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August 12, 2019

VIA EMAIL & HAND DELIVERY

Louisiana Department of Environmental Quality
Public Participation Group
602 N. 5th Street
Baton Rouge, LA 70802
deq.publicnotices@la.gov

Re: Comments on 14 Proposed Initial Title V/Part 70 Air Permits, Proposed Initial Prevention of Significant Deterioration Permit, and the Associated Environmental Assessment Statement for FG LA, LLC (Formosa) Chemical Complex
AI No.: 198351
Permit Nos.: 3141-V0, 3142-V0, 3143-V0, 3144-V0, 3145-V0, 3146-V0, 3147-V0, 3148-V0, 3149-V0, 3150-V0, 3151-V0, 3152-V0, 3153-V0, 3154-V0, PSD-LA-812
Activity Nos.: PER20150001 through PER20150015

Dear Public Participation Group:

On behalf of RISE St. James,[1] Louisiana Bucket Brigade,[2] Sierra Club,[3] Center for Biological

[1] RISE St. James is a faith-based environmental and social justice organization working to save its community.

[2] Louisiana Bucket Brigade is an environmental health and justice organization working with communities that neighbor the state's oil refineries and chemical plants.

[3] Sierra Club is one of the oldest and largest national nonprofit environmental organizations in the country, with approximately 3.5 million members and supporters dedicated to exploring, enjoying, and protecting the wild places and resources of the earth; practicing and promoting the responsible use of the Earth's ecosystems and resources; educating and enlisting humanity to protect and restore the quality of the natural and human environment; and using all lawful means to carry out these objectives. One of Sierra Club's priority national goals is promoting and improving air quality. In particular, Sierra Club seeks to reduce the unnecessary and often harmful use of fossil fuels in facilities like the proposed Formosa Chemical Complex.

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Diversity,[4] Healthy Gulf,[5] Earthworks,[6] No Waste Louisiana,[7] and 350 New Orleans.[8] ("Commenters"), we submit these comments on the 14 proposed initial Title V/Part 70 air permits, initial Prevention of Significant Deterioration (PSD) permit, and associated Environmental Assessment Statement (EAS) for the FG LA, LLC (Formosa)[9] Chemical Complex planned for construction in St. James, Louisiana.

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[4] The Center for Biological Diversity ("Center") is a non-profit organization with more than 1.4 million members and online activists throughout the United States, including over 9,000 in Louisiana. The Center's mission is to ensure the preservation, protection and restoration of biodiversity, native species, ecosystems, public lands and waters and public health. The Center believes in and advocates for environmental justice for all species, including people. In furtherance of these goals, the Center seeks to reduce U.S. greenhouse gas emissions and other air pollution to protect biological diversity, the environment, and human health and welfare.

[5] Healthy Gulf was founded in 1994 and has more than 25,000 members and supporters in all five Gulf states committed to uniting and empowering people to protect and restore the natural resources of the Gulf Region.

[6] Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the impacts of oil, gas, mining, and petrochemical development while seeking sustainable solutions. For more than 25 years, Earthworks has worked to advance policy reforms, safeguard land and public health, and improve corporate practices. Its team works with local communities, partner organizations, public agencies, and elected officials to advance these goals nationwide, including in Louisiana. Earthworks has 212 supporters living in Louisiana, including in St. James Parish.

[7] No Waste Louisiana is an alliance of local chapters dedicated to supporting waste prevention policies and community practices of reduction, reuse, and refill, moving Louisiana away from the landfill and protecting our neighborhoods, bayous, and parks from pollution.

[8] 350 New Orleans' mission is to support initiatives that raise consciousness and promote sound policy around climate change. 350 New Orleans was created because the climate crisis poses unprecedented threats to life, and coastal Louisiana is especially vulnerable. It supports frontline communities in "Cancer Alley" in their fight for clean air, soil, water and a livable climate.

[9] According to the company website, FG LA is a member of Formosa Plastics Group, which is Taiwanese-based conglomerate. *About* Us, SunshineProjectLA.com (last visited July 8, 2019), http://www.sunshineprojectla.com/about-us. Formosa Plastics Corporation, U.S.A. is affiliated with the Taiwan-based Formosa Plastics Group (FPG). *Id.* Formosa Plastics Corporation owns and operates a chemical plant in Baton Rouge. Formosa Plastics, fpusa.com (last visited July 8, 2019), http://www.fpcusa.com/about.html.

INTRODUCTION

Formosa proposes to construct 14 separate major facilities, including 10 chemical plants, in St. James, a community that lives and breathes within "Cancer Alley," a region that stretches along the Mississippi River from Baton Rouge to New Orleans. Cancer Alley is so-named because it experiences the highest cancer risk in the nation due to a plethora of industrial facilities.[10] Formosa's proposed chemical facilities would manufacture ethylene and propylene, and produce polyethylene, propylene, and ethylene glycol primarily to produce plastics. The other four facilities, including electric- and steam-generating units, would support these operations.[11] The complex would operate just one-half mile from the residential community of Union across the Mississippi River, and approximately one mile upriver from Fifth Ward Elementary School and the residential community of Welcome.[12] This project's massive air pollution emissions would vastly add to the significant environmental and health burden that African American communities in and around St. James already bear from the existing plants.[13] Indeed, Formosa's own air modeling confirms what residents already know—the air is already saturated with pollution. Moreover, the project's emissions would add to those Louisiana Department of Environmental Quality (LDEQ) recently approved for the area. These include two new major petrochemical plants, Yuhuang Chemical Inc.'s YCI Methanol Plant and South Louisiana Methanol's St. James Methanol Plant, along with Nucor Steel Louisiana major expansion project. And there are more new major sources in the permitting stages. In addition to criteria pollutants and air toxics, this project would produce over 13 million tons of greenhouse gas emissions annually, making it the second largest greenhouse gas emitter in the state. A decision to permit such significant greenhouse gas emissions would be irresponsible given this region's extreme vulnerability to climate change. As St. James residents told LDEQ at the recent public hearing, Formosa's chemical complex would only bring sickness and destroy the local environment. As proposed, these permits would violate the Clean Air Act and raise serious public trustee and Title VI concerns.

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[10] Seven of the top ten census tracts with the highest cancer risk in the nation are located along this corridor, concentrated around point sources located in St. John the Baptist Parish and St. Charles Parish. *See National Air Toxics Assessment, 2014 NATA: Assessment Results*, EPA (last updated Aug. 27, 2018), https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results#nationwide.

[11] The Utility 2 plant will contain two combustion turbines with associated heat recovery steam generators. The electricity produced by the combustion turbine generators and steam turbine generator will be used in the process areas. In addition to the cogeneration units, the Utility 2 Plant will use a boiler to produce steam. The boiler fires natural gas and will be rated at a nominal heat input of 1,200 MMBtu/hr. LDEQ Statement of Basis at 53.

[12] *See* Attach. A, Affidavit of Justin Kray (Kray Aff.), Ex. 1, Map of New & Existing Industrial Facilities Map (showing Formosa site relative to residential communities); *see also* Attach. B, Formosa's Map showing "Distance to Fifth Ward Elementary School."

[13] *See* Attach. A, Kray Aff., Ex. 1, Map of New & Existing Industrial Facilities in St. James.

For the following reasons, which are detailed further below, LDEQ must deny the proposed permits:

- Formosa failed to demonstrate that its proposed chemical complex will not "cause or, or contribute to" air pollution in violation of the Clean Air Act's Prevention of Significant Deterioration (PSD) requirements.

- Formosa's refined air modeling shows clear exceedances of the National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$ 24-hour and NO_2 1-hour.

- Formosa failed to comply with mandatory air modeling requirements, invalidated its Class I modeling for the Breton Wilderness Area and violating Louisiana's regulations governing estimates of ambient concentrations.

- Formosa's Class II air quality modeling violates Louisiana regulations and EPA guidance, resulting in potential underestimated air quality impact analysis.

- Formosa's failed to get approval for its decision to significantly deviate from its air modeling protocol.

- Formosa underestimated the potential emissions from its proposed complex.

- The limits established in the proposed PSD permit do not reflect Best Available Control Technology (BACT).

- LDEQ should have required Lowest Achievable Emission Rate (LAER) standards for PM2.5 and NOx sources.

- The proposed Title V permits fail to assure compliance with emission limits due to, among other reasons, failure to require continuous emissions monitoring and adequate conditions for parametric monitoring.

- Formosa's parent company has a long and significant history of environmental violations, calling into serious question Formosa's ability to comply with the proposed permits.

- Formosa's Environmental Assessment Statement (EAS) submissions are incorrect in concluding that LDEQ's approval of the petrochemical complex, as proposed, would satisfy the agency's public trustee duty under Article IX of the Louisiana Constitution.

- Formosa's EAS fails to include a full assessment of its toxic emissions in combination with existing sources for the area, which already has an unacceptable cancer risk.

- Formosa's EAS fails to show the real and potential effects of its proposed Ethylene Oxide emissions, which would be among the top in the U.S.

- Formosa's EAS fails to include any information about the potential and real adverse environmental effects of Formosa's greenhouse gas emissions, nor does it include any information about the associated costs to society.

- Formosa did not analyze the risk of storm-related chemical releases in its EAS.

- Formosa failed to properly evaluate the extent of its flood risk or to prove that it was justified in siting a petrochemical complex in a floodplain.

- Formosa provides a lopsided cost-benefits analysis that fails to include environmental and social costs.

- Adverse impacts from Formosa's proposed complex would disproportionately impact communities of color, potentially violating federal civil rights regulations.

CLEAN AIR ACT FRAMEWORK

The Clean Air Act requires EPA to adopt and periodically update National Ambient Air Quality Standards ("NAAQS") for certain harmful air pollutants. *See* 42 U.S.C. § 7409. The NAAQS protect people's health by limiting the concentration of each such pollutant allowable in the ambient air people breathe. *Id.* § 7409(b). Because of their role within the overall statutory scheme, the NAAQS are generally considered to be "the engine that drives nearly all of Title I of the [Clean Air Act]." *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 468 (2001). To date, the EPA has promulgated NAAQS for six types of air pollutants. *See* 40 C.F.R. pt. 50. Achieving and maintaining attainment with the NAAQS is "central" to the Clean Air Act's regulatory scheme. *Union Electric Co. v. EPA*, 427 U.S. 246, 258 (1976). After setting a NAAQS, EPA designates areas as "attainment" or "nonattainment" based on whether they meet that standard. *Id.* § 7407(d). LDEQ currently classifies St. James Parish as "attainment" for all criteria pollutants,[14] but Formosa's modeling concludes that St. James would be in non-attainment for at least two separate NAAQS if Formosa's complex, and other permitted facilities in the area, are built.

I. Prevention of Significant Deterioration and the State Implementation Plan

Every state must develop for EPA approval a state implementation plan (SIP) to ensure that the NAAQS are achieved and maintained. 42 U.S.C. § 7410(a)(1)-(2), (l). In areas designated attainment, the Clean Air Act requires the prevention of significant deterioration of air quality. *Id.* §§ 7470-7479 (the "PSD provisions"). Clean Air Act regulations command that "each

[14] *See* https://deq.louisiana.gov/page/ambient-air-monitoring-program.

applicable State Implementation Plan . . . shall contain emission limitations and such other measures as may be necessary to prevent significant deterioration of air quality." 40 C.F.R. § 51.166. The Clean Air Act defines the "significant deterioration" that must be prevented in two parts. First, new construction or modification of large stationary sources of air pollution (like Formosa's chemical complex) must not cause or exacerbate a violation of any NAAQS. *Alabama Power Co. v. Costle*, 636 F.2d 323, 362 (D.C. Cir. 1979); *see* 42 U.S.C. § 7475(a)(3) (establishing preconstruction review requirements). Second, to ensure air quality does not degrade significantly, the Act required EPA to set maximum allowable increases in air pollution levels ("increments"), 42 U.S.C. § 7476; *see also id.* § 7473 (establishing by statute certain increments), and required that new construction or modification of such sources of air pollution also not cause or contribute to a violation of any increment. *Alabama Power*, 636 F.2d at 362; 42 U.S.C. § 7475(a)(3).

The "principal mechanism" for monitoring compliance with the NAAQS and "the consumption of allowable increments" is the preconstruction review and permitting process in 42 U.S.C. § 7475. *Alabama Power*, 636 F.2d at 362. No new or modified "major emitting facility"[15] may be built in an attainment area unless it receives a preconstruction permit, and any applicant for such a permit must demonstrate that new emissions from the proposed project "will not cause, or contribute to," an exceedance of any NAAQS or any increment. 42 U.S.C. § 7475(a)(3). Through SIPs, most states, including Louisiana, implement a permit program that requires each new and modified major stationary source of pollution to seek a pre-construction permit that sets emissions limitations for that source. 42 U.S.C. § 7410(a)(2)(C). The PSD program requires states to issue pre-construction permits that impose emissions limitations "necessary ... to prevent significant deterioration of air quality." 42 U.S.C. § 7471. A major new or modified source seeking a PSD permit must certify that it will comply with several requirements, including the application of best available control technology ("BACT") for each pollutant subject to the PSD program, *id.* § 7475(a)(4), and a "demonstration" that its emissions "will not cause, or contribute to, air pollution in excess of any ... [NAAQS] in any air quality control region." *Id.* § 7475(a)(3).

II. The Louisiana State Implementation Plan

Louisiana SIP provisions that incorporate the Clean Air Act's PSD requirements are in Louisiana Administrative Code (LAC) 33:III.509. 40 C.F.R. § 52.970(c) (identifying EPA approved regulations in the Louisiana SIP); *see also* 40 C.F.R. § 52.999(c) and 52.986. Major stationary sources as defined under LAC 33:III.509.B must meet the state's PSD requirements under LAC 33:III.509.J-R. LAC 33:III.509.A.2. "No new major stationary source or major modification to which the requirements of Subsection J-Paragraph R.5 of this Section apply shall begin actual construction without a permit that states that the major stationary source or major modification will meet those requirements." LAC 33:III.509.A.3. Such requirements include, among other things, the following:

[15] Major emitting facilities are those with the potential to emit at least 100 tons per year of any air pollutant, in certain source categories, or 250 tons per year in any other source category. *Id.* § 7479(1).

(1) Application of "best available control technology ["BACT"] for each regulated NSR pollutant [i.e., PSD pollutant] that [the source] would have the potential to emit in significant amounts." LAC 33:III.509.J.2.

(2) Demonstration by the "owner or operator of the proposed source . . . that allowable emission increases from the proposed source [], in conjunction with all other applicable emissions increases or reductions, including secondary emissions, would not cause or contribute to air pollution in violation of: a. any national ambient air quality standard in any air quality control region; or b. any applicable maximum allowable increase over the baseline concentration in any area." LAC 33:III.509.K.1.

(3) A "preliminary determination [by LDEQ] whether construction should be approved, approved with conditions, or disapproved." LAC 33:III.509.Q.1.

(4) Public availability "of all materials the applicant submitted, a copy of the preliminary determination, and a copy or summary of other materials, if any, considered in making the preliminary determination," along with public notice, public comment, and an opportunity for a public hearing. LAC 33:III.509.Q.2.b-c.

III. Title V

The Clean Air Act requires each state to develop and submit to EPA an operating permit program intended to meet the requirements of Title V of the Act. 42 U.S C. § 7661a(d)(l). The state of Louisiana submitted a title V program governing the issuance of operating permits on November 15, 1993, and revised this program on November I 0, 1994. 40 C.F.R. part 70, Appendix A. The EPA granted full approval to Louisiana's title V operating permits program in 1995. 60 Fed. Reg. 47296 (September 12, 1995); 40 C.F.R. part 70, Appendix A. This program, which became effective on October 12, 1995, is codified in LAC, Title 33, Part III, Chapter 5.

All major stationary sources of air pollution and certain other sources are required to apply for Title V operating permits that include emission limitations and other conditions as necessary to assure compliance with applicable requirements of the CAA, including the requirements of the applicable state implementation plan (SIP). CAA §§ 502(a) and 504(a), 42 U.S.C. §§ 7661a(a) and 7661c(a); *see also* LAC 33:III.507.C.2. Title V permits are the primary method for enforcing and assuring compliance with the Clean Air Act's pollution control requirements for major sources of air pollution. *Operating Permit Program,* 57 Fed. Reg. 32,250, 32,258 (July 21, 1992). Each Title V permit must list all applicable federally-enforceable requirements and contain enough information to determine how applicable requirements apply to units at the permitted source. The Clean Air Act makes clear that Title V permits must "include enforceable emission limitations and standards . . . and such other conditions as are necessary to assure compliance with *applicable requirements* of [the Clean Air Act and applicable State Implementation Plan ("SIP")]." 42 U.S.C. § 7661c(a) (emphasis added); *see also Sierra Club v.*

EPA, 536 F.3d 673 (D.C. Cir. 2008). The Title V operating permit program does not generally impose new substantive air quality control requirements, but does require permits to contain monitoring, recordkeeping, reporting, and other requirements to assure compliance by sources with existing applicable emission control requirements. 57 Fed. Reg. 32250, 32251 (July 21, 1992) (EPA final action promulgating the Part 70 rule). The part 70 regulations contain monitoring rules designed to satisfy this statutory requirement.

As a general matter, permitting authorities must take three steps to satisfy the monitoring requirements in the EPA's part 70 regulations. First, a permitting authority must ensure that monitoring requirements contained in applicable requirements are properly incorporated into the title V permit. 40 CFR 70.6(a)(3) (i)(A). Second, if the applicable requirements contain no periodic monitoring, permitting authorities must add monitoring "sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit." 40 CFR 70.6(a)(3)(i)(B). Third, if the applicable requirement has associated periodic monitoring but the monitoring is not sufficient to assure compliance with permit terms and conditions, a permitting authority must supplement monitoring to assure compliance. *See* 40 CFR 70.6(c)(1).

The regulations make clear that the term "applicable requirement" is very broad and includes, among other things, "[a]ny term or condition of any preconstruction permit" or "[a]ny standard or other requirement provided for in the applicable implementation plan approved or promulgated by EPA through rulemaking under title I of the [Clean Air] Act." 40 C.F.R. § 70.2; *see also* LAC 33:III.507.A.3 ("Any permit issued under the requirements of this Section shall incorporate all federally applicable requirements for each emissions unit at the source."). Indeed, "applicable requirements" includes the duty to obtain a construction permit that meets the requirements of the Act's Prevention of Significant Deterioration ("PSD") program. *See* 42 U.S.C. § 7475. Thus, Title V permits must incorporate the terms and conditions of the PSD permit because they are applicable requirements.

DETAILED COMMENTS

I. FORMOSA FAILED TO COMPLY WITH AIR QUALITY IMPACT REQUIMENTS.

A. Formosa Failed to Demonstrate That its Proposed Complex Will Not Cause or Contribute to Air Pollution, in Violation of PSD Requirements.

Formosa's refined modeling for F shows exceedances of the NAAQS. Statement of Basis, p. 65, EDMS 11687336. That is, the $PM_{2.5}$ 24-hour maximum modeled concentration, plus background, is 51.66 μg/m^3, which exceeds the NAAQS limit of 35 μg/m3. *Id.* In addition, the NO_2 1-hour maximum modeled concentration, plus background, is 422.53 μg/m^3, which vastly exceeds the NAAQS limit of 189 μg/m^3. *Id.* at 66. Further, Formosa's refined modeling for $PM_{2.5}$ 24-hour shows increment consumption at receptor locations. *Id.* This modeling therefore shows clear exceedances of the NAAQS, along with increment consumption.

Formosa, attempting to avoid the plain result of these modeled violations—Nonattainment New Source Review permitting—utilized an extralegal method set out in LDEQ's Air Quality Monitoring Procedures (AQMP) to purportedly demonstrate compliance. LDEQ AQMP, p. 2-5. Specifically, the AQMP provides that "if the maximum contribution from the proposed project is less than the significance level at the receptor(s) and time(s) of the potential exceedance(s), the proposed project will not cause nor significantly contribute to the potential NAAQS exceedance(s)." LDEQ AQMP, p. 2-6. Formosa determined that its contribution to the exceedances of the NAAQS and Class II increment were below the relevant Significant Impact Levels (SILs) and that its complex therefore was in compliance. Statement of Basis, p. 65–66.[16]

The Clean Air Act unambiguously prohibits Formosa's use of SILs. The Act's and Louisiana's PSD provisions require Formosa to demonstrate that the emissions from its proposed complex will "not cause, or contribute to" an exceedance of any NAAQS or any increment. *See* 42 U.S.C. § 7475(a)(3); LAC 33:III.509.K.1. Congress used mandatory and expansive language throughout § 7475(a) to make its directive clear and leave no gaps for EPA or LDEQ: "no" covered source may be constructed, "unless" that source "demonstrates" that it "will not" "cause, or contribute to," "any" violation of the NAAQS or "any" increment. 42 U.S.C. § 7475(a)(3); *see Consumer Electronics Ass'n v. FCC*, 347 F.3d 291, 298 (D.C. Cir. 2003) ("the Supreme Court has consistently instructed that statutes written in broad, sweeping language should be given broad, sweeping application."). Congress specifically used the terms "cause" and "contribute" together to ensure the PSD program would prevent increments and the NAAQS from being exceeded by considering all possible violations or contributions to violations. *Alabama Power Co. v. Costle*, 636 F.2d 323, 362 (D.C. Cir. 1979); H.R. Rep. No. 95-294, at 9; S. Rep. No. 95-127, at 11, 32 (1977). By including "or contribute to," Congress unambiguously covered any triggering or worsening of a NAAQS or increment violation. *See North Carolina v. EPA*, 531 F.3d 896, 910 (D.C. Cir. 2008) (where statute uses disjunctive "or" to connect terms, terms have different meaning). Within the plain meaning of the Clean Air Act, Formosa has shown that its facility will contribute to NAAQS violations and exceedance of a Class II increment.

This result also is consistent with the purpose and broader structure of the PSD program. The "emphatic goal of PSD is to prevent [increments] from being exceeded," as well as to prevent exceedances of NAAQS. *Alabama Power*, 636 F.2d at 362 ("On their face, these provisions establish the thresholds as limitations that are not to be exceeded …."); *Sierra Club v. EPA*, 705 F.3d 458, 465 (D.C. Cir. 2013) (permitting authorities must "prevent violations by requiring demonstration that a proposed source or modification will not cause [or contribute to] a

[16] Specifically, Formosa completed additional modeling to "show [Formosa's] NO2 contribution to the maximum modeling concentration to be 0.019 $\mu g/m^3$ which is below the 7.5 SIL and the PM2.5 contribution to the maximum modeling concentration is 0.052 $\mu g/m^3$ which is below the 1.2 $\mu g/m^3$ SIL." Statement of Basis, p. 65. Also following this extralegal method, Formosa completed additional modeling to purportedly demonstrate that the proposed emissions from its proposed chemical complex do not cause or contribute to the modeled increment consumption at the receptor locations that showed increment consumption. "The results show [Formosa's] PM2.5 contribution to the maximum modeled PM2.5 Increment [] is 0.00163 $\mu g/m^3$ which is below the 1.2 $\mu g/m^3$ SIL." Statement of Basis, p. 66.

violation."); *see also* 42 U.S.C. § 7473(b)(4) (defining "maximum allowable concentration" for pollutant as being no greater than NAAQS for that pollutant); *See also* H.R. Rep. No. 95-294, at 9 (1977), reprinted at 1977 U.S.C.C.A.N. 1077, 1087 ("The purpose of the permit is to assure that the allowable increments and [NAAQS] will not be exceeded as a result of emissions from any new or modified major stationary source."). By allowing Formosa nonetheless to use SILs to avoid the consequences of those violations, LDEQ would be authorizing rather than preventing significant deterioration.

Formosa's proposed use of the SILs also is illegal under the Clean Air Act, because it improperly allows the agency to wear blinders, focusing only on Formosa's compliance with the SIL, rather than the quality of the area's ambient air and any other impacts projected to occur, such as the construction of other sources. By ignoring this information, LDEQ impermissibly frees itself to issue permits to sources that will in fact violate the standards or increments—in fact, LDEQ could continue to issue these permits to new sources in the same area, one after the other, that each model NAAQS and Class II exceedances but individually contribute less than the SIL.

