadsheet 'LocoTiming') as 0.8544.

¹⁹ Daily emissions based on 1 train per day calculated as: [(2 locomotives unloading) × (8.92 hours/locomotive not unloading) + (1 locomotive not unloading) × (1.08 hours/locomotive not unloading)] × (idling emission factor in g/bhp-hr/engine) / (454 g/lb).

As shown in Table 4, the Final EIR, Table 4.3.14, underreports *unmitigated offsite* peak daily and annual emissions from locomotives within San Luis Obispo County (*i.e.*, outside the Refinery boundary) by about 25 to 32 percent. *Mitigated offsite* emissions presented in the Final EIR, Table 4.3-16, suffer from the same problem and are, thus, underreported in the same way. Thus, total peak daily and annual emissions within San Luis Obispo County presented in Tables 4.3.14 through 4.3-17 are incorrect and not supported by the underlying calculations.

The Final EIR's reporting errors can be traced back to the calculations for *offsite* locomotive emissions in the spreadsheets presented in Final EIR Appendix B.1. Instead of relying on the locomotive emissions determined for San Luis Obispo County (*see* Table 2 above), the summary spreadsheet for operational emissions (Final EIR, Appendix B.1, p. B.1-1, 'Summary of Operational Emissions'), which is incorporated into Final EIR Table 4.3.14, relies on the maximum locomotive emissions within San Luis Obispo County determined for the three most probable routes to the Roseville or Colton Railyards (Appendix B.1, p. B.1-9, 'Locomotive Emissions,' *see* section 'By District to Switchyard'). The following shows a sample calculation for peak daily ROG and NOx emissions from locomotives within San Luis Obispo County ("SLOC") from this spreadsheet, which produces the values reported in the Final EIR, Table 4.3.14 (**bolded** terms in the first section identify the respective location in the spreadsheet):

(Within California: Mainline Rail Outside SLO County) ×
(By District to Switch Yards: San Luis Obispo) /
(Locomotive/Trip Information: RT Distance to SLOC Line (mi)) =
By District to Switch Yards: San Luis Obispo County

thus, for the longest roundtrip distance within San Luis Obispo County of the three routes:

(mainline rail emissions outside SLOC: 249.13 lbs/day ROG and 3,084.46 lbs/day NOx) ×
(roundtrip distance to SLOC line: 134.1 miles) /
(roundtrip distance from SLOC line to CA border: 1,193 miles) =
mainline locomotive emissions within SLOC: **28.00 lbs/day ROG** and **346.64 lbs/day NOx**

where

mainline rail emissions outside SLOC =
(line haul emission factors: 1.05 g/bhp-hr/engine ROG and 13.00 g/bhp-hr/engine NOx)
/ (454 g/lb) × **(3 locomotives)** × (4,300 bhp/locomotive) × (load factor: 0.28) ×
(roundtrip duration from SLOC line to CA border: 29.8 hours)

As shown, this calculation only accounts for *offsite* emissions from **three** 4,300-horsepower locomotives while in line haul mode in San Luis Obispo County (*i.e.*, traveling between the Refinery boundary and the San Luis Obispo County boundary with Monterey County) but does not include the substantial *offsite* emissions that would be generated within San Luis Obispo County by:

a) the **two additional** 4,300-horsepower haul locomotives per train needed for the 30-mile roundtrip distance between the City of Santa Margarita and the City of San Luis Obispo over Cuesta Grade²⁰ (see Appendix B.1, p. B.1-9, **Line Haul SM/SLO: 5.34 lbs/day ROG and 66.12 lbs/day NOx**) and

b) the **switching activities** that would occur *offsite* outside of the Refinery boundary, about 14.6 percent of total switching emissions; thus total offsite switching emissions are estimated as: $0.146 \times (\text{total switching emissions: } 25.23 \text{ lbs/day ROG and } 198.66 \text{ lbs/day NOx}) = \mathbf{3.67 \text{ lb/day ROG and } 28.93 \text{ lb/day NOx}$.

Together, these omitted emissions (locomotives over Cuesta Grade: 5.34 lbs/day ROG + 3.67 lbs/day ROG = **9.02 lbs/day ROG** and switching: 66.12 lbs/day NOx + 28.93 lbs/day NOx = **95.05 lbs/day NOx**²¹) account for the discrepancy between the unmitigated emissions from locomotive operations reported in the Final EIR Table 4.3.14 and those calculated in Appendix B.1 (see Table 4). The same calculation can be made for all other pollutants.

Table 5 summarizes revised total unmitigated ROG+NOx and DPM emissions within San Luis Obispo County, *i.e., onsite and offsite Project* emissions including the omitted *offsite* emissions from locomotives over Cuesta Grade and offsite switching, compared to those presented by the Final EIR, Table 4.3.15.

Table 5:
Total unmitigated Project operational emissions of ROG+NOx and DPM within San Luis Obispo County based on Final EIR, Appendix B.1 compared to Final EIR and SLOCAPCD significance thresholds (significant emissions bolded)

Pollutant	SLOCAPCD Thresholds	Final EIR ^a	Based on Final EIR Appendix B.1 ^b	Discrepancy ^c
ROG+NOx				
Peak daily (lbs/day)	25	621.4	725.53	104.13
Annual (tons/year)	25	52.3	60.61	8.31
DPM				
Peak daily (lbs/day)	1.25	24.2	29.80	5.60

Numbers may not add up due to rounding

a From: Final EIR, Table 4.3.14

b Revised peak daily ROG+NOx and DPM emissions = (ROG+NOx and PM10 emissions from 'Total Emissions within SLOC' from Table 2) + (ROG+NOx and PM10 from Row 3 from Table 4); revised annual ROG+NOx and DPM emissions = (ROG+NOx and PM10

²⁰ Final EIR, p. 2-23.

²¹ Sums do not exactly correspond to the values presented in Table 4 due to rounding.)

emissions from 'Total Emissions within SLOC' from Table 2) + (ROG+NOx and PM10 from Row 7 from Table 4)

c Discrepancy = (Based on Final EIR Appendix B.1) - (Final EIR)

As shown in Table 5, the discrepancies between the emission estimates reported in the Final EIR, Table 4.3.14, and those based on the Final EIR's Appendix B.1 alone exceed the SLOCAPCD's peak daily of significance thresholds for ROG+NOx and DPM multiple times. The same problem, *i.e.*, omission of emissions from the two additional haul locomotives over Cuesta Grade and offsite switching activities, occurs for *mitigated* emissions and is carried over into the Final EIR's presentation of *unmitigated* and *mitigated* Project operational emissions within San Luis Obispo County (Tables 4.3.14 through 4.3.17) and estimates of health impacts due to increased ozone concentrations (Table 4.3.22; *see* Comment II.B).

It is important to accurately quantify emissions because Mitigation Measure AQ-3, which is intended to reduce ROG+NOx and DPM emissions to below the SLOCAPCD's thresholds of significance, relies on the emission estimates presented in the Final EIR; because the Final EIR substantially underreports peak daily ROG+NOx and DPM emissions, this mitigation measure will not reduce all Project emissions in excess of the air district's daily thresholds of significance. Therefore, the Final EIR fails to adequately mitigate significant emissions. For a discussion of all feasible mitigation, *see* Comment III.E below.

Further, because the health risk modeling presented by the Final EIR, Table 4.3.22, relies on the emission estimates reported in Table 4.3.16,²² the Final EIR also fails to disclose the magnitude of and adequately mitigate significant health risks.

These discrepancies must be corrected in a revised EIR, circulated for public review, to ensure that sufficient emission reductions will be required to offset Project emissions below the SLOCAPCD's thresholds of significance and that health risks due to Project emissions are not underestimated and adequately mitigated.

C. The Final EIR Substantially Underestimates Mainline Locomotive Emissions

The Final EIR's estimates for mainline locomotive emissions rely on emission factors developed by the EPA in grams/horsepower-hour ("g/hp-hr").²³ To calculate emissions based on these emission factors, the Final EIR makes assumptions about two

²² Compare peak daily and annual emissions in Final EIR, Table 4.3.1, with Final EIR, Appx. B.1., p. B.1-247, 'Mainline Rail Routes: District Thresholds Mitigated.'

²³ Final EIR, Appx. B.1., p. B.1-9, 'Locomotive Emissions,' *see* 'Emission Factor (g/bhp-hr/engine).'

parameters: a) the train speed²⁴ and b) the locomotive engine load factor, *i.e.*, the percentage of engine power used. The Final EIR fails to demonstrate that its assumptions are realistic for the Project trains.

Train Speed

The Final EIR estimates the number of hours the crude oil trains would travel through each air district by multiplying the distance within each air district in miles with an average train speed of 40 miles per hour²⁵ (“mph”) (with exception of the distance between the San Luis Obispo County line to the SMR over Cuesta Grade, where an average train speed of 20 mph was assumed²⁶). As explained in Dr. Fox’s forthcoming comments, an average mainline train speed of 40 mph is very high for the terrain that will be traversed within California because:

- a) some of the routing is mountainous where trains will move slower and pause to add/drop helper engines;
- b) some of the routing is in urban areas where speeds may be lower, *e.g.*, Sacramento or Oakland;
- c) crude unit trains are long and heavy; and
- d) there may be congestion and delays, especially in areas with lots of rail traffic and passenger trains that have priority (such as Roseville-Benicia).

Dr. Fox estimated a conservative average train speed of 26 mph, considerably lower than the 40 mph assumed by the Final EIR for mainline train travel.

Figure 1a shows probable rail routes through California for the Project’s trains and Figure 1b shows a physical relief map of California.

²⁴ Train speed is specified rather than locomotive speed because each train is typically hauled by more than one locomotive.

²⁵ Final EIR, Appx. B.1, p. B.1-9, ‘Locomotive Emissions,’ *see* ‘Average Line haul Speed, mph’.

²⁶ Final EIR, Appx. B.1, p. B.1-9, ‘Locomotive Emissions,’ *see* ‘SM to SLO Time (20 mph) hrs’.



Figure 1a: Probable rail routes through California to the Refinery
(excerpted from: Final EIR, Figure 2-9)



Figure 1b: Physical relief map of California

Elsewhere the Final EIR claims that “most of the mainline route trains are expected to have an average speeds between 30 and 40 mph” and recognizes that:

There are areas along the mainline rail route that have reduced speed limits for trains that pass in proximity of sensitive receptors. For example, in the City of San Luis Obispo, trains are limited to a speed of 25 miles per hour. In the City of Davis, there are stretches of track that are limited in speed to 10 mph.²⁷

Yet, the Final EIR it fails to carry over this realization regarding train speeds into its calculations of mainline emissions with the exception of a lower train speed of 20 mph over Cuesta Grade for the two additional locomotives (the other three locomotives attached to the train are assumed to continue traveling at 40 mph).

Clearly, given the diverse terrain the crude oil trains must traverse in California and the many existing restrictions on train speed through populated areas, an average train speed of 40 mph is unrealistically high and, consequently, the number of hours calculated for locomotives traveling through most, if not all, air districts are too low.

²⁷ Final EIR, p. 4.3-74.

Further, review of the sources cited by the Final EIR also do not support a statewide average trains speed of 40 mph. The Final EIR cites to “POLB 2008, Port of Long Beach” as the source for the average train speed.²⁸ Neither the main text of the Final EIR nor Appendix B.1 identify this study; however, since the Final EIR similarly refers to the Port of Los Angeles Inventory of Air Emissions 2010 as “POLA 2011,”²⁹ the reference is presumably to the 2008 emissions inventory conducted for the Port of Long Beach. This document contains a section on locomotives;³⁰ however, this document does not contain information on train travel speed *and* the provided information from which speed could be derived is specific to locomotives calling on the Port of Long Beach travelling 21 miles along the Alameda Corridor and 84 miles between the north end of the Alameda Corridor and the Air Basin boundary.³¹ The terrain along these corridors is largely flat and go through the Central Valley where relatively little congestion and delays can be expected and, thus, train speed will be relatively high. Further, the trains calling on the Port of Long Beach primarily transport intermodal (containerized) freight, with lesser amounts of dry bulk, liquid bulk, and car-load (box car) freight³². Thus, most trains are considerably lighter and, thus, can be expected to have higher average travel speeds than the trains delivering crude oil to the Refinery. In sum, the average train speed of 40 mph assumed by the Final EIR throughout California is unrealistic. I note that just because a loaded train goes slowly up or down a mountain or along a windy portion of track, does not mean that an empty train can go full speed. For example, due to the winding tracks in Feather River Canyon in the Sierra Nevada through the Feather River AQMD, all trains, whether full or empty, are restricted to 25 mph.³³

In the Final EIR’s calculations, train speed is inversely proportional to estimated emissions; therefore, locomotive emissions for the many sections of California through hilly terrain where trains will be slow, are substantially underestimated. Consequently,

²⁸ Final EIR, Appx. B.1., p. B.1-10, ‘Locomotive Emissions,’ *see* Notes (“Locomotive speed based on POLB 2008 of 40 mph”).

²⁹ Final EIR, p. 4.3-96.

³⁰ Port of Long Beach, Air Emissions Inventory – 2008, Section 5: Railroad Locomotives; <http://www.polb.com/environment/air/emissions.asp>. (Exhibit 2)

³¹³¹*Ibid*, p. 158 and Table 5.9.

³² Port of Long Beach, Air Emissions Inventory – 2008, *op. cit.*, p. 141.

³³ For example, Route Descriptions, Feather River Canyon (“The Feather River Route is divided into the following subdivisions: Sacramento Subdivision from [El Pinal (Stockton) and] Binney Junction to Oroville; Canyon Subdivision from Oroville to Keddie [and Portola]. ... The speed limit is 70 mph from Binney Junction to Oroville, 45 mph thence to Poe, and 25 mph all the way through the canyon.”); <http://home.earthlink.net/~donwinter/Railroad%20Infrastructure%20and%20Traffic%20Data/Trunk%20Routes/Original%20California%20Zephyr%20Route/Route%20Descriptions/Binney%20Junction%20to%20Keddie.htm>; Trains Magazine, Double Tracking Donner Summit (“... Union Pacific is finally realizing that even though the grades are stiffer over the Sierra on the Donner Pass route, it is also a more direct route into and out of Northern California than the Feather River Canyon, and despite the grades, does not have the 25mph speed limit of the Canyon.”); <http://cs.trains.com/trn/f/111/t/138251.aspx>.

the Final EIR also substantially underestimates health risks (*see* Comment II). In fact, the Final EIR in the section discussing cancer risks for the uprail air districts recognizes and illustrates the inverse relationship between train speed and emissions of carcinogenic diesel particulate matter emissions, as shown in the excerpt in Figure 2.

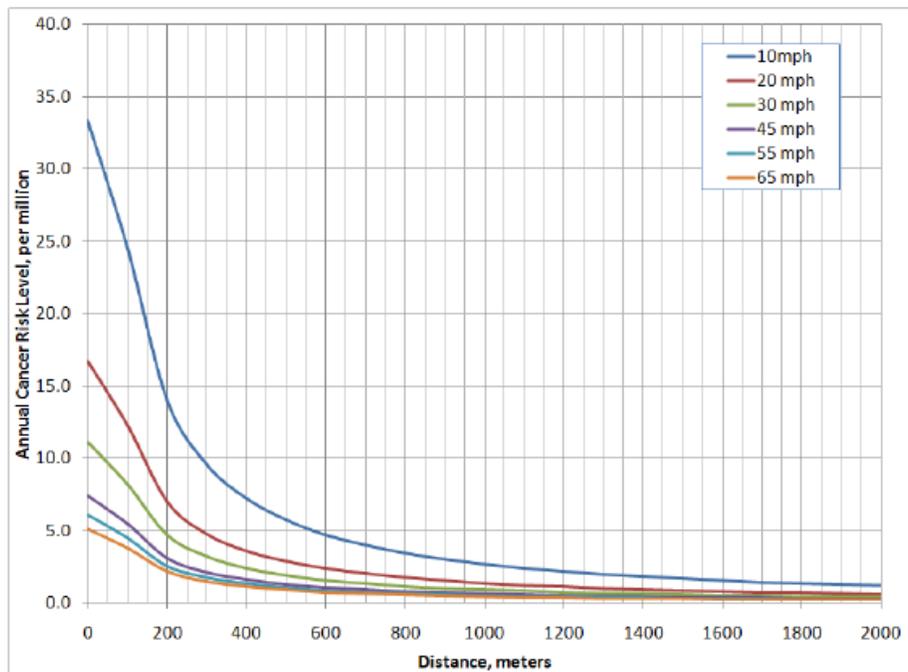


Figure 2: Mainline Locomotive Cancer Risk, by speed and distance from Mainline
From: Final EIR, Figure 4.3-9

As shown, the higher the speed, the lower the emissions and resulting cancer risk or, the lower the speed, the higher the emissions and resulting cancer risk.

Locomotive Load Factor

Further, the Final EIR assumes an average mainline load factor of 28 percent for trains traveling within California³⁴ (with exception of the distance between the San Luis Obispo County line to the SMR over Cuesta Grade, where it assumes an average load factor of 18 percent over Cuesta Grade for the two additional locomotives³⁵). For the 28 percent load factor, the Final EIR cites to POLA 2011 and POS 2011,³⁶ which reference

³⁴ Final EIR, Appx. B.1, p. B.1-9, 'Locomotive Emissions,' *see* 'Line Haul Load Factor.'

³⁵ Final EIR, Appx. B.1, p. B.1-9, 'Locomotive Emissions,' *see* 'SM to SLO Load' and Notes ("SM to SLO Grade would add 2 engines, operating under dynamic braking (2.1% load) coming downhill (11.7 miles), standard 28% load uphill (3.3 miles) and a standard 28% load returning (15 miles) for an average of 18% load.")

³⁶ Final EIR, Appx. B.1., p. B.1-10, 'Locomotive Emissions,' *see* Notes ("Locomotive load factor based on (cont'd)

the 2011 Port of Los Angeles Inventory of Air Emissions and the 2011 Carbon Footprint Study for the Port of Seattle.³⁷ These documents, like the 2008 Port of Long Beach Inventory, rely on the percentage of full power in each locomotive throttle notch setting³⁸ and the average percentage of line haul locomotive operating time in each throttle notch setting listed in the EPA's Regulatory Support Document which was published as background to EPA's locomotive rule-making process.^{39,40,41,42} The derivation of this average load factor of 28 percent is shown in the excerpt in Table 6 from the Port of Los Angeles 2011 inventory below.

