

ADAMS BROADWELL JOSEPH & CARDOZO

A PROFESSIONAL CORPORATION

ATTORNEYS AT LAW

601 GATEWAY BOULEVARD, SUITE 1000
SOUTH SAN FRANCISCO, CA 94080-7037

TEL: (650) 589-1660
FAX: (650) 589-5062

rkoss@adamsbroadwell.com

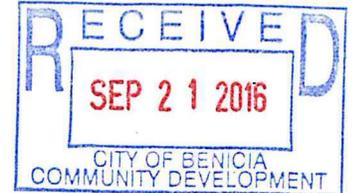
SACRAMENTO OFFICE

520 CAPITOL MALL, SUITE 350
SACRAMENTO, CA 95814-4721

TEL: (916) 444-6201
FAX: (916) 444-6209

DANIEL L. CARDOZO
CHRISTINA M. CARO
THOMAS A. ENSLOW
TANYA A. GULESSERIAN
LAURA E. HORTON
MARC D. JOSEPH
RACHAEL E. KOSS
LINDA T. SOBCZYNSKI

September 20, 2016



By Email and Overnight Mail

Honorable Mayor Patterson
and City Council Members
City of Benicia
250 East L Street
Benicia, CA 94510

epatterson@ci.benicia.ca.us
mhughes@ci.benicia.ca.us
tcampbell@ci.benicia.ca.us
aschwartzman@ci.benicia.ca.us
cstrawbridge@ci.benicia.ca.us

Re: Valero Crude by Rail Project (12PLN-00063)

Dear Honorable Mayor Patterson and City Council Members:

We are writing on behalf of Safe Fuel and Energy Resources California (“SAFER California”) to provide additional information for the City Council’s consideration of Valero’s appeal of the Planning Commission’s unanimous decision to deny the Use Permit Application for the Valero Crude by Rail Project. SAFER California has submitted numerous comments on the Project’s significant, unmitigated impacts throughout the City of Benicia’s review of the Project. On September 15, 2016, City staff issued its report for tonight’s City Council hearing on Valero’s appeal. Included as an attachment to staff’s report is a September 13, 2016 letter from Valero responding to some of SAFER California’s expert’s (Dr. Phyllis Fox) analyses of the Project’s significant, unmitigated air quality and public health impacts. We reviewed the letter with Dr. Fox and found that it not only fails to remedy the Final Environmental Impact Report’s numerous errors and omissions identified in our previous comments, but also misstates the law and the facts. Dr. Fox’s detailed responses to Valero’s letter are attached¹ and summarized below. We are also providing new information regarding significant hazards risks from the Project’s import and storage of tar sands dilbits crudes.

¹ **Attachment A:** Letter form Phyllis Fox to Rachael Koss re: Review of September 13, 2016 Letter from Donald Cuffel, September 20, 2016.

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A. Valero Misstates the Law and the Facts Regarding the Project's Air Quality and Public Health Impacts from Crude Slate Changes

In a March 28, 2016 letter to the City Council, Valero urged the City to ignore the Project's impacts from crude slate changes. SAFER California's March 30, 2016 response clearly showed why Valero's argument was unsupported by the facts and the law. Yet, at the eleventh hour, Valero makes similar, erroneous arguments again. Valero's arguments are still unsupported by the facts and the law.

Valero argues that the City need not consider the Project's impacts from crude slate changes because "Valero **already** has the legal right to store and process any crudes available on the market, as long as it does so consistent with its rights and obligations as established by the City and BAAQMD approvals of" the Valero Improvement Project ("VIP").² Valero also argues that the City should not consider impacts from crude slate changes because "Valero has already processed Bakken crude."³ Valero is wrong for four reasons.

First, as we previously explained, the California Environmental Quality Act ("CEQA")⁴ requires the City to determine whether a project would change the existing environment by increasing emissions as compared to actual existing emissions -- not whether the Project will change the environment by exceeding hypothetical emissions allowed under permit limits. This was precisely the issue before the California Supreme Court in *Communities for a Better Environment v. South Coast Air Quality Management District*.⁵ The Court rejected the argument that "the analytical baseline for a project employing existing equipment should be the maximum permitted operating capacity of the equipment, even if the equipment is operating below those levels at the time the environmental analysis is begun."⁶

² Letter from Donald Cuffel, Valero Benicia Refinery, to Mayor Elizabeth Patterson and City Council, September 13, 2016 ("Valero Letter"), pp. 1-2 (emphasis in original).

³ *Id.*, p. 1.

⁴ Pub. Resources Code § 21000, et seq.

⁵ *Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.4th 310.

⁶ *Id.* at 316.

The Court held that CEQA requires the baseline to reflect “established levels of a particular use,” not the “merely hypothetical conditions allowable under the permits...”⁷ Following the Supreme Court decision, the court in *Communities for a Better Environment v. City of Richmond*⁸ similarly rejected the city’s use of a hypothetical baseline, which failed to reflect actual operational conditions. “The [Supreme Court] stated that using hypothetical, allowable conditions as a baseline ‘will not inform decision makers and the public of the project’s significant environmental impacts, as CEQA mandates.’”⁹ Thus, Valero’s argument has already been rejected by the California Supreme Court.

Second, there is zero evidence that any prior approvals by the City or BAAQMD allow Valero to replace up to 70,000 barrels per day of crude oil currently delivered by marine vessel from Alaska and various foreign sources with an equivalent amount of North-American sourced crude oil transported by rail. Indeed, Valero fails to point to any evidence that a crude slate change was evaluated for the VIP. In fact, the crudes Valero now proposes to import via rail (Bakken and tar sands) were not available on the west coast prior to 2002, which was the environmental baseline period for the VIP.¹⁰ As Dr. Fox previously explained,

[t]he crudes available by ship in 2002 are chemically and physically different from the crudes available by rail in 2014, over a decade later. The oil markets have changed dramatically due to the advent of fracking and the development of tar sands, all of which occurred long after the VIP EIR analyses were performed.”¹¹

Thus, the Project’s impacts from crude slate change could not have been analyzed in the VIP.

Third, the record shows that Valero processed Bakken crude one time from one barge. There is no evidence that Valero regularly imports Bakken crude, and certainly no evidence that it has imported up to 70,000 barrels per day of Bakken (which would be 42% of the refinery’s total crude throughput).

⁷ *Id.* at 322.

⁸ *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70.

⁹ *Id.* at 89.

¹⁰ See Fox Comments on IS/MND, July 1, 2013.

¹¹ See Fox Comments on DEIR, Comment I.

Finally, Valero's argument that the City shouldn't be concerned with crude slate changes blatantly ignores North American-sourced crudes' "unique chemical and physical compositions that affect the relative amounts of specific chemicals in the emissions,"¹² which CEQA requires the City to evaluate in its EIR. For example, Bakken and tar sands crudes have higher levels of benzene which will cause increased benzene emissions.¹³ Also, for example, Bakken crudes have much higher vapor pressures, which increases volatile organic compounds ("VOC") and hazardous air pollutants emissions from storage tanks.

In short, CEQA requires the City to determine whether the Project would change the existing environment, regardless of Valero's existing permits. Further, the record is replete with substantial evidence showing that crude slate changes would result in significant, on-site air quality and public health impacts. Therefore, the City Council must reject Valero's arguments to the contrary.

B. Substantial Evidence Shows that the Project Would Result in Significant Air Quality and Public Health Impacts from Tank Emissions

Dr. Fox previously showed that the Project's crude storage tank emissions exceed BAAQMD's VOC annual and daily CEQA significance thresholds.¹⁴ Valero attempts to rebut this evidence by arguing that Dr. Fox's conclusions "are based on radically erroneous assumptions about Valero's operations"¹⁵ and "tank emissions are not relevant, since tanks are being neither added nor modified for the CBR Project, and Valero is not proposing to store any crudes it is not already authorized to store."¹⁶ Valero is wrong. As Dr. Fox previously explained, her conclusions were based on information contained in Valero's own application to BAAQMD for the Project, as well as measured data and BAAQMD Regulation 8-5-301.¹⁷ Further, the record shows that the Project includes storing light Bakken crude oils with vapor

¹² Attachment A, p. 5.

¹³ *Id.*

¹⁴ See Fox Comments on DEIR, September 15, 2014, Comment II.B and Fox Appeal Comments, April 4, 2016, Comment II.C.