Finally, the illegality of the SILs is consistent with recent case law. The D.C. Circuit vacated EPA's regulations establishing $PM_{2.5}$ significant monitoring concentrations, which are closely analogous exemptions from statutory air monitoring, on the ground that they violate the "extraordinary rigid" language of the Clean Air Act on PSD preconstruction monitoring. *See Sierra Club v. E.P.A.*, 705 F.3d 458, 466 (D.C. Cir. 2013). The Court remanded the $PM_{2.5}$ SIL, without reaching the same issue of whether the SILs are in violation of the Act's language on procedural grounds. *Id.* at 464, 466.[17] But as explained above, Section 7475 leaves no room for doubt. Neither Formosa nor any other major source that causes or contributes to a violation of the NAAQS or an increment can absolve itself of the violation.

Formosa attempts to defend LDEQ's method of using SILs to demonstrate that the proposed project does not cause or contribute to an exceedance of the NAAQS as an EPA-approved practice. *See* Formosa Supp. EAS, pp. 5-6 (referencing an EPA April 17, 2018 memo). But, as explained, EPA's practice is likewise illegal. EPA cannot authorize a violation of the NAAQS, and indeed any such attempt runs counter to the Act's clear mandate that EPA set the NAAQS at

[17] The D.C. Circuit left open the possibility it could invalidate the SILs as unlawful under the Clean Air Act, just like significant monitoring concentrations, should the EPA persist in proposing them:

> We disagree with the Sierra Club that it is necessary to decide the EPA's authority to promulgate SILs at this point. To do so would require that we answer a question not prudentially ripe for determination. On remand the EPA may promulgate regulations that do not include SILs or do include SILs that do not allow the construction or modification of a source to evade the requirements of the Act as do the SILs in the current rule. In such an event, we would not need to address the universal disallowance of all *de minimis* authority. If the EPA promulgates new SIL provisions for $PM_{2.5}$ and those provisions are challenged, we can then consider the lawfulness of those SIL provisions.

Sierra Club, 705 F.3d at 464.

a level that is "requisite to protect the public health," with "an adequate margin of safety." 42 U.S.C. § 7409(b)(1).[18] The Supreme Court has construed this mandate as requiring the NAAQS to be set at levels "not lower or higher than is necessary – to protect the public health with an adequate margin of safety." *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 475-76 (2001). Because by law the NAAQS must already reflect the absolute pollution limit requisite to protect health, EPA cannot specify that pollution levels higher than the NAAQS are permissible.

Formosa has not demonstrated that its $PM_{2.5}$ emissions will "not cause, or contribute to" an exceedance of the $PM_{2.5}$ 24-hour NAAQS or increment, nor has it demonstrated that its NO_X emissions will "not cause, or contribute to" an exceedance of the NO_2 1-hour NAAQS. Instead, its modeling shows NAAQS and increment violations. LDEQ must not kick the can down the road through its extralegal grafting of the SILs and let Formosa off the hook. LDEQ must address the NAAQS and increment violations based on Formosa's modeling and examine the regional sources.

B. Formosa Failed to Follow Mandatory Modeling Requirements, thus Invalidating its Air Quality Analysis.

Louisiana SIP regulations require Formosa to demonstrate that emissions from the proposed complex will not cause or contribute to an exceedance of any applicable PSD increment. *See* LAC 33:III.509.K.[19] This includes a demonstration that emissions from the proposed complex will not cause or contribute to an exceedance of applicable Class I PSD Increments for NO_2, SO_2, PM_{10}, and $PM_{2.5}$ at the Breton Wilderness Class I Area. To make this demonstration, the regulations mandate that "[a]ll estimates of ambient concentrations required under this Subsection [i.e., LAC 33:III.509, Prevention of Significant Deterioration] shall be based on applicable air quality models, databases, and other requirements specified in Appendix W of 40 CFR Part 51 (Guideline on Air Quality Models)." LAC 33:III.509.L.1. There is no question,

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[18] Attempting to inject ambiguity into the statute, EPA now argues § 7475(a)(3) is ambiguous because the Act does not define the terms "cause" or "contribute." EPA, Legal Memorandum: Application of Significant Impact Levels in the Air Quality Demonstration for Prevention of Significant Deterioration Permitting under the Clean Air Act, 2 (Apr. 2018). But EPA undermines itself, for it also recognizes that "absence of a statutory definition does not by itself establish that a term is ambiguous." *Id.*; *NRDC v. EPA*, 489 F.3d 1250, 1258 (D.C. Cir. 2007) (rejecting the argument from EPA that "Congress's failure to provide a statutory definition" created ambiguity, and holding "[t]here is no such rule of law").

[19] K. Source Impact Analysis

1. The owner or operator of the proposed source or modification shall demonstrate that allowable emission increases from the proposed source or modification, in conjunction with all other applicable emissions increases or reductions, including secondary emissions, would not cause or contribute to air pollution in violation of:

   a. any national ambient air quality standard in any air quality control region; or

   b. any applicable maximum allowable increase over the baseline concentration in any area.

therefore, that Formosa was required to follow Appendix W requirements for its modeling, but it failed to do so.

The Breton Wilderness Class I area is approximately 180 kilometers away from Formosa's proposed chemical complex. Formosa Class I Modeling Protocol, Sept. 7, 2018, at 1. Appendix W mandates the "screening approach" "[t]o determine if a compliance demonstration for NAAQS and/or PSD increments may be necessary beyond 50 km (i.e., long-range transport assessment)." 40 C.F.R. § Pt. 51, App. W, 4.2.c. The mandated screening approach has two steps. First, Formosa must "determine the significance of the ambient impacts at or about 50 km from [the proposed chemical complex]" "[b]ased on application in the near-field of the appropriate screening and/or preferred model." 40 C.F.R. § Pt. 51, App. W, 4.2.c.i. Formosa stipulated to a significant ambient impact on the Class I area at 50 km.[20]

Step 2 requires further assessment "[i]f a near-field assessment is not available or this initial analysis indicates there may be significant ambient impacts at that distance …." *Id.* This step 2 assessment required Formosa to consult with EPA Region 6 to determine the appropriate model.[21] Appendix W specifically mandates that "applicants shall reach agreement on the specific model and modeling parameters on a case-by-case basis in consultation with the appropriate reviewing authority (paragraph 3.0(b)) *and EPA Regional Office*. 40 C.F.R. § Pt. 51, App. W, 4.2.c.ii (emphasis added). Formosa skipped this requirement. It never consulted with EPA "to reach agreement on the specific model and modeling parameters," to use.[22] *See id.*

Formosa's error was particularly egregious here. EPA made certain to emphasize that the air quality model that Formosa used, the CALPUFF modeling system, was no longer EPA's

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[20] *See* Email from K. Olson (Formosa Consultant) to A. Randall (LDEQ), Dec. 11, 2018, EDMS 11454853, http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11454853&ob=yes&child=yes.

[21] 40 C.F.R. § Pt. 51, App. W, 4.2.c.ii.

[22] Commenters submitted a Freedom of Information (FOIA) request to EPA for "all records in the possession, custody, or control of EPA Region 6 that refer or relate to FG LA, LLC's modeling protocol and consultation in connection with its Prevention of Significant Deterioration permit application and associated Class I increment modeling for its planned Chemical Complex in St. James, Louisiana." FOIA Request, July 3, 2019, EPA-R6-2019-00783, https://foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-R6-2019-007083&type=request. EPA responded on July 18, 2019. Attach. C, Affidavit of Corinne Van Dalen, Ex. 1, Letter from Susanne Andrews, Acting Deputy Region Counsel to Corinee [sic] Van Dalen, July 18, 2018 (EPA final deposition for EPA-R6-2019-007083 showing no documents were withheld)). EPA released records to the public on July 19, 2019. *See* FOIA Online, https://foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-R6-2019-007083&type=request. These records are completely devoid of any document showing that Region 6 was "consulted in determining the appropriate and agreed upon screening technique to conduct the second level assessment." *Id.* Likewise, EPA has no record that shows that Formosa "reach[ed] agreement on the specific model and modeling parameters on a case-by-case basis in consultation with the . . . EPA Regional Office," as mandated by Appendix W. 40 C.F.R. § Pt. 51, App. W, 4.2.c.ii. *Id.*

preferred model when it amended Appendix W in 2017. *See* 40 C.F.R. § Pt. 51, App. W, 4.2.c, App. A; Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter, 82 FR 5182-01 (final rule) (Jan. 17, 2017).[23, 24] In revising Appendix W, EPA stated that "EPA has fully documented the past and current concerns related to the regulatory use of the CALPUFF modeling system and believes that these concerns, including the well-documented scientific and technical issues with the modeling system, support the EPA's decision to remove it as a preferred model in appendix A of the Guideline." 82 Fed. Reg. at 5195. EPA referenced years of studies on the CALPUFF modeling system that raise piercing questions about the model's reliability.[25]

The Interagency Workgroup on Air Quality Monitoring (the "Workgroup"), which includes EPA and Federal Land Manager representatives, has studied the CALPUFF modeling system since at least 1998.[26] In a 2016 report, the Workgroup cited its own studies and outside reviews showing the ease with which modelers could manipulate the meteorological data component of the CALPUFF model, CALMET, that "has often resulted in an 'anything goes' process, whereby model control option selection can be leveraged as an instrument to achieve a desired modeled outcome, without regard to the scientific legitimacy of the options selected."[27] Beyond the inconsistencies in meteorological data, the Workgroup explained that studies show CALPUFF fails to analyze the core chemical reactions necessary to accurately predict ozone formation from single sources.[28]

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[23] https://www.govinfo.gov/content/pkg/FR-2017-01-17/pdf/FR-2017-01-17.pdf.

[24] EPA's revisions to Appendix W took effect May 22, 2017. Further Delay of Effective Dates for Five Final Regulations Published by the Environmental Protection Agency Between December 12, 2016 and January 17, 2017, 82 FR 14324-01 (Mar. 20, 2017). EPA gave permitting agencies discretion to continue to accept modeling protocols submitted in keeping with the old rule for one year, until May 22, 2018, *id.* at 5182, but Formosa submitted the instant protocol in September 2018, *see* Formosa Class I Modeling Protocol, Sept. 7, 2018, EDMS 11776548, https://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11776548&ob=yes&child=yes.

[25] *See* EPA, Resp. to Comments on Revisions to the Guidelines on Air Quality Models, Dkt No. EPA-HQ-OAR-2015-0310-0156, p. 69 (Dec. 20, 2016), *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0310-0156.

[26] EPA, "Reassessment of the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report: Revisions to Phase 2 Recommendations," EPA-454/R-16-007, at p. iv (Dec. 2016), *available at* https://www3.epa.gov/ttn/scram/appendix_w/2016/IWAQM_Phase2_Reassessment_2016.pdf.

[27] *Id.* at p. 2.

[28] *Id.* at p. 42.

All of these issues can lead to model predictions that are off target. In 2012, EPA commissioned a detailed study of CALPUFF's predictive accuracy, along with that of competing models, against data from field observation studies of emissions tracers taken in the United States and in Europe.[29] This study also concluded that the CALPUFF model results were highly variable and CALMET parameters were in practice vulnerable to manipulation "to obtain a desired outcome in CALPUFF."[30] The study also found there was no single set of "pass through" CALMET inputs that would ensure consistency and fully address CALPUFF's variability concerns.[31] Moreover, several other long-range-transport models proved more accurate in predicting tracer data than CALPUFF.[32] As the study noted in reviewing one European tracer analysis, all of the other "[f]our of the five [long-range-transport-assessment] models were able to reproduce the observed tracer bifurcation at the farther downwind distances," but, even after the researchers explored ways to manipulate the model, CALPUFF produced results that showed the plume traveling too far north.[33]

The revised Appendix W requires case-by-case consultation with EPA to avoid these documented concerns with the CALPUFF modeling system. These concerns warrant particular scrutiny by EPA here because of the high volumes of relevant criteria pollutants Formosa would be permitted to release, in conjunction with the emissions from several other large major sources of air pollutants that have been proposed to be built in or near the Breton Wilderness's air shed.

Because Formosa failed to comply with the mandatory air modeling requirements in Appendix W, Formosa invalidated its Class I modeling and violated Louisiana Air Regulations and SIP provision governing estimates of ambient concentrations under LAC 33:III.509.L.1. Formosa, thus, failed to demonstrate that its proposed chemical complex will not cause or contribute to an exceedance of any Class I PSD increment as required by LAC 33:III.509.K. LDEQ must withdraw its approval of Formosa's Class I air modeling protocol and order Formosa to engage in consultation with EPA Region 6 and LDEQ to determine an "appropriate and agreed-upon" long-range-transport modeling protocol. *See* 40 C.F.R. Part 51, App'x W, 4.2.c.ii. Formosa must then submit the new modeling protocol for approval and public comment.

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[29] *See* Environ Int'l., "Documentation of the Evaluation of CALPUFF and Other Long Range Transport Models Using Tracer Field Experiment Data," EPA-454/R-12-003, at pp. 5–7 (Introduction) (May 2012), *available at* https://www3.epa.gov/ttn/scram/reports/EPA-454_R-12-003.pdf.

[30] Environ Int'l, *supra*, at p. 29–30 (Executive Summary, "Conclusions of LRT Dispersion Model Tracer Test Evaluation.")

[31] *Id.*

[32] *Id.* at 31 (Executive Summary, "Conclusions of LRT Dispersion Model Tracer Test Evaluation."), 141 (Conclusions).

[33] *Id.* at 141.

Moreover, because Formosa failed to comply with modeling requirements it has no basis for its claim that it has minimized air quality effects by complying with applicable regulations. *See* Formosa EAS, July 18, 2018, p. 8, EDMS 112230529.

C. Formosa's Class II Air Quality Modeling violates Louisiana Regulations, EPA Guidance, and Deviates from Formosa's own Modeling Protocol in ways that Could Underestimate its Criteria Pollutants.

As explained by Commenters' air quality modeling expert, Todd Cloud, Formosa violates applicable regulations and guidance in its NAAQs and Class II increment modeling.[34] The result of these errors is that Formosa could have significantly understated its modeled air quality impacts and exceedances of air quality standards. DEQ must require Formosa to submit a revised NAAQs and Class II increment modeling protocol.

Most broadly, Formosa improperly submitted NAAQs and Class II increment modeling starting at the edge of its property line, rather than above the complex itself. This is inconsistent with Louisiana regulations that do not make any exception from the definition of "ambient air," for portions of the source's property.[35] Formosa's decision almost certainly reduced modeled pollution concentrations.[36]

Although Formosa's exclusion of its property from the modeling was not allowed under state law, Formosa did not even follow EPA's more permissive guidance that would allow "ambient air" to "begin[] at a fence line (i.e., controlled access) and not a property line" that is unpatrolled or ungated.[37] Without justification, Formosa placed its receptor grids at its more distant, property line boundaries that likely will not be enclosed from public access.[38] This unjustified decision to extend outward the point at which Formosa begins to measure its air quality impacts very likely served to decrease the modeled concentrations detected for all criteria pollutants. LDEQ must therefore require Formosa to remodel the NAAQs and Class II increment from the source of emissions without excluding air above its facility.

Formosa's Class II increment modelling of PM_{10} and $PM_{2.5}$ violates applicable regulations both in Formosa's estimates of the available increment and its own increment consumption. This is

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[34] *See* Attach. D, Affidavit of Todd Cloud (Cloud Aff.), Ex. 2, pp. 3–10.

[35] LAC 33:III.111 (defining "ambient air" to mean, "the outdoor air or atmosphere which surrounds the earth").

[36] *See id.* at 3.

[37] *Id.* at 3; *see generally*, Draft Guidance: Revised Policy On Exclusions from "Ambient Air," USEPA (November 2018), https://www.epa.gov/sites/production/files/2018-11/documents/draft_ambient_air_guidance_110818.pdf

[38] Attach. D, Cloud Aff., Ex. 2, p. 3.

particularly egregious because, even with these errors, Formosa modeled that it would exceed the allowable Class II increment for the 24-hour $PM_{2.5}$ standard.

For one, it is unclear whether Formosa accurately estimated its own $PM_{2.5}$ emissions in the model. In addition to the many potential inaccuracies in Formosa's PM emissions calculations discussed in the expert report of Dr. Ranajit Sahu,[39] Formosa provided no justification for its speciation of $PM_{2.5}$ emissions as a percentage of its PM_{10} emissions.[40] In some cases, Formosa projected $PM_{2.5}$ emissions at less than 20 percent of its PM_{10} emissions, even for combustion sources for which "PM10 and PM2.5 are generally equivalent."[41] The result is that Formosa may have further "drastically underestimate[d] emissions and therefore ambient impacts."[42] LDEQ must therefore require Formosa to provide detailed support for its $PM_{2.5}$ estimates or re-model with higher projected $PM_{2.5}$ emissions.

Formosa also failed to adhere to applicable regulations in calculating the PM_{10} and $PM_{2.5}$ increments consumed by other regional sources. Under 40 C.F.R. Part 51, Appendix W, Section 8.2.2,[43] Formosa was required to model "potential" emissions based on each source's maximum permitted emission limit or "actual" emissions" calculated using the specific formula that multiplies the maximum allowable emission limit (or federally enforceable permit limit) times the actual operating level and actual operating factor, both of which represent the average over the most recent 2 years. Indeed, Formosa committed in its 2015 and 2018 modeling protocols to LDEQ that it would do just that, and gather off-property source emissions data based on "permit allowable emission rates."[44]

Instead of following the agreed protocol, Formosa provided historical, 2016 PM emissions for several large regional sources, including every $PM_{2.5}$ source.[45] There is no evidence in the record that LDEQ knew or ever approved of Formosa's decision to deviate from the method in Appendix W and to rely on historic emissions for other sources, let alone approved the change in

[39] Attach. E, Affidavit of Ranajit Sahu (Sahu Aff.), Ex. 1, Technical Comments on the Proposed FG LA Complex (Sahu Report).

[40] Attach. D, Cloud Aff., Ex. 2, 7.

[41] *Id.*

[42] *Id.*

[43] 33 La. Admin. Code Pt III, 509(L), provides that "[a]ll estimates of ambient concentrations required under this Subsection shall be based on applicable air quality models, databases, and other requirements specified in Appendix W of 40 CFR Part 51 (Guideline on Air Quality Models)." Any deviation from Appendix W standards must be approved in writing by the state administrator and the modification must be subject to notice and opportunity for public comment. *Id.*

[44] *Id.* at 5.

[45] *Id.* at 4.

writing.[46] Formosa also failed to document its method for determining which regional sources to include in the increment analysis for $PM_{2.5}$,[47] leading to a concern that Formosa's modeling of the increment could be under inclusive. Once again, this likely served to substantially understate existing PM_{10} and $PM_{2.5}$ emissions. This also violated Formosa's obligation to obtain LDEQ approval for its modeling protocol. LDEQ must therefore require Formosa to create a documented inventory of other sources included in the Class II increment model. After completing supplemental modeling, Formosa must then be held to account for any NAAQs or Class II increment violations revealed.

II. FORMOSA PERVASIVELY UNDERESTIMATES ITS POTENTIAL TO EMIT.

As documented at length in Section 3 of Dr. Sahu's expert report, Formosa's permit applications rely routinely on underestimated, and often inappropriate, emissions factors for assessing the petrochemical complex's potential to emit ("PTE").[48] Accurate PTE estimates are critical for determining the complex's overall emissions profile and impacts on ambient air quality. As Dr. Sahu concluded, "[t]aken as a whole, the PTE emissions estimates provided in the permitting record underestimate PTE emissions for every single pollutant, and as a result, the impact of the facility's emissions are also underestimated."[49] LDEQ must order Formosa to revise its PTE calculations with fully supported, more accurate representations of each source's maximum potential emissions.

The likely inaccurate PTE estimates are consequential, because they call into question whether Formosa complies with the health-based NAAQS and Class II increments.[50] As described in Section I, Formosa has already modelled that St. James would be in nonattainment, by wide margins, for the 1-hour NO_X (NO_2) and 24-hour $PM_{2.5}$ NAAQS standards and nearly exceeds the $PM_{2.5}$ annual standard.[51] Formosa's modeling already shows that its complex would consume the Class II increment for 24-hour $PM_{2.5}$ and nearly consume the increment for annual NO_2.[52] Formosa only narrowly avoided conducting refined modelling of its 1-hour SO_2 emissions.[53] The

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[46] *See* LAC 33:III.509.L.

[47] Attach. D, Cloud Aff., Ex. 2, 7.

[48] *See* Attach. E, Sahu Aff., Ex. 1, Sahu Report, pp. 9–42.

[49] *Id.* at 9.

[50] The distortionary impact of the inaccurate PTE figures discussed here is likely magnified by other errors in Formosa's air quality modeling, outlined in the report of Todd Cloud (Attach. D, Ex. 2) and in Section I above.

[51] Attach E, Sahu Aff., Ex. 1, Sahu Report at 7.

[52] *Id.*

[53] *Id.* at 5.

pervasive underestimates in Formosa's PTE calculations may well outstrip what, if any, margin for error Formosa has left from violating these or other NAAQS standards.[54] Air quality and public health in St. James may be even more clearly at risk than Formosa's modeling presently reveals. Because of the lack of rigor in the Title V permits' monitoring conditions, described in Section V and Dr. Sahu's expert report, Formosa regularly could emit more pollution than its permit limits allow without LDEQ or the public knowing.

The problems with Formosa's PTE estimates fall into several categories. First, PTE is required to be determined based on the "**maximum** capacity of a stationary source to emit any air pollutant under its physical and operational design."[55] But Formosa repeatedly looked to the AP-42 emissions factors to produce its PTE estimates, which are not based on maximum but, at best, average emissions from a source category.[56] Indeed, EPA counsels against using AP-42 emissions factors in permitting determinations except as a "last resort," when better information is unavailable.[57] In particular, EPA cautions against using AP-42 factors in situations in which the consequences for a poor estimate may be high.[58] State environmental agencies have echoed EPA's warnings against using AP-42 factors in permitting.[59]

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[54] *Id.* at 7–8.

[55] LAC 33:III.502 (emphasis added); *see United States v. Louisiana.-Pacific Corp.*, 682 F. Supp. 1141, 1158 (D. Colo. 1988) ("The concept contemplates the maximum emissions that can be generated while operating the source as it is intended to be operated and as it is normally operated.").

[56] Attach E, Sahu Aff., Ex. 1, Sahu Report at 10–11; *see* AP-42 Manual, Fifth Ed., Introduction, pp. 1–2 (Jan. 1995) ("In most cases, these factors are simply averages of all available data of acceptable quality."), *available at* https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors.

[57] AP-42 Manual, Introduction, *supra*, at p. 3. For example, EPA warns:

> Before simply applying AP-42 emission factors to predict emissions from new or proposed sources, or to make other source-specific emission assessments, the user should review the latest literature and technology to be aware of circumstances that might cause such sources to exhibit emission characteristics different from those of other, typical existing sources. Care should be taken to assure that the subject source type and design, controls, and raw material input are those of the source(s) analyzed to produce the emission factor. This fact should be considered, as well as the age of the information and the user's knowledge of technology advances.

Id. at 4.

[58] AP-42 Manual, Introduction, *supra*, at p. 3.

[59] *See*, e.g., NJ DEP Memorandum from John Preczewski, P.E., Assistant Director of Air Quality Permitting Program, to Air Quality Permitting Staff 1 (Dec. 14, 2007) ("Use of emissions factors, AP-42 and others, can be problematic and permit applicants may only use them in the absence of other reliable methods."), *available at* http://www.state.nj.us/dep/aqpp/permitguide/GuidelinesEvalPropEmissRates.pdf.