POLA 2011, and POS 2011").

³⁷ Final EIR, p. 4.3-96.

³⁸ EPA, Office of Mobile Sources, Locomotive Emission Standards Regulatory Support Document, April 1998, revised, p. 13.; <http://www3.epa.gov/otaq/documents/420r98101.pdf>. (Exhibit 3) ("Power settings for railroad engines (throttle position) generally involve eight discrete positions, or notches, on the throttle gate, in addition to idle and the dynamic brake function... Each throttle notch position is numerically identified, with notch position one being the lowest power setting, other than idle, and position eight being maximum power. Because of this design, each notch on the throttle corresponds to a discrete setting on the fuel delivery system of the engine. These are the only engine power settings at which the locomotive can operate. The net effect of this method of control is that the engines can operate at only eight distinct power levels for propulsion, and at idle and dynamic brake.")

³⁹ The Port of Los Angeles, Inventory of Air Emissions for Calendar Year 2011, p. 118 ("The average load factor for a typical line haul locomotive calling on the Port has been estimated by multiplying the percentage of full power in each throttle notch setting by the average percentage of line haul locomotive operating time in that setting, as summarized in Table 6.6. Both of these sets of percentages are EPA averages listed in the RSD documentation. This average load factor is probably overestimated because the throttle notch distribution is representative of nation-wide operation; including time traveling uphill when the higher notch positions are most often used. However, detailed throttle notch information has not been available to enable the development of an average on-port load factor. In the table, dynamic braking is DB."); https://www.portoflosangeles.org/pdf/2011_Air_Emissions_Inventory.pdf. (Exhibit 4)

⁴⁰ Port of Seattle, Carbon Footprint Study for the Asia to North America Intermodal Trade, June 2011, p. 13 ("The load factor used for rail operations was determined using weighted time in notch settings as per recent port emission inventories. The load factor applied in this study is 0.28. This load value is based on operation data taken from 63 trains from 4 Class I railroads over many sections of the country with various types of terrain." Internal citations omitted); http://www.portseattle.org/cargo/green-gateway/documents/carbon_footprint_study_20110610.pdf. (Exhibit 5)

⁴¹ Port of Long Beach, Air Emissions Inventory – 2008, *op. cit.*, p. 151.

⁴²EPA, Locomotive Emission Standards Regulatory Support Document, *op. cit.*

Table 6: Estimated Average Load Factor

Notch	% of Full Power in Notch	% of Operating Time in Notch	% Full Power x % Time
DB	2.1%	12.5%	0.003
Idle	0.4%	38.0%	0.002
1	5.0%	6.5%	0.003
2	11.4%	6.5%	0.007
3	23.5%	5.2%	0.012
4	34.3%	4.4%	0.015
5	48.1%	3.8%	0.018
6	64.3%	3.9%	0.025
7	86.6%	3.0%	0.026
8	102.5%	16.2%	0.166
Average line haul locomotive load factor:			0.28

DB = dynamic breaking

From: Port of Los Angeles, Inventory of Air Emissions for Calendar Year 2011, *op. cit.*, Table 6-6

The supporting parameters for the average load factor – throttle notch setting and average percentage of line haul locomotive operating time in each throttle notch – represent nationwide averages based on data collected by EPA.⁴³ Consequently, the average line haul load factor based on these parameters represents an average determined for all types of locomotives, unit and manifest trains carrying all types of freight in all kinds of rail cars, and across all types of terrain. While this nationwide average load factor may be appropriate for developing emissions inventories for rail operations on a larger scale, it is a very poor indicator to use for estimating project-specific emissions on a regional or local basis for a particular type of load, especially on a daily basis within specific air districts. Clearly, hauling a load of grains across the Great Plains or short intermodal freight trains across the largely flat Los Angeles Basin will require lower throttle notch settings and load factors than hauling heavy crude tank cars across the varied terrain in California, including the rugged mountains of the Sierra Nevada. Throttle mode and time spent in each throttle mode affect locomotive fuel consumption and emissions from locomotives; as a consequence, the nationwide average load factors determined for all types of rail transportation across the entire U.S. are not appropriate for estimating air district-specific emissions from hauling crude oil

⁴³See EPA, Locomotive Emission Standards Regulatory Support Document, *op. cit.*; (“In the case of line-haul operations, the data came from 63 trains operated by five Class I railroads. Train operations were spread over many regions of the nation and represented approximately 2,475 hours of freight train operations.”); collected data in Appx. B.

trains through California, especially not where trains will be hauling heavy crude oil trains across steep terrain.

Revised Emission Estimates Based on Lower Average Train Speed

To illustrate the effect of speed on emissions, I prepared revised emission estimates assuming a lower average train speed of 26 mph (as determined by Dr. Fox) within California (outside of San Luis Obispo County) and otherwise relying on all of the Final EIR's assumptions and using the Final EIR's methodology; the results are summarized in Table 7.

Table 7: Unmitigated peak daily and annual locomotive emission estimates within California (outside of San Luis Obispo County) from Final EIR based on 40 mph average mainline locomotive speed and revised based on 26 mph average mainline locomotive speed

	Peak Daily Emissions (lbs/day)					
	ROG	CO	NOx	SO ₂	PM10	PM2.5
Final EIR, Appendix B.1, p. B.1-9 (40 mph)	249.13	303.70	3,084.46	14.24	142.36	138.09
Revised	383.28	467.23	4,745.32	21.90	219.01	212.44
Difference	134.15	163.53	1,660.86	7.67	76.66	74.36
	Annual Emissions (tons/year)					
	ROG	CO	NOx	SO ₂	PM10	PM2.5
Final EIR, Appendix B.1, p. B.1-9 (40 mph)	11.57	37.96	251.50	1.78	7.71	7.48
Revised	17.79	58.40	386.93	2.74	11.86	11.51
Difference	6.23	20.44	135.42	0.96	4.15	4.03

As shown in Table 7, locomotive emissions dramatically increase when assuming a lower average train speed of 26 mph compared to the Final EIR's assumption of 40 mph. (Emissions within San Luis Obispo County are similarly underestimated.) Thus, the Final EIR substantially underestimates mainline rail emissions. Adjustment of the average load factor to a more realistic value would further increase emissions. I note, that the above estimates for mainline emissions in California cannot be scaled to the air districts based on mileage alone the way the Final EIR estimates emissions. As discussed earlier, the train speed and load factors can vary substantially depending on terrain, speed limits, and other factors; these factors must be taken into account to provide adequate emission estimates for all air districts (including San Luis Obispo County).

D. The Final EIR Fails to Correctly Characterize Mitigated Onsite Locomotive Emissions at the SMR and, Consequently, Total Project Emissions within San Luis Obispo County

The Final EIR's estimates of *mitigated* operational locomotive and total Project emissions (Final EIR Tables 4.3.16, and 4.3.17) assume the use of locomotives that comply with the U.S. Environmental Protection Agency ("EPA") Tier 4 emission standards as well as limited locomotive idling time onsite at the SMR to no more than 15 consecutive minutes per Mitigation Measure AQ-2b. However, the County continues to doubt that the Applicant will be able to enter into a contract with Union Pacific Railroad ("UPRR") that contains provisions for UPRR to use only Tier 4 locomotives.⁴⁴

Yet, the Final EIR only provides summary tables incorporating the effect of Tier 4 locomotives and idling restrictions (Tables 4.3.16 and 4.3.17) but fails to provide summary tables incorporating only those mitigation measures the County recognizes as indisputably feasible and certain to be implemented. According to the Final EIR, these measures include *only* idling restrictions *onsite* at the SMR and the reduction of all remaining *onsite* emissions at the Refinery to below the SLOCAPCD's significance thresholds (be it by methods to reduce emissions from SMR equipment, contributions to SLOCAPCD programs to reduce emissions elsewhere, or the use of emission reduction credits, as discussed further below.) Thus, the Final EIR fails to adequately identify the significance of *mitigated* emissions after implementation of those mitigation measures it finds feasible.

E. The Final EIR Fails to Adequately Assess and Identify Significant Impacts due to Emissions of Criteria Pollutants for All Air Districts Outside of SLOCAPCD

The Final EIR analyzes the impacts on air quality resulting from mainline locomotive emissions of ozone precursors to and from the SMR along two potential northern routes (blue) and two southern routes (red), as shown in Figure 1a above.

Specifically, the Final EIR presents estimates for mainline emissions within each air district along two northern routes to the Roseville Railyard via Martinez or via Stockton and along the southern route to the Colton Railyard in Table 4.3.18 (*unmitigated*) and Table 4.3.20 (*mitigated*). The Final EIR also presents estimates for mainline emissions within each air district past the Roseville and Colton Railyards to California border and from the California border to the Canadian border in

⁴⁴ For example, Final EIR, p. 4.3-62.

Tables 4.3.19 (*unmitigated*) and 4.3.21 (*mitigated*). The Final EIR’s estimates of *mitigated* emissions assume the exclusive use of Tier 4-compliant locomotives.⁴⁵

However, the Final EIR fails to provide summary tables that compare total district-wide peak daily and annual *unmitigated* and *mitigated* mainline emissions before and past the Roseville or Compton Railyards with the respective air district’s thresholds of significance. The Final EIR claims that it provides such a comparison for Table 4.3.18 (*unmitigated* emissions before Roseville Railyard):

Criteria pollutant emissions from the mainline operations are tabulated in Table 4.3.18 by Air District (see Table 4.3.22 for a comparison with each of air district thresholds).⁴⁶

This incorrect, Table 4.3.22 does *not* tabulate unmitigated emissions from Table 4.3.18 but instead only provides thresholds of significance for NO_x and ROG for the affected air districts along with the Final EIR’s findings of significance for *mitigated* and *unmitigated* ROG and NO_x emissions indicated as yes (“Y”) or no (“N”), as shown in the following excerpted in Table 8. This presentation makes it difficult to follow the Final EIR’s findings, which as discussed below, are incorrect.

Table 8: Excerpted Table 4.3.22 from Final EIR

Air District	Thresholds of Significance						Incremental Increase in ozone, ppb	Mortality per 1,000 persons	Morbidity per 1,000 persons
	NO _x		VOC/ROG		Significant?*				
	Daily (lbs)	Annual (tons)	Daily (lbs)	Annual (tons)	NO _x	ROG /VOC			
SCAQMD	55		55		Y/N	N/N	0.00	0.01	0.01
VCAPCD	25		25		Y/Y	N/N	0.01	0.03	0.05
SBCAPCD	240	-	240	-	Y/N	N/N	0.04	0.13	0.15
SLOAPCD	25	25	25	25	Y/N	Y/N	0.02	0.06	0.06
MBUAPCD	137		137		Y/N	N/N	0.02	0.06	0.08
SMAQMD	65		65		Y/N	N/N	0.01	0.02	0.03
SJVAPCD		10		10	Y/N	N/N	0.00	0.01	0.01
YSAQMD		10		10	N/N	N/N	0.06	0.18	0.23
BAAQMD	80	15	80	15	Y/N	N/N	0.01	0.02	0.02
PCAPCD	82		82		Y/N	N/N	0.05	0.17	0.19
N. Sierra	25 .		25 .		Y/N	N/N	0.02	0.08	0.08
Feather R	25 .		25 .		Y/N	N/N	0.00	0.01	0.01
Butte	25 .		25 .		Y/N	N/N	0.03	0.17	0.13
Tehama	25 .		25 .		Y/N	N/N	0.05	0.26	0.21
Shasta	25 .		25 .		Y/Y	Y/N	0.04	0.20	0.17
Siskiyou	25 .		25 .		Y/Y	Y/N	0.09	0.46	0.36
Mojave	137 .	25	137 .	25	Y/N	N/N	0.04	0.13	0.17

* for unmitigated/mitigated emissions. Incremental ozone and mortality/morbidity based on unmitigated emissions. Mitigated emissions include the use of Tier 4 locomotives.

⁴⁵ Final EIR, p. 4.3-59. (“Tables 4.3.20 and 4.3.21 provide an estimate of the mainline emissions with the implementation of mitigation measures requiring the use of Tier 4 locomotives.”)

⁴⁶ Final EIR, p. 4.3-56.

Further, review of the underlying spreadsheets in Appendix B.1. shows that, contrary to the Final EIR’s claim, Table 4.3.22 does not compare *unmitigated* ROG and NOx emissions from Table 4.3.18 with the respective districts’ thresholds of significance but rather combined *mitigated* ROG and NOx emissions from Tables 4.3.20 and 4.3.21, *i.e.*, the maximum peak daily and annual ROG emissions determined for each route and each air district (for the SCAQMD and Placer County APCD, this includes both emissions before and beyond the Colton and Roseville Railyards, respectively). I note that there is no equivalent table for *unmitigated* or *mitigated* emissions of CO, SO₂, PM10, or PM2.5. In fact, the Final EIR fails to provide any discussion whatsoever of the significance of *unmitigated* or *mitigated* criteria pollutant emissions in uprail air districts other than for ROG and NOx.

I tabulated the Final EIR’s estimates for *unmitigated* emissions of NOx and ROG by uprail air district from Tables 4.3.18 and 4.3.19 in Table 9 for a more straightforward understanding of the Final EIR’s conclusions regarding their significance.

Table 9: Total *unmitigated* mainline ROG and NOx emissions outside of SLOCAPCD within California

Air District	Thresholds of Significance		Total Unmitigated Mainline Emissions				Significant?	
	NOx (lbs/day)/ (tons/year)	ROG (lbs/day)/ (tons/year)	NOx		ROG		NOx	ROG
			(lbs/day)	(tons/year)	(lbs/day)	(tons/year)		
SCAQMD ^a	55/--	55/--	565.39	46.10	45.67	2.12	YES	no
VCAPCD	25/--	25/--	298.80	24.36	24.13	1.12	YES	no
SBCAPCD	55/10	55/10	559.54	45.62	45.19	2.10	YES	no
MBUAPCD	137/--	137/--	586.43	47.82	47.37	2.20	YES	no
SMAQMD	65/--	65/--	195.94	15.98	15.83	0.73	YES	no
SJVAPCD	--/10	--/10	259.34	21.15	20.95	0.97	YES	no
YSAQMD	--/10	--/10	166.05	13.54	13.41	0.62	YES	no
BAAQMD	80/15	80/15	715.87	58.37	57.82	2.68	YES	no
PCAPCD ^a	82/--	82/--	461.29	37.61	37.26	1.73	YES	no
Nevada/ Northern Sierra	25/--	25/--	152.56	12.32	12.44	0.57	YES	no
Feather River	25/--	25/--	136.21	11.11	11.00	0.51	YES	no
Butte	25/--	25/--	236.18	19.26	19.08	0.89	YES	no
Tehama	25/--	25/--	209.80	17.11	16.95	0.79	YES	no
Shasta	25/--	25/--	371.92	30.33	30.04	1.39	YES	YES
Siskiyou	25/--	25/--	462.11	37.68	37.32	1.73	YES	YES
Mojave	137/--	137/25	1,038.41	84.67	84.67	3.89	YES	no

Emissions exceeding air districts’ significance thresholds shown in grey

AQMD = Air Quality Management District; APCD = Air Pollution Control District; SCAQMD = South Coast AQMD; VCAPCD = Ventura County APCD; SBCAPCD = Santa Barbara County APCD; MBUAPCD = Monterey Bay Unified APCD; SMAQMD = Sacramento Metropolitan AQMD; SJVAPCD = San Joaquin Valley APCD; YSAQMD = Yolo Solano AQMD; BAAQMD = Bay Area AQMD; PCAPCD = Placer County APCD; Nevada/Northern Sierra = Nevada County/Northern Sierra APCD, Feather River = Feather River AQMD; Butte = Butte County AQMD; Tehama =

Tehama County AQMD, Shasta = Shasta County AQMD; Siskiyou = Siskiyou County APCD; and Mojave = Mojave Desert AQMD

- a Total *unmitigated* Project mainline emissions calculated as the sum of the maximum emissions from Tables 4.3.18 and 4.3.19 for each air district

The Final EIR, without presenting a direct comparison of *unmitigated* emissions with the respective air districts' significance thresholds, finds that *unmitigated* emissions of ROG and NO_x for routes between the Refinery and the Roseville and Colton Railyards "would be emitted at levels above the daily CEQA thresholds established by most of the air districts along the route" and for routes between the Roseville and Colton Railyards and the California border "would add to an impact that was already found to be significant as discussed above." This brief discussion is entirely inadequate to disclose the significant impacts that would occur within the uprail air districts and is also incorrect.

First, the vague admission that *unmitigated* ROG and NO_x emissions "would be emitted at levels above the daily CEQA thresholds established by most of the air districts along the route" is meaningless to the affected air districts without identification. Further, some air districts don't even have daily thresholds but only established annual thresholds. As shown in Table 9a, *unmitigated* NO_x emissions estimated by the Final EIR would exceed the daily *and/or* annual significance thresholds established by *all*, not most, air districts and *unmitigated* ROG emissions would exceed the daily significance thresholds established by the Shasta County AQMD and the Siskiyou County APCD. Thus, the Final EIR fails to properly identify significant impacts from *unmitigated* ROG and NO_x emissions for all uprail air districts.

Identification of *unmitigated* emissions within each uprail air district, as tabulated in Table 9a for ROG and NO_x, is important because the County doubts that Mitigation Measure AQ-5, which requires the use of Tier 4-compliant locomotives, would be implemented due to federal preemption. (*See* discussion in Comment IV.) Thus, a summary table showing whether significance thresholds would be exceeded in the affected air districts is indispensable. Such a summary table, which should be included in a Revised EIR, must include all pollutants including CO, SO₂, PM₁₀, or PM_{2.5}.

Second, the Roseville Railyard is located within the Placer County APCD's jurisdiction and the Colton Railyard is located within the South Coast AQMD's jurisdiction. Thus, emissions generated before and beyond the railyards (Tables 4.3.18 and 4.3.19) must be summed for these two air districts before making a finding of significance. As discussed, the Final EIR provides no such summary table and its discussion does not discuss the combined impacts in these two air districts. A reviewer cannot be expected to tease this information piece by piece from the tables presented in the Final EIR.