¹⁵ Valero Letter, p. 2.

¹⁶ *Id.*, p. 4.

¹⁷ See Fox Appeal Comments, Comment II.C; see also DEIR, Appendices E.3 and E.4.

pressures up to 13 psi in tanks currently permitted to store heavy crudes with vapor pressures of 0.3 to 4 psi.¹⁸ Thus, Valero's argument fails.

C. Substantial Evidence Shows that the Project Would Result in Significant Air Quality and Public Health Impacts from Rail Car Fugitive Emissions

Dr. Fox previously showed that the Project's rail car fugitive VOC emissions from unloading at the proposed unloading rack would be significant.¹⁹ In response, Valero now argues that the City "has no authority to regulate rail operations because of federal preemption."²⁰ Valero's argument is completely baseless. These emissions are not from rail operations. Rather, these emissions are fugitive emissions from rail car components which occur (1) when a rail car is completely under Valero's control at the refinery unloading rack, and (2) while Valero pipes the crude from the rail car to the tanks. Thus, federal preemption is irrelevant and Valero's argument fails.

D. Substantial Evidence Shows that the Project's Import of Tar Sands Dilbits Would Result in Significant, Unmitigated Impacts

The Project would allow Valero to import North American-sourced crude oil, including Canadian tar sands crudes blended with diluents, or "dilbits," and light fracked shale oil crudes, by rail. It is widely known that light fracked shale oil crudes, such as Bakken, are highly volatile and, therefore, pose substantial hazards risks from accidents. Tar sands crudes prior to blending have generally been considered less hazardous. However, recent studies show that tar sands dilbits (a blend of bitumen with a lighter petroleum product) are equally as hazardous as Bakken. Specifically, it has been determined that dilbit flammability and explosivity impacts are similar to, or greater than, those of Bakken crudes.²¹ This is

¹⁸ Attachment A, p. 17.

¹⁹ See Fox Appeal Comments, April 4, 2016, Comment II.A.

²⁰ Valero Letter, p. 6.

²¹ Attachment A, p. 20.

because diluent (which is highly flammable and explosive) is added to the make bitumen flow in and out of tank cars easily.²² As a result, tar sands dilbits pose a significant risk of fires and explosion “in the event of a rail accident during transit or on-site during idling and unloading.”²³ Dr. Fox explains that, for example, spills into the sump “could ignite and explode if the vapors encountered heat, sparks or a flame, such as could be generated by the locomotive, locomotive/rail car wheels on the tracks, maintenance work, coupling/decoupling of railcars, etc.”²⁴ In Dr. Fox’s opinion, “dilbits may present a greater fire and explosion risk and result in higher tank VOC emissions than light fracked shale crudes, such as Bakken crude oil.”²⁵

In addition, Dr. Fox explains that dilbits pose a significant hazard risk to Sulphur Springs Creek. Specifically, “[a] dilbit does not behave the same as a conventional crude when spilled in a waterway” because “[t]he blended lighter diluent generally evaporates readily when exposed to ambient conditions, leaving behind the heavy ends, the bitumen.”²⁶ Thus, a dilbit release creates “a difficult to cleanup spill as the heavier bitumen will be left behind.”²⁷ Tellingly, a major dilbit pipeline release into the Kalamazoo River in 2010 is still being remediated.²⁸

According to Dr. Fox, “tar sands dilbits may represent a worst case for air quality, risk of upset, biology and other impacts.”²⁹ Yet, the City completely failed to analyze the Project’s impacts from importing, unloading and storing dilbits at the refinery, as required by CEQA.

E. Conclusion

Valero’s last-ditch effort to sweep the Project’s significant, on-site air quality, public health and hazards impacts under the rug is unavailing. The record is replete with substantial evidence showing that the Project would result in significant, unmitigated on-site impacts which are clearly outside the bounds of

²² *Id.*, pp. 20-21.

²³ *Id.*, p. 21.

²⁴ *Id.*

²⁵ *Id.*, p. 22.

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.*, p. 20.

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federal preemption. Therefore, we urge the City Council to deny Valero's appeal and uphold the Planning Commission's decision.

Sincerely,

A handwritten signature in blue ink that reads "Rachael E. Koss". The signature is written in a cursive style.

Rachael Koss

REK:ljl

cc: Teresa Olson tolson@ci.benicia.ca.us

ATTACHMENT A

Phyllis Fox, Ph.D., PE
Environmental Management
745 White Pine Avenue
Rockledge, FL 32955
321-626-6885
PhyllisFox@gmail.com

September 20, 2016

Rachael Koss
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080-7037
rkoss@adamsbroadwell.com

Re: Review of September 13, 2016 Letter from Donald Cuffel

Dear Ms. Koss:

As you requested, I have reviewed the September 13, 2016 letter from Donald Cuffel, presenting "Further Rebuttal in Support of Appeal of Planning Commission Resolution No. 16-1, Denying Use Permit Application 12PLN-00063 and Declining to Certify Final Environmental Impact Report for the Valero Benicia Crude-by-Rail Project (SCH #2013052074)." ("Cuffel Letter")¹ This letter is notable for its lack of support for numerous assertions. With few exceptions, the letter simply reiterates arguments that have been made elsewhere in the record and rebutted in numerous comments by myself and others for which responses have not been provided. The Cuffel Letter presents no new evidence and fails to respond to my prior comments.

¹ Letter from Donald Cuffel, Valero Benicia Refinery, to Mayor Elizabeth Patterson and Members of the City Council, September 13, 2016; Available at: http://beniciaindependent.com/wp-content/uploads/2016/09/6_Valero_Submittal_-_Clarification_and_Rebuttal_Cuffel_091316-OCR.pdf.

I. CRUDE QUALITY

Impacts Must Be Evaluated Relative to the Baseline

Mr. Cuffel asserts that “Valero **already** has the legal right to store and process any crudes available on the market, as long as it does so consistent with its rights and obligations as established by the City and BAAQMD approvals of 2003 and 2008, for the Valero Improvement Project (“VIP”).”² This is wrong. This unsupported assertion confuses requirements under CEQA with so-called “legal rights” granted by the City and BAAQMD.

First, this merely reiterates an issue that has been raised elsewhere in the record and has been thoroughly rebutted. Mr. Cuffel presents nothing new.³

Second, Mr. Cuffel fails to cite any place in prior approvals or the record in this case where permission was granted to replace up to 70,000 barrels per day (“bbl/day”) of crude oil currently delivered by marine vessel from Alaska and various foreign sources with an equivalent amount of “North American-sourced crude oil” transported by rail. I am not aware of any. Project rail imports can include a wide range of light crudes including Bakken crude oil and a wide range of tar sands crude oils, including diluted bitumens⁴ (“dilbits”),⁵ none of which were refined in large amount in the Project baseline.

Third, under CEQA, impacts are evaluated relative to a baseline, not “legal rights” such as existing permits and City approvals. The baseline is the “actual” conditions at the site and in the vicinity of a project, as they exist at the time the notice

² Cuffel Letter, pp. 1-2 (emphasis in original).

³ Phyllis Fox, Comments on Final Environmental Impact Report for the Valero Crude by Rail Project, Benicia, California, February 8, 2016 (“Fox Comments FEIR”), , Comment II.

⁴ A dilbit is a bitumen diluted with one or more lighter petroleum products, typically natural-gas condensates such as naphtha. Diluting bitumen makes it much easier to transport. If the diluent density is greater than or equal to 800 kg/m³, the diluent is typically synthetic crude and accordingly the blend is called synbit. See Wikipedia, Dilbit; <https://en.wikipedia.org/wiki/Dilbit>.

⁵ DEIR, Table 3-1.

of preparation is published.⁶ Existing permits and City approvals do not establish the baseline under CEQA. Thus, the argument Mr. Cuffel is making at the eleventh hour is irrelevant.

The baseline here is 2011 to 2012,⁷ a period when little or no alternative crudes, such as Bakken and tar sands crudes, were processed at the Valero refinery. Mr. Cuffel attempts to head off this absence argument by stating: "First, it must be noted that Valero has already processed Bakken crude."⁸ However, this is not news and does not establish the CEQA baseline.