Because the AP-42 emission factors reflect average emissions rates, Formosa is likely underestimating PTE for nearly every source in which it relies on AP-42 emissions factors, in violation of Louisiana air regulations and EPA guidance. Formosa also made this same error even for some sources that do not rely on AP-42 factors, like its fugitive VOC emissions estimates that are based on EPA data explicitly listed as averages.[60] LDEQ must require Formosa to modify all PTE estimates that rely on AP-42 factors, or average emissions rates, and instead provide well-supported, more accurate estimates of a source's maximum potential emissions.

Formosa further compounded the error of relying on AP-42 factors by often using inapposite AP-42 factors or relying on low-confidence AP-42 data, without justifying these decisions. For example, rather than applying the high end of AP-42 emissions rate testing data for NO_X from flares, 0.2 lb./MMBtu, Formosa used an emissions factor one-third as high, 0.068 lb./MMBtu.[61] To make matters worse, the testing data from which this factor was derived was from burning a nearly pure propylene gas—in contrast to Formosa's own report of its waste gas streams, which it believes will contain far lower concentrations of propylene and, often, higher concentrations of NOx-forming nitrogen.[62] Formosa repeated this error in the emissions factors it used for its combustion control devices, like its thermal oxidizers.[63] In other words, at times, Formosa is not just inappropriately relying on average, AP-42 factors, but is stretching to make apples-to-oranges comparisons between those factors and its own emissions sources.

In addition, AP-42 factors are ranked from A (the best) to E (the worst), based on the reliability of the data used to create them.[64] EPA warns that test data informing some emissions factors in the AP-42: "may vary by an order of magnitude or more. . . . Even when the major process variables are accounted for, the emission factors developed may be the result of averaging source tests that differ by factors of five or more."[65]

Formosa relied on D-rated factors in estimating particulate matter emissions from natural-gas combustion.[66] D-rated sources are "below average," in that "there may be reason to suspect that these facilities do not represent a random sample of the industry."[67] By contrast, Formosa

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[60] Attach E, Sahu Aff., Ex. 1, Sahu Report, p. 30.

[61] *Id.* at 21–22.

[62] *Id.*

[63] *Id.* at 22–23.

[64] AP-42 Manual, Introduction, *supra*, at pp. 8–10.

[65] AP-42 Manual, Introduction, *supra*, at p. 3.

[66] Attach E, Sahu Aff., Ex. 1, Sahu Report, p. 14.

[67] AP-42 Manual, Introduction, *supra*, p 10.

rejected using D- or E-rated AP-42 data for hazardous air pollutants from natural-gas combustion.[68] But rather than project emissions of these pollutants, using other, more reliable data sources, Formosa simply omitted the pollutants altogether.[69] And these hazardous air pollutants comprised the large majority of HAPs from natural-gas combustion.[70] This is particularly concerning given the significant amounts of air toxics Formosa is already projecting it will release and the vast quantities of natural gas it would burn in its process. LDEQ must order Formosa to develop an accurate inventory of its maximum potential emissions from each source, looking to references beyond the AP-42 where necessary.

Finally, in some cases Formosa provided no basis at all for its emissions assumptions. For instance, Formosa assumed that each of its flares would have relatively high destruction efficiencies of 98 or 99 percent, regardless of the flare type, the waste gas composition, or the flow rate to the flare.[71] But Formosa cited no active guidance justifying this decision, particularly since a flare's actual destruction efficiency is heavily dependent on operating conditions.[72] Even small differences in real-world flare efficiency could have enormous consequences for actual emissions of hazardous and criteria pollutants from the flares, particularly in high-flow-rate scenarios, like Maintenance, Startup, and Shutdown and upsets.[73] To instead represent true PTE, Formosa should have assumed the lowest potential destruction efficiencies for each flare.[74]

In another consequential example, Formosa assumed, without providing support, that $PM_{2.5}$ would only be 0.197 percent of total PM emissions from its cooling towers.[75] Dr. Sahu opined that this was "an extraordinary assumption," that appears to be "dramatically wrong," as readily available cooling tower emissions data show $PM_{2.5}$ to be more than double the share of PM assumed without support by Formosa.[76]

LDEQ must require Formosa to revise its PTE estimates, using emissions data that reflect maximum potential emissions and that are supported by verifiable and relevant data. As it stands, Formosa's PTE estimates may deeply underestimate its potential emissions, including of

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[68] Attach E, Sahu Aff., Ex. 1, Sahu Report, pp.15, 17–18.

[69] *Id.* at 15.

[70] *See id.* at 15, 17–18.

[71] *Id.* at 18–20.

[72] *Id.* at 19–20.

[73] *Id.*

[74] *Id.* at 20.

[75] *Id.* at 23.

[76] *Id.* at 23–24.

pollutants like $PM_{2.5}$ and NO_X that Formosa's existing modeling already shows could pose concern for human health.

III. THE EMISSION LIMITS DO NOT REFLECT THE BEST AVAILABLE CONTROL TECHNOLOGY (BACT).

A. Best Available Control Technology (BACT)—Legal Background.

The Clean Air Act requires that a permit issued to a major new source of air pollution in an attainment area include emission limits that reflect the installation of BACT for each regulated air pollutant.[77] A permit cannot issue without proper BACT limits.[78] The limits proposed in the draft permits do not represent BACT because they fail to reflect the maximum emission reductions that are achievable.

The Clean Air Act defines BACT as an:

> emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.[79]

Louisiana's federally approved State Implementation Plan (SIP) similarly makes clear that BACT is, "an emissions limitation…based on the maximum degree of reduction from each pollutant subject to regulation under this Section that would be emitted from any proposed major stationary source or modification…"[80]

The BACT review "is one of the most critical elements of the PSD permitting process" because it determines the amount of pollution that a source will be allowed to emit over its lifetime.[81] As

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[77] 42 U.S.C. §§ 7471, 7475(a)(2), 7479(3).

[78] 42 U.S.C. § 7475(a)(4); *Alaska Dep't of Envtl. Conservation v. EPA,* 540 U.S. 461 (2004) (upholding EPA's authority to block a PSD permit where the state permitting authority's BACT determination was unreasonable).

[79] 42 U.S.C. § 7479(3).

[80] LAC 33:III.509.B (providing BACT definition).

[81] *In re Mississippi Lime*, 15 E.A.D. 349, 361 (E.A.B. 2011); *In re Knauf,* 8 E.A.D. 121, 123-24 (E.A.B. 1999).

such, the BACT analysis must be "well documented" and a decision to reject a particular control option or a lower emission limit "must be adequately explained and justified."[82] While the applicant has the duty to supply a BACT analysis and supporting information in its application, "the ultimate BACT decision is made by the permit-issuing authority."[83] Therefore, LDEQ has an independent responsibility to review and verify the applicant's BACT analyses and the information upon which those analyses are based to ensure that the limits in any permit reflect the maximum degree of reduction achievable for each regulated pollutant.[84] As demonstrated by Dr. Sahu,[85] many of the emission limits in the proposed PSD permit do not represent BACT.

BACT requires a case-by-case[86] analysis in order to determine the lowest emission rate for the pollutant in question for the source in question, reflecting the maximum degree of emissions reduction[87] that is achievable considering collateral factors such as cost, energy, and other environmental impacts. By using the terms "maximum" and "achievable," the Clean Air Act sets forth a "strong, normative" requirement that "constrain[s]" agency discretion in determining BACT.[88] Pursuant to those requirements, "the most stringent technology is BACT" unless the applicant or agency can show that such technology is not feasible or should be rejected due to specific collateral impact concerns.[89] The collateral impacts exception is a limited one, designed only to act as a "safety valve" in the event that "unusual circumstances specific to the facility make it appropriate to use less than the most effective technology."[90] If the agency proposes permit limits that are less stringent than those for recently permitted similar facilities, the burden is on the applicant and agency to explain and justify why those more stringent limits were

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[82] *In re Mississippi Lime*, 15 E.A.D. at 361; *In re Knauf*., 8 E.A.D. at 131.

[83] *In re: Genesee Power Station Ltd. Partnership,* 4 E.A.D. at 832, 835.

[84] *See* 42 U.S.C. § 7479(3) ("permitting authority" makes BACT determination); 40 C.F.R. § 70.7(a)(5).

[85] Attach. E, Sahu Aff., Ex. 1, Sahu Report, Section 4.

[86] 42 U.S.C. § 7479(3); New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting, Draft, ("NSR Manual"), p. B-5, EPA's Office of Air Quality Planning and Standards (Oct. 1990), https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf.

[87] NSR Manual, pp. B.1-B.2, B.23.

[88] *Alaska,* 540 U.S. at 485-86.

[89] *Alaska Dep't of Envtl. Conserv. v. EPA*, 298 F.3d 814, 822 (9th Cir. 2002).

[90] *In re Kawaihae Cogeneration Project*, PSD Appeal Nos. 96-6, 96-10, 96-11, 96-14, 96-16, 7 E.A.D. 107, 117 (E.A.B. Apr. 28, 1997); *In re World Color Press, Inc.*, 3 E.A.D. 474, 478 (Adm'r 1990) (collateral impacts clause focuses on the specific *local* impacts); *In re Columbia Gulf Transmission Co.*, PSD Appeal No. 88-11, 2 E.A.D. 824, 827 (Adm'r 1989); NSR Manual at B.29.

rejected.[91] The need to aim for the lowest limits achievable as part of the BACT analysis was emphasized by the Environmental Appeals Board, which stated in reversing a permit issuance:

> If reviewing authorities let slip their rigorous look at 'all' appropriate technologies, if the target ever eases from the 'maximum degree of reduction' available to something less or more convenient, the result may be somewhat protective, may be superior to some pollution control elsewhere, but it will not be BACT.[92]

BACT's focus on the maximum emission reduction achievable makes the standard both technology-driven and technology-forcing.[93] A proper BACT limit must account for both general improvements within the pollution control technology industry and the specific applications of advanced technology to individual sources, ensuring that limits are increasingly more stringent. BACT may not be based solely on prior permits, or even emission rates that other plants have achieved, but must be calculated based on what available control options and technologies can achieve for the project at issue and set standards accordingly.[94] For instance, technology transfer from other sources with similar exhaust gas conditions must be considered explicitly in making BACT determinations.

The U.S. EPA established a top-down approach for making BACT determinations to ensure that BACT determinations are "reasonably moored" to the Clean Air Act's statutory requirement that BACT represent the maximum achievable reduction.[95] While an agency is not required to utilize the top-down process as laid out in the NSR Manual, where, as here, it purports to do so, the

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[91] *In re Indeck-Elwood, LLC*, PSD Appeal 03-04, 13 E.A.D. 184-190 (E.A.B. Sept. 27, 2006); *In re Knauf Fiber Glass, GMBH*, PSD Permit No. 97-PO-06, 8 E.A.D. 121, 131-32 (E.A.B. Feb. 4, 1999).

[92] *In re: Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, slip op. at 16 (EAB 2009) (hereinafter "*In re NMU*"); see also *Utah Chapter of Sierra Club*, 226 P.3d at 734-35 (remanding permit where there "was evidence that a lower overall emission limitation was achievable").

[93] *See* NSR Manual, pp. B.12, B.5, B.16.

[94] An agency must choose the lowest limit "achievable." While a state agency may reject a lower limit based on data showing the project does not have "the ability to achieve [the limit] consistently," *In re Newmont*, PSD Appeal No. 05-04, 12 E.A.D. at 429, 443 (E.A.B. Dec. 21, 2005), it may only do so based on a detailed record establishing an adequate rationale, *see id.* Moreover, actual testing data from other facilities is relevant to establishing what level of control is achievable given a certain technology. *Id*. at *30. The word "achievable" does not allow a state agency to only look at past performance at other facilities, but "mandates a forward-looking analysis of what the facility [under review] can achieve in the future." *Id*. at *32. Thus, the agency cannot reject the use of a certain technology based on the lack of testing data for that technology, where the record otherwise establishes that the technology is appropriate as an engineering matter. NSR Manual, at B.5.

[95] *Alaska, Dep't of Envtl. Conservation v. U.S. E.P.A.,* 540 U.S. 461, 485, 488–89 (2004)

process must be applied in a "reasoned and justified manner."[96] Louisiana purports to follow EPA's top down approach to determine BACT.[97]

In a top-down analysis, the first step is to *identify all potential available control technologies* for the unit.[98] This includes all technologies or techniques with "practical potential for applications." These technologies should not be limited to those used within the United States.

The second step is to *eliminate technically infeasible options*. Now, technical infeasibility should be "clearly documented" to show that the control technology would not be successful, due to difficulties based on physical, chemical, and engineering principles.

In the third step, the applicant *ranks the remaining control technologies by control effectiveness* for each pollutant and for each unit subject to BACT analysis. Here, the list should present information on the 1) control efficiencies; 2) expected emission rate; 3) expected emission reduction; 4) environmental impacts; 5) energy impacts; and 6) economic impacts.

Finally, the applicant *evaluates the most effective controls and document results* and selects the most effective control measure not eliminated during the evaluation process. Measures are eliminated from top to bottom based on well-documented energy, environmental, or economic impacts.

B. The Proposed PSD Permit Fails to Require BACT.

Formosa's proposed permit does not correctly utilize the top down approach and ultimately fails to require BACT or the proper emissions limits for many of its sources. Specifically, the proposed permit is deficient because it: (1) fails to properly implement LDEQ's own top down BACT determination analysis; (2) fails to select the BACT emissions rate based on Best Achievable Rate for the technology selected as BACT, and; (3) rejects BACT based on cost considerations without basis.

1. The BACT determination does not correctly utilize a top-down analysis.

In the first step in the top down BACT analysis, the applicant considers all control options with a "practical potential for application to the emission unit under evaluation." A control option is considered "available" if "there are sufficient data indicating (but not necessarily proving)" the

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[96] *Alaska, Dep't of Envtl. Conservation v. U.S. E.P.A.,* 298 F.3d 814, 822 (9th Cir. 2002),

540 U.S. 461 (2004)

[97] "Consistent with EPA guidance, LDEQ utilizes the 'top-down' approach to determine BACT." LDEQ Preliminary Determination Summary, p. 7, EDMS 1187336.

[98] NSR Manual at p. B-5.

technology "will lead to a demonstrable reduction in emissions of regulated pollutants or will otherwise represent BACT."[99] Formosa's draft permit fails to consider key technologies, and at times fails to include any limitations resembling BACT. LDEQ, thus, must deny the permit and require Formosa to conduct a proper analysis and implement BACT.

As Dr. Sahu discusses in detail in his report, the proposed permit's SO_2 BACT determination for Boilers, Heaters, and Pyrolysis Furnaces is incomplete in that it failed to consider dry sorbent injection (DSI) to reduce emissions.[100] Instead, the permit selects fuel gas as BACT, which can result in higher levels of sulfur compound emissions. In connection with the same equipment, and adding the turbines, the BACT determination is incomplete by omitting any consideration of the condensable portion of PM.[101]

Further, the BACT determination is incomplete in failing to consider Optical Gas Imaging (OGI), which pin points larger leaking sources more quickly than LDAR (Leak Detection and Repair technology).[102] As Dr. Sahu explains, this responsiveness is essential to keeping fugitive VOC emissions low. *Id.* Notably, Formosa rejected leakless technology in part because it is not available for all components.[103] But the top-down analysis, and the Clean Air Act, require a rational basis for eliminating technology that would otherwise constitute BACT.

In other cases, the proposed permit fails to require BACT at all. While technologies for PM_{10} and $PM_{2.5}$ from the process vents were explored, LDEQ failed to select any of them. Sahu Report at 51. Similarly, on a number of sources with fugitive emissions, the permit relies on either Maximum Achievable Control Technology ("MACT") or National Emission Standards for Hazardous Air Pollutants (NESHAPs) to reduce VOC emissions.[104] But, counterintuitively, MACT, also known as "the MACT floor," sets the minimum standard that industry must meet to comply. MACT and NESHAPs standards are used in this permit to establish critical conditions such as leak threshold, monitoring frequency, and time allowed for repair. Applying these less stringent results in a permit that is weaker than what BACT requires.

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[99] *In re Spokane Regional Waste-to-Energy Applicant*, 2 E.A.D. 809, slip op. at 22 (Adm'r June 9, 1989).

[100] Attach. E, Sahu Aff., Ex. 1, Sahu Report, pp. 49-50.

[101] *Id.* at 50.

[102] *Id.* at 52.

[103] *See id.* at 52-53.

[104] *Id.* at 53.

2. The BACT analysis failed to incorporate rate and other factors necessary to establish emissions limits.

BACT encompasses all of the factors required to achieve an emissions limitation, including factors such as rate, concentration, and averaging time. As the BACT clearinghouse manual explains, BACT is not an equipment requirement but a performance requirement.[105]

It is interesting to note that BACT is somewhat of a misnomer. The form of the requirement is defined as an emission limitation and not as an equipment standard. Therefore, one is constrained to assume that the emission limitation would, in many cases, correspond to the emission rate achieved with either basic or control equipment which would otherwise be determined to be an appropriate control technology requirement. In other words, BACT should be established as a performance requirement, not as an equipment requirement, on authorities to construct and permits to operate.[106]

Moreover, BACT is forward-looking and technology forcing, evaluated on a case-by-case basis. It is not determined based simply on reviewing previously issued permits. Here, the proposed permit selected rates and other factors based on previously issued permits. Specifically, the permit failed to consider the rate for:

- Vapor combustors
- Thermal oxidizers
- Bag filters
- Draft eliminators
- Furnaces NOx

The permit also neglected to consider the concentration in determining the NOx emissions for the heater and boilers and the averaging time when determining the NOx emissions for the turbines.[107]

The BACT analysis must incorporate rate and other factors necessary to establish emissions limits.

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[105] CAPCOA BACT Clearinghouse Resource Manual VIII. Control Technology Definitions, https://ww3.arb.ca.gov/bact/docs/controltech.htm

[106] *Id.*

[107] *See* Attach. E, Sahu Aff., Ex. 1, Sahu Report, p. 49.

3. The Proposed Permit Failed to require BACT to reduce GHG emissions.

The project would emit nearly 14 million tons of greenhouse gas emissions, making this complex the second largest GHG emitter in Louisiana and one of the largest in the U.S. These emissions will have an impact well beyond the communities surrounding the facilities. Greenhouse gases emitted from this project include CO_2, N_2O, methane, and sulfur hexafluoride.

Despite these significant emissions, Formosa identifies general design features and controls that could maintain high levels of thermal efficiency and waste heat recovery, that could, in turn reduce CO2e emissions, but adopts none of them. One option the applicant did identify as feasible and cost effective explicitly was not incorporated into the GHG emission calculations or the enforceable conditions of the permit. Ultimately, the proposed permit does not include BACT for greenhouse gas emissions, and no emission rate reduction is anticipated.[108] This failure to apply BACT to greenhouse gas emissions would violate the Clean Air Act.

4. The proposed permit impermissibly rejects BACT based on cost without basis.

When determining if the most effective pollution control option has sufficiently adverse economic impacts to justify rejecting that option and establishing BACT as a less effective option, a permitting agency must determine that the cost-per-ton of emissions reduced is beyond "the cost borne by other sources of the same type in applying that control alternative."[109] This high standard for eliminating a feasible BACT technology exists because the collateral impacts analysis in BACT step 4 is intended only as a safety valve for when impacts unique to the facility make application of a technology inapplicable to that specific facility. To reject pollution control option, BACT requires a demonstration that the costs per ton of pollutant removed are disproportionately high for the specific facility compared to the cost per ton to control emissions at other facilities.

Formosa rejected catalytic oxidation for four units based on a cost ranging from $3,720 and $5,673 per ton, yet it provided absolutely no basis for its conclusion that this amount was excessive. In fact, projects spend significantly more money on BACT per ton.[110] The record must include evidence that the value is not cost effective. A control technology is considered to be "cost effective" for BACT if its cost effectiveness in dollars per ton of pollutant removed falls

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[108] *Id.* at 63-64.

[109] NSR Manual at B.44; *See also Steel Dynamics, Inc.*, 9 E.A.D. 165, 202 (E.A.B. 2000); *Inter-Power*, 5 E.A.D. at 135 ("In essence, if the cost of reducing emissions with the top control alternative, expressed in dollars per ton, is on the same order as the cost previously borne by other sources of the same type in applying that control alternative, the alternative should initially be considered economically achievable, and, therefore, acceptable as BACT." (quoting NSR Manual at B.44) (emphasis original)).

[110] Attach. E, Sahu Aff., Ex. 1, Sahu Report, pp. 46-47.

within a reasonable range of cost-effectiveness estimates where other costs are calculated using the same methodology.

IV. LDEQ SHOULD REQUIRE LOWEST ACHIEVABLE EMISSION RATE (LAER) STANDARDS FOR PM2.5 AND NOx SOURCES.

While the Clean Air Act requires that new major sources in attainment areas receive emissions limits that reflect BACT, the Lowest Achievable Emission Rate (LAER) standards, which are more stringent than BACT, are required for new stationary sources located in non-attainment areas. One notable difference between the two standards is that LAER requires the applicant to install the technology regardless of cost; cost is not a consideration. As described earlier, the modeling demonstrates that the area around the proposed project site exceeds both the 24-hour $PM_{2.5}$ and the NO_2 1-hour NAAQS, and is frighteningly close to non-attainment for the $PM_{2.5}$ annual NAAQS. Further, Formosa's modeling already shows consumption of the Class II increment for 24-hour $PM_{2.5}$ and near consumption of the increment for annual NO_2.[111]

Due to these modeling results, LDEQ should require Formosa to conduct a LAER analysis for these pollutants. Specifically, LDEQ should require Formosa to perform a LAER analysis for $PM_{2.5}$ and NOx emissions for the cooling towers, boilers, furnaces, heaters, and turbines. LDEQ's public trustee duty, discussed in detail in Section VII below, requires the agency to address, among other things, whether "[t]he potential and real adverse environmental effects of the proposed facility been avoided to the maximum extent possible."[112] This is a high standard and requires LDEQ to consider the application of LAER to prevent further degradation of the air notwithstanding an official nonattainment designation for the area, which could take years. Application of LAER would most certainly be a "mitigating measure[] which would offer more protection to the environment than the facility as proposed without unduly curtailing non-environmental benefits."[113] Indeed, LDEQ's public trustee duty requires it to do more than simply apply its own regulations; it has to show it performed its public trustee analysis.[114] For these reasons, LDEQ must require LAER for $PM_{2.5}$ and NO_X emissions.

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[111] *Id.* at 7.

[112] *In re American Waste and Pollution Control Co.,* 633 So. 2d 188, 194 (La. App. 1 Cir. 1993) (detailing the analysis mandated by the Louisiana Supreme Court in *Save Ourselves* to meet the Louisiana Constitution's public trustee provision). LDEQ refers to this 5-part inquiry as the "IT Requirements" or "IT Questions" after the name of the permittee in *Save Ourselves*.

[113] *See id.*

[114] *Save Ourselves*, 452 So. 2d at 1160 (stating, "From our review it appears that the agency may have erred by assuming that its duty was to adhere only to its own regulations rather than to the constitutional and statutory mandates."); *see also In re Oil & Gas Exploration*, 70 So. 3d at 110–11 (finding LDEQ did not support its determination by a preponderance of the evidence that the proposed permit minimized or avoided potential and real adverse environmental impacts to the maximum extent, even though there were environmentally-protective conditions therein, because the record lacked a display of LDEQ's "individualized consideration or a fair balancing of environmental factors.").

V. THE PROPOSED TITLE V PERMITS FAIL TO ASSURE COMPLIANCE WITH EMISSION LIMITS DUE TO THE FAILURE TO REQUIRE CONTINUOUS EMISSIONS MONITORING, FAILURE TO REQUIRE ENFORCEABLE CONDITIONS FOR PARAMETIC MONITORING, AMONG OTHER REASONS.