Third, the Final EIR, Table 4.3.22, finds that total *unmitigated* mainline emissions of NOx within each air district (ROG+NOx for the SLOCACPD) would exceed the daily and/or annual significance thresholds within all air districts with exception of the Yolo Solano APCD. This is incorrect, as shown in Table 9a, *unmitigated* annual mainline NOx emissions within the Yolo Solano APCD (13.54 tons/year) would by far exceed the district’s annual significance threshold of 10 tons/year. Thus, the Final EIR fails to identify significant impacts for the Yolo Solano APCD.

II. The Final EIR’s Analyses of Health Impacts Are Erroneous and Not Supported and Fail to Identify Significant Impacts

The Final EIR presents two analyses for health impacts resulting from Project emissions: a) a health risk assessment for near-Refinery impacts and b) an analysis of health impacts resulting from mainline operational emissions of ozone precursors. Both analyses are substantially flawed.

A. The Final EIR’s Health Risk Assessment Is Erroneous and Fails to Identify the Magnitude of Cancer Risk Near the Refinery

The Final EIR presents the results of a revised health risk assessment for *unmitigated* emissions near the Refinery in Table 4.3.23 and Figure 4.3-6. In Table 4.3.34 and Figures 4.3-7 and 4.3-8, the Final EIR presents two scenarios for *mitigated* emissions near the Refinery: a) for full mitigation including the use of Tier 4 Locomotives, idling restrictions, and clean trucks (Mitigation Measures AQ-2a, 2b and 4b) and b) for partial mitigation including idling restrictions, daytime unloading only and clean trucks (Mitigation Measures AQ-2b, 4b, and 4c). Table 10 shows the Final EIR’s results for cancer risks for the two mitigated scenarios.

Table 10: Cancer risks due to mitigated emissions from the Project near the Refinery

Scenario	PMI	MEIR	Worker	Louise Ln	Trilogy Prkwy	Monadella Street	Olivera Ave	Sig?
Mitigation: Tier 4 Locomotives, idling restrictions, clean trucks (AQ-2a, 2b and 4b)								
Scenario 1 - Rail Spur + SMR + trucks	23.2	6.0	0.27	1.1	1.0	5.1	3.8	No
Scenario 2 - Rail Spur + SMR + trucks+ Mainline	24.4	6.5	0.31	1.1	1.0	6.5	4.2	No
Partial Mitigation: idling restrictions, daytime unloading only and clean trucks (AQ-2b, 4b, 4c)								
Scenario 1 - Rail Spur + SMR + trucks	54.7	10.4	0.63	2.5	1.8	9.6	9.6	Yes
Scenario 2 - Rail Spur + SMR + trucks+ Mainline	58.0	13.6	0.69	2.6	1.9	13.6	10.9	Yes

PMI = point of maximum impact; MEIR = maximally exposed individual resident

These estimates for cancer risks near the Refinery are based on substantially underestimated emissions because they rely on an average train speed of 40 mph, as discussed in Comment I. As shown in Figure 2 above (excerpted from the Final EIR), emissions and cancer risks increase at lower speeds as the locomotives spend more time traversing a certain distance. The Final EIR did not take into account that trains slow down near the Refinery but instead assumed a constant speed of 40 mph all the way to the unloading rack. Thus, the Final EIR fails to identify the magnitude of health risks near the Refinery and fails to require adequate mitigation.

B. The Final EIR's Analysis of Health Impacts Resulting from Total Mainline Operational Emissions of Ozone Precursors Is Erroneous and Not Supported

The Final EIR, concluding that mainline emissions of ozone precursors would remain above the significance thresholds even after mitigation," proceeds to present an analysis "to clarify the potential health impacts of these emissions." Specifically, the Final EIR's analysis estimates the incremental increase in ozone in parts per billion ("ppb") for each air district due to Project emissions of the ozone precursors NO_x and ROG and calculates the associated increase in mortality and morbidity for the residents in each air districts. The Final EIR concludes that "[a]dverse human health impacts that are likely to result from the proposed project's air quality impacts include an increase in ozone, morbidity, and mortality."⁴⁷ There are several problems with the Final EIR's analyses and conclusions.

First, I note that the Final EIR, Table 4.3.22, presents the units for the health risk values - morbidity and mortality - as incidences per 1,000 persons; however, the presented values represent incidences of morbidity and mortality per 1,000 persons **per year**.

Second, the Final EIR provides no definition of mortality or morbidity and provides no thresholds or context that would enable a lay person to interpret the significance of the mortality and morbidity values presented in Table 4.3.22. An adequate discussion must at least include a definition of mortality rate (a measure of the number of deaths in a given population) and morbidity rate (a measure of the incidence rate or the prevalence of a disease or medical condition), which is typically given in units of deaths per 1,000 persons per year, and a discussion of the results. Without providing an adequate discussion of these values and putting them into context, they remain without meaning for the general public.

⁴⁷ Final EIR, pp. 4.3-62 through 4.3-64.

For mortality, an appropriate threshold to evaluate the significance of the calculated values for mortality, for example, is the one-in-a-million lifetime (70 years) *de minimis*⁴⁸ risk threshold for premature death considered insignificant by most regulatory agencies. The Bay Area AQMD, for example, used the one-in-a-million lifetime *de minimis* significance threshold to support the development of its CEQA thresholds of significance for PM2.5 based on excess deaths due to increased PM2.5 concentrations.⁴⁹ This *de minimis* significance threshold for mortality is likewise appropriate here for determining the significance of excess deaths due to increased ozone concentrations.

The significance of increased mortality determined by the Final EIR for each air district can thus be determined by multiplying by the average lifetime of a person and accounting for the population within the air district. The following shows this calculation for Siskiyou County as an example:

$$\begin{aligned} & (\text{increased mortality: } 0.46 \text{ additional deaths}/1,000 \text{ persons}/\text{year}^{50}) \times \\ & (\text{population of Siskiyou County: } 43,799^{51}) \times (70 \text{ years}) / (1,000) = \\ & \mathbf{1,410 \text{ additional deaths/lifetime in Siskiyou County}} \\ & \mathbf{>1-in-one-million lifetime significance threshold for mortality} \end{aligned}$$

Alternatively, the *de minimis* threshold for mortality can be annualized by dividing the one-in-a-million lifetime risk level by the average lifetime of a person, which is typically assumed to be 70 years (e.g., used for health risk assessments⁵²),

⁴⁸There is a practice of risk management called "*de minimis*," which dictates that there exists a level of statistical risk probability for hazards below which people need not concern themselves. This level is often set at either 1 in 100,000 or 1 in 1,000,000, and is set either for a one-year period, or for a lifetime (70 years). The term *de minimis* is a shortened version of the Latin phrase *de minimis non curat lex* which means "the law does not care about very small matters."

⁴⁹See BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, p. 64; <http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/revised-draft-ceqa-thresholds-justification-report-oct-2009.pdf?la=en>. (Exhibit 6) ("A change in ambient concentration of PM2.5 by 0.2 µg/m³, independent of other vehicle pollutants would result in significant forecasted health impacts. Based on a study of intra-urban pollution in Los Angeles, a 0.2 µg/m³ increase in PM2.5 would result in a 0.28 percent increase in non-injury mortality or an increase of about twenty-one excess death per 1,000,000 population per year from non-injury causes in San Francisco (Jerrett 2005). Applying the health effects assessment methodology and Concentration Response Functions in the CARB Staff Report on AAQS for PM published in 2002. A 0.2 µg/m³ increase in PM2.5 affecting a population of 100,000 adults would result in about 20 extra premature deaths per year (CARB 2002). These effects are well above the one-in-a-million lifetime *de minimis* risk threshold for premature death considered insignificant by most regulatory agencies...")

⁵⁰ Final EIR, Table 4.3.22.

⁵¹ Google, Siskiyou County, California/Population; <https://www.google.com/search?q=siskiyou+county+populaiton&ie=utf-8&oe=utf-8>.

⁵² For example, Final EIR, Appx. B.1, p. B.1-22, 'Cancer Risk Calculation,' value for AT (averaging time) = (cont'd)

resulting in an annual significance threshold for mortality of 0.0143 deaths per year.⁵³ Relying on the estimates provided by the Final EIR, the significance of increased mortality due to increased ozone concentrations, for example, for Siskiyou County, can be determined as follows:

(increased mortality: 0.46 additional deaths/1,000 persons/year:) ×
(population of Siskiyou County: 43,799⁵⁴) =
20.14 additional deaths/year in Siskiyou County
>0.0143deaths/year significance threshold for mortality

Thus, based on the Final EIR's presented numbers, increased mortality in Siskiyou County would by far exceed the one-in-a-million lifetime (70 years) *de minimis* risk threshold for premature death (or 0.0143 deaths per year) and represents a significant impact. In other words, based on the Final EIR's numbers, 20 persons⁵⁵ in the District may die per year as a direct consequence of the increased ozone concentrations resulting from locomotive emissions of ozone precursors ROG and NOx within this air district.

For morbidity, results could be explained in terms of the number of additional incidences of hospitalizations, emergency room visits, school absences, and days with restricted activities within a District. For example, the increased morbidity of 0.36 per 1,000 persons per year for the Siskiyou APCD presented in Final EIR Table 4.3.22 (which is for hospitalizations for COPD, *see* below) could be explained as follows: 1 additional person out of every 2,778 persons per year,⁵⁶ or a total of 16 additional persons per year,⁵⁷ would be hospitalized for COPD in the Siskiyou APCD per year as a direct consequence of the increased ozone concentrations resulting from locomotive emissions of ozone precursors ROG and NOx within this air district.

Second, the Final EIR claims that the presented incremental ozone concentrations, mortality and morbidity are based on *unmitigated* emissions.⁵⁸ This is incorrect. Review

25,550 days = 70 years.

⁵³ (1 death/1,000,000 persons)/(70 years/person) = 0.0143 deaths/year.

⁵⁴ Google, Siskiyou County, California/Population, *op. cit.*

⁵⁵ (2013 Population of Siskiyou County: 43,799 persons) × (0.46 additional deaths/1,000 persons/year) = 20.15 additional deaths/year in Siskiyou County.

⁵⁶ (1,000 persons/year/0.36 additional hospital admissions for COPD in Siskiyou County) = 2,777.8 additional hospital admissions for COPD in Siskiyou County/year.

⁵⁷ (2013 Population of Siskiyou County: 43,799 persons) × (0.36 additional hospital admissions for COPD in Siskiyou County/1,000 persons/year) = 15.77 additional hospital admissions for COPD in Siskiyou County/year.

⁵⁸ Final EIR, footnote to Table 4.3.22 ("Incremental ozone and mortality/morbidity based on unmitigated emissions.").

of the spreadsheets provided by the Applicant’s consultant supporting Appendix B.1 shows that the calculation of increased ozone concentrations, and subsequently the calculation of mortality and morbidity, are based on *mitigated* locomotive emissions within each air district, as shown in the excerpt in Table 11 below.

Table 11: Excerpt from Final EIR, Appendix B.1, p. B.1-247

Mainline Rail Routes: District Thresholds

Compare to Final EIR, Tables 4.3-20 and 4.3-21

Mitigated Air District	Thresholds of Significance				Project Emissions, lbs/day		Project Emissions, tpy		Sig NOx?	Sign VOC?
	NO _x		VOC/ROG		NOx	VOC	NOx	VOC		
	Daily	Annual	Daily	Annual						
SCAQMD	55 lbs.		55 lbs.		56.55	6.11			N	N
VCAPCD ⁴	25 lbs.		25 lbs.		29.88	3.22			Y	N
SBCAPCD ²	55 lbs.	10 tons	55 lbs.	10 tons	55.95	6.03	5.38	0.22	Y	N
SLOAPCD ³	25 lbs.	25 tons	25 lbs.	25 tons	34.66	3.73	3.33	0.13	Y	N
MBUAPCD ⁴	137 lbs.		137 lbs.		58.64	6.32			N	N
SMAQMD	65 lbs.		65 lbs.		19.59	2.11			N	N
SJVAPCD ⁵		10 tons		10 tons	25.93	2.79	2.49	0.10	N	N
Yolo/Solano AQMD		10 tons		10 tons	16.61	1.79	1.60	0.06	N	N
BAAQMD	80 lbs	15 tons	80 lbs	15 tons	71.59	7.71	6.88	0.28	N	N
PCAPCD	82 lbs		82 lbs		46.17	4.95	4.44	0.20	N	N
Nevada/Northern Sierra	25 lbs.		25 lbs.		15.30	1.60	1.50	0.10	N	N
Feather River	25 lbs.		25 lbs.		13.60	1.50	1.30	0.00	N	N
Butte	25 lbs.		25 lbs.		23.62	2.54	2.27	0.09	N	N
Tehama	25 lbs.		25 lbs.		20.98	2.26	2.02	0.08	N	N
Shasta	25 lbs.		25 lbs.		37.19	4.01	3.58	0.14	Y	N
Siskiyou	25 lbs.		25 lbs.		46.21	4.98	4.44	0.18	Y	N
Mojave	137 lbs.	25 tons	137 lbs.	25 tons	103.80	11.20	10.00	0.40	N	N

Given the County’s doubts with respect to the legal viability of requiring UPRR to use only Tier 4 locomotives as well as requiring emission reductions outside of the SMR boundary (*see* Comment IV), the Final EIR’s presentation of incremental ozone concentrations and resulting health impacts based on *mitigated* emissions, *i.e.*, using only Tier 4 locomotives, is deceptive and fails to disclose the magnitude of health impacts resulting from Project emissions within the affected air districts. Instead, the Final EIR should have provided estimates for incremental ozone concentrations and resulting health impacts based on *unmitigated* emissions.

Third, as discussed in Comment I.C, the Final EIR substantially underestimates mainline rail emissions for all air districts due its unrealistic assumptions with respect to train speed and locomotive load factor. Further, Comment I.B demonstrates that the Final EIR substantially underreports total *unmitigated* and *mitigated* emissions within San Luis Obispo County because it fails to account for offsite switching emissions and the additional two locomotives required to guide the trains over Cuesta Grade. The same problems are carried over into the estimates of incremental ozone concentrations, mortality and morbidity, which are therefore much too low.

Fourth, the Final EIR identifies a change in relative risk (“RR”) of mortality and morbidity of 0.75 percent and 2.05 percent, respectively per 10 ppb change in the **1-hour** maximum ozone concentration based on studies by Anderson et al. (1997) and the World Health Organization, which are summarized in a 2005 report by the California Air Resources Board (“CARB”);⁵⁹ yet, the Final EIR’s calculations of incremental increase in ozone and morbidity are based on the change in **8-hour** maximum ozone concentrations, which are considerably lower than the change in 1-hour maximum ozone concentrations and, thus, the Final EIR considerably underestimates mortality and morbidity.

Fifth, the Anderson et al. (1997) study, upon which the Final EIR relies for the relative risk in morbidity (2.05 percent/10 ppb change in 1-hour maximum ozone concentrations), only investigated hospital admissions for COPD for all ages. Hospital admissions for COPD are just one of the health consequences of exposure to elevated ozone concentrations. For example, emergency room visits for asthma often do not result in hospital admissions, yet, they are often directly related to ozone pollution. The 2005 CARB study computed a meta-analytic result of 2.31 percent change in emergency room visits for children under the age of 18 per 10 ppb change in 1-hour maximum ozone concentrations (taking into account the fraction of emergency room patients that were admitted to the hospital). The 2005 CARB study also cited to a study by Stieb *et al.* (1996) which estimated a 3.5 percent change in emergency room visits per 10 ppb change in 1-hour maximum ozone concentrations for persons over 15 years of age.⁶⁰ These emergency room visits are also indicators for ozone-related morbidity, yet, the Final EIR is entirely silent on morbidity beyond hospital admissions for COPD even though Appendix B.1, p. B.1-265, contains a list of baseline morbidity by county for emergency room visits under the age of 18.

Sixth, children, people with compromised immune systems, and the elderly are particularly susceptible to the detrimental health effects of ozone. The 2005 CARB study also identifies a study by Burnett *et al.* (2001), which determined a 6.6 percent increase in respiratory hospital admissions for children under the age of 2 per 10 ppb increase in 1-hour maximum ozone concentrations.⁶¹ Thus, morbidity for children under the age of 2 is higher by a factor of 3.2 (6.6%/2.05%) than those for the general population. The

⁵⁹ Final EIR, p. 4.3-64. (“Potential changes in potential morbidity rates were based on the CARB (2005) study where Anderson et al. (1997) reported a relative risk of 1.04 (95% CI= 1.02-1.07) for hospital admissions for Chronic Obstructive Pulmonary Disease for all ages for a 50 μm^3 [sic] change in ozone. This converts to 2.05% per 10 ppb change in 1-hour maximum ozone.”)

⁶⁰ CARB, Review of the California Ambient Air Quality Standard for Ozone, Volume IV, Appendix B; March 11, 2005 (“CARB 2005”); <http://www.arb.ca.gov/carbis/research/aaqs/ozone-rs/ozone-final/vol4.pdf>.

⁶¹Ibid.

Final EIR entirely fails to address the higher morbidity for children and other susceptible persons due to higher ozone concentrations.

Seventh, in addition to hospital admissions and emergency room visits, there is considerable scientific research reporting significant relationships between elevated ozone levels and other morbidity effects, as summarized in the 2005 CARB study:

Controlled human studies have established relationships between ozone and symptoms such as cough, pain on deep inspiration, shortness of breath, and wheeze. In addition, epidemiological research has found relationships between ozone exposure and acute infectious diseases (e.g., bronchitis, and sinusitis) and a variety of “symptom-day” categories. Some “symptom-day” studies examine excess incidences of days with identified symptoms such as wheeze, cough, or other specific upper or lower respiratory symptoms. Other studies estimate relationships with a more general description of days with adverse health impacts, such as “respiratory restricted activity days” or work loss days. We selected a few endpoints that reflect some minor morbidity effects and carefully adjusted estimates to avoid double counting (e.g., adjusted minor restricted activity days by number of asthma-related emergency room visits).

The 2005 CARB study discusses the results of a study of 1,933 fourth grade students from 12 southern California communities participating in the Children’s Health Study, which determined a 62.9% change in absences associated with a 20 ppb change in 8-hour average ozone concentrations. CARB used the results of this research to support its development of a revised ambient air quality standard for ozone.⁶² The Final EIR is entirely silent on school absences or restricted activity days even though Appendix B.1, p. B.1-265, contains a list of baseline school loss days by county for ages 5 through 17 and minor restricted activity days for 18 years of age and over.