The EIR disclosed that the Refinery has processed Bakken crude in the past, imported by barge,⁹ which I acknowledge in my comments. However, as I previously noted, the EIR is silent on the amount of Bakken crude refined in the past, when it was refined, and the tank(s) that stored the crude, critical facts required to assess Project impacts. There is no evidence, for example, that Bakken crude was imported during the CEQA baseline and if so, how much. There is also no evidence that it was stored in the six tanks proposed to hold the crude-by-rail imports.

In spite of my prior comments noting that the record does not include any baseline crude quality data, Mr. Cuffel fails to supply any, which is essential to evaluate Project impacts.¹⁰ Merely mentioning that "Valero has already processed Bakken

⁶ See, e.g., *Communities for a Better Env't v. S. Coast Air Quality Mgmt. Dist* (2010) 48 Cal.4th 310, 320-21 [holding that the baseline must reflect "existing physical conditions in the affected area that [constitutes] the real conditions on the ground, rather than the level of development or activity that could or should have been present according to a plan or regulation[]"]; *Sunnyvale W. Neighborhood Assn. v. City of Sunnyvale City Council* (2010) 190 Cal.App.4th 1351, 1376-93 [rejecting a municipality's use of a baseline of projected traffic in the year 2020] [Sixth Appellate Dist.]; *Citizens for East Shore Parks v. Cal. State Lands Comm.* (Cal.App., Dec. 30, 2011, No. A129896 [2011 Cal.App.LEXIS 1645] at pp. 8-9 [holding that the proper baseline for CEQA analysis and evaluation of environmental impacts is "what [is] actually happening," not what might happen or what could be happening."] Internal citations, quotations, and emphasis omitted.

⁷ Initial Study, p. I-6.

⁸ Cuffel Letter, p. 1.

⁹ FEIR, p. 2.4-44, RTC A10-1.

¹⁰ See Phyllis Fox, Comments on Valero's Appeal of Planning Commission's Denial of Valero Crude-by-Rail Project, Benicia California, April 4, 2016 ("Fox Appeal Comments"), p. 14.

crude” does not provide the information required to evaluate Project impacts. The amount of Bakken crude refined, where it was stored, and the date(s) it was imported and refined must be known.

It is common for refineries to evaluate small quantities of crudes they are considering before committing to large shipments.¹¹ Thus, while small amounts of Bakken crude may have been processed as a litmus test for the Project, there is no evidence in the record that Bakken crude was a major source of crude feed for the Refinery in the baseline. This Project proposes to import up to 70,000 bbl/day of Bakken, or 42% of the total crude throughput.¹² This is a significant change in crude slate that has not been evaluated in any CEQA document.

Fourth, even if “legal rights” were a valid basis to evaluate impacts (which they are not), this test would also fail as a surrogate for CEQA analysis because the baseline for the VIP is prior to 2002. The subject crudes, Bakken and tar sands crudes, were not available on the west coast in the VIP baseline, prior to 2002. Thus, the VIP EIR did not consider these crudes, as I previously explained in my comments on the IS/MND.¹³

Fifth, Mr. Cuffel fails to cite any place in the 2003 and 2007 VIP approvals, or the record in the Crude by Rail (“CBR”) case, where the impacts of a crude switch were evaluated. I am not aware of any. I have written extensive comments on the lack of any analysis of the impacts of a crude switch and the types of impacts to be expected.¹⁴ As I previously explained, “...the CBR Project DEIR cannot rely on the VIP CEQA review to address the impacts of refining any of them. Rather, the VIP EIR proposed to import

¹¹ Garrett et al, 2016, p. 40.

¹² RDEIR, p. 2-20: Permitted Refinery throughput is an average of 165,000 bbl/day, so the Project would supply: $100\% \times (70,000 / 165,000) = 42.4\%$ of the total throughput.

¹³ Phyllis Fox, Comments on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063, July 1, 2013 (“Fox Comments IS/MND”).

¹⁴ Fox Comments IS/MND; Phyllis Fox, Comments on the Draft Environmental Impact Report (DEIR) for the Valero Benicia Crude by Rail Project, September 15, 2014 (“Fox Comments DEIR”), Comment I and Fox Comments FEIR, Comment II.

heavy sour crudes by ship. The crudes available by ship in 2002 are chemically and physically different from the crudes available by rail in 2014, over a decade later. The oil markets have changed dramatically due to the advent of fracking and the development of tar sands, all of which occurred long after the VIP EIR analyses were performed.”¹⁵ The record still does not contain a responsive analysis.

VIP Emission Reductions Do Not Mitigate Project Impacts

Mr. Cuffel asserts that “criteria pollutant emissions and toxic releases were reduced by extraordinary amounts [by the VIP], and the emissions reductions have remained constant since activation of the FGS [flue gas desulfurization] in 2011.”¹⁶ This is irrelevant and misleading with respect to emission increases from the CBR Project because reductions achieved by the VIP do not mitigate increases caused by the CBR Project. In fact, the reductions achieved by the VIP are part of the baseline for the CBR Project, which will increase emissions of some pollutants, VOCs and hazardous air pollutants (“HAPs”), for example, relative to the VIP and post-VIP baseline.

Re-do of VIP EIR

Many comments on the CBR Project noted the absence of any analysis of the impact of a change in crude quality on emissions due to its proposal to import crudes oils that were not evaluated for the VIP. Mr. Cuffel twists these comments to imply that they amount to “repeating the VIP environmental review” and “provides the City an opportunity to undo and second-guess the City’s approval of the VIP Project.”¹⁷ Nothing could be further from the truth.

The VIP baseline is the years prior to 2002¹⁸. The heavy, high sulfur foreign-sourced crudes available by ship in 2002 that the VIP project was designed to refine are

¹⁵ Fox Comments DEIR, Comment I.A.3.a, p. 9.

¹⁶ Cuffel Letter, p. 2.

¹⁷ Cuffel Letter, p. 2.

¹⁸ ESA, Valero Refining Company's Land Use Application for the Valero Improvement Project, Environmental Impact Report, Draft, October 2002 (DEIR). The Benicia Planning Commission certified

chemically and physically different from the “North American-sourced crude oils” available by rail in 2014, over a decade later. In fact, the record contains no evidence that the “North American-sourced crude oil” transported by rail under the CBR Project¹⁹ were the target of the VIP project or even were commercially available in the pre-2002 VIP baseline period. The oil markets have changed dramatically due to the advent of fracking and the development of tar sands, all of which occurred long after the VIP EIR analyses were performed.”²⁰ The analysis of the environmental impacts of importing, storing and refining these new crudes, which was not considered in the VIP EIR, does not require revisiting the VIP EIR, but rather correcting a major omission in the CBR Project EIR, which is currently before the City and the BAAQMD. The glaring omission here is any analysis whatsoever of the impacts of a crude switch.

Crude Type Affects Emissions

Mr. Cuffel next incorrectly asserts that “the fundamental factual error that pervades all of [my] comments lies in [my] assertion that crude type drives emissions levels.”²¹ No citation to the record is provided where I make this assertion. In fact, I have never asserted that “crude type drives emissions levels.”

Rather, I have documented that the new “North American sourced crudes” have unique chemical and physical compositions that affect the relative amounts of specific chemicals in the emissions,²² independent of the red herring throughput theory advanced by Mr. Cuffel at the eleventh hour, after the close of public comments, in Appendix 1 of his letter.

the Final EIR, consisting of the DEIR and the Responses to Comments in Resolution No. 03-4. This FEIR was amended in 2007. Supporting documents available at:
http://www.ci.benicia.ca.us/index.asp?Type=B_BASIC&SEC=%7B737165B4-11C5-4974-9B0B-0AE4AC535ECC%7D.

¹⁹ DEIR, Table 3-1.

²⁰ Fox Comments DEIR, Comment I.A.3.a, p. 9.

²¹ Cuffel Letter, p. 2.

²² Fox Comments IS/MND, Comment II.D, and Fox Comments DEIR, Comment I.

For example, my comments demonstrate that Bakken crudes and dilbits have elevated levels of benzene which will result in elevated benzene emissions, for comparable throughputs. Similarly, Bakken crudes have much higher vapor pressures than crudes refined in the baseline, which increases VOC and HAP emission from storage tanks, independent of refinery throughput. Similarly, Bakken crudes are much more flammable, increasing the probability and consequences of accidents, independent of refinery throughput. The same throughput would produce higher emissions in both cases because the composition of the crude has changed. There are many similar compositional differences that increase emissions that I document in my comments that have nothing whatsoever to do with refinery throughput. The refinery throughput argument is a red herring, diverting attention away from the real issue, the physical and chemical compositional differences between the baseline crude slate and the crude slate post Project.