The Clean Air Act requires that each Title V permit "shall include enforceable emission limitations and standards . . . and such other conditions as are necessary to assure compliance with applicable requirements of [the Act], including the requirements of the applicable implementation plan." 42 U.S.C. § 7661c(a) (emphasis added). Applicable requirements include "any standard or other requirement provided for in the applicable implementation plan approved or promulgated by EPA through rulemaking under title I of the Act that implements the relevant requirements of the Act" and "any term or condition of any preconstruction permits issued pursuant to regulations approved or promulgated through rulemaking under title I, including parts C or D, of the Act." 40 C.F.R. §70.2. Terms and conditions of PSD permits are thus "applicable requirements" which must be incorporated into the Title V permit. Consistent with the Act, LDEQ Title V regulations provide that the agency "shall incorporate into each permit sufficient terms and conditions to ensure compliance with all state and federally applicable air quality requirements and standards at the source and such other terms and conditions as determined by the permitting authority to be reasonable and necessary." LAC 33:III.501.C.6.

BACT is an emissions limitation that must be enforceable in a Title V permit. The Louisiana SIP defines BACT as "an emissions limitation…based on the maximum degree of reduction from each pollutant subject to regulation under this Section that would be emitted from any proposed major stationary source or modification…" LAC 33:III.509.B. In order for BACT to actually "limit" emissions it must be enforceable. Indeed, the Louisiana SIP requires that BACT be incorporated as enforceable conditions of the permit, either through emission limits or operating parameters. *See id.* That is, where a specific numeric limit is technically or economically infeasible, the Louisiana SIP provides that "a design, equipment, work practice, or operational standard or combination thereof may be prescribed instead to satisfy the requirement for best available control technology." *Id.* The provision further stresses that "[s]uch standard shall, to the degree possible, set forth the emission reduction achievable by implementation of such design, equipment, work practice or operation, and provide for compliance by means that achieve equivalent results." *Id.*

Permit limits must be both legally and practically enforceable (i.e., enforceable as a practical matter). *See In the Matter of Yuhuang Chemical Inc. Methanol Plant*, Order on Petition No. VI-2015-03 at 14 (August 31, 2016). As EPA has explained, in order to be enforceable as a practical matter, the permit must, among other things, "clearly specify how emissions will be measured or determined for purposes of demonstrating compliance." *Id.* To accomplish this, "limitations must be supported by monitoring, recordkeeping, and reporting requirements sufficient to enable regulators and citizens to determine whether the limit has been exceeded and, if so, to take

appropriate enforcement action." *Id.* (emphasis added). As Dr. Ranajit Sahu details in Sections 5.1-5.7 of his expert report,[115] many conditions the proposed permits are not practically enforceable.

Each of the proposed Title V permits includes the following Louisiana Air Emission Permit General Condition: "Failure to install, properly operate, and/or maintain all proposed control measures and/or equipment as specified in the application and supplemental information shall be considered a violation of the permit and LAC 33:III.501." LAC 33:III.551, Table 1, I. But this condition is meaningless unless all inputs and assumptions from the application are made enforceable and include proper monitoring and recordkeeping. As Dr. Sahu discusses, the Title V permits must contain explicit conditions for all assumptions used to calculate the potential to emit where there are no requirements for Continuous Emissions Monitors (CEMS). Sahu Report at 5.1.

Further, where LDEQ does not require CEMS as suggested by Dr. Sahu (Sahu Report at 5.2), it must provide adequate rationale to support its decision. Dr. Sahu discusses technically available CEMS for various combustion sources, explaining that CEMS "reduce uncertainty in confirming emissions in order to assure compliance with limits." *Id.* Since the use of CEMS allow LDEQ and the public to assess compliance with emission limits, LDEQ must require such monitors as measures to avoid or mitigate adverse environmental impacts whenever available. In addition, LDEQ must require stack testing as suggested by Dr. Sahu (Sahu Report at 5.3) where CEMS are not available, with parameter monitoring to assure compliance between stack tests. Again, since these measures would help assure compliance with the emissions discussed, LDEQ must require such measures.

VI. LDEQ SHOULD DENY THE PERMITS BECAUSE OF FORMOSA'S SIGNIFICANT RECORD OF ENVIRONMENTAL NONCOMPLIANCE.

Louisiana Regulations require that "an applicant shall [] have no history of environmental violation(s)" demonstrating "an unwillingness or inability to achieve and maintain compliance with the permit for which the application is being made." LAC 33:I.1707.A. The sole exception to this rule is if LDEQ makes a determination that "the applicant's history of environmental violation(s) can be adequately addressed by permit conditions." *Id.* Given Formosa's extensive history of environmental violations, LDEQ must deny the permits or add conditions to the permits that adequately address that history.

[115] Attach. E, Sahu Aff., Ex. 1.

A. Louisiana regulations require LDEQ to consider Formosa Plastic Group's and Formosa Petrochemical Corp.'s long history of environmental violations when reviewing FG LA's proposed air permits.

LAC 33:I.1707 was promulgated in accordance with La. R.S. § 30:2014.2, which orders LDEQ to adopt rules setting out the requirements for "a person seeking [a] permit." The statute defines "person" as "an individual, partnership, corporation, or other entity who owns a controlling interest in a company or who participates in the environmental management of the facility for an entity applying for a permit or an ownership interest in a permit." La. R.S. § 30:2014.2(B). Thus the "applicant" referenced in the Louisiana regulations under § 1707 must encompass all "persons" as defined by the underlying statute.

Formosa Plastics Group ("FPG") and Formosa Petrochemical Corp. ("FPC") squarely fall within this definition of "person" as entities "who own a controlling interest in" and/or will "participate[] in the environmental management of" the facility for which the permits are sought. *Id.* FG LA LLC is operated by FG Inc., which is a fully owned subsidiary of FPC.[116] In April of last year, Gov. John Bel Edwards and FPC executive Keh-Yen Lin issued a joint announcement that FPC purchased the 2,400-acre site in St. James, and that "Formosa plans to operate the complex" under its Louisiana registered subsidiary, FG LA LLC.[117] Keh-Yen Lin serves as both the CEO of the FG LA LLC project and as the executive vice president of FPC.[118] These connections qualify both FPG and FPC as "persons" under La R.S. § 30:2014.2(B). Therefore, Louisiana regulations require LDEQ to consider both groups' history of environmental violations when evaluating the proposed air permits.

B. FPG's history of environmental violations demonstrate an unwillingness or inability to comply with the proposed permits.

In the U.S., at least 98 state or federal civil enforcement cases have been filed against FPC, 53 of which were for Clean Air Act violations.[119] Since 2000, FPC has paid a total of $20,790,268 in penalties, $19,936,707 of which were for environmental violations.[120] In 2009, Formosa Plastics

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[116] *About Us*, SUNSHINE PROJECT LA (last visited July 24, 2019), http://www.sunshineprojectla.com/about-us 9 (stating that FG LA is a member of Formosa Plastics Group (FPG).

[117] Office of the Governor, *Formosa Selects St. James Parish for $9.4 Billion Louisiana Project*, LOUISIANA.GOV (Apr. 23, 2018), http://gov.louisiana.gov/news/sunshine-project.

[118] *Id.*

[119] *Enforcement Case Search Results*, EPA ECHO, https://echo.epa.gov/facilities/enforcement-case-search (search "Find Name(s) That:" for "Formosa Plastics Company"; select "Any" for "Case Lead"; then follow "Search" hyperlink).

[120] *Violation Tracker Parent Company Summary: Formosa Plastics*, GOOD JOBS FIRST (last visited July 23, 2019), https://violationtracker.goodjobsfirst.org/prog.php?parent=formosa-plastics.

Corp., Texas, and Formosa Plastics Corp., Louisiana, agreed to spend more than $10 million on pollution controls to address air, water, and hazardous waste violations at two petrochemical plants in Point Comfort, Texas, and Baton Rouge, Louisiana, in addition to $2.8 million in civil penalties.[121] In a report issued at the beginning of this year, Environment Texas named Formosa Plastics the No. 1 worst polluter in the Corpus Christi area.[122] But then again in June 2019, the Southern District of Texas granted monetary and injunctive relief against Formosa for 1,149 continuous days of discharging plastic pellets in violation of the Clean Water Act, and for failure to report those violations to state or federal authorities as required by Formosa's permits.[123] The Court concluded that Formosa's "violations are enormous" and that "Formosa is a serial offender."[124]

In Louisiana, Formosa has consistently failed to remedy documented violations at its Baton Rouge facility. The surrounding neighborhood is 92% African American, with over 50% of households living below the federal poverty level.[125] The facility has registered "high priority violations" of the Clean Air Act *every single month* since August 2009.[126] All of these high priority violations include excessive emissions of vinyl chloride, a known human carcinogen.[127] Since 2006, the facility has released at least 10,000 pounds per year of vinyl chloride from *fugitive emissions* alone.[128] EPA has also registered the facility as a "significant noncomplier" of

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[121] In its complaint, the U.S. alleged that Formosa violated Clean Air Act provisions regulating the leaks of air pollutants from chemical manufacturing equipment and emissions of vinyl chloride, RCRA provisions governing hazardous waste management, and Clean Water Act wastewater discharge limits. The U.S. also alleged that the Texas facility violated Clean Air Act provisions regulating benzene waste operations and Emergency Planning and Community Right-to-Know Act ("EPCRA") toxic release inventory reporting obligations. *Civil Enforcement Case Report, Case Number: 06-2006-3410*, EPA ECHO (last updated July 10, 2019), https://echo.epa.gov/enforcement-case-report?id=06-2006-3410.

[122] Luke Metzger & Grant Durow, *Air Pollution from Industrial Malfunctions and Maintenance in Texas in 2017*, ENVIRONMENT TEXAS 35 (Jan. 2019), https://environmenttexas.org/sites/environment/files/reports/TX_MajorMal_scrn.pdf.

[123] *Waterkeeper v. Formosa Plastics Corp, Texas*, No. 6:17-CV-0047, 2019 WL 2716544, at *8–9 (S.D. Tex. June 27, 2019).

[124] *Id.* at *8.

[125] *Detailed Facility Report, FRS ID: 110000597444*, EPA ECHO (last updated July 10, 2019), https://echo.epa.gov/detailed-facility-report?fid=110000597444.

[126] *Detailed Facility Report, FRS ID: 110000597444*, EPA ECHO (last updated July 10, 2019), https://echo.epa.gov/detailed-facility-report?fid=110000597444.

[127] *Toxicological Review of Vinyl Chloride*, EPA (May 2000), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1001tr.pdf.

[128] *TRI On-Site and Off-Site Reported Disclosed or Otherwise Released Trend Report for Formosa Plastics Corp Louisiana for Vinyl Chloride*, EPA (last updated April 2019), https://iaspub.epa.gov/triexplorer/release_trends?tri=70805FRMSPGULFS&p_view=TRYR&trilib=TRI

the Resource Conservation and Recovery Act ("RCRA") *every month* since April 2004.[129] Over the last two years, the facility has been subject to one formal RCRA enforcement action and four formal Clean Air Act enforcement actions, including a federal penalty of $277,200 for, *inter alia*, failure to correct deficiencies reported in its 2008 and 2011 compliance audits.[130] In addition, in 2003 the state fined Formosa over $4 million after an operator at the Baton Rouge facility opened the bottom valve on the wrong reactor, releasing 8,000 pounds of vinyl chloride into the atmosphere. The Chemical Safety Board ("CSB") later found that Formosa knew of the potential for severe consequences resulting from opening the bottom valve on a reactor under pressure before the incident occurred.[131]

FPC also recently closed operations at its Delaware City PVC plant, which was listed as a U.S. Superfund site in 1983 due to groundwater contamination from earthen lagoons and pits used to dispose of PVC waste and sludge.[132] In 1996, a second groundwater plume was discovered

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[129] *Detailed Facility Report, FRS ID: 110000597444*, EPA ECHO (last updated July 10, 2019), https://echo.epa.gov/detailed-facility-report?fid=110000597444.

[130] On February 7, 2017, EPA Region 6 issued a Consent Agreement Final Order (CAFO) citing Formosa for the following violations: (1) failure to maintain data used to estimate population and environmental receptors for the offsite consequence analyses; (2) failure to ensure that process hazard analysis (PHA) findings and recommendations are resolved in a timely manner; (3) failure to update process hazard analysis every five years; (4) failure to conduct an adequate PHA for the vinyl chloride monomer (VCM) process; (5) failure to properly implement certain operating procedures; (6) failure to conduct a management of change; and (7) failure to correct deficiencies in 2008 and 2011 compliance audits. *Civil Enforcement Case Report, Case Number: 06-2016-3361*, EPA ECHO (last updated July 20, 2019), https://echo.epa.gov/enforcement-case-report?id=06-2016-3361.

[131] CSB Issues Final Report and Safety Video on Formosa Plastics Explosion in Illinois, Concludes That Company and Previous Owner Did Not Adequately Plan for Consequences of Human Error, CSB (Mar. 6, 2017), https://www.csb.gov/csb-issues-final-report-and-safety-video-on-formosa-plastics-explosion-in-illinois-concludes-that-company-and-previous-owner-did-not-adequately-plan-for-consequences-of-human-error/; Civil Enforcement Case Report, Case Number: LA000A00002203300000200163, EPA ECHO (last updated July 10, 2019), https://echo.epa.gov/enforcement-case-report?id=LA000A00002203300000200163.

[132] *Superfund Site: Delaware City PVC Plant*, EPA (last updated July 23, 2019), https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0300091.

beneath the Formosa PVC plant.[133] In 2003, the Acting Director of EPA's Hazardous Site Cleanup Division sent a letter to Formosa regarding ongoing groundwater contamination beneath the site impacting both the Columbia and Potomac aquifers.[134] In 2014—thirty-one years after the site was placed on the Superfund Program's National Priorities List—EPA found the extent of that groundwater contamination, and its potential impact on the surrounding community, had still not been fully evaluated.[135] The next five-year evaluation of the site is scheduled for September of this year.

FPG's international environmental compliance record is also replete with gross violations of environmental standards. In 2009, the German environmental organization Ethecon Foundation named Formosa Executives as the recipients of its annual "Black Planet Award" for documented injuries and fatalities at or near Formosa facilities; explosions (including one at a facility in Illinois, triggering the evacuation of nearby communities); and repeated dumping of toxic materials in Taiwan and Cambodia.[136] In 2016, Formosa Steel—a subsidiary of FPG—took responsibility for an accidental chemical spill in Vietnam, affecting more than 40,000 workers who rely on fishing and tourism.[137] The spill is now considered "Vietnam's worst environmental disaster."[138] In 2017, an environmental justice group discovered that Formosa Petrochemical's №6 Naphtha Cracker Complex in Taiwan exceeded pollutant and particulate emission standards over 25,000 times, yet never paid the proper fines for those emissions.[139]

Though this summary is not exhaustive, these examples illustrate FPG's and FPC's record of persistent environmental violations, demonstrating a clear "unwillingness or inability to achieve and maintain compliance" with environmental regulations in Louisiana, nationwide, and abroad. LAC 33:I.1707.A.1. LDEQ must therefore reject the proposed permits or include additional permit conditions that the agency determines will adequately address that history. *Id.*

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[133] *Fourth Five-Year Review Report, Delaware City PVC Plant Site*, EPA 6 (Sep. 2, 2014), https://semspub.epa.gov/work/03/2184664.pdf.

[134] *Id.* at 6.

[135] *Id.* at 25.

[136] *Statement Black Planet Award 2009*, ETHECON (last visited July 23, 2019), https://www.ethecon.org/en/902.

[137] Angel. L. Martínez Cantera, *'We are jobless because of fish poisoning': Vietnamese fishermen battle for justice*, THE GUARDIAN (Aug. 14, 2017), https://www.theguardian.com/global-development/2017/aug/14/vietnamese-fishermen-jobless-fish-poisoning-battle-justice.

[138] *Id.*

[139] Chih-hsin Liu & Aaron Wytze, *Open Data VS. Taiwan's Largest Petrochemical Plant*, G0V.NEWS (Feb. 3, 2017), https://g0v.news/open-data-vs-taiwans-largest-petrochemical-plant-d6a62ee35fc7.

C. LDEQ should conduct a supplemental evaluation of FPG's and FPC's management at other U.S. facilities if it allows the project to move forward.

Louisiana regulations grant agencies the authority to evaluate the applicant's management of any facilities or activities subject to federal environmental regulations. LAC 33:I.1707.B. If, pursuant to that evaluation, the agency finds "the applicant has demonstrated an unwillingness or inability to achieve and maintain compliance with the permit for which application is being made," the agency may deny the permit or include additional conditions as "reasonably deemed necessary for the protection of human health and the environment." *Id.* Given Formosa's persistent history of environmental noncompliance, LDEQ should conduct an evaluation of Formosa's past and present activities in the U.S., if it allows this project to move forward at all. This evaluation should address, at minimum, if and how the proposed permits take into account Formosa's persistent record over nearly a decade of "high priority Clean Air Act violations" at its Baton Rouge facility, and "serial" Clean Water Act noncompliance in Point Comfort, TX. This evaluation can also include Formosa's international activities, as nothing in the regulations expressly limit the evaluation to domestic activities. If this evaluation reveals an unwillingness or inability on Formosa's behalf to comply with applicable environmental laws, then LDEQ must deny the permits or include conditions "as reasonably deemed necessary for the protection of human health and the environment." LAC 33:I.1707.B.1.

VII. FORMOSA'S ENVIRONMENTAL ASSESSMENT STATEMENT (EAS) IS FLAWED AND FAILS TO INCLUDE INFORMATION NECESSARY FOR LDEQ TO CARRY OUT ITS PUBLIC TRUSTEE DUTY.

Formosa's Environmental Assessment Statement (EAS) submissions are incorrect in concluding that LDEQ's approval of the petrochemical complex, as proposed, would satisfy the agency's public trustee duty under Article IX of the Louisiana Constitution. In making its claim, Formosa relies heavily on the argument that it has complied with the NAAQS and therefore has minimized health impacts.[140] Formosa also asserts that "[g]enerally, the avoidance of any real and potential effects of the Facility on human health has been achieved by the proper siting of the Facility."[141] Formosa is mistaken about both conclusions, and omits to address many of the considerable potential and real environmental harms the complex could impose.

As explained in Section I, Formosa's modeling shows that St. James would be in nonattainment for the NAAQS 1-hour NO_2 and 24-hour $PM_{2.5}$ standards and would nearly exceed the $PM_{2.5}$ annual standard. As detailed in Sections I.C and II, Formosa's emissions estimates and air quality impacts modeling likely significantly understate the degree to which its complex and

[140] Formosa Initial EAS at 1, 15, 44 (July 18, 2018), EDMS No. 11230529; Formosa Supp'l EAS at 5–6, 21–22 (Jan 7, 2019), EDMS No. 11457119.

[141] Formosa Initial EAS at 8 (July 18, 2018), EDMS No. 11230529. Formosa repeatedly invokes this argument as the basis for its finding that approval of the plant would be justified. *See also* Formosa Supp'l EAS at 4 (Jan 7, 2019), EDMS No. 11457119.

other regional facilities may be contributing to air pollution, raising concern about even greater nonattainment and Class II increment consumption. The area's nonattainment also renders Formosa's alternative-site-selection process arbitrary and capricious by its own criteria, as the company claimed that the "important environmental consideration" of attainment status was its sole, "first tier," criteria for selecting a site.[142]

Formosa would also be permitted to emit 1.6 million pounds toxic air pollutants each year. It could emit over 100,000 pounds per year of a trio of known and probable human carcinogens, ethylene oxide, benzene, and formaldehyde, making it one of the largest sources of these pollutants in Louisiana, as explained in Section VII.B–C below. EPA has already designated several census tracts in St. James Parish as exceeding the lifetime exposure risk to cancer-causing chemicals and Formosa failed to address how its facility would exacerbate this preexisting problem. To top it off, the proposed Title V permits simply do not contain monitoring that is sufficient to ensure that Formosa will remain in compliance with its permitted emissions, as described in Section V.

Formosa will become one of the largest sources of greenhouse gas emissions in Louisiana, at a time when worsening storms and rising seas greatly menace Louisianans, as explained in Section VII.D. And in the face of increasing likelihood of intense storms due to climate change, Formosa failed to grapple with its flood risk from severe storms, address the risk of storm-induced chemical releases, or prove that it would be adequately insured in the event of these or similar hazards, as outlined in Section VII.E. It is simply not the case that Formosa has minimized the risks to residents' health and the environment. It is in fact a deadly threat.

Formosa's claim that it made a "proper siting" is simply misplaced. Formosa would reshape the character of St. James west bank residential communities, placing fourteen major source plants about a half mile from the residents of Union, just over a mile from an elementary school, and in proximity to other, already-overburdened communities—predominately African-American, historic communities. In fact, Formosa entirely ignores the community of Union, directly across the river from the complex, incorrectly claiming that it would be sited at least a mile away from residents.[143]

Formosa seems to believe that somehow all of this is inevitable, including that "it simply would not be possible to place the site along the river without an African-American community being present somewhere in the general vicinity."[144] LDEQ should not oblige the mistaken thinking that any Louisianans must accept elevated cancer, health, and environmental risks.

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[142] Initial EAS at 37.

[143] See, for example, Supp'l EAS at 4.

[144] Supp'l EAS at 26.

The considerable and numerous real and potential adverse effects of this plant, to the environment and human health, along with the massive economic costs in tax exemptions and public services, far outweigh the economic benefits Formosa claims it will bring. LDEQ should reject Formosa's application.

A. Overview of LDEQ's Public Trust Duty and Environmental Assessment Statement Requirements.

Louisiana's public trust doctrine is in the state Constitution under Article IX, § 1. It provides:

> The natural resources of the state, including air and water, and the healthful, scenic, historic, and esthetic quality of the environment shall be protected, conserved, and replenished insofar as possible and consistent with the health, safety, and welfare of the people. The legislature shall enact laws to implement this policy.[145]

The Louisiana Supreme Court interpreted Article IX, § 1 as a mandate to LDEQ, requiring the agency "to determine that adverse environmental impacts have been minimized or avoided as much as possible consistently with the public welfare" "before granting approval of proposed action affecting the environment."[146] To make this mandatory determination, the Supreme Court made clear that LDEQ must "consider whether alternate projects, alternate sites, or mitigative measures would offer more protection for the environment than the project as proposed without unduly curtailing non-environmental benefits." *Id.* The First Circuit elaborated on this requirement, turning it into a 5-part inquiry that must address whether:

(1) The potential and real adverse environmental effects of the proposed facility have been avoided to the maximum extent possible;

(2) A cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter outweighs the former;

(3) There are alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits;

(4) There are alternative sites which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits;

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[145] La. Const. art. IX, § 1.

[146] *Save Ourselves v. La. Envtl. Control Comm'n*, 452 So. 2d 1152, 1157 (La. 1984).

(5) There are mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing non-environmental benefits?[147]

Courts have made clear that "as public trustee, the LDEQ is duty-bound to demonstrate that it has properly exercised the discretion vested in it by making basic findings supported by evidence and ultimate findings that flow rationally from the basic findings; and it must articulate a rational connection between the facts found and the order, or in this case, the permit issued."[148]

The Supreme Court further explained that "[L]DEQ's actions must be diligent, fair, and faithful to protecting the public interest in the state's resources."[149] The Court went on to say that "[LDEQ's] role as the representative of the public interest does not permit it to act as an umpire passively calling balls and strikes for adversaries appearing before [the Secretary]; the rights of the public must receive active and affirmative protection at the hands of [LDEQ]."[150] Critically, the Court made clear that LDEQ has to do more than simply apply its own regulations; it has to show it performed its public trustee analysis.[151]

The Supreme Court explained that "[t]he regulatory scheme provided by constitution and statute mandates a particular sort of careful and informed decision-making process and creates judicially enforceable duties."[152] Further, "if the decision was reached procedurally, without individualized consideration and balancing of environmental factors conducted fairly and in good faith," the Supreme Court instructed that "it is the courts' responsibility to reverse."[153] Indeed, the First

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[147] *In re American Waste and Pollution Control Co.,* 633 So. 2d 188, 194 (La. App. 1 Cir. 1993). LDEQ refers to this 5-part inquiry as the "IT Requirements" or "IT Questions" after the name of the permittee in *Save Ourselves*.

[148] *In re Oil & Gas Exploration, Development, & Production Facilities, Permit No. LAG260000*, 2010-1640, p. 4 (La. App. 1 Cir. 6/10/11); 70 So. 3d 101, 104 (emphasis in original) (citing *Save Ourselves, Inc.,* 452 So. 2d at 1159–60).