I prepared revised estimates of mortality and morbidity for each of the affected air districts accounting for a) offsite switching emissions and the additional two locomotives required to guide the trains over Cuesta Grade and b) 1-hour ozone concentrations instead of 8-hour ozone concentrations and otherwise using the Final EIR’s methodology. These estimates do not account for any of the above discussed underestimates of mainline emissions but are based on the Final EIR’s estimates for uprail districts. Table 12 summarizes the revised results.

⁶²Ibid.

Table 12: Revised health impacts due to offsite *unmitigated* mainline ozone precursor emissions

Air District/Basin	Unmitigated Project Emissions ^a				Revised Project Impacts ^b		
	NOx		ROG		Incremental Increase in 1-hr Ozone (ppb)	Mortality ^{c,d} (deaths/1,000 persons/year)	Morbidity ^d (incidents/1,000 persons/year)
(lbs/day)	(tons/year)	(lbs/day)	(tons/year)				
SCAQMD	565.39	46.10	45.67	2.12	0.029	0.087	0.115
VCAPCD	298.80	24.36	24.13	1.12	0.122	0.334	0.470
SBCAPCD	559.54	45.62	45.19	2.10	0.442	1.322	1.599
SLOAPCD	348.75	28.41	28.12	1.32	0.158	0.584	0.602
MBUAPCD	586.43	47.82	47.37	2.20	0.219	0.598	0.827
SMAQMD	195.94	15.98	15.83	0.73	0.081	0.278	0.315
SJVAPCD	259.34	21.15	20.95	0.97	0.015	0.052	0.060
YSAQMD ³	166.05	13.54	13.41	0.62	0.586	1.588	2.064
BAAQMD	715.87	58.37	57.82	2.68	0.049	0.161	0.192
PCAPCD	461.29	37.61	37.26	1.73	0.572	1.710	2.021
Nevada/ Northern Sierra	152.56	12.32	12.44	0.57	0.211	0.840	0.798
Feather River	136.21	11.11	11.00	0.51	0.037	1.710	2.021
Butte	236.18	19.26	19.08	0.89	0.362	1.689	1.331
Tehama	209.80	17.11	16.95	0.79	0.636	2.648	2.219
Shasta	371.92	30.33	30.04	1.39	0.484	2.005	1.739
Siskiyou	462.11	37.68	37.32	1.73	0.949	3.870	3.125
Mojave	1,038.41	84.67	84.67	3.89	0.464	1.239	1.672
					Total	20.716	21.170

- a Emissions exceeding air districts' significance thresholds shown in grey
- b Supporting calculations provided in Attachment 1
- c Mortality exceeding annualized *de minimis* threshold of 0.0143/1,000 persons/year shown in grey
- d Hospital admissions for COPD all ages

As shown in Table 12, total mortality and morbidity resulting from unmitigated locomotive emissions of ozone precursors ROG and NOx for all air districts within California add up to about 21 deaths per 1,000 persons per year and about 22 additional hospital admissions for chronic obstructive pulmonary disease (“COPD”) for all ages, a factor of more than 10 higher than those disclosed by the Final EIR of 2 deaths per 1,000 persons per year and about 2 additional hospital admissions for COPD for all ages.⁶³ Mortality within each air district by far exceeds the above discussed *de minimis* risk threshold for premature death as the minimum number of persons to exceed the significance threshold in each air district is below 500 and all air districts have far higher populations than that.⁶⁴ These impacts are solely based on locomotive engine exhaust emissions and will be much higher when the fugitive ROG emissions from tank cars identified in Dr. Phyllis Fox’s forthcoming letter are accounted for.

⁶³ Calculated as sum of mortality and morbidity for all air districts, respectively, from Table 4.3.22.

⁶⁴ For example, calculation for lowest mortality: (*de minimis* threshold: 0.0143 deaths/year) / (mortality SJVAPCD: 0.052 deaths/1,000 persons/year) = 274.7 persons.

In sum, the Final EIR's presentation of ozone-related morbidity resulting from Project emissions of ozone precursors is substantially flawed and fails to convey the seriousness of health impacts that may result from operation of the Rail Spur Project. In addition, this failure undermines a full and adequate discussion of mitigation measures, which the Final EIR must include particularly given its finding of significant and unavoidable impacts, as discussed further below. I suggest that the County correct this section of the air quality analysis per the comments above and publish a revised EIR for public review.

III. The Final EIR Improperly Defers a Feasibility Determination for Proposed Mitigation Measures and Fails to Require all Feasible Mitigation Measures to Reduce Significant Impacts with Respect to Air Quality, Health Risks, and Greenhouse Gases

The Final EIR, referring to the potential federal preemption of proposed mitigation measures intended to reduce emissions from UPRR locomotives, improperly defers a legal analysis of their feasibility and improperly defers preparation of a mitigation monitoring and reporting plan ("MMRP"). Further, the Final EIR fails to require all feasible mitigation to mitigate significant Project impacts.

A. Summary of Significant Impacts due to Air Pollutant Emissions with and without Proposed Mitigation Measures

The Final EIR concludes that the Project's *unmitigated* operational emissions of ROG+NO_x and DPM within San Luis Obispo County would substantially exceed the SLOCACPD's thresholds of significance for these pollutants, resulting in significant impacts on air quality.⁶⁵ As demonstrated in Comment I above, emissions within San Luis Obispo County are even higher than presented by the Final EIR. Specifically, Project operational activities would result in *unmitigated* emissions of about 726 lbs/day and about 72 tons/year ROG+NO_x,⁶⁶*i.e.*, 29 times the District's daily significance threshold of 25 lbs/day and almost 2.5 times the annual significance threshold of 25 tons/year for these pollutants.⁶⁷ Project operational activities would also result in *unmitigated* emissions of almost 30 lbs/day diesel particulate matter,⁶⁸*i.e.*, almost 24 times the District's significance threshold of 1.25 lbs/day for this pollutant.⁶⁹ (The Final EIR also concludes that the Project's *unmitigated* operational emissions in air districts uprail from San Luis Obispo County would exceed the respective air districts'

⁶⁵ Final EIR, p. 4.3-Table 4.3.15.

⁶⁶ See Table 5 above.

⁶⁷ $(725.53 \text{ lbs/day}) / (25 \text{ lbs/day}) = 29.0$; $(60.61 \text{ tons/year}) / (25 \text{ tons/year}) = 2.42$.

⁶⁸ See Table 5 above.

⁶⁹ $(29.80 \text{ lbs/day}) / (1.25 \text{ lbs/day}) = 23.8$.

significance thresholds for some pollutants, resulting in significant impacts on air quality.⁷⁰ The following section discusses the Final EIR's section for San Luis Obispo County; however, all comments related to Tier 4-compliance engines and federal preemption are equally applicable to uprail districts and the respective proposed mitigation measures.)

The Final EIR determines that with use of Tier 4 locomotive engines and limiting locomotive idling onsite to 15 consecutive minutes, while substantially reducing emissions within San Luis Obispo County, emissions would remain far above the District's respective daily significance thresholds, and proposes implementation of the following mitigation measures:

AQ-2a Prior to issuance of Notice to Proceed, the Applicant shall provide a mitigation, monitoring and reporting plan updated annually. The plan shall investigate methods for reducing the onsite and offsite emissions, both from fugitive components and from locomotives or from other SMR activities (such as the diesel pumps, trucks, and compressors to reduce DPM). In addition, locomotive emissions shall be mitigated to the extent feasible through contracting arrangements that require the use of Tier 4 locomotives or equivalent emission levels. The plan shall indicate that, on an annual basis, if emissions of ROG+NO_x and DPM with the above mitigations still exceed the thresholds, as measured and confirmed by the SLOCAPCD, the Applicant shall secure SLOCAPCD-approved onsite and/or offsite emission reductions in ROG + NO_x emissions or contribute to new or existing programs to ensure that project-related ROG + NO_x emissions within SLO County do not exceed the SLOCAPCD thresholds. Coordination with the SLOCAPCD should begin at least six (6) months prior to issuance of the Notice to Proceed for the Project to allow time for refining calculations and for the SLOCAPCD to review and approve any required ROG+NO_x emission reductions.

AQ-2b Prior to issuance of Notice to Proceed, the Applicant shall implement a program, including training and procedures, to limit all locomotive onsite idling to no more than 15 consecutive minutes except when idling is required for safety purposes. Locomotive idling records shall be maintained and provided to the SLOCAPCD on an annual basis, along with training materials and training records.

The Final EIR declares in numerous instances that, since UPRR would own and operate the locomotives, the federal Interstate Commerce Commission Termination Act ("ICCTA") may preempt the Applicant from entering into contractual provisions with

⁷⁰ Final EIR, p. 4.3-56.

UPRR requiring the use of locomotives that comply with the Tier 4 emission level requirement in Mitigation Measure AQ-2a because such a requirement may improperly impact interstate commerce.⁷¹ The County finds that Mitigation Measure AQ-2b, restricting locomotive idling on site to 15 consecutive minutes, is feasible and not preempted by ICCTA because the locomotives, while UPRR-owned, would be operated by Phillips 66 employees while on site.⁷²

For ROG+NO_x emissions, Mitigation Measure AQ-2a and 3 additionally require onsite and/or offsite emission reductions to mitigate emissions of these pollutants to below the SLOACPD's threshold of significance. However, the County again notes that it may be preempted by federal law from requiring emission reduction credits for *offsite* mainline rail emissions, *i.e.*, outside of the Santa Maria Refinery facility boundary,⁷³ which account for more than 60 percent of total unmitigated Project emissions within San Luis Obispo County.⁷⁴ Further, the County states that DPM emissions would remain significant because existing sources at the Refinery cannot provide sufficient DPM emission reductions and the SLOACPD does not have an emissions reduction program for DPM.⁷⁵ Consequently, the Final EIR finds that due to "possible preemption by Federal law which could prevent the mitigation measures from being implemented (outside of the SMR facility boundary), emission reduction credits and reductions in DPM through the use of Tier 4 locomotives might not be achievable and impacts from criteria pollutant emissions within SLOC would remain *significant and unavoidable (Class I)*. I note that the Final EIR in its determination of the Class I impact incorrectly refers only to *criteria pollutants* and fails to identify the significant and unavoidable impacts on air quality due to offsite and onsite emissions of *diesel particulate matter*, a toxic air contaminant with carcinogenic properties.

As discussed in the following comments, the Final EIR's mitigation measures are inconsistent with the Final EIR's findings of significant and unavoidable impacts(Class I) and the County is not preempted by federal law from requiring that the Applicant mitigate offsite emissions; improperly defers the analysis of federal preemption to determine the feasibility of its proposed mitigation measures; improperly defers the preparation of a mitigation monitoring and reporting plan ("MMRP")

⁷¹ For example, Final EIR, pp. 4.3-53 and 4.3-54.

⁷² Final EIR, pp. 44.3-54 and RTC SLOACPD-16 and -20.

⁷³ Final EIR, pp. 4.3-54 and 4.3-55.

⁷⁴ (Final EIR, Table 4.3-14, unmitigated *offsite* locomotive ROG+NO_x emissions within SLOC: 28.00 lbs/day ROG + 646.6 lbs/day NO_x = **374.64 lbs/day ROG+NO_x**) / (Final EIR, Table 4.3-14, unmitigated *total* Project ROG+NO_x emissions within SLOC: 58.55 lbs/day ROG + 562.80 lbs/day NO_x = **621.35 lbs/day ROG+NO_x**) = **0.603**.

⁷⁵ Final EIR 4.3-54 and RTC SLOACPD-17.

without providing specific performance standards; and fails to evaluate and require all feasible mitigation measures.

B. Improper Deferral of Preparation of Mitigation Monitoring and Reporting Plans and Lack of Specific Performance Standards Fail to Ensure Proper Implementation of Mitigation Measures

Instead of developing a suite of feasible, well-defined mitigation measures in a process that is accessible to the affected community for public review, Mitigation Measure AQ-2a, which addresses emissions within San Luis Obispo County, and the similarly worded Mitigation Measure AQ-3, which addresses mainline emissions outside of San Luis Obispo County, require only that the Applicant provide mitigation, monitoring and reporting plans that “shall investigate methods” for reducing emissions. The County provides no evidence why it would be impracticable to investigate these methods during the CEQA process and provide the mitigation monitoring and reporting plan (“MMRP”) for public review.

I previously commented that this approach improperly defers analysis and that the mitigation measures as written fail to provide specific performance standards.⁷⁶ In response, the County states that the “SLOCAPCD has a well establish [sic] policy of requiring offsets for emissions and the agency issues permits for operations that enable it to ensure enforceability of the provisions in the EIR. Historical use of these instruments, and the permitting history of the SMR and the SLOCAPCD as well as consultation with and comments from the SLOCAPCD during the EIR process, provides the assurances that the mitigation measures are feasible, effective and will be adopted by the agencies.”⁷⁷ This response is not persuasive.

1. The County Must Explore all Feasible Onsite Mitigation Before Relying On Emission Reduction Credits

First, the County’s response only addresses the procedures for using emission reduction credits (“ERCs”) to offset emissions but does not address any other “methods for reducing the onsite and offsite emissions, both from fugitive components and from locomotives or from other SMR activities (such as the diesel pumps, trucks, and compressors to reduce DPM)” or “new or existing programs” which it requires the Applicant to investigate. Specifically, Mitigation Measure AQ-2a lays out the following sequence to achieve emission reductions:

⁷⁶ Pless Comments on Revised Draft EIR, Comment V.C.

⁷⁷ RTC ABJC-35.

1. Reducing onsite and offsite emissions from fugitive components and from locomotives *or* from other SMR activities *and* requiring the use of Tier 4 locomotives *or* equivalent emission levels through contracting arrangements.
2. *If* after implementing the above, emissions of ROG+NO_x and DPM still exceed the SLOCAPD's significance thresholds, securing SLOCAPCD-approved onsite and/or offsite emission reductions in ROG+NO_x emissions *or* contributing to new or existing programs.

Yet, based on its response, it appears that the County has already resigned itself to accepting ERCs as valid mitigation to offset emissions without requiring that ERCs may only be used as a last resort *if* all other methods for contemporaneous emission reductions described in Mitigation Measure AQ-2a have been thoroughly exhausted.

2. *Past Experience with the Mitigation Plan for the Throughput Increase Project Demonstrates that Existing Protocols, Policies, and Permitting Practices at the SLOCAPCD and the County Do Not Provide Assurance that Proposed Mitigation Measures Are Feasible, Effective and Will Be Adopted*

Second, I disagree that the existing protocols, policies, and permitting practices at the SLOCAPCD and the County provide assurance that the proposed mitigation measures for the Project are feasible, effective and will be adopted by the agencies in a manner that satisfies the intent of the Final EIR. History indicates otherwise.

The most germane example in this respect can be found in the approval process for the Mitigation Plan required by the Final EIR for the Phillips 66 Santa Maria Refinery Throughput Increase Project. Here, the County's Conditions of Approval for the Applicant's Throughput Increase Project⁷⁸ incorporated the following three mitigation measures from the Final EIR to effect the required emission reductions (103.1 lbs/day ROG+NO_x and 1.45 lbs/day DPM):⁷⁹

- AQ-1.1 Prior to issuance of the updated permit and increase in Refinery throughput, the Applicant *shall apply* BACT [best available control technology] *on the crude heaters, coker heaters and boilers, vacuum heaters and superheaters, and/or utilize an equivalent method onsite with other equipment, to reduce the NO_x emissions to less than the SLOCAPCD thresholds.*

⁷⁸ SLOAPCD and San Luis Obispo County, Phillips 66 Santa Maria Refinery Throughput Increase Project, Final Environmental Impact Report, SCH #20081010111, October 2012 (hereafter "Throughput Increase EIR"); <http://www.slocleanair.org/phillips66feir.php>.

⁷⁹ 1/16/2014 Phillips 66 Letter, Attachment 1 (BACT Analysis, Santa Maria Refinery, EIR Mitigation Plan – Crude Throughput Increase), p. 1.

AQ-1.2 To the extent feasible, *and if AQ-1.1 does not reduce emissions to below the thresholds*, all trucks under contract to the SMF shall meet EPA 2010 or 2007 model year NO_x and PM emission requirements *and a preference for the use of rail over trucks* for the transportation of coke shall be implemented to the extent feasible in order to reduce offsite emissions. Annual truck trips associated with refinery operations and their associated model year and emissions shall be submitted to the SLOCAPCD annually.

AQ-1.3 Prior to issuance of the updated permit, *if emissions cannot be mitigated below significance thresholds through implementation of mitigation measures AQ-1.1 and AQ-1.2*, then offsite mitigation will be required as per SLOCAPCD guidance in the CEQA Handbook.⁸⁰

Mitigation Measures AQ-1.1 through AQ-1.3 clearly lay out what types of emission reductions are acceptable as mitigation and in which sequence they must be considered:

- 1) Installation of best available control technology (“BACT”) on refinery equipment *and/or* utilize an equivalent method *onsite* with other equipment;
- 2) *If* the above does not reduce emissions below the SLOCAPCD’s significance thresholds, requiring trucks under contract with the SMR to meet EPA emission requirements; and
- 3) *If* the above does not reduce emissions below the SLOCAPCD’s significance thresholds, requiring offsite mitigation.

Yet, review of the air quality mitigation plan approved by the SLOCAPCD and the County shows that these explicit instructions and their intended sequence of implementation were not followed and *did not require implementation of BACT and/or all feasible mitigation onsite* to reduce the project’s significant operational emissions, as intended by the mitigation measures, thereby frustrating the intent of CEQA.

Specifically, the District approved: 1) lower emission limits for Boilers B-504 and B-506 resulting in a 14.2 lbs/day reduction in NO_x emissions to satisfy Mitigation

⁸⁰ County of San Luis Obispo, Board of Supervisors Meeting, Minutes, Resolution No. 2013-35, Resolution Affirming the Decision of the Planning Commission and Conditionally Approving the Application of Phillips 66 for Development Plan/Coastal Development Permit DRC2008-00146, February 26, 2013; *emphasis added*;
<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/156/TWludXRlcw==/9/n/12635.doc> and
<http://agenda.slocounty.ca.gov/agenda/sanluisobispo/1884/QXR0YWNoZWVudC0gQV8yX0JPUyByZlXNvbHV0aW9uIHdpdGggZmluZGluZ19jb25kaXRpb25zX0NFUUEgZmluZGluZ3NfRklOLnBkZg==/12/n/12271.doc>.