Mr. Cuffel claims his attached Appendix 1 “graphically demonstrates that emissions levels are driven not by crude type, but by throughput” in an effort to cover up the fact that the EIR has failed to analyze the impacts of a switch in crude type.²³ While irrelevant to the crude quality issues I raised, this new analysis also fails to demonstrate what it set out to prove, that gross emissions are related to production.

This analysis is based on crude oil sulfur content in weight percent (wt. %) and the API gravity²⁴ of the crude oil. Setting aside the fact that this analysis fails to address crude compositional differences and their impact on specific chemical species, such as benzene and metals, there are other problems with Mr. Cuffel’s analysis. First, sulfur content and API gravity of the crude oil have anything to do the amount and type of emissions except sulfur dioxide (“SO₂”) (which is not an issue in this case), as

²³ Cuffel Letter, p. 2 and Appendix 1.

²⁴ API gravity is thus an inverse measure of a petroleum liquid's density relative to that of water (also known as specific gravity). It is used to compare densities of petroleum liquids. See Wikipedia, API gravity; Available at https://en.wikipedia.org/wiki/API_gravity.

previously explained in my comments on the DEIR²⁵. Second, the analysis is opaque. The underlying data is not presented so the analysis can be independently reviewed. Third, the analysis leaps from a chart that plots sulfur weight % (“wt%”) against API gravity to a chart containing numeral rankings of emissions based on crude type without any support whatsoever for the intervening steps.²⁶ The text notes that “fuel gas consumed and throughput (production rates)” for only three refining units (crude unit, FCCU, Fluid Coker) were used as a “proxy for refinery emissions.”²⁷ However, the text is silent on how this was done.

The record in this case contains abundant evidence that this analysis is incorrect. It includes published, peer-reviewed journal articles demonstrating that greenhouse gas emissions increase when tar sands crudes are refined. In addition, Bakken crudes, when blended with heavy crudes to meet crude slate requirements, as proposed by the CBR Project, have resulted in refinery operating issues at other refineries, which required adjustments to operating procedures and resulted in increased emissions. Bakken crudes contain higher paraffinic content that can result in waxy coatings on storage tanks, increasing tank cleaning emissions; greater development of sludges and solids when combining Bakken with non-Bakken crude oils, increasing tank cleaning emissions; elevated hydrogen sulfide (“H₂S”) content, requiring operational changes to avoid potential increases in corrosion; fouling of the cold preheat train; desalter upsets; and fouling of hot preheater exchangers and furnaces; as well as corrosion.²⁸ These operating problems increase emissions. These operating problems and attendant emission increases were not disclosed in the EIR.

²⁵ Fox Comments DEIR, Comment I.

²⁶ Cuffel Letter, Appendix 1, p. 3, Un-named and Un-numbered Chart.

²⁷ Cuffel Letter, Appendix 1, p. 3.

²⁸ Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013; Available at: <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>; Gordon Schremp, Trends in Sources of Crude Oil, 2014 IEPR Workshop, California Petroleum Overview & Background, June 25, 2014, p. 47; Available at: http://www.energy.ca.gov/2014_energy/policy/documents/2014-06-25_workshop/presentations/01_Schremp_Final_2014-06-25.pdf.

II. EMISSIONS FROM STORAGE TANKS

Mr. Cuffel, in his September 13, 2016 letter, attempts to rebut my September 15, 2014 estimates of volatile organic compound (“VOC”) emissions from storage tanks²⁹, a full two years after they were submitted and five months after the close of public comments. Rebuttal to these comments should have been presented in responses to comments on the DEIR and RDEIR. His comments demonstrate a fundamental lack of understanding of CEQA and of the comments that have been filed in this case.

Mr. Cuffel’s Initial Assumptions Are Wrong

Mr. Cuffel starts his tank emission commentary by asserting that my tank emission calculations “are based on radically erroneous assumptions about Valero’s operations”, citing my September 15, 2014 DEIR comments. Each of these so-called “radically erroneous” assumptions is discussed below.

First, all of Mr. Cuffel’s comments address the wrong set of comments. I revised my September 2014 tank VOC emission calculations in my comments on Valero’s appeal of the Planning Commission’s denial of the Valero CBR Project on April 4, 2016. My revised tank VOC emissions are based on information that was made available after the DEIR was published.³⁰ Thus, as an initial matter, Mr. Cuffel’s comments are irrelevant as he has critiqued the wrong set of tank VOC emission calculations.

Second, Mr. Cuffel incorrectly asserts, with no support, that “if a light sweet crude is replaced it must be replaced with a similar light sweet crude; thus a heavy sour crude would never be replaced with a light sweet crude”.³¹ Nothing in the Valero and NuStar Title V permits requires this like-kind swap. Further, this is exactly what Valero

²⁹ Fox Comments DEIR, Comment II.B.

³⁰ Fox Appeal Comments, Comment II.C.

³¹ Cuffel Letter, p. 3.

proposed in its application to the BAAQMD for the Project.³² In fact, the BAAQMD, in its comments on the DEIR, expressed the same concern.

Valero proposed to store imported Bakken crude oil in tanks permitted to store crude oil with vapor pressures of 0.3 to 4 pounds per square inch (“psi”), which are heavy crude oils.³³ Light crude oils, such as Bakken crudes, have much higher vapor pressures, up to 15 psi. Thus, the Project would replace heavy sour crudes with vapor pressures of 0.3 to 4 psi with light sweet crudes with vapor pressures up to 15 psi. I estimated that the increase in VOC emissions from this switch would exceed the BAAQMD’s annual and daily CEQA significance thresholds for VOC emissions, constituting a significant impact under CEQA.³⁴

Third, Mr. Cuffel critiques my initial tank VOC emission analysis, asserting I used a vapor pressure of 15.5 psi for Bakken crude, when Valero is limited by BAAQMD Regulation 8-5 to a vapor pressure in its storage tanks of less than 11 psi.³⁵ However, this regulation allows a vapor pressure greater than 11 psi with an approved emission control system.³⁶ Mr. Cuffel is silent as to which tanks would be involved and their emission control system. Further, I supported my choice of 15.5 psi with actual measured data and subsequently revised it to 13 psi based on Valero’s own assumptions in its hazard analyses.

Regardless, the existing Title V permits for the tanks that would receive the rail-imported crude oil (TK-1701 to TK-1708) do not require any vapor pressure monitoring. Rather, the permits allow the use of a “lookup table” to determine vapor pressure. A “look up” table does not measure vapor pressure, but rather uses defaults for generic types of crude. Further, the vapor pressure only needs to be looked up “initially and

³² See A/N 2502; 1/21/16 Bui Email; and Fox Appeal Comments, Comment II.C.

³³ Fox Appeal Comments, Comment II.C. See Figure 2 and Table 1.

³⁴ Fox Appeal Comments, Comment II.C, p. 16.

³⁵ Cuffel Letter, p. 3.

³⁶ BAAQMD Regulation 8-5-301.

upon change in service”.³⁷ This is not adequate to determine emissions day-in and day-out on a year round basis.

Thus, the vapor pressure of crude oil stored in tanks that would receive the rail-imported crude is not the “actual” vapor pressure measured in the tanks. The actual vapor pressure must be used to establish the CEQA baseline and the increase in VOC emissions due to the Project relative to the baseline. Further, the tank vapor pressure limits in these two Title V permits are unenforceable as both a legal and practical matter³⁸ because no measurements are required. Thus, they cannot be relied on by the EIR to limit tank VOC emissions to the levels claimed by Mr. Cuffel.