[149] *In re Am. Waste and Pollution Control Co.*, 93-3163, p. 9 (La. 9/15/94); 642 So. 2d 1258, 1262) (citing *Save Ourselves*, 452 So.2d at 1157).

[150] *Save Ourselves*, 452 So. 2d at 1157.

[151] *Save Ourselves*, 452 So. 2d at 1160 (stating, "From our review it appears that the agency may have erred by assuming that its duty was to adhere only to its own regulations rather than to the constitutional and statutory mandates."); *see also In re Oil & Gas Exploration*, 70 So. 3d at 110–11 (finding LDEQ did not support its determination by a preponderance of the evidence that the proposed permit minimized or avoided potential and real adverse environmental impacts to the maximum extent, even though there were environmentally-protective conditions therein, because the record lacked a display of LDEQ's "individualized consideration or a fair balancing of environmental factors.").

[152] *Save Ourselves*, 452 So. 2d at 1159.

[153] *Id.* at 1158.

Circuit warned that "until [L]DEQ, as the agency designated by the legislature with the responsibility to protect the environment, fully complies with its responsibilities and obligations, any action taken not in compliance therewith, e.g., the issuance of the permit herein, is null and void and must be vacated."[154]

The Louisiana Environmental Quality Act incorporates the public trustee requirements as follows: "The secretary [of LDEQ] shall act as the primary public trustee of the environment, and shall consider and follow the will and intent of the Louisiana Constitution and Louisiana statutory law in making any determination relative to the granting or denying of permits."[155] The Act also provides that "[t]he applicant for a new permit or a major modification of an existing permit as defined in rules and regulations that would . . . constitute a major source under the rules of the department shall submit an environmental assessment statement as a part of the permit application."[156] Importantly, the Act goes on to say that "[t]he environmental assessment statement provided for in this Section shall be used to satisfy the public trustee requirements of Article IX, Section 1 of the Constitution of Louisiana."[157] But as detailed below, Formosa's EAS and Supplemental EAS fail to satisfy these requirements, and thus are insufficient to enable LDEQ to satisfy its public trustee duty under the state Constitution.

B. Formosa's EAS fails to include a full risk assessment of its toxic emissions in combination with existing sources for this area which already has an unacceptable cancer risk.

The proposed permits would allow Formosa to emit over 800 tons, or 1,600,000 pounds per year of toxic air pollutants.[158] Three of these toxic air pollutants (Ethylene Oxide, Benzene, and Formaldehyde)[159] are regulated by LDEQ as "known and probable human carcinogens."[160] Based on 2017 Toxic Release Inventory (TRI) data, [161] only two other sources in the U.S., and

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[154] *In re Rubicon, Inc.*, 95-0108, p. 9, (La. App. 1 Cir. 2/14/1996); 670 So.2d 475, 489.

[155] La. R.S. 30:2014(A)(4).

[156] La. R.S. § 30:2018.A; *see also* La. R.S. § 30:2018.B (mandating that the EAS address the required public trustee analysis).

[157] La. R.S. § 30:2018.B.

[158] LDEQ Statement of Basis at 55–56.

[159] *Id*.

[160] LAC 33:III.5112, Table 51.1.

[161] *TRI On-Site and Off-Site Reported Disposed of or Other Released Top 100 Facilities for Ethylene Oxide*, IASPUB.EPA.GOV (last visited Jun 26, 2019), https://iaspub.epa.gov/triexplorer/release_fac?p_view=USFA&trilib=TRIQ1&TAB_RPT=1&Fedcode=&LINESPP=&sort=RE_TOLBY&industry=ALL&FLD=RELLBY&FLD=TSFDSP&sort_fmt=2&TopN=&STATE=All+states&COUNTY=All+counties&chemical=000075218&year=2017&report=&BGCOLO

one source in the state, reported Ethylene Oxide emissions that exceed Formosa's proposed limit of 7.70 tons per year (tpy) or 15,400 pounds/yr.[162] The proposed permits would also allow Formosa to emit 36.58 tpy or 73,160 lbs./yr. of Benzene.[163] Again, only one plant in Louisiana reported that it emitted more than that amount of Benzene in 2017, and only 5 other plants in the country topped that amount.[164] In addition, the proposed permits would allow Formosa to emit 8.90 tpy or 17,800 lbs./yr. of Formaldehyde.[165] Just nine of the thirty Louisiana facilities that reported Formosa releases in 2017, released more Formaldehyde than LDEQ is proposing to allow Formosa to emit.[166]

As explained below, several census tracts in St. James and surrounding parishes have cancer risks exceeding EPA's upper limit of acceptable risk for total lifetime cancer. Where the National Air Toxics Assessment (NATA) shows elevated cancer risks, EPA recommends conducting "more detailed assessments, including emissions testing and more refined modeling" in order to "better understand local risks."[167] Formosa has not conducted any site-specific studies investigating how its emissions of Ethylene Oxide, Benzene, and Formaldehyde—the three primary drivers of cancer risk in the United States—will contribute to cumulative cancer risk in the surrounding area, as recommended by EPA. Given the proximity of the elementary school, residential communities, and a church to these cancer-causing emissions, LDEQ must require a comprehensive assessment.

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[162] Formosa Title V Permits for EG-1 and EG-2.

[163] LDEQ Statement of Basis at 55.

[164] *See TRI On-Site and Off-Site Reported Disposed of or Other Released for all 30 Facilities for Formaldehyde,* IASPUB.EPA.GOV (last visited Aug. 7, 2019), https://iaspub.epa.gov/triexplorer/release_fac?p_view=USFA&trilib=TRIQ1&TAB_RPT=1&Fedcode=&LINESPP=&sort=RE_TOLBY&industry=ALL&FLD=RELLBY&FLD=TSFDSP&sort_fmt=2&TopN=&STATE=All+states&COUNTY=All+counties&chemical=000071432&year=2017&report=&BGCOLOR=%23D0E0FF&FOREGCOLOR=black&FONT_FACE=arial&FONT_SIZE=10+pt&FONT_WIDTH=normal&FONT_STYLE=roman&FONT_WEIGHT=bold.

[165] LDEQ Statement of Basis at 55.

[166] *See TRI On-Site and Off-Site Reported Disposed of or Other Released Top 100 Facilities for Benzene*, IASPUB.EPA.GOV (last visited July 8, 2019), https://iaspub.epa.gov/triexplorer/release_fac?p_view=USFA&trilib=TRIQ1&TAB_RPT=1&Fedcode=&LINESPP=&sort=RE_TOLBY&industry=ALL&FLD=RELLBY&FLD=TSFDSP&sort_fmt=2&TopN=&STATE=22&COUNTY=All+counties&chemical=000050000&year=2017&report=&BGCOLOR=%23D0E0FF&FOREGCOLOR=black&FONT_FACE=arial&FONT_SIZE=10+pt&FONT_WIDTH=normal&FONT_STYLE=roman&FONT_WEIGHT=bold

[167] *Id.*

Other highly concerning toxic emissions allowed by the proposed permits include 1-3-Butadiene at 23.89 tpy, Acetaldehyde at 17.78 tpy, Ammonia at 436.75 tpy, n-Hexane at 146.72 tpy, and Vinyl acetate at 59.84 tpy, among others. Only one other facility in the U.S. reported Vinyl acetate releases in excess of the proposed Formosa limit based on 2017 TRI data.[168] These pollutants should also be included in the assessment, along with the over 40 additional air toxics that would be emitted from the proposed complex that Formosa failed to consider.[169]

1. Background on risk values.

The Integrated Risk Information System ("IRIS") program is an independent, scientist-led office at EPA, intentionally insulated from regulatory processes to ensure a health-protective and science-based approach.[170] EPA IRIS values represent the best available science on the human health effects associated with exposure to various chemicals, and are "the preferred source of toxicity information used by EPA."[171] There are several IRIS toxicity values that express inhalation risk. The most common values are the inhalation unit risk (IUR) and reference concentration value (RfC), used for cancer and noncancer assessments respectively:

- Noncancer Assessment - RfC: The inhalation RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

- Cancer Assessment - IUR: The IUR is the upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 $\mu g/m^3$ in air. The interpretation of inhalation unit risk would be as follows: if unit risk = 2×10^{-6} per $\mu g/m^3$, 2 excess cancer cases (upper bound estimate) are expected to develop per 1,000,000 people if exposed daily for a lifetime to 1 µg of the chemical per m^3 of air.

2. Formosa's emissions compared with IRIS toxicity values.

The table below shows the maximum modeled concentration of some of Formosa's toxic emissions as compared to EPA IRIS toxicity values, and then estimates health risk from

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[168] *See TRI On-Site and Off-Site Reported Disposed of or Other Released Top 100 Facilities for Vinyl Acetate*, IASPUB.EPA.GOV (last visited Aug. 2, 2019), https://iaspub.epa.gov/triexplorer/release_fac?p_view=USFA&trilib=TRIQ1&sort=RE_TOLBY&sort_fmt=2&state=All+states&county=All+counties&chemical=000108054&industry=ALL&year=2017&tab_rpt=1&fld=RELLBY&fld=TSFDSP.

[169] *See* Attach. D, Cloud Aff., Ex. 2, Section 1.5.3.

[170] *Basic Information about the Integrated Risk Information System*, EPA (last updated Oct. 22, 2018), https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system.

[171] *Id.*

inhalation exposure. IURs are expressed in per µg/m^3, and thus cannot be directly compared with Formosa's concentration estimates. For purposes of comparing Formosa's anticipated emissions of various air toxins, RfC values are used. Because the RfC value is generally used for noncancer health assessments, these comparisons provide a useful estimated threshold for exposure beyond which a person will experience deleterious health effects, but do not capture the full risks that may be associated with exposure to carcinogenic pollutants. In the case of Ethylene Oxide, the IRIS program does not provide an RfC value, but instead calculates a concentration value associated with a cancer risk of 1-in-1 million, as described below the table.[172] The rows highlighted in gray show where Formosa's maximum modeled concentrations exceed the EPA's IRIS values for that pollutant—i.e., exceed the "a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime."[173]

Pollutant	**Max. Modeled Con. ("MMC") (µg/m3)[174]**	**IRIS RfC (noncancer) for Inhalation Exposure (mg/m3)**	**IRIS RfC (noncancer) for Inhalation Exposure (µg/m3)**	**MMC/RfC (or other value used if applicable)*****
Ethylene Oxide	0.41	--	0.0002*	2050
Benzene	2.62	0.03	30	0.08733
Formaldehyde**	0.03	--	--	--
1,3-Butadiene	0.72	0.002	2	0.36
Acetaldehyde	3.59	0.009	9	0.39889
Ethylene Glycol**	134.18	--	--	--
n-Hexane	342.59	0.7	700	0.489414286
Propionaldehyde	0.15	0.008	8	0.01875
Vinyl Acetate	213.73	0.2	200	1.06865
Ammonia	44.82	0.5	500	0.08964
Sulfuric Acid	0.55	*Not evaluated by the IRIS program*		

*There is no RfC value for EtO inhalation exposure. Instead, the IRIS value used reflects the lower-bound commensurate lifetime chronic exposure level of EtO corresponding to an increased cancer risk of 1-in-1 million. Source:

[172] All of the information in the table comes from Formosa's initial Air Quality Analysis, July 2018, EDMS 11246153, except for the information for Ethylene Oxide and Ethylene Glycol, which is from Formosa's Updated Ethylene Oxide and Ethylene Glycol Analysis, Dec. 2018, EDMS 11431688.

[173] *Basic Information about the Integrated Risk Information System*, EPA (last updated Oct. 22, 2018) (describing Reference Concentration (RfC)), https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system.

[174] Formosa Air Quality Analysis at 37–38 (unless noted otherwise).

https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/1025_summary.pdf#nameddest=cancerinhal at 5.
**There is no concentration-based inhalation IRIS value for this pollutant that can be easily compared to Formosa's modeled concentration.
***The values in this column were calculated by dividing Formosa's Max. Modeled Concentration figure in the column on the far left by the corresponding figure for that toxic pollutant in the column that is second from the right (IRIS RfC (noncancer) for Inhalation Exposure (µg/m3)), which is the IRIS value for 1 in 1 million cancer risk.

3. LDEQ must require Formosa to conduct a full assessment of its toxic emissions in combination with the current and authorized future emissions for the St. James area, using the IRIS values.

Formosa's models do not account for pre-existing cancer risk in St. James, despite the fact that several census tracts in St. James and surrounding parishes have cancer risks exceeding EPA's upper limit of acceptable risk for total lifetime cancer exposure (1-in-10,000, aka 100-in-1 million).[175] Where the NATA shows elevated cancer risks, EPA recommends conducting "more detailed assessments, including emissions testing and more refined modeling" in order to "better understand local risks."[176] Formosa has not conducted any site-specific studies investigating how its emissions of Ethylene Oxide, Benzene, and Formaldehyde will contribute to cumulative cancer risk in the surrounding area, as recommended by EPA. Formosa also has not conducted any assessments, emissions testing, or refined modeling showing how its emissions will affect cancer risk in these already over-burdened areas. As public trustee, LDEQ must require Formosa to model the *total risk* that will result from Formosa's total carcinogenic emissions *on top of* existing cancer risk using EPA's IRIS values[177] to accurately reflect the increased lifetime health risk to surrounding communities.[178]

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[175] *National Air Toxics Assessment, 2014 NATA: Assessment Results*, EPA (last updated Aug. 27, 2018), https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results#nationwide.

[176] *Id.*

[177] Louisiana's Toxic Air Pollutant Ambient Standards at most include annual exposure standards, though some only have 8-hour standards for acute exposure (i.e., n-Hexane, Propionaldehyde, and Ammonia). *See* LAC 33:III.5112, Table 51.2. Many of these standards are based on outdated information that does not represent the best available science. *See id.* at Historical Note (showing last amendment in Dec. 2007). Generally, EPA's IRIS values represent lifetime risk, i.e. daily inhalation exposure over 70 years. For this reason, it is critical that LDEQ require Formosa to use the IRIS cancer assessment values when conducting its full analysis.

[178] *See, e.g.*, *In re General Permit for Discharges from Oil and Gas Exploration, Dev. & Prod. Facilities*, 2010-1640 (La. App. 1 Cir. 6/10/11); 70 So. 3d 101, 106 (holding LDEQ abused its discretion when it relied on general studies to issue a LPDES permit for produced water discharges without conducting individualized, direct studies of the cumulative impact of those discharges on the particular area in question).

A comprehensive assessment is particularly needed here, where a petrochemical complex would be built near sensitive receptors and residences in an area already saturated with toxic pollutants from existing and permitted facilities. The site is just a half a mile from the residential community of Union across the river on the east bank, and approximately one mile upriver from Fifth Ward Elementary School and the residential community of St. James on the west bank.[179] LDEQ must require Formosa to conduct a full assessment of its toxic emissions in combination with the current and authorized future emissions for the area using IRIS values for the agency's public trustee analysis.

LDEQ claims that Formosa will comply with National Emission Standards for Hazardous Air Pollutants. But even if Formosa complies with these standards, the pollutants will still adversely impact the surrounding area. The community will still suffer from exposure to these pollutants—especially in combination with the pollutants that already impact the area. The Louisiana Supreme Court made clear that LDEQ has to do more than simply apply its own regulations; it has to show it performed its public trustee duty by analyzing these effects and requiring mitigative measures.[180]

Formosa claims that it has avoided "any real and potential effects of the Facility on human health . . . by the proper siting of the Facility."[181] But the site places the facility one mile from an elementary school and approximately one half mile from the residential community of Union. How could siting the facility with its enormous toxic emissions—many of which are cancer-causing—this close to children and homes possibly mitigate harmful effects to these people? Formosa goes on to say that it will plant trees within the mere 300-foot buffer between emission units and its property line "to mitigate any potential environmental effects."[182] Aside from the fact that this is just absurd, it is completely unsupported.[183] Formosa provides no support whatsoever on how trees could somehow mitigate both acute and chronic inhalation exposure to Ethylene Oxide, Benzene—or any toxic emissions.

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[179] *See* Attach. A, Kray Aff., Ex. 1, Map of New & Existing Industrial Facilities (showing Formosa site relative to residential communities); *see also* Attach. B, Formosa's Map showing "Distance to Fifth Ward Elementary School."

[180] *See Save Ourselves*, 452 So. 2d at 1160 ("From our review it appears that the agency may have erred by assuming that its duty was to adhere only to its own regulations rather than to the constitutional and statutory mandates."); *see also In re Oil & Gas Exploration*, 70 So. 3d at 110–11 (finding LDEQ did not support its determination by a preponderance of the evidence that the proposed permit minimized or avoided potential and real adverse environmental impacts to the maximum extent, even though there were environmentally-protective conditions therein, because the record lacked a display of LDEQ's "individualized consideration or a fair balancing of environmental factors.").

[181] Formosa EAS at 8.

[182] *Id.*

[183] *Id.*

Further, the Parish granted Formosa's land use application based on its finding that "the physical and environmental impacts . . . are substantially mitigated by the physical layout of the facility, and the location of the site in proximity to existing industrial uses and away from residential uses."[184] But Formosa's site plan shows that the ethylene oxide-emitting plants (Ethylene Glycol Plant 1 and Ethylene Glycol Plant 2 and the associated flares) would be towards the front of the 2300-acre site adjacent closest to the school, church, and neighborhoods across and downriver.[185] This calls into question what information the Parish was relying on to conclude that the facility layout somehow mitigates impacts when the layout places the most dangerous parts of the facility closest to a school and residences.

The Parish has required Formosa to conduct fenceline monitoring along the eastern boundary of its property line to provide data on 1,3-butadiene, vinyl acetate, and ethylene oxide emissions in accordance with 40 C.F.R. § 63.658.[186] This requirement must be incorporated into the permits as enforceable operating conditions, along with fenceline monitoring provisions for VOCs and additional HAPs, including benzene, formaldehyde, hexane, toluene, and xylenes. Fenceline monitoring is especially important to detect leaks and fugitive emissions of dangerous toxic pollutants, and to measure the maximum ground-level impacts spikes (i.e., Ethylene Oxide emissions jump from 0.75 $\mu g/m^3$ to 0.41 $\mu g/m^3$).

C. Formosa's EAS fails to show the real and potential effects of its proposed Ethylene Oxide emissions on human health.

1. Ethylene Oxide's harmful effects.

According to EPA, Ethylene Oxide is linked to breast cancer, non-Hodgkin lymphoma, and lymphocytic leukemia.[187] In addition to significant cancer risks, the Agency for Toxic Substances and Disease Registry ("ATSDR") warns that acute respiratory exposure to Ethylene

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[184] *See* Attach. F, St. James Parish Council Resolution 19-07, Denying the Appeal of RISE St. James and Approving the Application of FG LA LLC under the St. James Parish Land Use Ordinance, with Conditions (Jan. 24, 2019); *see also* St. James Parish Council, Jan, 23, 2019 Minutes, https://www.stjamesla.com/AgendaCenter/ViewFile/Minutes/_01232019-179.

[185] *See* Formosa Area Map, Facility Overview, FG LA, Feb. 7, 2018 (showing Ethylene Glycol plants as EG1 and EG2 and associated flares as EG1-FLR and EG2-FLR); *see also* Attach B, Formosa's Map "Distance to Fifth Ward Elementary School."

[186] *See* Attach. F, St. James Parish Council Resolution 19-07, Denying the Appeal of RISE St. James and Approving the Application of FG LA LLC under the St. James Parish Land Use Ordinance, with Conditions (Jan. 24, 2019); *see also* St. James Parish Council, Jan, 23, 2019 Minutes, https://www.stjamesla.com/AgendaCenter/ViewFile/Minutes/_01232019-179.

[187] *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide*, EPA 3-66 (Dec. 2016), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1025tr.pdf.

Oxide may cause narrowing of the bronchi and partial lung collapse.[188] Inhalation of Ethylene Oxide can also produce central nervous system ("CNS") depression, and in extreme cases, respiratory distress and coma.[189] The ATSDR also notes that children may be more vulnerable to Ethylene Oxide exposure, especially chronic exposure.[190] EPA and the ATSDR have also warned that inhalation exposure to Ethylene Oxide can lead to spontaneous abortions.[191]

In 2016, EPA scientists in the agency's IRIS program produced an updated risk value for Ethylene Oxide exposure.[192] The IRIS program found Ethylene Oxide is far more carcinogenic than previously understood,[193] and linked long-term exposure to Ethylene Oxide to increased risk of cancers of the white blood cells, including non-Hodgkin lymphoma, myeloma, and lymphocytic leukemia, as well as breast cancer in females.[194] EPA's 2014 National Air Toxics Assessment ("NATA") estimated that Ethylene Oxide "significantly contributes to potential elevated cancer risks in some census tracts across the U.S."[195] Other scientists and health experts have independently confirmed EPA's findings, including the National Toxicology Program, the International Agency for Research on Cancer, and the Occupational Safety and

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[188] *Ethylene Oxide ([CH_2]$_2$O)*, ASTDR (last visited July 12, 2019), https://www.atsdr.cdc.gov/MHMI/mmg137.pdf.

[189] *Id.*

[190] *Id.*

[191] Ethylene Oxide: Hazard Summary, https://www.epa.gov/sites/production/files/2016-09/documents/ethylene-oxide.pdf; Toxicological Profile for Ethylene Oxide, https://www.atsdr.cdc.gov/toxprofiles/tp137.pdf.

[192] *Ethylene Oxide: History*, EPA:IRIS (last updated July 28, 2018), https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1025#tab-3 (describing IRIS's work from 2006–16 on the 2016 IRIS value for inhalation carcinogenicity); *see Notice of a Public Comment Period on the Draft IRIS Carcinogenicity Assessment for Ethylene Oxide*, 78 Fed. Reg. 44,117 (July 23, 2013); *see Evaluation of the Carcinogenicity of Ethylene Oxide Docket*, REGULATIONS.GOV (last visited July 12, 2019) https://www.regulations.gov/docket?D=EPA-HQ-ORD-2006-0756; *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide, Executive Summary*, EPA (Dec. 2016), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/1025_summary.pdf; *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide*, EPA (Dec. 2016), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1025tr.pdf [hereinafter *EtO Carcinogenicity Evaluation*].

[193] *See EtO Carcinogenicity Evaluation*, *supra* note 193.

[194] *See EtO Carcinogenicity Evaluation*, *supra* note 193 at 2.

[195] *Background Information on Ethylene Oxide*, EPA (last updated Feb. 27, 2019), https://www.epa.gov/hazardous-air-pollutants-ethylene-oxide/background-information-ethylene-oxide; *2014 NATA: Assessment Results*, EPA (last updated Aug. 27, 2018), https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results.

Health Administration.[196]

The IRIS program produced its updated Ethylene Oxide risk value following a rigorous, 10-year long, peer-reviewed process, including public notice and comment.[197] IRIS determined that the "full lifetime total cancer unit risk estimate," including age-dependent adjustment factors due to early-life inhalation exposure to Ethylene Oxide, is 5.0×10^{-3} or 0.005 per $\mu g/m^3$.[198] The commensurate chronic (lower-bound) exposure level of Ethylene Oxide corresponding to an increased cancer risk of 10^{-6} (1-in-1 million) is 2×10^{-4} or 0.0002 $\mu g/m^3$.[199] IRIS determined that EPA has "relatively high" confidence in the unit risk estimate, "based on strong epidemiological evidence supplemented by other lines of evidence," including "a large, high-quality epidemiology study with individual worker exposure estimates," and found that the method of linear low-exposure extrapolation used "is strongly supported," and that "[c]onfidence . . . is particularly high for the breast cancer component," based on "over 200 incident cases."[200]

On May 3, 2019, the National Environmental Justice Advisory Council, which is a federal advisory committee to the EPA, sent a letter to EPA voicing concerns about the impacts of Ethylene Oxide on environmental justice communities. NEJAC called on the EPA to "take prompt regulatory action under the Clean Air Act that assures the emission reductions needed from all chemical manufacturing and other sources, to protect public health from exposure to Ethylene Oxide, together with other toxic pollutants."[201]

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[196] National Toxicology Program, Report on Carcinogens, Fourteenth Addition, Ethylene Oxide (2016), https://ntp.niehs.nih.gov/ntp/roc/content/profiles/ethyleneoxide.pdf; International Agency for Research on Cancer, IARC Monographs 100F Ethylene Oxide (2012), https://monographs.iarc.fr/wp-content/uploads/2018/06/mono100F-28.pdf; Occupational Safety and Health Administration, OSHA Fact Sheet Ethylene Oxide (2002), https://www.osha.gov/OshDoc/data_General_Facts/ethylene-oxide-factsheet.pdf.