Measure AQ-1.1 (Condition of Approval 7), and 2) the use of newer trucks (engine model year 2007 or newer) to satisfy Condition AQ-1 (Condition of Approval 8),⁸¹ as shown in the following excerpt:

Condition 7 (AQ-1.1) The SLOCAPCD has issued an Authority to Construct for the Crude Oil Throughput Increase Project at the Santa Maria Refinery. Through the application process and modifications proposed by Phillips 66, SLOCAPCD engineering staff have determined that there will be no net increase of NOx or ROG from the Throughput Increase Project, provided Phillips 66 complies with the requirements outline in the SLOCAPCD letter dated March 2, 2015 and associated Authority to Construct # 6015 (Attachment 2). In addition, Phillips 66 has agreed to an emission limit for Boilers B-504 and B-506 that result in a 14.2 lbs/day reduction in NOx emissions.

Condition 8 (AQ-1.2) To reduce ROG and NOx emissions from the mobile sources (i.e., coke and sulfur truck trips) associated with the Throughput Increase Project, Phillips 66 has agreed to use newer trucks (i.e., engine model year 2007 or newer) as detailed in their letter dated February 26, 2015 (Attachment 1). Through the use of a cleaner truck fleet, Phillips 66 can demonstrate reduction of ROG + NOx emissions of 134.43 lbs/day and diesel particulate matter emissions of 5.5 lbs/day. SLOCAPCD agrees with the data presented Phillips 66's letter. As stated in that letter, each year Phillips 66 will need to show that the trucks utilized for coke and sulfur hauling do in fact achieve the required 89 lbs/day of ROG + NOx reductions needed to meet Conditions of Approval AQ-1. If Phillips 66 fails to demonstrate compliance with this measure, then off-site mitigation will be required as outlined in Condition 9 (AQ-1.3).

These measures do not satisfy Mitigation Measure AQ-1.1 because they do not require the installation of BACT on onsite equipment, as explained below, before resorting to other methods of emission reductions onsite and relying on off-site mitigation.

The basis for the development of this set of measures is found in a Mitigation Plan for the Throughput Increase Project developed by the Applicant⁸² (see Exhibit 8), which found BACT – determined to be the installation of ultra-low NOx burners as on the Refinery's onsite equipment – to be not cost-effective, as shown in the excerpt in Table 13 below.

⁸¹ Aeron Arlin Genet, SLOCAPCD, Letter to Rob Fitzroy, San Luis Obispo County, Re: Approval of Air Quality Mitigation for the Santa Maria Refinery Throughput Increase Project, March 4, 2015. (Exhibit 7.)

⁸² Jerry Stumbo, Phillips 66 Santa Maria Refinery, Letter to Aeron Arlin-Genet, SJVAPCD, and Murry Wilson, San Luis Obispo County, Re: EIR Mitigation Plan - Crude Throughput Increase Development Plan/Coastal Development Plan DCR2008-00146, Santa Maria Refinery, January 16, 2014, and 10 attachments (hereafter "1/16/2014 Phillips 66 Letter").

Table 13: Excerpt from Phillips 66 Mitigation Plan submitted to the SLOCAPCD

Conditions of Approval Measures for Project	Phillips 66 Mitigation Plan Summary
<p>7. (AQ-1.1) Prior to issuance of the Notice to Proceed authorizing an increase in Refinery throughput, the applicant shall apply BACT on crude heaters, coker heaters and boiler, vacuum heaters and superheaters, and or utilize an equivalent method onsite with other equipment, to reduce the NOx emissions to less than the SLOAPCD thresholds.</p>	<p>AQ-1.1 Phillips 66 BACT analysis indicates BACT is currently installed on equipment. Installation of ultra-Low NOX burners would not meet BACT cost effectiveness criteria and thus, such technology is not BACT (see Attachment 1). An equivalent method of onsite reductions will be used to reduce NOx, specifically, Phillips 66 will retire the following certificated emission reduction credits: # 589-Z2 and # 780-Z7: <u>10.86 T NOx/ROG</u></p>

From: 1/16/2014 Phillips 66 Letter, Table 1 (Project Air Quality Impact and Mitigation Measures)

Instead, rather than making modifications to the onsite equipment at the Refinery, the Applicant proposed to retire emission reduction credits (“ERCs”) in the amount of 10.86 tons/year NOx/ROG). While the SLOCAPCD did not accept the proposed use of ERCs to satisfy the requirements of Mitigation Measure AQ-1.1, the District appears to have accepted the Applicant’s conclusions regarding the cost-effectiveness of installing ultra-low NOx burners at the Refinery’s fired sources wholesale. Review of the Applicant’s BACT analysis⁸³ shows that it is substantively flawed.

The term “best available control technology” or “BACT” constitutes a standard of emissions for a specific type of equipment for major sources subject to federal New Source Review requirements under the federal Clean Air Act, such as the SMR:

“Best available control technology” means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.⁸⁴

⁸³ 1/16/2014 Phillips 66 Letter, Attachment 1 (BACT Analysis, Santa Maria Refinery, EIR Mitigation Plan – Crude Throughput Increase).

⁸⁴ 40 C.F.R. § 52.21.

The SLOCAPCD implements the “based on the maximum degree of reduction” requirement of the CAA” in District Rule 105, defining BACT as *the most stringent emission limitation or control technique* which:

- a. has been achieved in practice for such permit unit category or class or source; or
- b. is contained in any state implementation plan (SIP) approved by the United States Environmental Protection Agency (EPA) for such permit unit category or class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed permit unit demonstrates to the satisfaction of the Air Pollution Control Officer that such limitation or control techniques is not presently achievable; or
- c. is any other emission limitation or control technique, including process and equipment changes of basic and control equipment, found by the Air Pollution Control Officer to be technologically feasible for such class or category of sources or for a specific source, and cost-effective as compared to measures as listed in the Clean Air Plan (CAP) or rules adopted by the Board.⁸⁵

Although no particular method is required to determine BACT, a BACT analysis must determine the “most stringent emission limitation or control technique” and provide adequate support. The Applicant’s BACT analysis does not satisfy the “most stringent emission limitation or control technique” requirement of District Rule 105 because the analysis fails to even mention, let alone provide an analysis of, emission limitations or control techniques “achieved in practice for such permit unit category or class or source” or “contained in any state implementation plan.” The first step is typically to review the BACT databases established by the EPA, the California Air Pollution Control Officers Association (“CAPCOA”), the South Coast AQMD, and the Bay Area AQMD. Instead, the Applicant’s BACT Analysis simply claims, without any supporting documentation, that its engineering consultants identified the “best achievable NOx control levels for each of the combustion devices.” The Applicant identified the installation of ultra-low NOx burners (“ULNBs”) on four heaters (B-2A, B-2B, B-102A and B-102B) and two boilers (B-504 and B-506) to reduce currently permitted NOx emission levels to 20 parts per million (“ppm”) as technologically feasible and provides the results of a cost-effectiveness analysis for their installation.

Because the SLOCAPCD has not developed BACT guidelines, the Applicant relies on BACT guidelines developed by the Bay Area AQMD,⁸⁶ the so-called BAAQMD

⁸⁵ SLOCAPCD, Rule 105, Definitions, revised November 13, 2013;
<http://www.arb.ca.gov/DRDB/SLO/CURHTML/R105.pdf>.

⁸⁶ 1/16/2014 Phillips 66 Letter, Attachment 1 (BACT Analysis, Santa Maria Refinery, EIR Mitigation Plan (cont’d))

BACT/T-BACT Workbook.⁸⁷ The Applicant's BACT analysis finds the installation of ULNB on the subject heaters and boilers *technically feasible* but calculates that the costs for reducing NOx emissions on a per ton basis – \$40,586 to \$221,309/ton NOx reduced – would exceed the BAAQMD's maximum cost-effectiveness threshold of \$17,500/ton NOx reduced. Therefore, the Applicant's BACT analysis finds the installation of ULNBs on the subject units not cost-effective and rejects them as BACT. This analysis is substantively flawed.

BAAQMD Cost-effectiveness Threshold

Cost-effectiveness thresholds for BACT analyses are developed on a case-by-case basis taking into account a district's particular air pollution problems and challenges with making progress towards attainment status with ambient air quality standards. Neither the Applicant's BACT Analysis nor the District's analysis provide a discussion of why the BAAQMD's cost-effectiveness thresholds should be applicable for the SLOCAPCD. Thus, the cost-effectiveness threshold relied upon by the Applicant is not supported.

BACT for Heaters

In addition to the ULNBs considered by the Applicant, other available technologies include next-generation ULNBs, flue gas recirculation ("FGR"), and selective catalytic reduction ("SCR") technology. These technologies, or a combination thereof, can achieve much lower NOx emission levels than the **20 ppm** investigated by the Applicant's BACT Analysis and much lower BACT emission limits have been permitted and achieved in practice.

For example, the BAAQMD's BACT Handbook, upon which the Applicant's BACT analysis allegedly relies, currently identifies BACT for refinery heaters with a heat input of ≥ 50 million British thermal units per hour ("MMBtu/hour") as an emission limit of **5 ppm** NOx at 3% O₂ as *achieved in practice*; the typical control technology is identified as selective catalytic reduction ("SCR") plus low-NOx burners ("LNB").⁸⁸ This BACT emission level was based on the BAAQMD's BACT analysis for

– Crude Throughput Increase), pp. 1-2. ("The San Luis Obispo Air Pollution Control District (APCD) does not have a BACT standard. Other Air districts within California do have BACT standards in place. The Bay Area Air Quality Management District (BAAQMD) has a written standard. This standard will be used for the evaluation.")

⁸⁷ BAAQMD, BACT/T-BACT Workbook; <http://www.baaqmd.gov/permits/permitting-manuals/bact-tbact-workbook>.

⁸⁸ BAAQMD, BACT Handbook, Source Category: Heater – Refinery Process ≥ 50 MMBtu/hour Heat Input, January 14, 2008; <http://www.baaqmd.gov/~media/files/engineering/bact-tbact-workshop/combustion/94-3-1.pdf?la=en>. (Exhibit 9.)

the Clean Fuels Expansion Project at the Applicant's Rodeo Refinery⁸⁹ and is implemented into the current Title V permit for the subject natural gas- or refinery fuel gas-fired 85-MMBtu/hour heater (B-801 A/B Heater).⁹⁰ The Title V Permit for the Applicant's Rodeo Refinery also has permit limits of **10 ppm** NO_x at 3% O₂ for two other natural gas- or refinery fuel gas-fired process heaters greater than ≥50 MMBtu/hour (B-701: 50.2 MMBtu/hour and B-102: 82.1 MMBtu/hour).⁹¹

Examples from other air districts include a BACT determination by the SCAQMD for a 460-MMBtu/hour refinery fuel gas-fired heater with NO_x permit levels of **7 ppm** using SCR.⁹² The SCAQMD also permitted a 50-MMBtu/hour heater with SCR firing natural gas at the CENCO refinery in Los Angeles with a NO_x emission limit of **5 ppmvd**.⁹³

The combination of low-NO_x burner technology and SCR has been demonstrated to achieve very low emissions of NO_x in refinery applications. At the TOSCO Refining Company in the SCAQMD, a large refinery heater has been operational since 1995, equipped with low- NO_x burners and an SCR. Source tests have verified emissions of **7 ppm** or less. Large and small process heaters have also been demonstrated in the SCAQMD to achieve NO_x emissions in the **5 to 9 ppm** range using low- NO_x burners and SCR.⁹⁴

⁸⁹Ibid.

⁹⁰ BAAQMD, Final Major Facility Review Permit, Phillips 66 – San Francisco Refinery, Facility #A0016, Rodeo, CA, August 1, 2014 (“Rodeo Refinery Title V Permit”)(See Condition 22962.4.a for Source 45 U246 B-801 A/B Heater (“NO_x: 5 ppmv @ 3% oxygen (3 hr average)”)); http://www.baaqmd.gov/~media/files/engineering/title-v-permits/a0016/a0016_2014-08_mr-final-permit.pdf?la=en. (Exhibit 10.)

⁹¹ Rodeo Refinery Title V Permit. (See Condition 21096.3b for Source 461 U250 B-701 Heater and Condition 21097.3b for Source 36 U200 B-102 Heater (“NO_x 10 ppmv @ 3% oxygen (3 hr average”).)

⁹² SCAQMD, AQMD BACT Determinations, Equipment Category – Heater – Refinery, Equipment Category – Heater - Refinery Application No. 341340, Chevron, July 14, 2009; <http://www.aqmd.gov/docs/default-source/bact/laer-bact-determinations/aqmd-laer-bact/heater-refinery-an-3413340-chevron.doc?sfvrsn=2>. (Exhibit 11)

⁹³ SCAQMD, Notice of Intent to Establish Best Available Control Technology (BACT) for a 50 MMBTU/Hour Refinery Heater; <http://www.aqmd.gov/home/permits/bact/notices/cenco-public-notice>. (Exhibit 12)

⁹⁴ California Air Pollution Control Officers Association (“CAPCOA”), Best Available Control Technology Determination Data Submitted to the California Air Pollution Control Officers Association BACT Clearinghouse; <http://www.arb.ca.gov/bact/bact2to3.htm>. (SCAQMD BACT Determinations, 50 MMBtu/hr Tulsa Heaters Inc. process heater, John Zink low-NO_x burners with SCR, January 2001; and SCAQMD BACT Determinations, 764 MMBtu/hr Kinetics Technology International process heater, John Zink low-NO_x burners and SCR, June 1999.) (Exhibit 13)

Thus, the presumptive BACT level for the Refinery's heaters is **5 ppmvd** NO_x at 3% O₂, corresponding to 0.006 lbs NO_x /MMBtu, achieved using either natural gas or refinery fuel gas, low NO_x burners, and an SCR.⁹⁵

BACT for Boilers

Boilers, regardless of the specific service and design, should be able to meet comparable emission limits as process heaters, using a combination of ultra-low NO_x burners and post combustion controls. The heat-transfer method used in boilers, for example, fire tube versus water tube, does not affect the burners or performance of post-combustion controls. Emissions associated with these two heat transfer methods are indistinguishable.⁹⁶ Thus, refinery boilers, regardless of the specific service should be able to meet the same low NO_x levels as refinery heaters.

For example, the South Coast AQMD issued a NO_x BACT determination based on a refinery heater at Tosco Refining Company. The facility is operating a heater rated at 460 million Btu/hour, and the NO_x limit is **7 ppm**. The District issued the permit and the heater and SCR equipment have been operating since 1995. Compliance with the **7 ppm** NO_x limit has been verified by source tests.⁹⁷

BACT for SMR Refinery Heaters and Boilers

Clearly, as demonstrated by the BAAQMD's BACT determinations and permit limits for currently operating heaters at the Applicant's Rodeo Refinery and other facilities, BACT levels of **5 ppm** NO_x for heaters and **7 ppm** for boilers operating on refinery fuel gas have been achieved in practice and, thus, are BACT. These levels are considerably lower than the **20 ppm** NO_x assumed by the Applicant for its BACT analysis for the SMR Throughput Increase Project and should have been used for a proper BACT determination.

Conclusion Regarding Adequacy of Implementation of Mitigation Measures for SMR Throughput Increase Project and Implications for the SMR Rail Spur Project

⁹⁵ The emission rates in lbs/MMBtu calculated from ppmvd is based on firing natural gas. Many of the units fire refinery fuel gas and/or natural gas. Refinery fuel gas generally has a higher heating value and F factor than natural gas. Thus, the emission limits derived by converting ppmvd to lbs/MMBtu would be somewhat higher for refinery fuel gas-fired units, depending upon the composition of the fuel burned in each subject unit.

⁹⁶ See, for example, EPA, Compilation of Air Pollutant Emission Factors, ("AP-42"), Section 1.4; <http://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf>.

⁹⁷ SCAQMD, Notice of Intent to Establish Best Available Control Technology (BACT) for a 31.5 MMBTU/Hour Boiler, December 16, 1999; <http://www.aqmd.gov/home/permits/bact/notices/coca-cola-notice>. (Exhibit 14)

Clearly, the mitigation measures include in the Final EIR for the Throughput Increase Projects were not adequately implemented and circumvented by the Applicant's interpretation of BACT. Likewise, the mitigation measures in the Final EIR for the Rail Spur Project are not adequate because they lack specific performance standards and their language leaves interpretation open to the Applicant and the agencies without public involvement. This approach is not proper under CEQA.

C. The Final EIR and Staff Report Improperly Defer the Decision on the Feasibility of Proposed Mitigation Measures Due to Potential Federal Preemption, Thereby Creating a Legal Limbo that Cannot Support a Decision on a CEQA Document

A CEQA lead agency may not make a finding of significant and unavoidable impacts without requiring all feasible mitigation. Here, the Final EIR proposes a number of mitigation measures intended to reduce significant air pollutant emissions and health risks and presents mitigated emissions and health risks after their implementation. Yet, because of the potential federal preemption of *offsite* locomotive emissions under the Interstate Commerce Commission Termination Act ("ICCTA"), finds that mitigation measures considered in its analysis may not be legally implementable and, thus, finds significant and unavoidable impacts (Class I) within and outside of San Luis Obispo County.⁹⁸ Neither the Final EIR nor the Staff Report identify who would ultimately decide whether federal preemption applies to any, part, or all of the proposed mitigation measures. Thus, the Final EIR does not provide accurate information on the magnitude of impacts and fails to identify all feasible mitigation.

The County repeatedly hides behind the potential federal preemption by ICCTA and avoids making a decisive statement regarding the feasibility of a number of mitigation measures, including the ones cited above. Yet, the Final EIR's mitigation measures, as written, are devoid of any information regarding who would ultimately decide whether ICCTA applies and which performance standards would be applied to make such a determination:

- Would this determination be made by the County, the SLOCAPCD, another agency, or the courts? If it would be the County and the SLOCAPCD, as indicated in the Requirements for the Mitigation Monitoring and Reporting Requirements in Final EIR, Table 8.1, what prevents the agencies from making this decision now?

⁹⁸ Final EIR, AQ.2 and AQ.3.