In fact, the record indicates that Valero would be in violation of BAAQMD Regulation 8-5 without modification to include an approved emission control system.³⁹ The record demonstrates that the types of crude that Valero proposes to import by rail will include crudes with vapor pressures equal to 11 psi or greater. The hazard analysis, for example, assumed that the maximum vapor pressure of the rail-imported crude would be 13 psi. Many Bakken and other light crudes have a true vapor pressure of 11 psi or higher.⁴⁰ As noted above, the Title V permits that cover the tanks that

³⁷ BAAQMD, Valero Title V Permit, Facility #B2626, April 10, 2015, Table VII-J6, pdf 729, TK-1707 and TK-1708, vapor pressure monitoring frequency: “P/E initially and upon change of service”; monitoring type: “Look up table or sample analysis; Records”. BAAQMD, NuStar Title V Permit, Facility #B5574, December 20, 2010, Table VII-B, TK-1702, pdf 76, TK-1701, vapor pressure monitoring frequency: “iP/E initially and upon change of service”; monitoring type: “Look up table or sample analysis; Records”; Table VII-C, pdf 78, TK-1703 to 1706, vapor pressure monitoring frequency: “P/E initially and upon change of service”; monitoring type: “Look up table or sample analysis; Records”.

³⁸ See: *In the Matter of Yuhuang Chemical Inc.*, Order on Petition No. VI-2015-03 (Aug. 31, 2016) and U.S. EPA, Region 9, *In the Matter of Bakersfield Crude Terminal LLC, Plains Marketing, L.P., Plains All American Inc., Taft, California*, Proceeding under Section 113(a), Clean Air Act, as Amended, Docket No. R9-15-08, Finding and Notice of Violation.

³⁹ BAAQMD Rule 8-5, Section 8-5-301; 40 CFR 60.112B(b).

⁴⁰ FEIR, Comment B10-42 (Fox); Classification and Hazard Communication Provisions for Crude Oil - Bakken Crude Oil Data, June 13, 2014, Available at: <http://www.unece.org/fileadmin/DAM/trans/doc/2014/dgac10c3/UN-SCETDG-45-INF26e.pdf>; Dangerous Goods Transport Consulting, Inc., A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation, Submitted by American Fuel & Petrochemical Manufacturers, May 14, 2014, pp. 5, 19, Available for download from: <https://www.afpm.org>; North Dakota Petroleum Council, Bakken Crude Quality Assurance Study, Available at:

would store rail-imported crudes do not include any vapor any vapor pressure monitoring. Thus, Valero could store any crude in these tanks, in spite of the law, as there are no enforceable conditions.

Thus, the EIR must be modified to include enforceable conditions to prohibit the storage of any crude with a vapor pressure equal to or greater than 11 psi in the subject tanks, unless the tanks are modified to include an approved emission control system. The mitigation for this impact must include certified true vapor pressure, measured during unloading at the terminal, for each railcar in each unit train shipment and monthly tank vapor pressure measurements to verify compliance.

Fourth, Mr. Cuffel asserts that I assumed the “refinement of 70,000 barrels per day of Bakken crude, another operational impossibility.”⁴¹ My tank calculations do not assume that 70,000 barrels per day of Bakken crude are “refined.” They only assume that 70,000 barrels per day of Bakken crude are stored in tanks TK-1702 through TK-1708, as reported by Valero in its application for the Project submitted to the BAAQMD.⁴²

I revised my tank VOC emission calculations in my Appeal Comments to align with information disclosed in the RDEIR and in responses to Public Records Act (“PRAs”). My revised tank emissions are based on a true vapor pressure of 13 psi and are estimated relative to the CEQA baseline of 2011-2012. I selected 13 psi because Valero’s hazard analyses in the EIR are based on Bakken crude with a vapor pressure of 13 psi.⁴³ My revised tank VOC emissions, without considering roof landing, cleaning,

http://www.ndoil.org/image/cache/Summary_2.pdf; Jeff Thompson, Public Crude Assay Websites, February 24, 2011. http://www.coqa-inc.org/docs/defaultsource/meeting-presentations/20110224_Thompson_Jeff.pdf; Russell Gold, Analysis of Crude From North Dakota Raises Further Questions About Rail Transportation, Wall Street Journal, February 23, 2014; Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013 (TSBC 2013), Available at: <http://www.bst-tsb.gc.ca/eng/lab/rail/2013/lp1482013/LP1482013.asp>.

⁴¹ Cuffel Letter, p. 3.

⁴² DEIR, Appendices E.3 and E.4.

⁴³ RDEIR, Appx. F, pdf 326 and Table 5.1 (vapor pressure = (90 kPa)(0.145038 psi/kPa) = 13 psi.

and other tank emissions not estimated by the TANKS 4.09d model, discussed below, exceed the BAAQMD's daily and annual CEQA significance thresholds for VOC emissions.⁴⁴

Fifth, assuming, arguendo, that a vapor pressure limit of 11 psi were legally and practically enforceable, yielding "actual" VOC emissions, the increase in VOC emissions from tanks would still exceed the BAAQMD's CEQA significance thresholds for VOCs when emissions from tank roof landings, tank cleaning and other omitted tank emissions are included. Further, under CEQA total Project emissions, not just emissions from the tanks, must be compared to CEQA thresholds.

The TANKS Model

The TANKS 4.09d model used by the EIR to calculate tank VOC emissions⁴⁵ estimates rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. However, the model inputs and outputs were claimed as confidential business information ("CBI"), preventing any meaningful review. I commented that tank emissions are underestimated because tank roof landing, tank cleaning, inspection, water draw, and degassing emissions were omitted.⁴⁶ These emissions are routinely included in emission inventories.

Mr. Cuffel side steps this issue by arguing that the TANKS model used in the EIR to estimate tank VOC emission was developed by the U.S. EPA in its *Compilation of Air Pollutant Emission Factors* ("AP-42") and is routinely used by the BAAQMD, thus constituting "substantial evidence basis for assessment of tank emissions."⁴⁷ This is misleading and is not substantial evidence.

The tank VOC emissions were estimated using the EPA model, TANKS 4.09d, which is based on equations in AP-42. However, the EPA no longer recommends using

⁴⁴ Fox Appeal Comments, Comment II.C, pp. 15-16.

⁴⁵ DEIR, p. 10.1 *et seq.*, Appx. B.

⁴⁶ FEIR, Comments B10-48/50 (Fox).

⁴⁷ Cuffel Letter, p. 4, Comment 2(a).

this model to calculate tank emissions.⁴⁸ It is well known that both the TANKS model and the AP-42 equations and algorithms significantly underestimate tank VOC emissions.⁴⁹ EPA itself demonstrated that actual measurements of tank emissions using differential absorption lidar (“DIAL”)⁵⁰ underestimate tank VOC emissions by factors of 2 to 15, compared to those calculated using AP-42 equations/algorithms (and, thus TANKS 4.09), as demonstrated in the following summary data:

**Table 1.
Comparison of DIAL Results and
Tank Emissions Estimated Using AP-42.⁵¹**

Source	Source Description	Compound	Average DIAL flux, lb/hr ³	Estimated emissions using standard estimating procedures with actual conditions at the time of the DIAL test, lb/hr
Tanks 1020, 1021, 1024, and 1025	EFR ^c tanks storing crude oil	VOC	6.4 ^d	1.3 – 1.9 ^e
Tanks 1052, 1053, and 1055	EFR tanks storing crude oil	VOC	16.3 ^d	1.8 – 2.3 ^e
Tanks 501, 502, 503, and 504	EFR tanks storing light distillates	VOC	8.6 ^d	3.0 – 3.9 ^e
Tank 43	VFR ^f tank storing fuel oil #6	VOC	2	1.3
			9.3	1.3
Tanks 60, 63, 11, 12, 18, 42, 61, and 65	VFR and EFR tanks storing various products	VOC	9	0.6 – 9.1 ^e
Tanks 54, 55, 56, and 98	VFR and EFR tanks storing various products	VOC	3.1 ^d	0.3 – 9.7 ^e
Tanks 53 and 55	VFR tanks storing diesel fuel	VOC	23.8 ^d	4.8 – 5.2 ^e

Another recent study concluded that “[c]rude oil and heated oil tank emissions measured by DIAL were 5 to 10 times higher than estimated by TANKS.⁵² Thus, citing

⁴⁸ EPA, TANKS Emissions Estimation Software, Version 4.09D; Available at: <https://www3.epa.gov/ttnchie1/software/tanks/>.

⁴⁹ See literature review in EIP, Comments on EPA’s Draft “Emission Estimation Protocol for Petroleum Refineries, March 31, 2010, p. 5.