[197] *See, e.g.*, Letter from Scientists to EPA (Apr. 26, 2019) (filed by J. Sass, NRDC); Testimony of Jennifer Sass, Senior Scientist, NRDC (Mar. 27, 2019); Testimony of Michelle Mabson, Staff Scientist, Earthjustice (Mar. 27, 2019); *see also* Jennifer Sass, *ACC/TSCA Attack on IRIS: Formaldehyde, Chloroprene, EtO*, NRDC (Mar. 26, 2019), https://www.nrdc.org/experts/jennifer-sass/acctsca-attack-iris-formaldehyde-chloroprene-eto.

[198] EPA, *Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide, Executive Summary* at 5–6 (Dec. 2016), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/1025_summary.pdf.

[199] *Id.* at 2.

[200] *Id.* at 5.

[201] Available at: https://comingcleaninc.org/assets/media/documents/NEJAC-Letter-Ethylene%20Oxide-May-3-2019-Final.pdf.

2. Formosa's Ethylene Oxide Emissions & Modeling Flaws.

Despite the well-documented risks, LDEQ proposes to allow Formosa to emit 15,400 pounds of Ethylene Oxide a year,[202] which would make Formosa the third largest source of Ethylene Oxide in the country, and the second largest source in the state.[203] Indeed, Formosa's modeled ground-level Ethylene Oxide concentrations dwarf background Ethylene Oxide concentrations in surrounding communities. The table below illustrates the potential effect of Formosa's Ethylene Oxide emissions on Ethylene Oxide concentrations in the areas immediately surrounding the proposed site's census tract (highlighted in gray).[204] Using Formosa's modeled maximum ground-level concentration of Ethylene Oxide, the far right column in the table below shows these emissions would lead to a *1,320 to 7,764 percent increase* over 2014 background Ethylene Oxide exposure concentrations[205] in the census tracts surrounding the proposed site. This is an extraordinary increase in the 2014 background levels of Ethylene Oxide, a known carcinogen, in an already over-burdened region of the country.

County	Tract	Pop.	2014 Total Cancer Risk	2014 Risk/Nat. Avg.	2014 EC EtO (µg/m$^{3)}$	Formosa Max Ground-Level EtO/EC***
Ascension	3030	13,72	130.29	4.34	0.0311	1320%
Ascension	3060	5,123	88.34	2.94	0.0139	2949%
St. James	4030	3,382	91.60	3.05	0.0099	4130%

[202] *See* LDEQ Statement of Basis at 55.

[203] *TRI On-Site and Off-Site Reported Disposed of or Other Released Top 100 Facilities for Ethylene Oxide*, IASPUB.EPA.GOV (last visited Jun 26, 2019), https://iaspub.epa.gov/triexplorer/release_fac?p_view=USFA&trilib=TRIQ1&TAB_RPT=1&Fedcode=&LINESPP=&sort=RE_TOLBY&industry=ALL&FLD=RELLBY&FLD=TSFDSP&sort_fmt=2&TopN=&STATE=All+states&COUNTY=All+counties&chemical=000075218&year=2017&report=&BGCOLOR=%23D0E0FF&FOREGCOLOR=black&FONT_FACE=arial&FONT_SIZE=10+pt&FONT_WIDTH=normal&FONT_STYLE=roman&FONT_WEIGHT=bold.

[204] *Id.*

[205] These estimates do not capture the highest risk in a county, though general spatial patterns are "reasonably accurate." *Id.* To calculate these concentrations, the NATA relied on emissions data compiled for a single year as inputs to air quality models to estimate ambient air concentrations. EPA then combined those modeled concentrations with census data and other information to calculate exposure concentrations, i.e. long-term-average concentrations to which people are exposed after accounting for human activities. The NATA then developed census tract-level risk estimates by applying health benchmark data to the exposure concentrations. *Technical Support Document: EPA's 2014 National Air Toxics Assessment*, EPA.GOV (Aug. 2018), https://www.epa.gov/sites/production/files/2018-09/documents/2014_nata_technical_support_document.pdf.

Ascension	3100	6,760	78.27	2.61	0.0097	4239%
Ascension	3050	8,843	74.72	2.49	0.0073	5635%
Ascension	3090	4,165	74.50	2.48	0.0136	3017%
St. James	4040	2,565	72.15	2.40	0.0073	5648%
Assumptio	5010	3,788	65.65	2.19	0.0066	6225%
St. James	4050	2,155	64.94	2.16	0.0062	6561%
Assumptio	5030	3,884	57.48	1.92	0.0053	7764%
Formosa Modeled Max Ground-Level Con.					**0.41***	

*Does not include background sources.[206]
***The figures in this column were calculated by dividing Formosa's Max Modeled Concentration for Ethylene Oxide (0.41) by the column second from the far right (2014 EC EtO (µg/m3), which are the existing exposure concentrations taken from the NATA database for each census tract hear the facility.

Formosa's modeled ground-level Ethylene Oxide concentration is also at least *two thousand times greater* than the IRIS risk value for Ethylene Oxide, which corresponds to an increased cancer risk of 1-in-1 million (see table below). Formosa's EAS is silent on this shocking comparison and the associated cancer risks, despite the fact that the IRIS program constitutes the best available science on this matter. LDEQ must require Formosa to apply EPA's IRIS risk value in its analysis, for reasons discussed in the sections below.

Doc. No.	**Doc. Title**	**Date**	**Max. Modeled Con. ("MMC") (µg/m^3)**	**IRIS EtO Exposure Level Corr. to Increased Cancer Risk of 10^{-6} (µg/m^3)**	**MMC/IRIS**
11431688	Updated EtO and Et glycol analysis	Dec. 2018	0.41	2.0×10^{-4}	2,050***

***This value was calculated by dividing Formosa's Max. Modeled Concentration of 0.41 by .0002, the IRIS value for 1 in 1 million cancer risk.

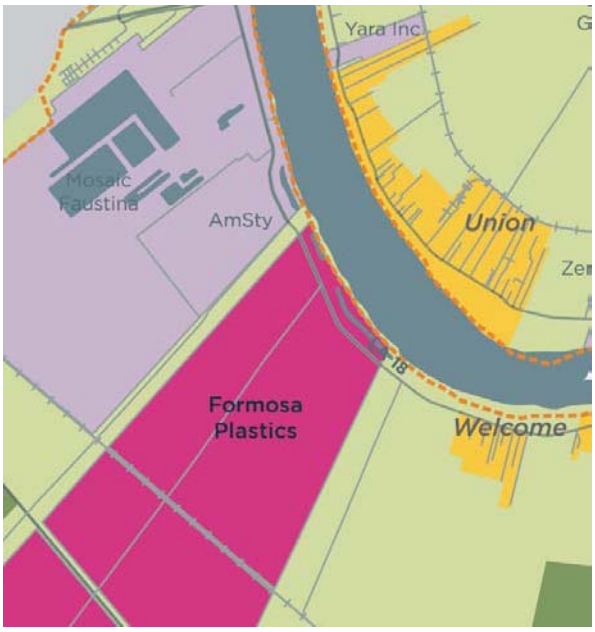
Furthermore, Formosa only maps the extent of modeled Ethylene Oxide concentrations greater than 0.02 µg/m^3 (equivalent to 1-in-10,000 risk).[207] Even at this overly conservative risk level, Formosa's own map shows that its Ethylene Oxide emissions adversely affect the residential community of Union, as illustrated below.[208] The map on the left is Formosa's Ethylene Oxide

[206] Formosa's Updated EtO and Et Glycol Analysis at 4.

[207] *See* Attach. G, Formosa Supp. EAS (Jan. 7, 2019) at P-1 (FG LA Ethylene Oxide Contour Map, Dec. 2018), LDEQ Doc 11457119.

[208] *See* Attach. G, Formosa Supp. EAS (Jan. 7, 2019) at P-1 (FG LA Ethylene Oxide Contour Map, Dec. 2018), LDEQ Doc 11457119, Ex.

Contour Map (i.e., cancer risk plot), where the red line represents the extent of its modeled Ethylene Oxide concentrations greater than 0.02 µg/m^3 (i.e., 1-in-10,000 risk).[209] The red line extends to the residential community of Union, as illustrated by the map on the right.[210]



A 1-in-10,000 risk level reflects EPA's *upper limit* of acceptable risk[211] and does not account for any margin of error, nor the cumulative effect of Formosa's carcinogenic emissions combined with background cancer risk. In order to accurately reflect the potential cancer risk to neighboring communities, LDEQ must require Formosa to model the extent of a 1-in-100,000 and 1-in-1,000,000 risk associated with its Ethylene Oxide emissions, taking into consideration age-dependent adjustment factors and background cancer risk levels with a margin of error. This is what Todd Cloud has done using Formosa's own modeling data.[212] As Mr. Cloud's cancer risk plot shows, Formosa's Ethylene Oxide concentrations exceed the 1-in 100,000 risk level at the elementary school, and this does not include age-dependent adjustment factors or background cancer risk levels.[213]

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[209] *Id.* (image showing portion of contour map).

[210] *See* Attach. A, Kray Aff., Ex. 1, Map of New & Existing Industrial Facilities (showing Formosa site relative to residential communities).

[211] *National Air Toxics Assessment, 2014 NATA: Assessment Results*, EPA (last updated Aug. 27, 2018), https://www.epa.gov/national-air-toxics-assessment/2014-nata-assessment-results#nationwide.

[212] *See* Attach. D, Cloud Aff., Ex. 2, ¶¶ 6-9 (attaching 1 in 100,000 risk plot and 1 in 1,000,000 risk plot).

[213] *Id.*

Formosa's modeled ground-level concentrations of Ethylene Oxide fail to account for potentially significant margins of error. At least two plants in the Formosa complex will emit Ethylene Oxide: Ethylene Glycol 1 ("EG1") and Ethylene Glycol 2 ("EG2") (proposed Ethylene Oxide emissions for both plants are shown in the table below).[214] Accounting for margins of error is critically important to determining whether Ethylene Oxide emissions from these sources may reach nearby residents including students at Fifth Ward Elementary, members of a nearby church, and Union residents across the river. LDEQ must require Formosa to include margin of error estimates in its total projected Ethylene Oxide emissions and update all relevant models relying on those estimates in order to enable the agency and the public to understand the potential and real health risks posed by Formosa's Ethylene Oxide emissions.

Facility	EtO Emission Pt.	Avg lb/hr.	Max lb/hr.	Tpy EtO
EG1	EG1-TO	0.66	0.66	2.88
	EG1-FLR	0.08	38.29	0.36
	EG1-FUG	0.14	0.14	0.61
	Subtotal			3.85
EG2	EG2-TO	0.66	0.66	2.88
	EG2-FLR	0.08	38.29	0.36
	EG2-FUG	0.14	0.14	0.61
	Subtotal			3.85
TOTAL				7.7

Formosa also fails to account for *acute* Ethylene Oxide exposure that may occur during flaring events. Formosa estimates that its emissions of Ethylene Oxide may reach as high as 38 pounds per hour during these events, again, only a half-mile from Union and one mile away from the

[214] Formosa has released two different values for the maximum ground-level impact concentration of EtO during the permitting process. In its initial Air Quality Analysis dated July 2018, Formosa modeled a maximum ground-level impact concentration for EtO of 0.74 µg/m^3 (a mere 0.01 µg/m^3 less than 75% of the Ambient Air Standard ("AAS")—the threshold for requiring additional TAPs modeling). Five months later, Formosa released an updated EtO and ethylene glycol analysis, reducing the ground-level impact concentration for EtO by 45% to 0.41 µg/m^3. *See* Formosa Updated TAPs Modeling Analysis for Ethylene Oxide and Ethylene Glycol, EDMS 11432533. The sole rationale for these reductions was that Formosa had provided "updated equipment component counts and stream speciation, which affected the fugitive emission estimate" for EG1 and EG2. Yet, the data provided in the original AQA and updated EtO and Et glycol analysis are identical for EtO emission points, including fugitive emissions. Thus, the public has no ability to independently analyze whether such drastic reductions in Formosa's modeled EtO ground-level impact concentrations are warranted. This gap is especially significant as the ground-level impact concentrations dictate how far out into neighboring communities the 25% EtO AAS buffer reaches, including the level of exposure at the nearby elementary school, residences, and church. *See* Formosa Supp. EAS, Exhibit P, EDMS 11457119.

Fifth Ward Elementary School.[215] Acute inhalation exposure to Ethylene Oxide poses significant health risks including partial lung collapse, pulmonary edema, seizures, loss of consciousness and coma. Children are not little adults and have very real physiological differences that make them more susceptible to the harmful effects from exposure to Ethylene Oxide. For instance, children may be more vulnerable to these risks due to their relatively higher respiratory minute volume as compared to adults.[216] There is additional concern for smaller children due to the fact that Ethylene Oxide is heavier than ambient air and higher concentrations detected nearer to the ground may result in higher exposure for children, especially those attending school at the elementary school. Yet nowhere in Formosa's EAS does it model the geographic range of potential acute exposure during these flare events. LDEQ must require Formosa to model the extent of acute exposure risk to Ethylene Oxide that will occur during flaring events, and include both margins of error and age-dependent adjustment factors in those estimates in order to account for the increased susceptibility of minors to acute Ethylene Oxide inhalation exposure.

Formosa's EAS is silent on the increased cancer risk that its proposed Ethylene Oxide emissions pose to children. Both chronic and acute Ethylene Oxide inhalation exposure can produce more severe health impacts, including increased cancer risk, in children due to their relatively higher respiratory minute volume as compared to adults.[217] EPA guidance states that age-dependent adjustment factors (ADAFs) should be used to account for these enhanced risks to children.[218] Formosa, however, has not considered these factors in any of its models. LDEQ must require Formosa to apply these factors in its EAS, and include margins of error estimates. This is especially critical given that in Formosa's Supplemental EAS, the 0.02 $\mu g/m^3$ boundary appears to reach the residential community of Union and is less than a quarter of a mile west[219] of the closest church and Fifth Ward Elementary School, which serves hundreds of pre-kindergarten to sixth grade students.[220]

3. Formosa's EAS is silent on the long-term cancer risks posed by Ethylene Oxide and other project emissions.

Formosa's EAS is silent on the long-term cancer risk posed by its proposed emissions of Ethylene Oxide and other carcinogens, instead focusing only on present cancer rates in the

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[215] *See* Proposed Title V Permit for Ethylene Glycol Plant 1, 3142-V0, EDMS Doc 11687337; Title V Permit for Ethylene Glycol Plant 2, 3151-V0, EDMS 11687491.

[216] *Ethylene Oxide*, ATSDR 5–6 (last updated Oct. 21, 2014) https://www.atsdr.cdc.gov/MHMI/mmg137.pdf.

[217] *See* *EtO Carcinogenicity Evaluation*, *supra* note 193 at 3-66.

[218] *Id.*

[219] *Id.*

[220] *St. Louis Academy*, http://stjamesfwe.sharpschool.net/ (last visited Jun. 25, 2019).

Industrial Corridor recorded between 2011 and 2015.[221] The most severe health concerns related to Ethylene Oxide exposure occur over the long term. It is therefore inadequate for Formosa to focus solely on four-year-old data on existing cancer rates without considering the potential increased cancer risk and other health impacts that will result from long-term inhalation exposure to Ethylene Oxide, and other carcinogens, over the project's lifetime. This gap is especially significant given that the two sources of Ethylene Oxide—EG1 and EG2—sit a mere mile away from an elementary school and a half mile from the nearby community of Union.

4. Formosa fails to cite independent, peer-reviewed studies to support its cursory critiques of the best available science on Ethylene Oxide-related health risks.

Formosa suggests in its Supplemental EAS that the IRIS risk factor for Ethylene Oxide, as applied by the 2014 NATA, is 19,000 times lower than the naturally occurring levels of Ethylene Oxide created by the human body.[222] But Formosa provides no citation for this claim. Further, the calculations and assumptions on which the claim is based are not cited in the EAS or Supplemental EAS. For this reason alone, LDEQ must disregard this information. Formosa's claims also ignore the fact that the IRIS risk value for Ethylene Oxide quantifies cancer risk above background levels, *including* endogenous levels of Ethylene Oxide produced by the human body.[223] As for Formosa's reference to the American Chemistry Council's Request for Correction with EPA, that request cites only one study, which was funded by the Council's own Ethylene Oxide Panel.[224] Best available science does not include studies funded by the very industries that are subject to regulation. LDEQ must only consider independent, peer-reviewed studies that are scientifically defensible.

5. LDEQ must require Formosa to consider the best available science on Ethylene Oxide-related health risks and that of other Toxic Air Contaminants, and must include emissions reductions where necessary to protect the public health.

Louisiana's Air Regulations require that all air permit applications "at minimum" contain "such other data as may be necessary for a *thorough* evaluation of the source and existing or proposed activities." La. Admin. Code § 33.III.517.D.18 (emphasis added). The definition of

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[221] Formosa Supp. EAS, at 8–9.

[222] Formosa Supp. EAS, at 8.

[223] *Comments Regarding Ethylene Oxide (EtO) On the National Emissions Standards for Hazardous Air Pollutants: Hydrochloric Acid Production Residual Risk and Technology Review*, NRDC.ORG 2 (Apr. 26, 2019), https://www.nrdc.org/sites/default/files/eto-neshap-letter-20190426.pdf.

[224] *Request for Correction under the Information Quality Act: 2014 National Air Toxics Assessment (NATA)*, American Chemistry Council (Sep. 20, 2018), https://www.americanchemistry.com/EO/Request-for-Correction-under-the-Information-Quality-Act-2014-NATA.pdf; C.R. Kirman & S.M. Hays, *Derivation of endogenous equivalent values to support risk assessment and risk management decisions for an endogenous carcinogen: Ethylene oxide*, 91 Reg. Tox. & Pharm. 165, 171 (2017).

"thorough"—meaning "carried through to completion; exhaustive"[225]—necessarily requires, at minimum, consideration of the best available science to understand the health risks posed by a permittee's proposed emissions, especially where those emissions include thousands of pounds per year of known carcinogens. [226] Otherwise, a permittee would simply be able to select the data most beneficial to its analysis, reading "thorough" out of the regulation entirely. Given the word "thorough" only appears three times in the State's Air Regulations, its insertion here should not be ignored, but rather interpreted to require all that would be necessary for an exhaustive analysis of a source's existing or proposed activities. LDEQ must therefore require Formosa to engage with the best science available on the health risks posed by Ethylene Oxide, benzene, and other carcinogens, namely the IRIS risk values for each and the 2014 NATA estimates of existing cancer risk. Should that analysis reveal that additional emission reductions at the Formosa facility are necessary to protect the public health of local residents, LDEQ must require Formosa to implement such emission reductions consistent with its public trustee duty under the Louisiana Constitution.

D. Formosa's EAS fails to include any information about the potential and real adverse environmental effects of Formosa's greenhouse gas emissions, nor does it include any information about the associated costs to society.

LDEQ proposes to allow Formosa to emit 13,628,091 million tons per year of greenhouse gases (measured in carbon dioxide equivalents, "CO2e"). Formosa's greenhouse gas emissions would constitute the largest new source planned or permitted in the U.S. since 2012.[227] Its greenhouse gas emissions would match those of Big Cajun II, the largest coal-fired power plant and biggest existing source of greenhouse gas emissions in the state, at 13,901,727 tons per year.[228] Despite Formosa's enormous greenhouse gas emissions, the EAS fails to provide any information or analysis on the potential and real adverse environmental effects of these emissions on the climate associated costs to society such as sea level rise and associated human displacement, extreme weather events, increased ambient temperatures, altered precipitation patterns, and loss of habitat and species. Formosa's silence on the effects of its greenhouse gas emissions is especially egregious given that Louisiana's coast is disappearing due to the effects of climate change-

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[225] Merriam-Webster's Collegiate Dictionary (11th ed. 2011).

[226] *See also* La R.S. § 30:2060(C) (requiring LDEQ to "place emphasis on those sources of emissions representing the greatest risk to human health" in order to reduce statewide TAPs emissions by 50% of 1987 levels by 1996).

[227] *See Tracking Oil and Gas Infrastructure Emissions*, ENVIRONMENTALINTEGIRTY.ORG (2019, May 31), http://www.environmentalintegrity.org/oil-gas-infrastructure-emissions; *Greenhouse Gases from a Growing Petrochemical Industry*, ENVIRONMENTALINTEGRITY.ORG (February 29, 2016), http://www.environmentalintegrity.org/reports/greenhouse-gases-from-a-growing-petrochemical-industry/.

[228] Big Cajun II Title V Permit No. 2260-00012-V6, issued 4/25/19, at pdf p. 8, EDMS Doc. 11624907, http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11624907&ob=yes&child=yes.

induced sea level rise. Indeed, Louisiana's Comprehensive Master Plan for a Sustainable Coast published in 2017 blames Louisiana's disappearing coast on "the effects of climate change," among other causes.[229] For this reason alone, LDEQ must deny the permits. Formosa must provide information about the potential and real adverse environmental effects of its greenhouse gas emissions and the costs to society imposed by these effects. As further support, Commenters adopt the detailed comments provided by Sierra Club on this subject, which are included and made part of these comments as Attachment H.

E. The EAS Fails to Address Severe Weather and Accident Risk.

As a public trustee, LDEQ has a duty to ensure that Formosa's proposed petrochemical complex will not create undue chemical hazards to the public and the environment, particularly in the face of increasingly intense storms and worsening flood risks that could impact the facility during its lifetime. It has a corresponding duty to require Formosa to mitigate any remaining risk, such as with proof of adequate planning and insurance.[230] LDEQ has not discharged that duty here.

The Clean Air Act's General Duty Clause, Section 112(r)(1), additionally, imposes a duty that chemical facilities that handle "extremely hazardous substance[s],"[231]

> identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as

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[229] *Louisiana's Comprehensive Master Plan for a Sustainable Coast*, COASTAL.LA.GOV ES-2 (June 2, 2017), http://coastal.la.gov/wp-content/uploads/2017/04/2017-Coastal-Master-Plan_Web-Book_CFinal-with-Effective-Date-06092017.pdf.

[230] *See, e.g.*, *Save Ourselves, Inc. v. La. Envt'l Control Comm'n*, 452 So. 2d 1152, 1157 (La. 1984) (holding agency failed to provide sufficient reasons responding to petitioners' concerns about potential threat to New Orleans' water supply from, among other things, flooding from hazardous waste landfill near Mississippi River); *Matter of Rubicon, Inc.*, 95-0108 (La. App. 1 Cir. 2/14/96), 670 So. 2d 475, 483 (requiring public trustee to ensure that "the potential and real adverse environmental effects of the proposed project have been avoided to the maximum extent possible," and to address whether "there are alternative projects or alternative sites or mitigating measures which would offer more protection to the environment than the proposed project without unduly curtailing non-environmental benefits to the extent applicable.").

[231] EPA has compiled a list of "extremely hazardous substances," based on the criteria that these chemicals "are known to cause or may reasonably be anticipated to cause death, injury, or serious adverse effects to human health or the environment." 42 U.S.C. § 7412(r)(3)-(4). Congress specifically mandated that ethylene oxide, which Formosa would release in large quantities, be included on the list. *See* 42 U.S.C. § 7412(r)(3). EPA, pursuant to congressional directive, has promulgated a much longer list of toxic, explosive, and flammable chemicals that include other chemicals Formosa would be permitted to emit. *See* 40 C.F.R. § 68.130. The General Duty Clause applies regardless of the amount of the listed substance the facility has onsite. 40 C.F.R. § 68.1; *United States v. Gibson Wine Co.*, 2017 WL 1064658, at *2 (C.D. Cal. Mar. 20, 2017).