- What additional information would influence the decision-making entity's determination that is not already available or should have been investigated during the CEQA review process for the Project: further research; letters from the Applicant or UPRR; consultation with the Attorney General or the federal Surface Transportation Board; pending court decisions; or the adoption of a Final EIR for similar projects such as the proposed Valero Benicia Refinery crude-by-rail terminal?
- What is the timeframe when such a determination must be made before the alternate provisions in the respective mitigation measures may be employed by the Applicant?
- Would this decision-making process be an open process that involves public review and input or would it be restricted to interactions between the County and/or SLOCAPCD and the Applicant?

The Final EIR addresses none of these questions and therefore fails to provide proper performance standards for implementation of the respective mitigation measures.

D. Contrary to the Applicant's Claim, Offsite Mitigation for Project Impacts Is Not Preempted by Federal Law

The Applicant attempts to construe a specious argument that the cost of emission reductions for offsite Project emissions would be directly related to the number of additional train trips operated by UPRR on the mainline because it could influence decisions on whether to transport by rail or the number of unit trains to receive at the refinery, consequently interfering with interstate commerce by affecting the cost of rail transportation.⁹⁹This argument holds no water.

⁹⁹ Letter from Jocelyn Thompson, Allston & Bird LLP, to Murry Wilson, San Luis Obispo County, Re: Phillips 66 Company Rail Spur Extension Project, SCH #2013071028, November 24, 2014, pp. 4-5; [http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/FEIR+Phillips+Rail+Spur+Project+Dec+2015/Response+To+Comments/2_Applicant/Alston\\$!26Bird.pdf](http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project/FEIR+Phillips+Rail+Spur+Project+Dec+2015/Response+To+Comments/2_Applicant/Alston$!26Bird.pdf). ("The alternative requirement of securing equivalent emission reductions is also preempted. Air emissions offsets are a valuable asset, if already owned by a company, and can be costly to acquire if not. Here, the magnitude of that cost would be directly related to the number of additional train trips operated by UPRR on the mainline. Regardless whether this cost is imposed on UPRR and passed through to Phillips 66 or imposed directly on Phillips 66, it is a burden on rail transportation that can influence decisions whether to transport by rail or the number of unit trains to receive at the refinery. The two requirements in this mitigation measure would also interfere with interstate commerce by affecting the cost of rail transportation. As CARB also acknowledged in 1998: "Price is usually the significant determinant in a shipper's choice of modes or routes, with the result that railroad traffic levels and patterns are very sensitive to increases in costs. Overly stringent regulation can severely impact railroad traffic ...".)

Requiring the Applicant to mitigate offsite emissions attributable to Project operational activities – either by participating in air district-administered emission reduction programs and/or retiring emission reduction credits – would not impact UPRR operations and interstate commerce in any way and therefore such a requirement is not exempt by ICCTA. The costs for any such mitigation would be borne by the Applicant, not UPRR; it would therefore not affect UPRR’s costs of rail transportation. The Applicant’s decision to use or not to use rail transport based on cost considerations also does not constitute an interference with interstate commerce and would not constitute “overly stringent regulation that can severely impact railroad traffic,” as the Applicant’s letter insinuates. If that were the case, the Applicant would be guilty of such interference by not proposing the construction of a rail terminal and contracting with some rail carrier decades ago. In fact, if for some reason the costs of importing North American crudes in the future would exceed the costs of importing locally available crudes, the Applicant would most surely abandon or at least reduce crude-by-rail import of North American crudes, thereby reducing UPRR’s business. I doubt the Applicant would concede that such actions would constitute an interference with interstate commerce. Rather, the costs of ERCs and/or other mitigation simply become part of doing business (just like accounting for the costs of installing vapor recovery units on the rail terminal) and would only affect the Applicant’s findings regarding the economic feasibility of the Project but would not affect UPRR’s costs of rail transportation.

While cost is at the forefront of the company’s motivation to import cost-advantaged North American crudes via rail, as disclosed by the Project objectives,¹⁰⁰ the Applicant’s costs of doing business are not a consideration for the CEQA process and it may very well turn out to be the case that these crude oils cannot be cost-effectively transported to the SMR. (The fact that these crudes are characterized as ‘cost-advantaged’ on the market is based on their price at the point of production, not on their price at the ultimate point of delivery.) It is the County’s responsibility to assure that the company’s profits do not come at the expense of the affected environment.

In fact, the SLOCAPCD, the agency identified as responsible for compliance verification of the proposed mitigation measures for impacts on air quality in cooperation with the County,¹⁰¹ agrees with this interpretation and explicitly recommends that emissions from locomotives be mitigated regardless of whether they are generated inside or outside the county’s boundaries.¹⁰² This opinion is echoed in

¹⁰⁰ Final EIR, p. 2-1 (“Allow the refinery to obtain a range of competitively priced crude oil by providing the capability to obtain raw material from North American sources that are served by rail.”)

¹⁰¹ Final EIR, Table 8.1.

¹⁰² Aeron Arlin Genet, SLOCAPCD, Letter to Murry Wilson, County of San Luis Obispo, Re: Recirculated Draft Environmental Impact Report (RDEIR) for the Phillips 66 Rail Spur Project, November 24, 2014. (cont’d)

comment letters submitted on the Draft EIR and Revised Draft EIR by the affected air districts uprival of San Luis Obispo County including the Placer County Air Pollution Control District ("PCAPCD"),¹⁰³the Santa Barbara Air Pollution Control District ("SBCAPCD"),¹⁰⁴the Sacramento Metropolitan Air Quality Management District ("SMAQMD"),¹⁰⁵ and the Ventura County Air Pollution Control District ("VCAPCD"),¹⁰⁶who unequivocally stress that Project-related emissions within their

("It is the SLOPCAPCD recommendation the emissions from the locomotives be mitigated regardless of whether generated inside or outside the county. If federal law preempts the county from requiring mitigation measures directly related to the locomotive then other measures, including off site mitigation, should be implemented to reduce the impacts from this project to below the threshold for the life of the project. ... It is the SLOPCAPCD's recommendation that real, quantifiable mitigations that are available today be proposed to mitigate the impacts from this project. SLOPCAPCD recommends an Annual Mitigation and Monitoring Plan be developed by the Applicant in coordination with impacted Air Districts to report annual emissions and quantify emission reductions for each District.")

¹⁰³ Angel Green, PCAPCD, Letter to Murry Wilson, County of San Luis Obispo, Re: Phillips Company Rail Spur Extension Project Recirculated Draft Environmental Impact Report (RDEIR), November 24, 2014. ("Prior to certifying the Final EIR, the PCAPCD recommends the Lead Agency investigate the likelihood of harvesting emission reductions and the associated cost effectiveness for the purchasing of offsite credits, and arrange for agreements with each impacted air district. The RDEIR should also include within its MMCRP a summary of the emissions and required reductions necessary within each air district (excluding emission reductions from mitigation which may be preempted by Federal law), as well as the cost effective amount per ton required by each air district.")

¹⁰⁴ Molly Pearson, SBCAPCD, Letter to Murry Wilson, County of San Luis Obispo, Re: SBAPCD Review of Recirculated Draft Environmental Impact Report for Phillips 66 Company Rail Spur Extension Project, November 24, 2014. ("Requiring air quality mitigation through obtaining Oxides of Nitrogen (NOx), Reactive Organic Compounds (ROC) and diesel PM (DPM) emission reduction credits through the local air districts' "emission reduction programs" for the life of the project, prior to issuance of the Notice to Proceed, would likely be very costly and perhaps infeasible. However, requiring the applicant to contribute to a new or existing program that achieves cost-effective reductions of ROC, NOx and DPM may be a feasible and effective way to reduce the stated impacts in the near-term and throughout the project life.")

¹⁰⁵ Larry Greene, SMAQMD, Letter to Murry Wilson, County of San Luis Obispo, Re: Phillips SMR Rail Spur Project, November 24, 2014. ("While regulating the main line locomotives may be federally preempted, mitigating the emissions of the project is not. The District has existing programs that provide offsite mitigation for CEQA purposes, and the County can require the project proponents to fund cost-effective mitigation to reduce the impact of the project to less than significant levels. The District routinely collects mitigation fees from projects and uses these fees to fund mitigation projects throughout the entire SFNA. These projects involve promoting clean technology for use in locomotive engines, on-road heavy-duty trucks, farm equipment and wood stoves. We also promote other cost-effective mitigation projects, and all of these efforts reduce ROG and NOx emissions in the SFNA. District staff is available and would be happy to work with the County and Phillips 66 to develop appropriate mitigation for this project.")

¹⁰⁶ Chuck Thomas, VCAPCD, Letter to Murry Wilson, County of San Luis Obispo, Re: Ventura County APCD Comments on the Recirculated Draft Environmental Impact Report for the Phillips Company Rail Spur Extension Project, November 24, 2014. ("Mitigation Measure AQ-3, recognizing Tier 4 locomotive engines as unlikely mitigation for the project, states that the applicant shall secure ROG and NOx emission reductions within each applicable Air District similar to the emissions reduction program (cont'd)

jurisdictions must be mitigated and offer their assistance to develop appropriate programs.

E. Other Feasible Measures to Reduce the Project's Significant Emissions

I previously commented that there are a number of feasible measures that should have been evaluated and incorporated into the Final EIR's mitigation measures. Specifically, I suggested evaluating the installation of additional and/or more efficient control technologies on existing units at the Santa Maria Refinery and replacement of older emission units including, for example, replacement of leaking components with leakless components, replacement of low-NO_x burners with ultra-low NO_x burners on all fired sources, or equipping any older, high-emitting equipment with BACT regardless of cost-effectiveness as well as off-site mitigation such as installing a vapor recovery system and replacement of leaking components at the Santa Maria Pump Station. The County responded:

As part of the Throughput EIR, the burner units were required to be replaced with low-NO_x burners, and most options for onsite reductions in emissions have been used or are planned to be used. Mitigation measure AQ-2a is written in that it allows the Applicant to obtain reductions from onsite or offsite/credits as they are available.

...

Other mitigation measures, such as the use of diesel particulate filters (DPF) on the trains, are not preferable to the use of Tier 4 locomotives. The use of DPF on large locomotive engines is not feasible as a portable, strap on-strap off type arrangement. Sizing, temperature control, re-generation capabilities are all needed for the use of DPF and these are not easily transferable to locomotives on the portable basis. The County and the SLOCAPCD have the authority to require mitigation for onsite emissions.¹⁰⁷

utilized by the San Luis Obispo County APCD to ensure that mainline rail ROG and NO_x emissions do not exceed the Air District thresholds for the life of the project. We fully support such an approach for mitigating project-related locomotive emissions in Ventura County. We, in fact, have employed a similar approach for industrial projects in this county. In instances when air quality impacts from project operations cannot be mitigated to insignificant levels with the available air pollution mitigation measures recommended for the project, the VCAPCD, in its Air Quality Assessment Guidelines, recommends an Emissions Reduction Program (ERP) to ensure sufficient mitigation of air quality impacts. An ERP would require the project proponent to contribute funds for programs that reduce air pollutant emissions from non-project sources commensurate with the amount of emissions that need to be mitigated. In this case, a legally enforceable agreement between the County of San Luis Obispo, VCAPCD, and the applicant could be executed such that funds would be provided by the applicant to the VCAPCD for emission reduction programs in Ventura County.”)

¹⁰⁷ RTC ABJC-35.

With respect to low-NOx burners, the Applicant was not required to replace the burners as part of the MMRP for the Throughput Increase Project, as discussed in Comment III.B.2 above. With respect to the remainder of the proposed mitigation measures, the County's response is not responsive as it does not discuss anything other than the use of ERCs, installation of low NOx burners on unidentified refinery units, and strap-on diesel particulate filters on locomotives.¹⁰⁸

1. *BACT for SMR Refinery Heaters and Boilers Must Be Required as Feasible Mitigation for the Project*

As discussed in Comment III.B.2, the MMRP for the Throughput Increase Project did not require implementation of BACT as intended and, thus, is available and must be required as CEQA mitigation for the Rail Spur Project.

2. *Alternatives for Operation of UPRR Locomotives in Switching Mode*

As currently proposed, switching activities would be performed by Phillips 66 using UPRR line haul locomotives.¹⁰⁹ This would require a total of 20 hours of switching and 6.5 hours of idling of these very large 4300-bhp line haul locomotives per train.¹¹⁰ Their use to perform switching operations at the SMR is overkill and emissions can be dramatically reduced by using appropriately-sized dedicated switcher locomotives with lower emissions profiles that would be owned and operated by Phillips 66. Other alternatives include Genset switcher locomotives and a stationary emission control system attached to the loading rack, as discussed below.

a) *Appropriately Sized Dedicated Switch Locomotive(s)*

It appears that Phillips 66 already owns or considers purchasing a company-owned switcher locomotive to move rail cars that would arrive with manifest trains carrying crude oil:

In a manifest train configuration, varying number of railcars would be dropped off at SMR by a passing train. A dedicated locomotive would remain on-site to move cars. This would be a small locomotive that would only be capable of moving a few rail cars at a time, and would not be used for unloading of unit trains. In a manifest train configuration, a number of crude oil railcars would be dropped at the refinery and then the train would continue to other destinations. Rail cars delivered via manifest train would meet the same specifications as discussed above for the unit train tank cars. The refinery would have a dedicated

¹⁰⁸Ibid.

¹⁰⁹ Final EIR, p. 2-26.

¹¹⁰ See Final EIR, Appx. B.1, p. B.1-9.

locomotive that would be used to move the railcars from the manifest train while they are on site. This dedicated locomotive would only be used for manifest deliveries.¹¹¹

This dedicated locomotive should be a) appropriately sized and comply with EPA Tier 4 emission standards and b) used for all switching activities to avoid the substantial emissions from the oversized UPRR locomotives. Using appropriately sized Tier 4-compliant locomotive(s) for switching operations would dramatically reduce diesel particulate matter and other air pollutant emissions and associated health risks.

b) Genset Yard Locomotives

Generator-Set (“Genset”) switcher locomotives use multiple smaller (approximately 700 horsepower) diesel engines to provide only the power that is needed and have electronic engine controls to better match locomotive activities to operating conditions. UPRR pioneered the Genset locomotive technology in 2002 and currently employs 172 switcher locomotives with ultra-low emissions, EPA-certified Tier 3 diesel engines.¹¹² UPRR summarizes the benefits of using these engines over line haul locomotives as follows:

The Genset switcher reduces emissions of oxides of nitrogen by 80 percent and particulate matter by 90 percent. It also uses up to 37 percent less fuel compared to older switching locomotives. This fuel savings translates into a greenhouse gas reduction of up to 37 percent.

At low throttle settings, only one of the engines operates, with the other two shut down. When additional power demand is needed, the second and third diesel engines automatically start and quickly go online, producing the right amount of electrical power required to move rail cars. When the Genset is not in use, all diesel engines automatically shut down to conserve fuel and reduce emissions.

In 2015, UPRR introduced the first Gensets certified to Tier 4 standards in Dolton, IL, a Chicago suburb.¹¹³

There is no reason why such Gensets should not be feasible for switching operations at the SMR, yet, the Final EIR fails to even acknowledge their existence, let alone analyze their potential for reducing the significant air quality and health impacts in the vicinity of the Refinery due to emissions of ozone precursors and carcinogenic diesel particulate matter.

¹¹¹ Final EIR, p. 2-23.

¹¹² UPRR, Environmental Management, Technology, Genset; <http://www.up.com/aboutup/environment/technology/index.htm>. (Exhibit 15.)

¹¹³ Ibid.

3. Stationary Locomotive Emissions Control System

Advanced Cleanup Technologies, Inc. (“ACTI”) has developed an innovative technology for reducing air pollution from locomotives in rail yards which does not require that the locomotives be modified to capture and treat the exhaust gas. The stationary system, which is referred to as Advanced Locomotive Emissions Control System (“ALECS”), is composed of an Emissions Treatment Subsystem (“ETS”) and an Emissions Capture Subsystem (“ECS”). The ETS contains two emissions removal technologies: a Cloud-Chamber Scrubber for removal of sulfur dioxide, particulate matter, hydrocarbons and a selective catalytic reduction system for the removal of oxides of NOx.

ALECS is designed to treat railroad locomotives’ exhaust gas while in maintenance and at rail yards. The exhaust gas is captured by a mechanism that attaches to the locomotive exhaust stack, directing the exhaust gas through an overhead manifold network to the ETS for removal of the toxic pollutants. The locomotives may move within designated areas while the system is attached. The system can treat several locomotives simultaneously. This system reduces sulfur dioxides by 99 percent, particulate matter by more than 95 percent, and NOx by 99 percent.¹¹⁴

This system was tested by the CARB and Placer County APCD at the Roseville Railyard.¹¹⁵ Figure 3 below shows a conceptual rendering of the ALECS system.

¹¹⁴ ACTI, Emissions Control System; <http://www.advancedcleanup.com/index.php?article=2>. (Exhibit 16)

¹¹⁵ Placer County APCD, Roseville Rail Yard Air Quality Study; <http://www.placer.ca.gov/departments/air/railroad> and CARB, Roseville Rail Yard Study, October 14, 2004; <http://www.arb.ca.gov/diesel/documents/rrstudy.htm>.