⁵⁰ Lidar is a surveying technology that measures distance by illuminating a target with a laser light. Differential absorption lidar (DIAL) measurements utilize two or more closely spaced (<1 nm) wavelengths to factor out surface reflectivity as well as other transmission losses, since these factors are relatively insensitive to wavelength. When tuned to the appropriate absorption lines of a particular gas, DIAL measurements can be used to determine the concentration (mixing ratio) of that particular gas in the atmosphere. See Wikipedia, Lidar; https://en.wikipedia.org/wiki/Lidar#Meteorology_and_atmospheric_environment.

⁵¹ U.S. EPA, Critical Review of DIAL Emission Test Data for BP Petroleum Refinery in Texas City, Texas, November 2010, Table 2; Available at: https://www3.epa.gov/airtoxics/bp_dial_review_report_12-3-10.pdf.

⁵² Rod Robinson, The Application of Differential Absorption Lidar (DIAL) for Pollutant Emissions Monitoring, January 2015, pdf 46; Available at: <http://www.h->

to EPA and BAAQMD use of the TANKS model (especially without citing to a specific source) does not validate the EIR's tank VOC emissions estimated only using EPA's TANKS 4.09d program, as the model is no longer supported by EPA, it excludes roof landing and tank cleaning emissions, and the underlying equations in AP-42 have been demonstrated in actual field measurement programs to underestimate tank VOC emissions. Thus, the very model that the EIR used to estimate tank VOC emissions, even setting aside roof landing, cleaning emissions and other tank emission sources, is well known to underestimate tank VOC emissions.

Other Tank Emissions

The TANKS 4.09d model used by the EIR to calculate tank VOC emissions estimates rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. As explained above, it does not estimate other tank emissions, including roof landing losses, inspection losses, or flashing losses.⁵³ Thus, the EIR underestimated tank VOC emissions by failing to include all sources of emissions.

The EPA specifically notes that the TANKS model does not include roof landing losses and recommends using equations/algorithms in AP-42, Chapter 7:⁵⁴

[HOW CAN I ESTIMATE EMISSIONS FROM ROOF LANDING LOSSES in the TANKS program?](#) Updated February 2010.

In November 2006, Section 7.1 of AP42 was updated with subsection 7.1.3.2.2 Roof Landings. The TANKS program has not been updated with these new algorithms for internal floating roof tanks. It is based on the 1997 version of section 7.1.

It is possible to estimate these losses in TANKS by using a portion of the guidance developed for degassing and cleaning a tank by modeling the vapor space under the roof as a fixed roof tank and calculating the emissions from one turnover. This is less accurate than using section 7.1.3.2.2 of AP42.

Similarly, the EPA provides guidance on estimating emissions from tank cleaning:⁵⁵

[gac.com/taq/airquality/raqpac/documents/2015/Jan%202015/DIAL%20202015%20Houston%20Meeting%20January%20\(sent%20version\).pdf](http://www3.epa.gov/taq/airquality/raqpac/documents/2015/Jan%202015/DIAL%20202015%20Houston%20Meeting%20January%20(sent%20version).pdf).

⁵³ Fox DEIR Comments, Comment II.B.

⁵⁴ EPA, TANKS Software Frequent Questions; available at <https://www3.epa.gov/ttn/chief/faq/tanksfaq.html#13>, accessed September 19, 2016.

HOW CAN I ESTIMATE EMISSIONS FROM DEGASSING AND CLEANING OPERATIONS DURING A TANK TURNAROUND?

The following procedure can be used to approximate emissions from each step of the operation:

Emptying (degassing)

1. For a fixed roof tank, calculate emissions from one turnover with the turnover factor (K_n) = 1 to account for vapors displaced during filling and then add the emissions from 1 turnover calculated as if the tank had a floating roof to account for clingage.
2. For a floating roof tank, calculate emissions for one turnover then add the emissions from the tank assuming it has a fixed roof with a height equal to the height of the legs (about 6 or 7 ft.) to approximate the vapor displaced from the space under the floating roof.

Cleaning (sludge handling)

Most wet sludges are about 80% to 90% liquid by weight. A conservative approach for estimating emissions is to assume the sludge is 80% liquid. The remainder is assumed to be VOC and emitted. As an alternative, the actual sludge moisture content can be determined.

Mr. Cuffel implies these emissions are *de minimus* by improperly concatenating “roof landing” and “tank cleaning” emissions, claiming that “[r]oof landing” occurs as the storage tanks are prepared for tank cleaning.⁵⁶ While true, this statement is misleading, as roof landings also occur under many other circumstances and are much more frequent than disclosed, often occurring daily to weekly. Roof landings would occur, for example, when crude sources are changed and between train deliveries.⁵⁷

Further, it is important to note that tank cleaning emissions could be substantially higher for Bakken crudes than for other types of crude and thus, cleaning would occur more frequently and cleaning emissions would be higher than for baseline crudes. Bakken crudes leave waxy deposits in pipelines and tanks, which require more frequent cleaning,⁵⁸ and, thus, higher cleaning emissions, than the crudes they would

⁵⁵ *Ibid.*

⁵⁶ Cuffel Letter, p. 3, Comment 1(b).

⁵⁷ See, for example, Plains Marketing, L.P., New Source Review Permit Application, Corpus Christi Dock and Storage Terminal, Corpus Christi, Texas, July 2015 Supplement, Section 3.4.6 and Enbridge, Superior Terminal Enhancement Project, Prevention of Significant Deterioration Permit Application, Enbridge Energy, Limited Partnership, Superior, Wisconsin Terminal, October 2012.

⁵⁸ Innovative Solutions for Processing Shale Oils, Hydrocarbon Processing, 7/10/2013, Available at: <http://www.hydrocarbonprocessing.com/Article/3223989/Innovative-solutions-for-processing-shale-oils.html>; Gordon Schremp, Trends in Sources of Crude Oil, 2014 IEPR Workshop, June 25, 2014, p. 47; Available at: http://www.energy.ca.gov/2014_energy_policy/documents/2014-06-

replace. Environmental impacts from chemical dispersants used to control these waxy deposits in tanks and pipelines also should be evaluated.

The Project is designed to import a wide range of crude oils from light sweet crudes such as Bakken crudes to heavy sour tar sands crudes.⁵⁹ Each switch in crude type, for example, would result in a roof landing. The EIR is silent on operational aspects of the proposed terminal that would require roof landings and thus fails as an informational document.

Tank Flashing Emissions

Mr. Cuffel attempts to dispense with tank flashing emissions by asserting the TANKS model, which does not include these emissions, “is widely accepted in the industry, and by BAAQMD, and therefore provides a substantial evidence basis for assessment of tanks emissions.”⁶⁰ However, it is widely known that this model does not include all tank emissions, but only the subset of rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses. All other tank emissions must be separately calculated. Thus, the “acceptance” of this model to estimate rim seal losses, withdrawal losses, deck fitting losses, and deck seam losses by BAAQMD and EPA does not excuse the EIR from excluding other tank emission sources that are not included in the TANKS model. These other emissions are conventionally separately estimated using EPA procedures or other models.

Mr. Cuffel also asserts that I am “... unaware of local regulations that have the effect of requiring stabilization of certain crude oils stored in external floating roof tanks... To comply with this requirement [BAAQMD Regulation 8-5], crudes stored at the Refinery undergo a stabilization process that removes the low molecular weight hydrocarbon components from the crude. The process minimizes flashing vapor while

[25_workshop/presentations/01_Schremp_Final_2014-06-25.pdf](#).

⁵⁹ DEIR, Table 3-1.

⁶⁰ Cuffel Letter, p. 4, Comment 2(d).

the crude liquid is being stored. Because of such regulatory requirements, any higher vapor pressure crudes must be “stabilized” prior to transport by rail.”⁶¹

I am well aware of the recently promulgated North Dakota regulations that require stabilization of North Dakota Bakken crudes.⁶² While North Dakota has implemented regulations to control this issue, they have not been effective as they are not enforceable. Another oil company, Tesoro, has stated in another fora:

“Oil producers at the wellhead must condition the crude oil, not Shippers. The intent of the Order was to “improve the marketability and safe transportation of the crude oil” through wellhead conditioning of the crude oil to remove more light ends and essentially put a cap on vapor pressure (not volatility, per se). Then rail facilities are required to notify NDIC when discovering that any crude oil tendered for shipment violates federal safety standards – the rail facilities are not required to (and it is not feasible to) test all crude oil coming into or out of the facility for light end content, vapor pressure, or volatility.”⁶³

Other crudes that Bakken would replace, such as ANS and California crudes, are hard to ignite because they do not have as much combustible light ends. Most light crudes, including the imported foreign crudes currently processed, are stabilized. These stabilized crudes will not actively boil at ambient temperature and can be more safely shipped, stored, and refined.