> are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

42 U.S.C. § 7412(r)(1). Section 112(r) further requires the project proponent to create a plan that addresses, among other process hazards, "reasonably anticipated external events as well as internal failures" such as hurricanes and floods.[232]

Formosa acknowledges that it is subject to Section 112(r),[233] yet it has neither identified the risks of chemical releases, in the context of severe storms, nor taken measures necessary to identify and to protect the public and environment against those risks.

This section begins with a discussion of the threat Formosa's complex could face from storms and storm-related chemical releases, and the standard by which Formosa should demonstrate it has addressed those significant threats. It then discusses Formosa's failure to document that it has sufficient insurance to protect against this and other hazards it could face.

1. Formosa Failed to Adequately Address the Storm-Related Chemical Risks.

Formosa has not documented how it would protect workers and nearby communities from the hazard of chemical releases due to the increasingly severe storms that its complex is likely to face. LDEQ must require Formosa to: analyze the risk of chemical releases in storms, follow FEMA standards concerning chemical facilities in floodplains, produce a detailed site elevation study, evaluate the accelerating threat of severe storms especially due to climate change, and to adopt measures designed to mitigate the risk of storm-induced releases. This task is especially urgent because of Formosa's refusal to adopt a 2-mile buffer from the nearby Fifth Ward elementary school and its proximity to St. James Parish communities.[234]

a. Formosa did not analyze the risk of storm-related chemical releases in its EAS.

Formosa's permit application fails to anticipate and sufficiently address the risk of chemical spills and other disasters due to storms. Formosa offered several chemical-release failure scenarios in a letter-filing to St. James Parish written to persuade the Parish not to impose a 2-

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[232] "If you are in an area subject to earthquakes, hurricanes, or floods, you should examine whether your process would survive these natural events without releasing the substance." EPA, General Guidance on Risk Management Programs for Chemical Accident Prevention, at p. 6-11, https://www.epa.gov/sites/production/files/2013-11/documents/chap-06-final.pdf (accessed July 27, 2019); *see generally* 40 CFR Part 68 (EPA Risk Management Plan regulations)

[233] *See* Ex. R to Formosa Supp'l EAS at p.4 (Jan. 2019), EDMS No. 11457119 [hereinafter "Buffer Zone Letter"]; 42 U.S.C. § 7412(r)(7)(B)(ii).

[234] *See* Buffer Zone Letter.

mile buffer zone to protect children at Fifth Ward Elementary School and other nearby residents.[235] None of the failures listed by Formosa relate to the potential for chemical releases from storms.[236] Formosa's drainage impact and hydrological modification impact studies also fail to discuss storm-related chemical releases.[237] DEQ must require Formosa actually to analyze the risks to employees and residents from storm-induced chemical releases.

b. Formosa failed to properly evaluate the extent of its flood risk or to prove that it was justified in siting a petrochemical complex in a floodplain.

In doing so, DEQ must also require Formosa to undertake a detailed analysis of its flood and storm risk, to understand the petrochemical complex's vulnerability to increasingly severe storms that could lead to flood damage and releases. This analysis should be at least searching as analogous FEMA regulations and standards applied by the federal government. The drainage studies Formosa submitted with its EAS fell well short of this mark.

The St. James Parish flood map indicates that the entire Formosa petrochemical site is either the 100-year or 500-year floodplain.[238] But while Formosa examined drainage from its facility in smaller-scale storms and a 100-year flood, it did not address rainfall events more significant than a 100-year storm.[239]

That showing would not suffice under regulations for projects in which FEMA is involved. FEMA regulations impose special constraints on the agency from taking any "critical action" in a floodplain.[240] "Critical action" refers to activities carrying a high level of public risk from flood

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[235] *See Id.* at p. 2; Formosa's Supp'l EAS at p. 12 (Jan. 2019), EDMS No. 11457119.

[236] *See* Ex. A to Buffer Zone Letter.

[237] *See* Exs. Q-1 – Q-2, Formosa Supp'l EAS (Jan. 2019), EDMS No. 11457119.

[238] http://maps.lsuagcenter.com/floodmaps/?FIPS=22093.

[239] Exhibits Q-1 – Q-2, Formosa Supp'l EAS, EDMS No. 11457119. Formosa's Hydrological Modification Impact Analysis reviewed what it claims is an "extreme storm event." But it was simply an examination of what would happen if a 100-year rainstorm occurred at the same time that the receiving canal for the plant's floodwaters, St. James Canal, was elevated at 4' above normal levels. *Id.* Formosa did not examine a 500-year flood or undertake an analysis of its likely future risk from storms.

[240] See 44 C.F.R. Part 9. In the case of "critical actions," the term "floodplain" is defined to "mean the area subject to inundation from a flood having a 0.2 percent chance of occurring in any given year (500–year floodplain)." *Id.* § 9.4.

These regulations were promulgated pursuant to Executive Order 11988 on Floodplain Management. *See* 44 C.F.R. § 9.1. Executive Order 11988 directs *all* federal agencies not "to conduct, support, or allow an action to be located in a floodplain," absent first considering "alternatives to avoid adverse effects and

damage.[241] It encompasses "an action for which even a slight chance of flooding is too great," including creating or extending "the useful life of structures or facilities . . . . Such as those which produce, use or store highly volatile, flammable, explosive, toxic, or water-reactive materials."[242] Approving Formosa's petrochemical complex would be such a "critical action" if undertaken by FEMA. FEMA's regulations would bar the agency from acting to authorize such a petrochemical complex in a 500-year floodplain, absent in-depth scrutiny to determine its necessity, minimize adverse impacts, and exhaust all non-floodplain alternatives.[243] And at bottom: "FEMA shall not act in a floodplain or wetland unless it is the only practicable location"; and "[i]f a practicable alternative exists outside the floodplain or wetland FEMA must locate the action at the alternative site."[244]

FEMA likewise recommends that state and local governments or private actors not build any similarly defined, at-risk facilities in a floodplain.[245] If such a facility must be built within a floodplain, "[t]he more common standards—freeboard, elevation above the 500-year floodplain and elevated access ramps—should be required."[246] Here, Formosa has made no showing that it is necessary to construct its facility in a floodplain, let alone documented how it examined mitigation measures or exhausted any alternatives outside of the floodplain. Formosa has not

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incompatible development in the floodplains." E.O. No. 11988, "Floodplain Management," 42 Fed. Reg. 29651 (May 24, 1977).

[241] *See* 44 C.F.R. § 9.4. "Critical Action," also includes actions concerning structures that enable essential services, like hospitals and power plants. *See id.* The FEMA terms "critical action," and "critical facility," also appear in both the International Building Code and the American Society of Engineers standards. *See* FEMA Mitigation Assessment Team, Hurricane Sandy, "Definitions of Critical Facilities and Risk Categories," https://www.fema.gov/media-library-data/1385591327349-677ba8c4e88360b7436338fb87221af2/Sandy_MAT_AppI_508post.pdf (last visited Aug. 7, 2019). Those standard-setting entities include critical facilities or actions in their highest "Risk Category IV," denoting buildings, damage to which would pose "risk to human life, health, and welfare. *Id.* Like the FEMA definitions, Risk Category IV includes both buildings that, if damaged, would disrupt provision of essential community services, like hospitals, and "facilities containing extremely hazardous materials that would threaten the public if released." *Id.*

[242] 44 C.F.R. § 9.4.

[243] *See* 44 C.F.R. §§ 9.6, 9.9–9.11.

[244] 44 C.F.R. § 9.6; *see also id.* § 9.9(d)(2) ("For critical actions, the Agency shall not locate the proposed action in the 500–year floodplain if a practicable alternative exists outside the 500–year floodplain.").

[245] FEMA, Managing Floodplain Development through the Nat'l. Flood Insurance Program, p. 6-18, https://www.fema.gov/media-library-data/20130726-1535-20490-8858/is_9_complete.pdf (last visited Aug. 7, 2019); *see also* FEMA, Critical Facility, Definition/Description, https://www.fema.gov/critical-facility ("A critical facility should not be located in a floodplain if at all possible.") (last visited Aug. 7, 2019).

[246] *Id.*

provided data showing it has sufficiently elevated its structures to reduce flood risk. In its EAS, Formosa only committed to elevate structures onsite to 1-foot above the 100-year flood elevation, plainly insufficient to meet FEMA's recommended standard.[247]

In addition, Formosa must address the risk climate-change fueled storms pose to its operations in the future, particularly the likelihood of flood- or storm-induced chemical releases. Formosa's economic impact analysis anticipates the petrochemical complex could operate until well after 2070,[248] and federal government studies conclude that future storms may be substantially more frequent and intense than today.

Research is making clear that the risk of intense storms already is increasing by alarming levels, making the traditional 100-year and 500-year floodplain values increasingly inaccurate measures of safety. Following the devastating August 2016 floods in Baton Rouge and across a wide swathe of South Louisiana, a study led by researchers from U.S. National Oceanographic and Atmospheric Agency (NOAA) found that climate change had raised the chance of that rainstorm by at least 40 percent and may have doubled the odds of it occurring.[249] The study explained that what is presently called a "100-year storm," has already become more like a 70-year (or more frequent) storm, and will become even more likely as the climate continues to change.[250]

Similarly, the federal government's National Climate Assessment states that in the southeastern United States, "[c]limate model simulations of future conditions project increases in temperature and extreme precipitation," by mid-century, even if the world acts to limit its overall greenhouse gas emissions.[251] And under scenarios that model our current consumption of fossil fuels—a trend that Formosa's more than 13 million tons-per-year of permitted greenhouse gas emissions would go far to reinforce—"much larger changes" in rainfall are projected for the late 21st century.[252] Formosa nowhere addresses this accelerating flood risk. LDEQ, as a public trustee, must require Formosa to address the potential—indeed, to some degree, inevitable—risks that

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[247] *See* Formosa Supp'l EAS at pp. 10 (Jan. 19, 2019), EDMS No. 11457119.

[248] Ex. L to Formosa EAS, p. 7 (stating "the ongoing production process . . . may last for another 50 years" after Formosa's currently projected capital spending on the plant ends in 2028).

[249] NOAA, "Climate Change Increased Chances of Record Rains in La. by at least 40 Percent," https://www.noaa.gov/media-release/climate-change-increased-chances-of-record-rains-in-louisiana-by-at-least-40-percent (Sept. 7, 2016) (visited July 18, 2019); K. van der Wiel et al., "Rapid attribution of the August 2016 flood-inducing extreme precipitation in south Louisiana to climate change," 21 Hydrol. Earth Syst. Sci. 897, 912 (Jan 19, 2017) (underlying study, after peer-review), https://www.hydrol-earth-syst-sci.net/21/897/2017/ (visited July 19, 2019).

[250] K. van der Wiel, et al., *supra*, at 913.

[251] Fourth Nat'l Climate Assessment, Ch. 19, Southeast, p. 751, *available at* https://nca2018.globalchange.gov/downloads/NCA4_Ch19_Southeast_Full.pdf (visited Aug. 7, 2019).

[252] *Id.* at p. 752.

storms in a changing climate will create for chemical safety and releases at the facility during the complex's expected lifetime.

The potential consequences of Formosa's failure to seriously grapple with its current and future flood risk could be stark. In 2018, the U.S. Chemical Safety Board ("CSB") concluded a detailed investigation of the chemical fire at Arkema's Crosby, Texas chemical plant that occurred during Hurricane Harvey.[253] The CSB's report concluded that Arkema had failed to prepare adequately for flooding, even though Arkema had been aware for a decade that its plant was entirely within either the 100-year or 500-year floodplain.[254] The company had built low-temperature warehouses, which stored highly combustible, organic peroxide, and power generators and transformers necessary to keep the organic peroxide cold, in lower lying areas of the site.[255] During Harvey, the site flooded two feet higher than the 500-year mark, swamping transformers and backup generators, as well as the low-temperature warehouses and backup refrigerated trailers.[256] Eventually, the plant's crew were forced to evacuate the site, and 350,000 pounds organic peroxide eventually combusted into a large chemical cloud that migrated over an evacuation route and threatened both nearby residents and first responders as the storm continued to rage.[257]

Only after the storm did Arkema perform a fine-grained site-elevation survey that showed the elevation and exact location of each relevant point at the facility, as well as a hydrological study focused on extreme weather events, such as hurricanes.[258] This sort of report would have enabled nuanced flood prevention, by pinpointing the safest and most vulnerable areas onsite for chemical storage in reasonably probable, extreme storm conditions.

Troublingly, the CSB concluded that the poor planning that allowed the Arkema explosion to occur was not unique: "other companies also might be unaware of the potential for flood risks to create process safety hazards at their facilities if flood-related information is not typically compiled or assessed in required safety analyses."[259] The CSB warned that "more robust industry guidance is needed to help hazardous chemical facilities better prepare for extreme weather

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[253] CSB, "Organic Peroxide Decomposition, Release, and Fire at Arkema Crosby Following Hurricane Harvey Flooding" (May 2018), https://www.csb.gov/arkema-inc-chemical-plant-fire-/ [hereinafter: "Arkema Report"].

[254] Arkema Report at 14, 81–84, 103.

[255] Arkema Report at 37.

[256] Arkema Report at 10–11.

[257] Arkema Report at 8–9.

[258] Arkema Report at 103.

[259] Arkema Report at 14.

events, such as flooding, hurricanes, snowstorms, tornadoes, or droughts."[260]

Formosa's failure to address the risks of severe floods and climate-induced storm risks, such as a 500-year and greater floods, falls short of existing standards, let alone the evolving industry standard that the CSB determined is necessary to protect against chemical disasters like Arkema's.

To comply with its public-trustee obligations and to ensure Formosa is meeting its responsibility under the Clean Air Act's Section 112(r), LDEQ must order Formosa to at least:

> 1) conduct risk analyses concerning the potential for chemical releases or spills onsite and outside of the complex's boundaries during storm events;
>
> 2) follow FEMA's standard in examining non-floodplain alternatives, mitigation measures, and providing sufficient justification for siting this complex in a floodplain;
>
> 3) provide a detailed site-elevation study of the complex;
>
> 4) model a range of extreme storm scenarios exceeding the 100-year and 500-year levels and including hurricanes that is informed by climate science; and
>
> 5) to adopt measures designed to protect against the risk of storm-induced releases.

2. Formosa provided no Proof it is Sufficiently Insured to Protect the Environment and Public from Reasonably Foreseeable Hazards.

Not only has Formosa failed to adequately address storm-related hazards, Formosa has submitted no evidence that it has obtained insurance sufficient to cover liabilities from any likely environmental risks, including storm damage, releases, and chemical explosions. Neither LDEQ nor St. James Parish sought information on Formosa's insurance coverage.[261] Without such evidence, it is possible that the $9.4-billion Formosa complex could become a costly environmental liability left for Louisianans to bear. LDEQ must require Formosa to file a certificate of insurance confirming that the complex will be adequately insured in the case of potential large-scale losses.

Under Article IX, LDEQ must ensure Formosa adopts "mitigating measures which would offer more protection to the environment than the proposed project without unduly curtailing non-

[260] Arkema Report at 14.

[261] See Attach. J, Affidavit of Michael Brown and accompanying exhibits.

environmental benefits."[262] Providing a guarantee of sufficient insurance to cover expected harms to the environment and public health, so that the losses can be timely, completely, and affordably redressed, is a critical "mitigating measure" that would protect the environment and improve the non-environmental benefits LDEQ believes would flow from the proposal.

The risks to the environment, communities, and plant workers of a large petrochemical complex's failure to possess sufficient financial assurance can be dramatic. Less than one month ago, the largest refinery on the East Coast, Philadelphia Energy Solutions, was forced to file for Chapter 11 bankruptcy, close operations, and fire more than 1,000 workers after it was rocked by a damaging explosion and blaze.[263] The refinery's property damage and loss of business insurance, that otherwise would have staved off the closure and bankruptcy filing, turned out to be inadequate to address the plant's full loss.[264] The potentially bankrupt company is now left with the unprecedented, complex task of safely recovering more than 30,000 barrels of highly toxic hydrochloric acid from the site, located within one of the country's largest cities.[265] This problem could have been avoided. The refinery's ownership admitted in its 2015 prospectus to investors that one of its business risks is underinsurance for the many hazards the refinery could face.[266]

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[262] *Matter of Rubicon,* 670 So. 2d at 483.

[263] L. Kearney, Reuters, "Bank Drops Objection to Financing Request by Bankrupt Philadelphia Energy Solutions" (July 23, 2019), https://www.reuters.com/article/us-pes-bankruptcy-insurance/bank-drops-objection-to-financing-request-by-bankrupt-philadelphia-energy-solutions-idUSKCN1UI2KU (visited Aug 4, 2019); Claire Sasko, Philadephia Magazine, "Kenney: PES Refinery 'Intends to Shut Down' as Blast Investigation Begins" (June 26, 2019), https://www.phillymag.com/news/2019/06/26/philadelphia-energy-solutions-closure/ (visited Aug. 7, 2019).

[264] *Id.*

[265] L. Kearney, Reuters, "Shut Philadelphia refinery begins risky job of removing toxic chemical" (Aug. 2, 2019), https://www.reuters.com/article/us-pes-bankruptcy-acid/shut-philadelphia-refinery-begins-risky-job-of-removing-toxic-chemical-idUSKCN1US1RB (visited Aug. 4, 2019).

[266] The company's prospectus stated:

> Our assets may experience physical damage as a result of an accident or natural disaster. These hazards can also cause personal injury and loss of life, severe damage to and destruction of property and equipment, pollution or environmental damage, and suspension of operations. We are insured under property, liability and business interruption policies, subject to the deductibles and limits under those policies. In addition, such insurance policies do not cover every potential risk associated with our operating facilities, and we cannot ensure that such insurance will be adequate to protect us from all material expenses related to potential future claims for personal and property damage, or that these levels of insurance will be available in the future at commercially reasonable prices. As we continue to grow, we will continue to evaluate

Here, we have no proof Formosa is insured at all, let alone proof that it has enough insurance to adequately cover potential losses at its massive complex. The Philadelphia Energy Solutions example makes clear that Louisianans cannot simply trust that Formosa will have purchased adequate insurance on its own.

It is important to bear in mind that significant accidents in the U.S. petrochemical industry are foreseeable, and significant prevention activities are required to reduce these risks to communities. In 2016, a *Houston Chronicle* and Texas A&M investigation found that a chemical explosion, fire, or toxic release occurs once every six weeks in the greater Houston area alone.[267] Between April 2019 and the filing of this comment, in August 2019, at least four fires at petrochemical facilities raged in the Houston area, including a fire at a polypropylene unit.[268]

Formosa offers no proof that it would have access to insurance to safely survive significant incidents at its petrochemical complex to address environmental liabilities or to even provide continued employment to its workers. As explained in Section VI, above, Formosa's history of industrial accidents, like its catastrophic spill in Vietnam, makes this no academic question. The environment of the state, the health of its residents, and Louisiana's massive investment of tax incentives into the project could be thrown into jeopardy.

In spite of this risk, in response to a public records request, LDEQ averred that "there is no requirement for 'an insurance policy or liability coverage' in the air regulations," and indicated that it would only demand such information from Formosa as required by the regulations for solid and hazardous waste permitting.[269] Formosa has not sought a solid or hazardous waste permit, and the insurance requirements for those permits likely would not extend to most of the

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> our policy limits and deductibles as they relate to the overall cost and scope of our insurance program.

Philadelphia Energy Solutions, SEC Form S-1 at p. 143 (Feb. 17, 2015), https://www.sec.gov/Archives/edgar/data/1632808/000104746915000839/a2223083zs-1.htm#cg42503_risks_related_to_our_business; *see also id.* at p. 21 (warning of same).

[267] M. Collette et al., Houston Chronicle, "Chemical Breakdown: Dangerous Chemicals, Roadblocks to Information Combine to Create Hidden Dangers" (May 7, 2016), https://www.houstonchronicle.com/news/investigations/article/Dangerous-chemicals-roadblocks-to-information-7420931.php (visited Aug. 4, 2019).

[268] M. Dempsey et al., Houston Chronicle, "Explosion, Fire at Exxon Mobil Baytown Plant Injures 37" (July 31, 2019), https://www.houstonchronicle.com/news/houston-texas/houston/article/ExxonMobil-s-Baytown-fire-the-latest-in-a-14270558.php?utm_source=newsletter&utm_medium=email&utm_campaign=HC_AfternoonReport&utm_term=news&utm_content=headlines (visited Aug. 4, 2019).

[269] *See* Attach. J, Aff. of Michael Brown, Ex. 1, LDEQ Public Records Request Corr.

risks Formosa could face in its active operations.[270] LDEQ's reading of the air regulations is misplaced, because the Clean Air Act's Section 112(r) General Duty Clause and risk management plan regulations do make it incumbent upon Formosa to take the measure of chemical risks and to mitigate them.[271] And Article IX also imposes a public trust obligation on LDEQ that is more searching than the bare requirements of the air regulations.[272] The time to undertake that analysis is now, "*before* granting approval of proposed action affecting the environment."[273] It is not clear that any other agency ever will evaluate Formosa's level insurance if LDEQ does not do so here. As noted, St. James Parish, in responding to a public records request, stated "that our process for industry does not include the requirement of certificates of insurance."[274]

LDEQ has made no effort to assure that Formosa has mitigated its environmental risks with purchase of adequate insurance.[275] To discharge its duty as a public trustee, LDEQ must demand that Formosa produce a certificate of insurance demonstrating adequate coverage.

F. Formosa's lopsided cost-benefits analysis fails to include environmental and social costs.

LDEQ's analysis "requires a balancing process in which environmental costs and benefits must be given full and careful consideration along with economic, social and other factors."[276] But Formosa's cost-benefit analysis only discusses alleged economic and other benefits without detailing environmental costs.[277] These costs must include, at minimum, the anticipated public health costs of toxic emissions inhalation exposure borne by the surrounding communities, calculated over the project's lifetime and adjusted for age-dependent factors. Without this information, LDEQ cannot balance such costs, as its public trustee duty requires, against the alleged benefits of the project. The EAS is thus facially insufficient under the Louisiana Constitution and La. R.S. § 30:2018.B for failing to address in any way the environmental impact costs of the project, including but not limited to Ethylene Oxide lifetime inhalation

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[270] *See* 33 LAC, Pt. V, Ch. 37; 33 LAC, Pt. VII, Ch. 13.

[271] *See* 42 U.S.C. § 7412(r)(1), (r)(7)(B)(ii); 40 C.F.R. Part 68.

[272] *See Save Ourselves*, 452 So. 2d at 1160 ("From our review it appears that the agency may have erred by assuming that its duty was to adhere only to its own regulations rather than to the constitutional and statutory mandates.")

[273] *See Save Ourselves*, 452 So. 2d at 1157 (emphasis added).

[274] Attach. J, Aff. of Michael Brown, Ex. 1, St. James Parish Public Records Request Corr.

[275] *Matter of Rubicon, Inc.,* 670 So. 2d at 483.

[276] *Save Ourselves, Inc. v. Louisiana Envtl. Control Comm'n*, 452 So. 2d 1152, 1157 (La. 1984).

[277] *See* EAS at 30-33, Supp. EAS at 19.

exposure. Accordingly, LDEQ must reject the permits.

Moreover, the EAS ignores that this project's adverse health impacts would fall disproportionately on African-Americans. Formosa's EAS fails to consider the fact that the African-American community of St. James is already over-burdened with air pollution and that adding to this pollution exacerbates this burden.[278] But LDEQ cannot ignore this fact. Indeed, the agency must examine the disparate impact of the added pollution to this African-American community in order to fully examine the social costs of the proposed plant. LDEQ must conduct a disparate impact analysis and consider less discriminating alternatives before it can issue a decision on the proposed permits. LDEQ may not issue these permits if less discriminating alternatives exist.