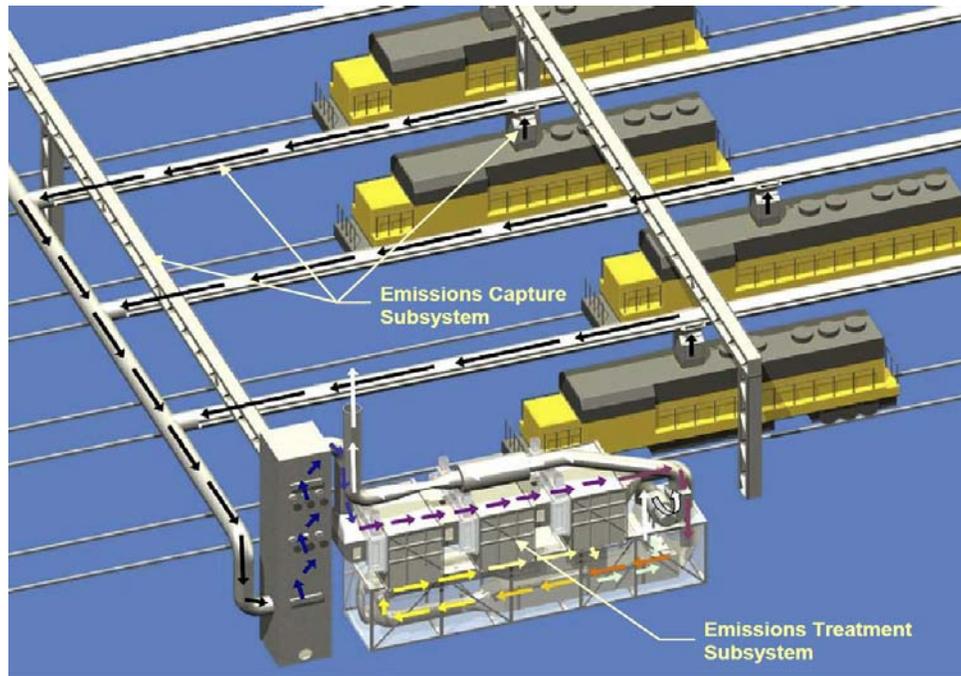


Figure 3: Conceptual diagram for ALECs
(from: CARB Final Report 2004)

The photograph in Figure 4 below shows a UPRR line haul locomotive under the ALECS at the Roseville Railyard.



Figure 4: UPRR Dash-8, 3900-bhp line haul locomotive under the ALECS at Roseville Railyard
(from: PCAPCD Final Report 2004)

Control efficiencies for the UPRR line haul locomotive were determined and approved by CARB at 96.8% through 100% for NO_x, 31.4% through 57.6% for ROG, and 80.9% through 98.5% for particulate matter, demonstrating very high efficiency. In addition to control of air pollutants, the system also provides a 70% to 79% reduction in sound energy.

Based on the results of the ALECS study, Placer County APCD developed Rule 515, Stationary Rail Yard Control Emission Reduction Credits, to authorize the generation of emission reduction credits based on this technology.¹¹⁶

According to the manufacturer of ALECS, the system is available in modular form and can, thus, be specified to the Project's specific design. An almost identical system, the Advanced Marine Emissions Control System ("AMECS") developed by the same company, ACTI, has been tested for marine applications, since 2004. In 2005 CARB approved pollutant removal efficiencies of 90% for NO_x and 90% for particulate matter.¹¹⁷

Thus, the County must at the very least investigate whether this system is available for use at the SMR.

4. *Replacement or Retrofitting of Onsite Shuttlewagon*

The Applicant also currently operates an onsite switch engine, or "shuttlewagon:"

Currently, the rail operations at the SMR consist of the export of petroleum coke for commercial use throughout the U.S. and abroad. A train typically arrives every Wednesday and drops off 18 to 20 empty cars. After delivering the empty cars, the engine picks up any full cars and leaves the SMR. This operation typically takes a few hours. Each full car hauls approximately 100 tons of coke. The delivered empty cars are filled with coke during the following week and moved around on site by the 'Shuttlewagon.' The Shuttlewagon, also referred to as a 'switching locomotive' is a small unit compared to an actual train locomotive. The Shuttlewagon operates less than two hours per week.¹¹⁸

¹¹⁶ PCAPCD, Rule 515, Stationary Rail Yard Control Emission Reduction Credits, Amended February 19, 2015;
<http://www.placer.ca.gov/~media/apc/documents/rules/reg%205/rule515stationaryrailyardcontrolmissionreductioncredits.pdf?la=en>. (Exhibit 17)

¹¹⁷ ACTI; <http://advancedemissioncontrol.com/>. (Exhibit 18)

¹¹⁸ FEIR, p. 2-31.

It is unclear, whether this “Shuttlewagon” is the same locomotive Phillips 66 intends to employ to move tank cars coming in with manifest trains. Either way, it is feasible to retrofit or replace this locomotive to comply with EPA Tier 4 emission standards, which could contribute to onsite emission reductions to mitigate Project emissions.

5. Conclusion Regarding Additional Feasible Mitigation Measures

In sum, the Final EIR fails to incorporate all feasible mitigation, both *onsite* and *offsite*, therefore failing to comply with CEQA’s requirement that the County evaluate and incorporate all feasible mitigation.

F. Mitigation for Greenhouse Gas Emissions Is Inadequate

The Final EIR requires implementation of two mitigation measures to address the significant greenhouse gas (“GHG”) emissions on a Project basis (AQ-6) and cumulative basis (AQ-9):

AQ-6 Prior to issuance of the Notice to Proceed, the Applicant shall provide a GHG mitigation, monitoring and reporting plan. The plan shall indicate that, on an annual basis, if GHG emissions exceed the thresholds, the Applicant shall provide GHG emission reduction credits for all of the project GHG emissions. Coordination with the San Luis Obispo Planning and Building Department should begin at least six (6) months prior to issuance of operational permits for the Project to allow time for refining calculations and for the San Luis Obispo Planning and Building to review and approve the emission reduction credits.

AQ-8 Prior to issuance of the Notice to Proceed, the Applicant shall provide a GHG mitigation, monitoring and reporting plan. The plan shall investigate methods to bring the Rail Spur Project GHG emissions at the refinery to zero for the entire project each year. The plan shall indicate that, on an annual basis, if after all onsite mitigations are implemented, the GHG emissions from the Rail Spur Project still exceed zero, then SLOCAPCD-approved offsite mitigation will be required. Methods could include the contracting arrangement that increases the use of more efficient locomotives, or through other, onsite measures. Coordination with the SLOCAPCD should begin at least six (6) months prior to issuance of operational permits for the Project to allow time for refining calculations and for the SLOCAPCD to review and approve the mitigation approach.

While well-intended, these measures are inadequate to ensure that Project greenhouse gas emissions would be mitigated to the intended extent as they lack adequate performance standards.

1. *The Final EIR Fails Adequately Mitigate Significant Greenhouse Gas Emissions*

The Revised Draft EIR finds significant and unavoidable impacts due to GHG emissions after implementation of mitigation measure AQ-6, which requires that the Applicant provide GHG emission reduction credits for all Project GHG emissions within San Luis Obispo County for the life of the project.¹¹⁹ (Again, this mitigation measure improperly defers analysis to the future.) This mitigation measure is inadequate. Before resorting to emission reduction credits and finding significant unavoidable impacts, the County must evaluate all feasible mitigation to reduce emissions, preferably on site.

The SLOCAPCD's CEQA Guidelines provide a long list of mitigation measures to reduce emission of greenhouse gases from projects including industrial projects.¹²⁰ (See Exhibit 19). In addition, the CAPCOA has published guidance for quantifying greenhouse mitigation measures.¹²¹ (See Exhibit 20.) Many of the mitigation measures mentioned in these documents are feasible for the Rail Spur Project and should be required to reduce its significant GHG emissions. I recommend that the County evaluate and require all feasible mitigation to reduce significant impacts with respect to global climate change due to GHG emissions associated with the proposed operational changes at the SMR including the Rail Spur Project and the SMR Throughput Increase Project.

Finally, because GHGs are global pollutants, the County may not stop at mitigating only emissions within its boundaries. Instead, the Applicant should be required to mitigate all Project emissions within North America.

¹¹⁹ Revised Draft EIR, p. 4.3-71.

¹²⁰ SLOCAPCD, CEQA Air Quality Handbook, A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review, April 2012, Table 3-5 Mitigation Measures, pp. 3-17 through 3-20;
http://www.slocleanair.org/images/cms/upload/files/CEQA_Handbook_2012_v1.pdf.

¹²¹ CAPCOA, Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August, 2010;
<http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>.

2. *Mitigation Measure AQ-6 Fails to Ensure that Greenhouse Gas Emission Reduction Credits Would Be Real, Additional, Quantifiable, Permanent, Verifiable, and Enforceable*

Mitigation Measure AQ-6 generically refers to “GHG emission reduction credits” that the Applicant “shall provide” without defining which entity would issue such credits or how the County would ensure that these credits would be *real, additional, quantifiable, permanent, verifiable, and enforceable*. Thus, the mitigation measure lacks specific performance goals.

IV. The Reduced Rail Deliveries Alternative Would Result in Significant Impacts with Respect to Air Quality, Health Risks, and Greenhouse Gas Emissions

The Applicant, presumably in response to Staff’s recommendation to deny the Project, now proposes adoption of the Reduced Rail Deliveries Alternative which would receive three, instead of five, 80-tank car trains per week. This alternative, the Applicant claims “will reduce all impacts associated with on-site Project activities to less than significant.”¹²²

As discussed below, this is incorrect and the Reduced Rail Deliveries Alternative would result in significant impacts with respect to air quality and health risks for onsite emissions.

A. The Applicant’s Selective Approach to Claim Federal Preemption for Some Mitigation Measures Intended to Reduce Emissions from UPRR Locomotives Is Not Supported

The Applicant provides extensive documentation discussing the alleged federal preemption of any and all control of railroad operations under the Interstate Commerce Commission Termination Act (“ICCTA”) including any mitigation measures aimed at reducing emissions from the locomotives both onsite and offsite.¹²³ In its letter discussing the Reduced Rail Delivery Alternative, the Applicant attempts to build a specious case to apply federal preemption to the Final EIR’s mitigation measures intended to reduce locomotive emissions wherever it is financially beneficial or otherwise convenient for the company and only concedes to portions of the County’s proposed mitigation measures if they are a) on site and b) impacts from onsite emissions could not otherwise be reduced to less than significant levels. The Applicant’s letter discloses this approach in Footnote 4:

¹²² Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, p. 1.

¹²³ For example, Phillips 66 2/1/2013 Letter to San Luis Obispo County, pp. 2-3 and 7-14.

As described above, other terminals have asserted that federal law preempts local regulation of terminals or unloading facilities as well as mainline rail operations. We agree this is generally a correct statement of law. *But in the specific circumstances of this Project, Phillips 66 has elected not to assert preemption with respect to an alternative aimed at reducing impacts from activities conducted the Refinery site.*¹²⁴

The Applicant provides no legal support for this selective approach to federal preemption.

Specifically, the Applicant asserts the following full and partial preemption for the Final EIR's mitigation measures:

For the reasons explained further above in Section I.B., many of the mitigation measures presented in the FEIR are preempted by federal law under the Supremacy and Commerce Clauses of the U.S. Constitution and therefore cannot be imposed by the County. The following measures are fully preempted and must be rejected in their entirety: AQ-3; AQ-5; BIO-11; CR-6; HM-2a; HM-2b; HM-2c; text following HM-2d; PS-4a; PS-4b; PS-4c; PS-4d; PS-4e; TR-4; and WR-3. The following measures are preempted to the extent they require mitigation for impacts from mainline rail activities, and must be edited to remove the preempted requirements: AQ-2a; AQ-4a; AQ-6; AQ-8; and N-2a. Attachment 11 to this letter presents more detail regarding the preempted mitigation measures.¹²⁵

Specifically, the Applicant asserts that the following air quality and noise mitigation measures related to locomotives are preempted by federal law:

- AQ-2a: Any mitigation intended to reduce onsite and offsite locomotive emissions within the SLOCAPCD including requiring Tier 4-compliant engines and emission reduction credits.
- AQ-3: Any mitigation intended to reduce locomotive emissions in uprail air districts including requiring Tier 4-compliant engines and emission reduction credits.
- AQ-4a: Any mitigation intended to reduce onsite and offsite locomotive emissions within the SLOCAPCD including requiring Tier 4-compliant engines and emission reduction credits.

¹²⁴ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, Footnote 4; *emphasis added*.

¹²⁵ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, p. 14.

- AQ-5: Any mitigation intended to reduce locomotive emissions in uprail air districts including requiring Tier 4-compliant engines and emission reduction credits.
- AQ-6: Any greenhouse gas emission reduction credits for mainline rail emissions.
- AQ-8: Any greenhouse gas emission reduction credits for mainline rail emissions.
- N-2a: Any restrictions on the arrival of trains and their movement and engine operations including: 2) shutdown of locomotives entering the site between the hours of 10 p.m. and 7 a.m. that are not being immediately unloaded.¹²⁶

Notably, the Applicant does not claim federal exemption for:

- AQ-2b: Limit locomotive onsite idling to no more than 15 consecutive minutes except when idling is required for safety purposes.
- AQ-4c: Unless mitigation measure AQ-2a (the use of Tier 4 locomotives only) is implemented, limit crude oil train unloading and switching activities on site to 7 a.m. to 7 p.m. except for the minimum activity needed to move the train on site.¹²⁷
- N-2a: (1) Limit locomotive operations to the east of the unloading rack between the hours of 10 p.m. and 7 a.m. to a combined total of 100 locomotive-minutes (idling and switching).

However, while the mitigation measures not directly claimed as preempted by the Applicant, full implementation of these mitigation measures is indirectly prevented or substantially hindered through the Applicant's other claims. To wit, the Applicant claims federal preemption for Mitigation Measure N-2a(2), which requires shutdown of locomotives that enter the refinery between the hours of 10 p.m. and 7 a.m. if they are not immediately unloaded. If locomotives are not shut down, they idle; thus, preemption of N-2a(2) indirectly prevents and/or hinders implementation of AQ-2b, AQ-4c, and N-2a(1) which contain restrictions on idling and on train movement and operation during nighttime hours.

The Applicant provides no discussion of how these contradictory mitigation measures would be implemented and who would be responsible for their legally correct

¹²⁶ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, Attach. 11.

¹²⁷Ibid.

implementation. The Applicant may not have it both ways. Either federal law preempts all measures intended to reduce emissions from or restrict movement and operation of UPRR locomotives or it doesn't. As the Applicant states elsewhere:

The FEIR describes the train unloading sequence at pages 2-26 to 2-27, and clearly discloses that the UPRR locomotives that deliver the train to the site are the same locomotives that will position the tanker cars for unloading, and will maneuver the tanker cars throughout the time that they are on-site. These locomotives are an integral part of interstate commerce – the tanker cars cannot arrive without the locomotives – and their status under federal law does not change when they cross the property boundary. In addition, their brief stay on Phillips 66's property does not give the County power over the locomotives and their impacts in ways that would otherwise be preempted by federal law.¹²⁸

Thus, the Applicant's selective assertion of federal preemption over portions of the Final EIR's mitigation measures affecting the operation of locomotives is not supported.

B. The Applicant's Claim that Near-Refinery Health Risks Associated with Diesel Particulate Matter Emissions from the Locomotives Would Be Reduced to Less Than Significant with the Reduced Rail Deliveries Alternative Is Incorrect and Unsupported

The Applicant claims that the Final EIR "demonstrates that the health risk associated with DPM from on-site activities would be reduced to less than significant as a result of the Reduced Rail Delivery Alternative."¹²⁹ "Specifically," the Applicant claims "the revised Health Risk Assessment in the Final EIR (FEIR Appendix B.2) demonstrates that with the Reduced Rail Deliveries Alternative, all impacts from equipment and operations under the jurisdiction of the County (i.e., the non-preempted equipment and activities) would be reduced to less than significant."¹³⁰ This claim is not supported and contradicted by evidence.

The Final EIR's health risk assessment for the Reduced Rail Deliveries Alternative relies on the following two mitigation scenarios:

- 1) **Full Mitigation:** Tier 4 Locomotives, idling restrictions, clean trucks (Mitigation Measures AQ-2a, 2b and 4b); and

¹²⁸ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, p. 12.

¹²⁹ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, p. 15, Footnote 3.

¹³⁰ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, p. 14-15.

2) **Partial Mitigation:** idling restrictions, daytime unloading only and clean trucks (Mitigation Measures AQ-2b, 4b, 4c).¹³¹

Based on these mitigation measures, the Final EIR, Table 5.9, finds cancer risks of 9.5 in one million for the partially mitigated Reduced Rail Deliveries Alternative (Scenario 2: SMR + Rail Spur + Trucks + Mainline with idle restrictions onsite + 2010 truck fleet + daytime unloading only (7 a.m. until 7 p.m.)), very close to the 10 in one million significance threshold. Based on this finding, the Final EIR concludes for the Reduced Rail Deliveries Alternative:

As shown in Table 5.9, the cancer risk at the maximally exposed individual resident would be less than 10 in a million for both the mitigation and partial mitigation cases. The partial mitigation case does not include Tier 4 locomotives since the County may be preempted by Federal law from implementing this measure. However, even without the use of Tier 4 engines, the cancer risk with partial mitigation would be less than significant with mitigation. Mitigation measures associated with impact AQ.4 for the Rail Spur Project would apply to this alternative.¹³²

However, the Applicant's assertion of federal preemption undercuts the Final EIR's findings. As summarized above, the Applicant carefully avoids directly claiming federal preemption for any mitigation measures supporting the less than significant health risk findings presented in the Final EIR. However, both idling and daytime only unloading activities are either entirely preempted or severely restricted by the Applicant's approach to selective preemption of mitigation measures intended to restrict the movement or operation of the locomotives on site. Table 14 summarizes cancer risks as determined by the Final EIR for the Reduced Rail Deliveries Alternative without the partial mitigation limiting unloading activities to daytime only (7 a.m. to 7 p.m. (red arrows)).

¹³¹See, Final EIR, Table 5.9, p. 5-58.

¹³² Final EIR, p. 5-47.