Thus, while “light” (domestic) crude may replace other types of “light” (foreign imported) crude, there are major differences in composition of these “light” crudes that affect environmental impacts. The EIR does not impose any condition(s) that require that natural gas liquids (“NGLs”) be removed from received crudes to mitigate these impacts. Thus, the EIR’s analyses must assume that they will be present in the crude supply for the Project as the North Dakota regulations are not enforceable on shippers.

⁶¹ Cuffel Letter, p. 4, Comment 2(d).

⁶² Industrial Commission of North Dakota, News, Industrial Commission Adopts New Standards to Improve Oil Transportation Safety, December 9, 2014; Available at: <http://www.nd.gov/ndic/ic-press/dmr-order25417.pdf>.

⁶³ Tesoro Savage Vancouver Energy Distribution Terminal Facility Draft Environmental Impact Statement, November 2015, T-S Comments on the DEIS, January 22, 2016, p. 4-12, pdf 188.

Otherwise, the EIR must impose enforceable conditions that prohibit receipt of live crude oils at terminal.

Geodesic Domes

In my DEIR comments, I noted that the significant increase in tank VOC emissions could be mitigated by requiring the use of geodesic domes.⁶⁴ Mr. Cuffel argues that geodesic domes are “irrelevant to the City’s review of Valero’s CBR Project, since Valero has not proposed any changes to the number of tanks, the emissions allowed for such tanks, or to store any crudes it is not already authorized to store.”⁶⁵

This claim is an uncited, incorrect summary of BAAQMD permitting regulations, not impact analysis as performed under CEQA. Further, it is incorrect because storing 13 psi vapor pressure crudes, as proposed, in tanks permitted to hold crude oil with vapor pressures of 0.3 to 4 psi, will *per se* increase VOC emissions.

Further, under CEQA, the increase in total VOC emissions from the Project must be compared to “actual” baseline emissions from the same Project components. If the resulting increase in total emissions is significant, the impact must be mitigated. The relevant increase is the total Project increase, not the increase from each project component taken alone, e.g., only the tanks, as argued by Mr. Cuffel.

Regardless, my revised tank emission calculations demonstrate that the VOC emission increase from the tanks taken alone would result in a significant impact.⁶⁶ When the increase due to the tanks is added to the increase due to other Project components, the Project increase very significantly exceeds the BAAQMD’s VOC daily and annual significance thresholds.

⁶⁴ Fox DEIR Comments, Comment II.B.1.

⁶⁵ Cuffel Letter, p. 4, Comment 2(c).

⁶⁶ Fox Appeal Comments, Comment II.C.

III. OTHER EMISSION SOURCES

Wastewater Processing Emissions

I noted that tank water draw emissions were not included in the DEIR's tank VOC emissions.⁶⁷ Mr. Cuffel argues that "tank emissions are not relevant, since [sic] tanks are being neither added nor modified for the CBR Project, and Valero is not proposing to store any crudes it is not already authorized to store."⁶⁸ As demonstrated throughout the EIR record, including in my comments,⁶⁹ this is incorrect. The Project will store light Bakken crude oils with vapor pressures up to 13 psi in tanks currently permitted to store heavy crudes with vapor pressure of 0.3 to 4 psi. This change in service and the resulting increase in VOC emissions were also noted by the BAAQMD in its comments:

"Change in Crude

Valero plans to purchase and process a range of crudes but does not expect to increase the total crude oil throughput or increase production of existing products or by-products. Air District staff recommends that the RDEIR address the potential changes in emissions associated with handling lighter crude, which can have higher volatile organic compound (VOC) content than the existing crude being processed; this can lead to increased fugitive emissions during transport and storage which should be evaluated for air quality impacts."⁷⁰

Mr. Cuffel further argues that "all material from tank dewatering is stored and processed in compliance with all of Valero's Title V permit conditions and BAAQMD regulations, which do not vary depending upon the vapor pressure of the crude."⁷¹ This claim is irrelevant, as the increase in VOC emissions from wastewater treating, caused by treating wastewaters with more volatile VOCs, must be evaluated compared to the "actual" VOC emissions from wastewater treatment in the CEQA baseline, not

⁶⁷ Fox DEIR Comments, Comment II.B.4.

⁶⁸ Cuffel Letter, p. 4, Comment 2(e).

⁶⁹ See, e.g., Fox Appeal Comments, Comment II.C.

⁷⁰ FEIR, Comment I12-10 (BAAQMD).

⁷¹ Cuffel Letter, pp. 4-5, Comment 2(e), emphasis in original.

according to (an unidentified) limit in an unidentified Title V permit. I am not aware of any condition in the existing Title V permits for the Valero and NuStar facilities that limit VOC emissions from treating tank draw VOC emissions. Mr. Cuffel fails to identify any.

Sump Emissions

The unloading facility includes a liquid spill containment sump with the capacity to contain the contents of at least one tank car.⁷² Crude oil that spills into this sump would release vapors including VOC and HAP emissions. The EIR does not include any emissions from this sump.

Mr. Cuffel attempts to dispense with this omission by arguing that: (1) sump emissions are not part of "normal" operations, (2) they do not need to be included as they are "speculative," (3) they would be immediately remediated, (4) there are no industry or BAAQMD standards or methodologies to estimate them, and (5) there is no significance threshold for them. Thus, he reasons that "[i]n the absence of such standards, methodologies or thresholds, CEQA does not require a separate evaluation of such impacts."⁷³ None of these excuses for omitting sump emissions are valid.

First, CEQA is not limited to "normal" operations, but rather must include the full range of foreseeable impacts. The mere existence of the sump indicates that spills of up to at least one full rail car are anticipated. The EIR, for example, includes the impacts of train accidents, which are not part of "normal" operations.

Second, sump emissions are not "speculative" because the Project includes a sump to collect leaks. The sump is a small tank that must be open to the atmosphere to collect the leaks. As the crude oil is volatile, and emits VOCs from tanks, crude oil collected in the sump would also emit VOCs.

⁷² DEIR, p. ES-2.

⁷³ Cuffel Letter, p. 5, Comment 2(4).

Third, the sump is designed to collect the entire contents of a rail car, or about 30,000 gallons of crude oil. This is a large amount of crude oil and cannot be instantly cleaned up. Equipment and personnel must be mobilized, residuals that cling to the sump must be removed, and the collected oil and oily materials must be transported off-site. I estimate that at least a day would be required to cleanup a 30,000-gallon spill into a sump. Further, VOC emissions occur during the spill itself. Finally, all of the spilled crude oil may not end up in the sump, but rather exposed on the ground surface. The BAAQMD has a daily VOC significance threshold. The daily sump emissions, plus VOC emissions from other sources on the day of the spill, could exceed the BAAQMD's daily VOC emission threshold.

Fourth, BAAQMD or other emission-unit-specific standards are not a pre-requisite for estimating emissions under CEQA. All sources of emissions must be included, regardless of the existence of a specific standard. Sumps are part of the facility wastewater treatment system, such as those typically found at refineries. There are standard methods to estimate sump emissions,⁷⁴ including simple mass balances and Excel spreadsheet model incorporating fundamental chemical engineering equations.

Fifth, a significance threshold is not required under CEQA to evaluate emissions from individual emissions units. Under CEQA, the total emissions from the Project are compared to significance thresholds.

In sum, the Project includes a sump, sumps emit VOCs, methods exist to estimate sump emissions, significance thresholds exist for VOC emissions, and the EIR failed to include sump emissions, thus failing as an informational document.

⁷⁴ See, e.g., San Joaquin Valley Air Pollution Control District, 2007 Area Source Emission Inventory Methodology, 310 - Oil Production Fugitive Losses, Available at: https://www.valleyair.org/Air_Quality_Plans/EmissionsMethods/MethodForms/Current/SumpsCells2007.pdf; Eastern Research Group, Preferred and Alternative Methods for Estimating Air Emissions from Wastewater Collection and Treatment, Final Report prepared for STAPPA ALAPCO EPA, March 1997; Available at: <http://www.sviva.gov.il/PRTRIsrael/PRTR/Documents/Methods/PRTR-Wastewater.pdf>.

Rail Car Fugitive Emissions

In my September 2014 DEIR comments, I noted that rail cars are not “vapor-tight” and thus would emit VOC emissions en route and at the site.⁷⁵ Mr. Cuffel’s only response to my “vapor tight” comment is that the City “has no authority to regulate rail operations because of federal preemption.”⁷⁶ However, I subsequently presented a much more detailed analysis of VOC emissions from railcars, based on actual fugitive component counts on the rail cars, while the rail cars are present on at Valero’s Terminal, under Valero’s control in my April 4, 2016 Appeal Comments, Comment II.A. These emissions are not rail operation emissions, but rather on-site unloading emissions and must be included in the VOC emission inventory for the Project. These VOC emissions alone are significant.

IV. DILBIT RISK OF UPSET

The Project will import “North American-sourced crude oil” by rail. The list of potential crudes in the DEIR includes Canadian tar sands crudes and a number of U.S. light fracked shale oil crudes, such as Bakken crude oil. Hazard and air quality impacts of the tar sands crudes were not evaluated in the EIR, as tar sands crudes are generally considered to be less hazardous than light fracked shale crudes, such as Bakken crude oil.

However, recent experience indicates that tar sands dilbits may represent a worst case for air quality, risk of upset, biology, and other impacts. The list of potential crudes that would be imported by the Project includes dilbits, *viz.*, Kearl Lake, Albian Heavy Synthetic, Access Western Blend, and Cold Lake.^{77,78} As noted above, a dilbit is a blend of bitumen with a lighter petroleum product.

⁷⁵ Fox EIR Comments, Comment II.E.

⁷⁶ Cuffel Letter, Comment 1(5), p. 6.

⁷⁷ See: www.crudemonitor.com.

⁷⁸ DEIR, Table 3-1.

The EIR does not evaluate the impacts of importing, unloading, and storing dilbits at the site. Recent work indicates that dilbit flammability and explosivity impacts are similar to or greater than those of Bakken crudes, especially stabilized Bakken crudes.⁷⁹

Undiluted bitumen, which has a flash point of +150 C, is generally considered to be non-flammable in derailments and is generally not considered in safety evaluations. However, diluent is added to make the bitumen flow into and out of tank cars more readily. The diluents, which may include a wide range of petroleum-based substances, including condensates and naphtha, have very low flash points (<-35°C),⁸⁰ much lower than ambient temperatures at the site and along most of the route. Material Safety Data Sheets published by dilbit producers classify dilbits as highly flammable or report a very low flash point.⁸¹

Thus, for the 24 to 72 hours after a release, dilbits are highly flammable and explosive, indicating significant risk of fires and explosion in the event of a rail accident during transit or on-site during idling and unloading. Spills into the sump, for example, could ignite and explode if the vapors encountered heat, sparks or a flame, such as could be generated by the locomotive, locomotive/rail car wheels on the tracks,

⁷⁹ See, e.g., David Thomas, Why Bitumen Isn't Necessarily Safer than Bakken, *Railway Age*, February 23, 2015; Available at: <http://www.railwayage.com/index.php/safety/why-bitumen-isnt-necessarily-safer-than-bakken.html>; Desmog Blog at: <http://www.desmogblog.com/2015/03/09/tar-sands-rail-disasters-latest-wave-bomb-train-assault>; Oil Change International, Transporting Tar Sands "As Dangerous" as Shale Oil, March 2, 2015 (explaining why tar sands is as explosive as Bakken crude); Available at: <http://priceofoil.org/2015/03/02/transporting-tar-sands-dangerous-shale-oil/> and EcoWatch, Yet Another Oil Bomb Train Explosion Marks Fourth Derailment in Four Weeks, March 9, 2015 (Article about tar sands derailment/fire, etc.); Available at: <http://www.ecowatch.com/yet-another-oil-bomb-train-explosion-marks-fourth-derailment-in-four-w-1882019182.html>.

⁸⁰ Haralampos Tsaprailis, Properties of Dilbit and Conventional Crude Oil, February 2014, Report Prepared for Alberta Innovates; Available at: http://www.ai-ees.ca/wp-content/uploads/2016/04/properties_of_dilbit_and_conventional_crude_oils_-_aitf_-_final_report_revised.pdf.

⁸¹ See, e.g., Christina Lake Railbit (<http://www.cenovus.com/contractor/docs/ChristinaLake-Railbit-MSDS.pdf>); Cenovas Heavy Crude Oil/Diluent Mix, Flash Point: -35 C (<https://www.cenovus.com/contractor/docs/HeavyCrude-DiluentMix.pdf>); MEG Energy Dilbit (<https://keystonepipeline-xl.state.gov/documents/organization/205570.pdf>).

maintenance work, coupling/decoupling of railcars, etc. The February 15, 2015 derailment and explosion of a CN oil train in Ontario, which was carrying dilbit, occurred at an ambient temperature of -40°C.⁸²

North Dakota recently promulgated regulations that require producers to stabilize Bakken crudes, which would partially mitigate some of their impacts, if only “stabilized” crudes were allowed at Valero. Mr. Cuffel makes this argument.⁸³ However, the recent Mosier, Oregon accident, which involved “stabilized” Bakken crude suggests stabilization does not resolve Bakken rail transport issues.

Regardless, this solution is not available for dilbits, as the highly volatile diluents are *intentionally* added to the crude oil to make it less viscous and/or to satisfy crude slate requirements. The low flash point, and resulting high flammability and volatility of the mixture, is determined by the blend’s most volatile component, the diluent.⁸⁴ Thus, in the long term, dilbits may present a greater fire and explosion risk and result in higher tank VOC emissions than light fracked shale crudes, such as Bakken crude oil, especially since the amount of diluent added to the bitumen is highly variable, ranging from 10% to >50% and is unregulated.

Dilbits also pose a significant hazard to nearby Sulphur Springs Creek. A dilbit does not behave the same as a conventional crude when spilled in a waterway, as the distribution of hydrocarbons is very different. The blended lighter diluent generally evaporates readily when exposed to ambient conditions, resulting in significant VOC emissions. This leaves behind the heavy ends, the bitumen. Thus, when a dilbit is released accidentally, it will generally create a difficult to cleanup spill as the heavier bitumen will be left behind.⁸⁵ A major dilbit pipeline release in 2010 into the

⁸² Thomas 2015, *op. cit.*

⁸³ Cuffel Letter, p. 4, Comment 2(d).

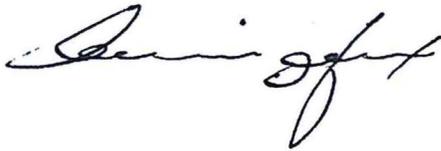
⁸⁴ Tsaprailis 2014 “[T]he flash point is determined by the lowest-boil-point components (volatiles). Consequently, the flash point of the dilbit is governed by the 20%-30% volume diluent component...”

⁸⁵ A Dilbit Primer: How It’s Different from Conventional Oil, Inside Climate News; Available at: <http://insideclimatenews.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar->

Kalamazoo River, near Marshall, Michigan,⁸⁶ is still being remediated. An onsite release at the Project site could adversely impact Sulphur Spring Creek.

In sum, Mr. Cuffel's letter reiterates arguments that have been made elsewhere in the record and rebutted in numerous comments by myself and others for which responses have not been provided. The Cuffel Letter presents no new evidence and fails to respond to my prior comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Phyllis Fox". The signature is fluid and cursive, with a large, stylized initial "P" and "F".

Phyllis Fox, Ph.D., PE

[sands-Alberta-Kalamazoo-Keystone-XL-Enbridge?page=show; http://www.ecowatch.com/5-years-since-massive-tar-sands-oil-spill-kalamazoo-river-still-not-cl-1882075674.html](http://www.ecowatch.com/5-years-since-massive-tar-sands-oil-spill-kalamazoo-river-still-not-cl-1882075674.html).

⁸⁶ Elizabeth McGowan and others, The Dilbit Disaster: Inside the Biggest Oil Spill You've Never Heard Of, Parts 1 and 2, 2012; Available at: <https://www.amazon.com/dp/B008EKH5F6> and <http://www.pulitzer.org/files/2013/national-reporting/2pdf.pdf>.