Cancer risks
 > 10 in one million

Table 14: Excerpt from Final EIR, Appendix B.2, Table 1

Scenario	PMI (Point of Maximum Impact)	MEIR (Maximum Exposed Individual Resident)	MEIW (Maximum Exposed Individual Worker)	Specific Residences MEIR			
				Louise Lane (East of SMR)	Trilogy Street (East of SMR)	Monadella Street (North of SMR)	Olivera Street (NE of SMR)
13. SMR+Rail Spur+Trucks with idle restrictions onsite + 2010 truck fleet+daytime unloading only (7:00 AM till 7:00 PM)	54.7	10.4	0.63	2.5	1.8	9.6	9.6
14. SMR+Rail Spur+Trucks+Mainline with idle restrictions onsite + 2010 truck fleet+daytime unloading only (7:00 AM till 7:00 PM)	58.0	13.6	0.69	2.6	1.9	13.6	10.9
<i>Three Trains per Week Alternative (Partially Mitigated without Tier 4 Locomotives) with 24-hr Unloading</i>							
15. SMR+Rail Spur+Trucks with idle restrictions onsite + 2010 truck fleet	84.6	14.8	1.00	2.5	1.8	13.9	14.8
16. SMR+Rail Spur+Trucks+Mainline with idle restrictions onsite + 2010 truck fleet	87.2	17.0	1.05	2.6	1.9	17.0	15.7
<i>Three Trains per Week Alternative (Partially Mitigated without Tier 4 Locomotives) Daytime Unloading Only (7:00 AM till 7:00 PM)</i>							
17. SMR+Rail Spur+Trucks with idle restrictions onsite + 2010 truck fleet+daytime unloading only (7:00 AM till 7:00 PM)	37.0	7.8	0.42	1.8	1.4	7.1	6.4
18. SMR+Rail Spur+Trucks+Mainline with idle restrictions onsite + 2010 truck fleet+daytime unloading only (7:00 AM till 7:00 PM)	39.0	9.5	0.46	1.9	1.5	9.5	7.1

As shown, under the Reduced Rail Deliveries Alternative, cancer risks at the maximally exposed individual resident (“MEIR”) are 17.0 in one million if only idling restrictions are enforced, far in excess of the significance threshold of 10 in one million. Therefore, if calm hours cannot be avoided during unloading, cancer risks will be significant. If idling restrictions cannot be enforced, per the Applicants claim to federal preemption of Mitigation Measure N-2(a), cancer risks will be even higher.

Further, as discussed in Comment I, the Final EIR substantially underestimates diesel particulate matter emissions from locomotives and, thus, cancer risk as modeled by the Final EIR is underestimated. Thus, cancer risks for the Reduced Rail Deliveries Alternative are similarly underestimated. In sum, cancer risks for the Reduced Rail Alternative are significant

C. The Applicant’s Attempt to Discredit the SLOCAPCD’s Significance Threshold for Diesel Particulate Matter Emissions Is Not Supported

In an effort to convince Planning Commission Staff that the Reduced Alternative would not result in significant and unavoidable (“Class I”) impacts on air quality on site, the Applicant provides a desperate attempt to discredit the SLOCAPCD’s CEQA threshold of significance for DPM of 1.25 lbs/day, claiming it to be an “arbitrary and irrelevant value” that cannot be found in the cited supporting documentation:

The staff report states that on-site emissions from the Reduced Rail Delivery Alternative would exceed a DPM significance threshold of 1.25 pounds per day.

Staff Report, p. 21. However, *1.25 pounds appears to be an arbitrary and irrelevant value*. The FEIR references the April 2012 SLOCAPCD CEQA Air Quality Handbook as the source for the 1.25 pounds-per-day threshold. FEIR p. 4.3-34. The SLOCAPCD in turn references another document – the Carl Moyer Program Guidelines – as the origin of the 1.25 pound per day threshold. Due to its length and irrelevance, the Carl Moyer Program Guidelines are not attached, but can be found at http://www.arb.ca.gov/msprog/moyer/guidelines/2011gl/2011cmpgl_20151218.pdf. Yet there is no mention of any such threshold in the Carl Moyer Program Guidelines, which relate to the administration of certain grants by the California Air Resources Board and have no connection whatsoever to CEQA. Due to its length and irrelevance, the Carl Moyer Program Guidelines are not attached, but can be found at... The document contains no discussion of CEQA, contains no emissions thresholds established to protect public health, *and uses the word 1.25 only four times, for completely unrelated purposes...*¹³³

This argument is without merit. Not finding the value “1.25” *verbatim* and designated as a threshold in the cited *Carl Moyer Program Guidelines* is hardly proof that the SLOCAPCD’s threshold is not supported. For once, there are any number of ways 1.25 lbs/day can be expressed, for example, as 114.06 lbs/quarter, 456.25 lbs/year, 0.0575 tons/quarter, 0.2281 tons/year – or as a non-truncated value, *e.g.*, 2.48 lbs/day. Neither of these examples is, of course, found in the *Carl Moyer Program Guidelines*, as this document is neither intended to nor does it provide air district-specific CEQA thresholds of significance, or for that matter, any other thresholds. The *Carl Moyer Program* provides funding to and is implemented in partnership with California’s 35 air districts to encourage the voluntary purchase of cleaner-than-required engines, equipment, and emission reduction technologies as a complementary means to regulations for reducing statewide air pollutant emissions; the *Carl Moyer Program Guidelines* spell out basic requirements for administrative procedures, eligibility criteria for projects in different source categories, cost-effectiveness criteria, and reporting practices for air districts to implement the program.¹³⁴ Because of the unique air pollution situation in each air district and the number of potentially eligible emission sources, the particulars of the program’s implementation are different for each of the 35 air districts in California. The *Carl Moyer Program* is based on results of decades of research by the CARB into the health effects of ozone precursors and toxic diesel particulate matter, their prominent sources in California, and potential for reduction, which is extensively cited to in the *Carl Moyer Program Guidelines*.

¹³³ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, Footnote 3; *emphasis added*.

¹³⁴ CARB, Carl Moyer Program Guidelines, Executive Summary;
<http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm>.

While the SLOCAPCD’s CEQA Handbook does not discuss how it derived its significance threshold for DPM, it does not, as claimed by the Applicant, cite the *Carl Moyer Guidelines* “as the origin of the 1.25 pound per day threshold,” but instead merely states that the threshold is “based on” the *Carl Moyer Guidelines*, as can be seen in the footnote to the excerpted table from the SLOCAPCD’s CEQA Handbook, p. 3-4, below.

Table 3-2: Thresholds of Significance for Operational Emissions Impacts

Pollutant	Threshold ⁽¹⁾	
	Daily	Annual
Ozone Precursors (ROG + NO _x) ⁽²⁾	25 lbs/day	25 tons/year
Diesel Particulate Matter (DPM) ⁽²⁾	1.25 lbs/day	
Fugitive Particulate Matter (PM ₁₀), Dust	25 lbs/day	25 tons/year
CO	550 lbs/day	
Greenhouse Gases (CO ₂ , CH ₄ , N ₂ O, HFC, CFC, F6S)	Consistency with a Qualified Greenhouse Gas Reduction Plan OR 1,150 MT CO ₂ e/year OR 4.9 CO ₂ e/SP/year (residents + employees)	

1. Daily and annual emission thresholds are based on the California Health & Safety Code Division 26, Part 3, Chapter 10, Section 40918 and the CARB Carl Moyer Guidelines for DPM.

2. CalEEMod – use winter operational emission data to compare to operational thresholds.

Typically, air districts do not pull significance thresholds out of thin air and there are a number of ways the SLOCAPCD may have developed this threshold for DPM based on the unique air pollution challenges in the airshed under its jurisdiction and I do not wish to speculate on the specific approach taken by the SLOCAPCD but would like to explain that there are multiple approaches that would have allowed the air district to establish a level of daily DPM emissions at which it believes additional projects subject to CEQA review would result in adverse health impacts. For example, the district could have taken a statistical, health impact-based approach considering any or all factors such as existing background population-weighted inhalation cancer risks in the airshed, current diesel particulate and/or toxic air contaminant emission inventories (from mobile and/or stationary sources), existing population count and expected growth, future statewide diesel particulate matter reductions from mobile sources, and taking into account the amount of funding the air district receives annually from the *Carl Moyer Program* and the resulting expected annual diesel particulate matter emission reductions in its jurisdiction and relying on any of the documentation cited in or relied upon by the *Carl Moyer Program Guidelines*. In sum, the Applicant may not simply discredit the SLOCAPCD’s adopted CEQA threshold of significance, especially not without providing any substantial evidence whatsoever (as discussed, the mere absence of “1.25” in a threshold context in the *Carl Moyer Program Guidelines* does not constitute substantial evidence).

The Applicant concedes that, “[a]s a practical matter, the 1.25 pound per day value can be applied as a screening threshold that triggers additional, more sophisticated analysis:”

See, e.g., SLOCAPCD CEQA Air Quality Handbook p. 3-5: “Diesel particulate matter (DPM) is seldom emitted from individual projects in quantities which relate to local or regional air quality attainment violations. DPM is, however, a toxic air contaminant and carcinogen, and exposure [to] DPM may lead to increased cancer risk and respiratory problems.” For projects that emit more than 1.25 lbs/day of DPM, “[i]f sensitive receptors are within 1,000 feet of the project site, a Health Risk Assessment (HRA) may also be required.” This is precisely what occurred in this case. The FEIR evaluates DPM as a toxic air contaminant (FEIR pp. 4.3-21-24; 4.3-64 to -68; 5-56 to 5-59), and demonstrates that the health risk associated with DPM from on-site activities would be reduced to less than significant as a result of the Reduced Rail Delivery Alternative (FEIR pp. 5-56 to 5-59).¹³⁵

The Applicant’s conclusion that the Reduced Alternative would reduce health risks associated with DPM from on-site activities to less than significant levels is not supported and relies on selective citation from the SLOCAPCD’s CEQA Handbook. Specifically, the Applicant’s Letter intentionally omits the last sentence in the cited paragraph from the SLOCAPCD’s CEQA Handbook, p. 3-5, which is highlighted in the excerpt below:

3.5.3 Diesel Particulate Matter (DPM) Emissions

Diesel particulate matter (DPM) is seldom emitted from individual projects in quantities which lead to local or regional air quality attainment violations. DPM is, however, a toxic air contaminant and carcinogen, and exposure DPM may lead to increased cancer risk and respiratory problems. **Certain industrial and commercial projects may emit substantial quantities of DPM through the use of stationary and mobile on-site diesel-powered equipment as well diesel trucks and other vehicles that serve the project.**

The Project is precisely such an industrial project that “may emit substantial quantities of DPM through the use of... mobile on-site diesel-powered equipment as well as diesel trucks and other vehicles that serve the project.” In fact, it is hard to imagine a project that would emit more diesel particulate matter than the potentially entirely uncontrolled locomotives that serve the Project and would operate on site (switching the tank cars and idling). In other words, the “seldom” finding highlighted by the Applicant most certainly does not apply here.

¹³⁵ Phillips 66 2/1/2013 Letter to San Luis Obispo County, *op. cit.*, Footnote 3.

The Applicant's selective citations also omit the following highlighted requirement specified in the SLOCAPCD's CEQA Handbook, p. 3-5:

Projects that emit more than **1.25 lbs/day** of DPM need to implement on-site Best Available Control Technology measures. If sensitive receptors are within 1,000 feet of the project site, a Health Risk Assessment (HRA) may also be required. Sections 3.5.1 and 3.6.4 of this Handbook provide more background on HRAs in conjunction with CEQA review. Guidance on the preparation of a HRA may be found in the CAPCOA report *HEALTH RISK ASSESSMENT FOR PROPOSED LAND USE PROJECTS* which can be downloaded from the CAPCOA website at www.capcoa.org.

Neither the Applicant nor the Final EIR provide any discussion of, or proof that *onsite* Best Available Control Technology ("BACT") would be implemented. The implementation of BACT is not restricted to any new stationary sources associated with the Project but can be any "on-site" measures. As discussed in Comments III.B.2 and III.E.1, BACT for the SMR's onsite fired sources is feasible and must be considered as a mitigation for the Project. In addition, technology exists for the proposed unloading rack that would substantially reduce diesel particulate matter emissions from the Project; this technology has been demonstrated in practice and is feasible for the Project and would not interfere with UPRR's operations. (See Comment III.E.3.)

D. The Reduced Rail Deliveries Alternative Does Not Reduce Significant Impacts on Air Quality and Associated Health Risks on a Daily Basis

Contrary to the Applicant's claim that the Reduced Rail Deliveries Alternative would "reduce all impacts associated with on-site Project activities to less than significant," the Final EIR supports several significant impacts, for example:

- Daily unmitigated (not Tier 4) on-site locomotive emissions of NO_x+ROG (24.18 lbs/day ROG + 214.05 NO_x = **238.23 lbs/day ROG+NO_x**) alone would exceed the SLOCAPCD's daily significance threshold for these pollutants of **25 lbs/day** by a factor of almost 10.¹³⁶
- Daily unmitigated (not Tier 4) on-site locomotive emissions of diesel particulate matter (**8.15 lbs/day**) alone would by far exceed the SLOCAPCD's daily significance threshold for this pollutant of **1.25 lbs day**.¹³⁷

Further, the Reduced Rail Deliveries Alternative does nothing to reduce the impacts on air quality and associated health impacts due to ozone precursors in the SLOCAPCD (Table 5.6) and the uprail air districts (Table 5.7). These remain significant and unavoidable impacts (Class I).

¹³⁶ Final EIR, Table 5-5.

¹³⁷ Ibid.

V. Readability of the Final EIR’s Section on Air Quality and Greenhouse Gases

The Final EIR’s presentation of emissions and health impacts in Section 4.3 (Air Quality and Greenhouse Gases) is at times unnecessarily hard to follow because of the order components of the discussion are presented.

For example, the Final EIR identifies significant and unavoidable (Class I) impacts for operational emissions within San Luis Obispo County on page 4.3-50 as shown in the following excerpt:

Impact #	Impact Description	Phase	Impact Classification
AQ.2	Operational activities associated with the Rail Spur Project within SLOC (i.e., on the project site (SMR) and on the mainline within SLOC) would generate criteria pollutant emissions that exceed SLOCAPCD thresholds.	Operations	Class I

The Final EIR follows this up with a discussion of *unmitigated* Project emissions on the same page referring to Tables 4.3.14 and 4.3.15, which is followed by the proposed mitigation measures, AQ-2a and AQ-2b, before presenting these tables. Because Tables 4.3.14 and 4.3.15 refer only to “operational emissions” (*see below*), the reviewer may be misled to assume that they present *mitigated* operational emissions when, in fact, they present *unmitigated* emissions. Similarly confusing is the presentation of the impact identification at the beginning and the conclusion regarding significance after implementation of all feasible mitigation at the end of the discussion. I suggest that the discussion in the Final EIR be rearranged as follows:

Final EIR	Proposed
1) Impact identification (<i>see excerpt above</i>)	1) Discussion of <i>unmitigated</i> operational emissions and impacts
2) Discussion of <i>unmitigated</i> operational emissions and impacts	2) Tables for <i>unmitigated</i> operational emissions
3) Mitigation measures	3) Mitigation measures
4) Tables for <i>unmitigated</i> operational emissions	4) Tables for <i>mitigated</i> emissions
5) Discussion of residual impact with Tables for <i>mitigated</i> emissions	5) Discussion of residual impacts
6) Conclusion regarding significance	6) Conclusion regarding significance
	7) Impact identification (<i>see excerpt above</i>)

A further handicap obstructing the ease of review are a number of imprecise captions for the presented summary tables. I suggest that the following captions in the FEIR be replaced with the captions shown in *italics*; proposed revisions are underlined:

Table 4.3.11 Construction Emissions
Table 4.3.11 Mitigated Construction Emissions

Table 4.3.14 Operational Emissions within SLOC, Peak Day and Annual
Table 4.3.14 Unmitigated Operational Emissions within SLOC, Peak Day and Annual

Table 4.3.15 Operational Emissions within SLOC and Thresholds

Table 4.3.15 Unmitigated Operational Emissions within SLOC Compared to SLOCAPCD Thresholds, Peak Day and Annual

Table 4.3.17 Mitigated Operational Emissions within SLOC and Thresholds

Table 4.3.17 Mitigated Operational Emissions within SLOC Compared to SLOCAPCD Thresholds, Peak Day and Annual

Table 4.3.18 Mainline Rail Emissions, Peak Day and Annual

Table 4.3.18 Unmitigated Mainline Rail Emissions Outside of SLOC to the Roseville and Colton Rail Yards, Peak Day and Annual

Table 4.3.19 Mainline Rail Emissions Pass [sic] the Roseville and Colton Rail Yards, Peak Day and Annual

Table 4.3.19 Unmitigated Mainline Rail Emissions Past the Roseville and Colton Rail Yards to the California Border, Peak Day and Annual

Table 4.3.20 Mitigated Mainline Rail Emissions, Peak Day

Table 4.3.20 Mitigated Mainline Rail Emissions Outside of SLOC to the Roseville and Colton Rail Yards, Peak Day and Annual

Table 4.3.21 Mitigated Mainline Rail Emissions Past the Roseville and Colton Rail Yards, Peak Day and Annual

Table 4.3.21 Mitigated Mainline Rail Emissions Past the Roseville and Colton Rail Yards to the California Border, Peak Day and Annual

Table 4.3.22 Health Impacts of Significant Emissions

Table 4.3.22 Health Impacts of Mitigated Ozone Precursor Emissions by Air District

Table 4.3.23 Health Risk HARP Modeling Results: Proposed Project Cancer Risk, Risk per Million

Table 4.3.23 Health Risk HARP Modeling Results: Proposed Project Near-Refinery Cancer Risk, Risk per Million

Table 4.3.27 Cumulative Health Risk HARP Modeling Results: Cancer Risk

Table 4.3.27 Cumulative Health Risk HARP Modeling Results: Near-Refinery Cancer Risk, Risk per Million

I also suggest that the Final EIR's main text be revised to clearly identify whether it refers to *unmitigated* or *mitigated* emissions. For example, the following statements refer to *unmitigated* emissions:

Emissions of ROG and NO_x would be emitted at levels above the daily CEQA thresholds established by most of the air districts along the route.¹³⁸

Table 4.3.19 provides an estimate of the additional air emissions that would be associated with a crude oil unit train traveling along some of these routes between the California border and the Roseville or Colton rail yards. These

¹³⁸ Final EIR, p. 4.3-56.

emissions would add to an impact that was already found to be significant as discussed above.¹³⁹

VI. Recommendation

Based on the above discussion, I find that the Final EIR for the Rail Spur Project remains substantively deficient as an informational document under CEQA and recommend that the County deny adoption of or revise the Final EIR to address the issues outlined above and recirculate the document for public review. Further, contrary to the Applicant's assertion, I find that the Reduced Rail Deliveries Alternative would result in significant impacts with respect to air quality and health risks.

Please feel free to call me at (415) 492-2131 or e-mail at petra.pless@gmail.com if you have any questions about the comments in this letter. For most cited sources not provided as exhibits, I have included weblinks; if you require a copy of any cited document, I will make it available upon request.

Best regards,

A handwritten signature in black ink, appearing to read "Petra Pless". The signature is stylized with a large, sweeping initial "P" and a flourish at the end.

Petra Pless, D.Env.

¹³⁹Ibid.