In addition to these comments on Formosa's deficient cost-benefit analysis, Commenters adopt the detailed comments provided by Healthy Gulf on this subject, which are included and made part of these comments as Attachment I.

VIII. LDEQ MUST COMPLY WITH FEDERAL CIVIL RIGHTS REGULATIONS.

Title VI of the Civil Rights Act of 1964 provides that "[n]o person in the United States shall, on the ground of race, color, or national origin . . . be subjected to discrimination under any program or activity receiving Federal financial assistance." 42 U.S.C. § 2000d (2012). Acceptance of federal funding and/or assistance from the EPA creates an obligation on the recipient to comply with EPA's implementing regulations. *See* 40 C.F.R. § 7.30. Although the Supreme Court has held that disproportionate impact is not the "sole touchstone of an invidious racial discrimination," the EPA regulations prohibit recipients of federal funds, such as LDEQ, from using "criteria or methods of administering its program or activity which have the effect of subjecting individuals to discrimination because of their race, color, [or] national origin, . . . or have the effect of defeating or substantially impairing accomplishment of the objectives of the program or activity with respect to individuals of a particular race, color, [or] national origin." *Village of Arlington Heights v. Metropolitan Housing Development Corporation*, 429 U.S. 252, 265 (1977); 40 C.F.R. § 7.35(b). Because LDEQ receives federal financial assistance from EPA, it must comply with federal regulations in implementing its air permitting program. The data below raises serious questions as to whether LDEQ's air permitting program meets EPA's regulations.

A. Adverse Impacts from Formosa's Proposed Complex Would Disproportionally Impact Communities of Color.

The communities immediately surrounding the proposed facilities (centered at 30.05900556, -90.91452222) are disproportionately minority. *See* Attach. K, EPA EJScreen Summary Reports for Welcome, Salsburg, Central, White Hall, Union, and St. James Parish. EJScreen is EPA's environmental justice screening and mapping tool that provides EPA with a nationally consistent

[278] *See* Section VIII, *infra*.

dataset and approach for combining environmental and demographic indicators.[279] The EJScreen data show that Welcome, Salsburg, Central, White Hall, and Union, all towns within three miles of the proposed facility, are 93%, 78%, 65%, 64% and 64% minority, respectively. *Id.*; *see also* 2010 Census Block Group for St. James Parish.[280] Additionally, the 2010 Census Tract data show that the tract containing the proposed facility (Tract 405) shows that 87.1% of the total population identifies as "Black or African American." *See* Attach. L. 2010 Census Tract Reference Map (showing census tracts); Attach. M, 2010 Demographic Profile Data (providing demographic data for Tract 405).[281] For perspective, St. James Parish is 52% minority, and Louisiana is only 41% minority on average. *See* Attach. K, EPA EJScreen Summary Reports for Welcome, Salsburg, Central, White Hall, Union, and St. James Parish. The data thus show that the proposed site for the facility is located within an area that has a significantly higher minority population than the parish as a whole or the state. Permitting the proposed facility would force residents of this predominantly minority area to live in the shadow of an ethane cracking plant.

EJScreen also demonstrates the relative environmental justice concerns for designated areas in "EJ Indexes." Due to the pollution that already inundates Welcome, Salsburg, Central, White Hall, and Union, the area is of significant environmental justice concern. For instance, the relevant EJ indexes show that the people who live within three miles of the center of the proposed facility site have a greater potential for exposure to $PM_{2.5}$, greater risk of cancer from toxic air pollution, and greater risk of respiratory illness than more than 75% of Louisiana's population. *See* Attach. O, EPA EJScreen Summary Report for Formosa Site; *see* https://www.epa.gov/ejscreen/how-interpret-standard-report-ejscreen.

The site selection process for the petrochemical complex raises particular disparate impact concerns. The proposed facility would be in the 5th district and just across the river from the 4th district, which are districts that were unilaterally redesignated by St. James Parish in its 2014 Land Use Plan.[282] In the 2014 plan, the 4th and 5th districts were designated as "Residential / Future Industrial," though they were designated as "Residential" in the 2011 Land Use Plan. *Id.* The Planning Commission also adopted a buffer zone map alongside the Land Use Plan in 2014, identifying areas like schools and churches in some parts of the parish where additional review would be required before permitting new industrial facilities. *Id.* at 11. The buffer map excluded almost every church and school in the 4th and 5th districts. *Id.* In fact, the map excluded an

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[279] EJScreen is available at https://www.epa.gov/ejscreen.

[280] U.S. Census Bureau, https://www2.census.gov/geo/maps/dc10map/GUBlock/st22_la/county/c22093_st_james/DC10BLK_C22093_000.pdf.

[281] U.S. Census Bureau, https://factfinder.census.gov/bkmk/table/1.0/en/DEC/10_DP/DPDP1/1400000US22093040400|1400000US22093040500?slice=GEO~1400000US22093040500.

[282] *See* Attach A, Kray Aff., Ex. 2, A Plan Without People: Why the St. James Parish 2014 Land Use Plan Must Be Changed, p. 5.

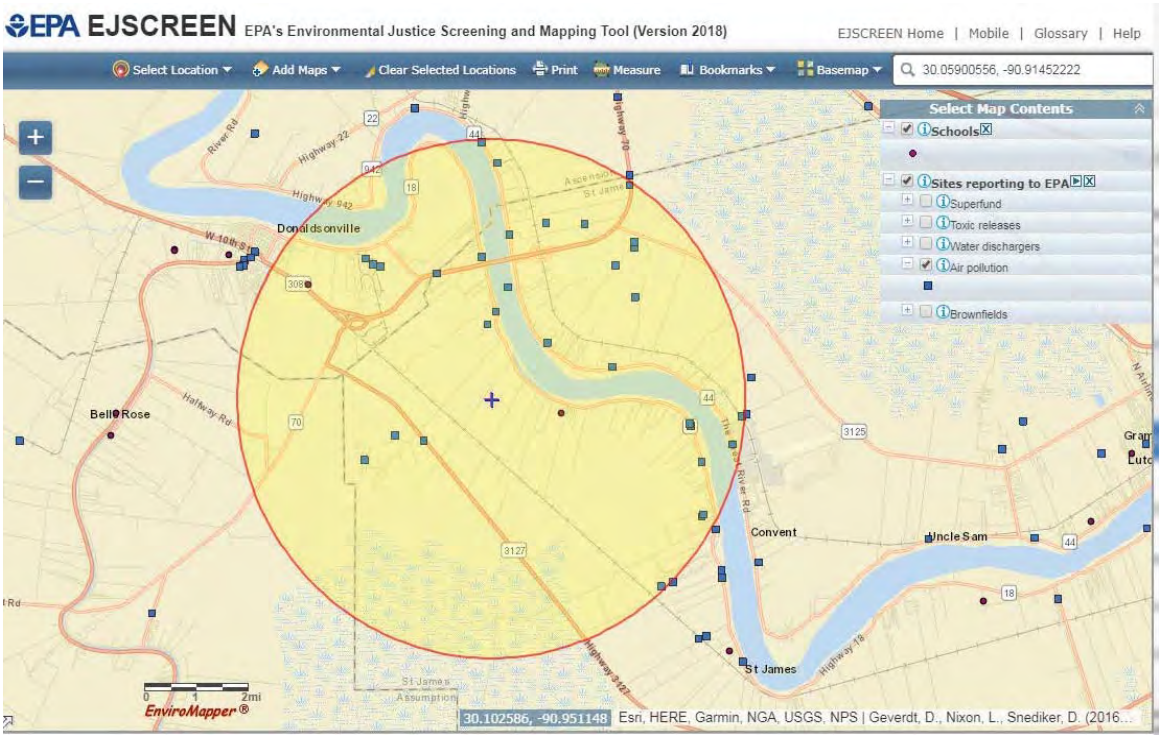
African-American church and the Fifth Ward Elementary school, which are both within a mile of the proposed facility.

Just following the enactment of the 2014 Land Use plan, in 2015, Formosa and the Louisiana Department of Economic Development partnered in the effort that led choosing the current proposed site.[283]

Including the churches and schools on the map would have created an opportunity for public input on the location of major industrial facilities like the proposed facility. *Id.* Instead, excluding the churches and schools left the predominantly minority communities surrounding the proposed facility vulnerable to industrial pollution, as FG partially relies on the incomplete buffer zone map to justify building the proposed facility in these communities. *Id.*; Supplemental EAS, Ex. R.

B. Major Sources of Air Pollution Are Clustered in the Minority Community Surrounding the Proposed Site.

There are already significant documented impacts to public health and environment of the communities surrounding the proposed facility. The area immediately surrounding the proposed plant is home to dozens of sources of industrial pollution. *See* EPA EJScreen Map of sites reporting to EPA below.



[283] Formosa Initial EAS, July 18, 2018, p. 36.

Indeed, four of the top five toxic chemical releasers in St. James Parish are within four miles of the proposed site, and nearby Donaldsonville is among the 50 most toxin-producing cities in the United States. *See* Attach. N, 2017 TRI Factsheet for St. James Parish; *see* https://blog.odetoclean.com/the-united-states-of-toxins-1e219e5a701f. Moreover, St. James Parish ranks number 56 in total releases per square mile against more than 2,300 ranked counties in the United States. *See* TRI National Analysis Interactive Map, https://www.epa.gov/trinationalanalysis/where-you-live.

Following are just some of the major local sources of air pollution that are already permitted by LDEQ.

- CF INDUSTRIES NITROGEN LLC, AI 2416, located 39018 Highway 13089, Donaldsonville, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS Doc ID 11584844, p. 9 of 170.[284] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	673.58
PM2.5	646.07
SO_2	23.40
NOx	4507.88
CO	2598.73
VOC	267.87

Acetaldehyde	9.99
Methanol	4697.47
Ammonia	2.00
Formaldehyde	253.32
Nitric Acid	107.66

(plus other hazardous air pollutants)
Total toxic air pollutant total – 5,061.88

CF Industries released 4,250.76 tons (8,501,522 pounds) of toxic pollutants into the air in 2017.[285] These pollutants included ammonia, chlorine, formaldehyde, methanol, and nitric

[284] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11584844&ob=yes&child=yes

[285] *See* U.S. Environmental Protection Agency, *TRI Facility Report: CF INDUSTRIES NITROGEN LLC (70346CFNDSHWY30)*, EPA (July 1, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=70346CFNDSHWY30.

acid.[286]

- AMERICAS STYRENICS LLC, AI 2384, located 9901 Highway 18, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS Doc ID 10661289, p. 4 of 131.[287] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	120.08
PM2.5	112.59
S02	28.63
NOx	938.45
CO	1,121.11
VOC	203.63

Total toxic air pollutants - 115.29

America's Styrenics released 58.84 tons (117,673 pounds) of toxic pollutants into the air in 2017.[288] These pollutants included benzene, ethylbenzene, ethylene, styrene, and toluene.[289]

- MOSAIC PHOSPHATES CO FAUSTINA PLANT, AI 2425, located at 9959 Hwy 18, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 10959649, p. 8 of 83.[290] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	413.25
PM2.5	407.68
S02	4.69
NOx	22.56
CO	18.41

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[286] *Id.*

[287] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=10661289&ob=yes&child=yes

[288] *See* U.S. Environmental Protection Agency, *TRI Facility Report: AMERICAS SYTRENICS LLC(70086CHVRNHWY18)*, EPA (July 1, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=70086CHVRNHWY1.

[289] *Id.*

[290] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=10959649&ob=yes&child=yes

VOC 3.53
Total toxic air pollutants – 1,780.39 (over 1,675 for ammonia)

Mosaic Phosphates released 316.50 tons (632,994 pounds) of toxic pollutants to the air in 2017.[291] These pollutants included ammonia and methanol. *Id*.

- PLAINS MARKETING, LP / ST. JAMES TERMINAL, AI 129733, 6410 Plains Terminal Road, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 11698397, p. 8 of 119.[292] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	3.70
PM2.5	3.70
S02	2.65
NOx	76.78
CO	112.18
VOC	253.27

- NUSTAR LOGISTICS, LP / ST. JAMES TERMINAL, AI 36538, located 7167 Koch Road, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 11269341, p. 5 of 85.[293] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	13.47
S02	24.34
NOx	95.26
CO	95.94
VOC	361.87

[291] *See* U.S. Environmental Protection Agency, *TRI Facility Report: MOSAIC PHOSPHATES CO FAUSTINA PLANT(70346GRCCHLAHIG)*, EPA (July 1, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=70346GRCCHLAHIG.

[292] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11698397&ob=yes&child=yes

[293] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11269341&ob=yes&child=yes

- MARATHON PIPELINE COMPANY, LP / ST. JAMES CAPLINE TERMINAL, AI 9292, located 6770 Highway 18, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 10532767, p. 2 of 349.[294] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	0.30
PM2.5	0.30
S02	0.28
NOx	4.23
CO	0.91
VOC	207.22

- AIR PRODUCTS & CHEMICALS, INC. (APCI) / CONVENT HYDROGEN PLANT, AI 120995, located 10759 Convent Way (LA Hwy 70 at Hwy 44) Convent, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 10003138, p. 3 of 15.[295] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	27.84
PM2.5	27.84
SO_2	0.34
NOx	87.03
CO	63.45
VOC	41.97

Total toxic air pollutants – 27.73 (19.01 for ammonia and 7.94 for methanol)

Air Products & Chemicals/Convent Hydrogen Plant released 8.05 tons (16,107 pounds) of methanol into the air in 2017.[296]

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[294] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=10532767&ob=yes&child=yes

[295] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=10003138&ob=yes&child=yes

[296] *See* U.S. Environmental Protection Agency, *TRI Facility Report: AIR PRODUCTS & CHEMCIALS INC – CONVEN SMR (70723RPRDC1759C)*, EPA (July 2, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=70723RPRDC1759C.

- MOTIVA CONVENT REFINERY, AI 2719, located at the foot of Sunshine Bridge – LA Highway 44, Convent, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 11274238, p. 7 of 193.[297] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	752.23
PM2.5	710.10
S02	1175.25
NOx	2177.23
CO	1511.09
VOC	1963.14
H2SO4	262.21

Total toxic air pollutants – 933.48

Motiva Convent Refinery released more than 361.57 tons (723,145 pounds) of toxic air pollutants into the air in 2017.[298]

- NUCOR STEEL LOUISIANA –DRI Plant, AI 157847, located 9101 Highway 3125, Convent, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 11715097, p. 6 of 65.[299] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	163.18
PM2.5	109.26
S02	28.34
NOx	159.43
CO	1216.33
VOC	42.17
CO2e	908,956.00

Total toxic air pollutants – 48.71

[297] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11274238&ob=yes&child=yes

[298] *See* U.S. Environmental Protection Agency, *TRI Facility Report: CONVENT REFINERY (70723TXCRFFOOTO)*, EPA (July 2, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=70723TXCRFFOOTO.

[299] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11715097&ob=yes&child=yes

Nucor Steel Louisiana released 8.09 tons (16,180 pounds) of ammonia into the air in 2017.[300]

- OCCIDENTAL CHEMICAL CORPORATION (OXYCHEM) / OXYCHEM - CONVENT FACILITY, AI 3544, located 7377 Highway 3214, Convent, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 10727936, p. 5 of 81.[301] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	22.93
PM2.5	21.99
S02	1.10
NOx	432.96
CO	34.91
VOC	27.07

Total toxic air pollutants - VOC TAPs – 14.34, Non-VOC TAPs 9.52

Oxychem-Convent Facility released 5.94 tons (11,885 pounds) toxic air pollutants into the air in 2017, which include: 1,1,2-trichloroethane, 1, 2-dichloroethane, 1,3-dichlorobenzene, ammonia, asbestos, bis(2-chloroethyl) ether, carbon tetrachloride, chlorine, chloroethane, dioxin and dioxin-like compounds, ethylene, ethylidene dichloride, hydrochloric acid, lead compounds, methanol, naphthalene, sulfuric acid, tetrachloroethylene.[302]

- TRANSCONTINENTAL GAS PIPELINE COMPANY, LLC-COMPRESSOR STATION, AI 7129, located 8797 Helvetia Street, Convent, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 9396832, p. 5 of 36.[303] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

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[300] *See* U.S. Environmental Protection Agency, *TRI Facility Report: NUCOR STEEL LOUISIANA LLC (7072WNCRST911HW)*, EPA (July 2, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=7072WNCRST911HW.

[301] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=10727936&ob=yes&child=yes

[302] *See* U.S. Environmental Protection Agency, *TRI Facility Report: OCCIDENTAL CHEMCIAL HOLDING CORP (70723CCDNTHIGHW)*, EPA (July 1, 2019), https://enviro.epa.gov/enviro/tris_control_v2.tris_print?pPrev=1&tris_id=70723CCDNTHIGH.

[303] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=9396832&ob=yes&child=yes

PM10	6.74
PM2.5	6.74
S02	0.58
NOx	3,005.63
CO	487.69
VOC	95.90

Total toxic air pollutants – 48.59 (36.00 for formaldehyde)

- YUHUANG CHEMICAL, AI 194165, located 5327 St. James Co-Op Street, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS Doc ID 10898624, p. 4 of 36.[304] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	0.29
PM2.5	0.29
S02	0.02
NOx	3.81
CO	3.20
VOC	14.78

Total toxic air pollutants – 14.64 (14.57 for methanol)

- SOUTH LOUISIANA METHANOL / ST. JAMES METHANOL PLANT, AI 188074, located at 7719-1 Highway 18, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ allows this facility to emit per year pursuant to an air permit. EDMS ID 11552176, p. 10 of 64.[305] According to the Air Permit Briefing Sheet, the permit allows the following criteria pollutants expressed in tons per year:

PM10	125.02
PM2.5	121.11
S02	10.18
NOx	221.62
CO	273.17
CO2e	1,389,582.00

Acetaldehyde	9.99
Methanol	26.16

[304] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=10898624&ob=yes&child=yes

[305] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11552176&ob=yes&child=yes

Ammonia	91.45
Formaldehyde	1.28
n-Hexane	29.94

(plus other hazardous air pollutants)
Total toxic air pollutants – 159.74

- ERGON MODA, AI 212862, located 7405 Highway 18, St. James, La.

The Air Permit Briefing Sheet for the facility shows the types and amounts of air pollutants that LDEQ would allow this facility to emit per year if it chose to issue the pending air permit. EDMS Doc ID 11330775, p. 4-5 of 155.[306] According to the Air Permit Briefing Sheet, the permit would allow the following criteria pollutants expressed in tons per year:

NOx	0.65
CO	0.02
VOC	50.27

Benzene	0.05
n-Hexane	1.43
Ammonia	4,697.47
Toluene	0.04

Total toxic air pollutants – 1.55

Moreover, more than half of these facilities have committed permit violations, and the Motiva Convent Refinery has a repeat history of violations. *See*, *e.g.*, EDMS IDs 2598025, 5361012, 8709749, 2369890, 3049445, 5526992, 2687434, 2369488, 5915560, 1836695. The emissions of these existing facilities as reported to the TRI and their permit violations, coupled with the high incidence of pollution-related disease in the Parish, suggest background ambient air pollutant concentrations may be elevated. *See* National Cancer Institute State Cancer Profiles, https://statecancerprofiles.cancer.gov; *see* Cancer in Louisiana, http://sph.lsuhsc.edu/wp-content/uploads/2018/10/Vol33.pdf. While FG argues in its Supplemental EAS that cancer incidence rates in Louisiana's Industrial Corridor (comprised of Ascension, East Baton Rouge, Iberville, St. Charles, St. James, St. John the Baptist, and West Baton Rouge parishes) do not differ significantly from rates in the rest of Louisiana for white men, black men, and black women, FG ignores the fact that these groups' cancer incidence rates in St. James parish alone are significantly higher than in rest of Louisiana. *See id*. at 52, 58, 61. Permitting yet another major source of air pollution in the minority communities of Welcome, Salsburg, Central, White Hall, and Union would further exacerbate the disproportionate adverse impacts to those communities.

[306] http://edms.deq.louisiana.gov/app/doc/view.aspx?doc=11330775&ob=yes&child=yes

C. Purported Compliance with NAAQS or Other Standards Does Not Constitute per se Environmental Justice Compliance.

Formosa claims that by meeting the NAAQS, "there is no adverse impact and no claim on non-compliance with Title VI." Formosa EAS, July 18, 2018, EDMS 11230529. But EPA has recognized that "[c]ompliance with environmental laws does not constitute per se compliance with Title VI." Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs (Draft Recipient Guidance) and Draft Revised Guidance for Investigation Title VI Administrative Complaints Challenging Permits (Draft Revised Investigation Guidance), 65 Fed. Reg. 39649, 39650-01 (June 27, 2000). EPA explained that "[f]requently, discrimination results from policies and practices that are neutral on their face, but have the effect of discriminating . . . [T]here may be instances in which environmental laws do not regulate certain concentrations of sources, or take into account impacts on some subpopulations which may be disproportionately present in an affected population." *Id*. at 39680.

Additionally, EPA's most recent environmental justice guidance document eliminates the rebuttable presumption that compliance with NAAQS shields a federally-funded permitting authority from being found in violation of Title VI. Draft Policy Papers Environmental Health-Based Thresholds, and Role of Complainants and Recipients in the Title VI Complaints and Resolution Process, 78 Fed. Reg. 24739 (April 26, 2013.)[307] The EPA has made clear that it will consider "the existence of hot spots, cumulative impacts, the presence of particularly sensitive populations that were not considered in the establishment of the health-based standard, misapplication of environmental standards, or the existence of site-specific data demonstrating an adverse impact despite compliance with the health-based threshold." *Id*. at 24742.

There is no doubt that the communities and areas surrounding Welcome, Salsburg, Central, White Hall, and Union are hot spots for harmful air emissions that result from the dense industrial activities that LDEQ has permitted for the area. These permitted emissions have a cumulative adverse impact that disproportionately affects minorities.

[307] The EPA recognizes this 2013 draft guidance as its current Title VI policy. *See* U.S. Environmental Protection Agency, *EPA's Title VI – Policies, Guidance, Settlements, Laws and Regulations* (Apr. 20, 2016), https://www.epa.gov/ocr/epas-title-vi-policies-guidance-settlements-laws-and-regulations (last visited Aug. 12, 2019).

CONCLUSION

For the foregoing reasons and for the reasons expressed by Dr. Sahu,[308] Todd Cloud,[309] the Sierra Club,[310] and Healthy Gulf,[311] Commenters urge LDEQ to deny the proposed PSD and Title V permits for Formosa's planned chemical complex in St. James, Louisiana.

Commenters reserve their right to raise additional issues and submit additional evidence, and/or adopt as their own the comments submitted by any other group or person in this matter, prior to LDEQ's final decision on the proposed PSD and Title V permits. La. R.S. 30:2014.3 (allowing issues and evidence to be submitted to LDEQ prior to issuance of a final decision).

Respectfully submitted by,

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On behalf of the following:

Anne Rolfes
Executive Director
Louisiana Bucket Brigade

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[308] *See* Attach. E, Sahu Aff., Ex. 1.

[309] *See* Attach. D, Cloud Aff., Ex. 2.

[310] *See* Attach. H, Comments of Sierra Club.

[311] *See* Attach. I, Comments of Healthy Gulf.

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LOUISIANA DEPARTMENT OF ENVIORNMENTAL QUALITY

Proposed Prevention of Significant Deterioration Permit (PSD-LA-812)
14 Proposed Title V Permits (3141-V0 through 3154-V0)
Associated Environmental Assessment Statement

FG LA Chemical Complex (AI 198351)
Welcome, St. James Parish, Louisiana
Activity Nos.: PER20150001 through PER20150015

AFFIDAVIT OF JUSTIN KRAY

I, Justin Kray, state:

1. I am a person above the age of majority who is competent to make this affidavit. I have personal knowledge of the statements made below.

2. I reside in New Orleans, Louisiana. I graduated in 2007 from the Pratt Institute with a Master's Degree in City and Regional Planning. I am a planner and cartographer, with an expertise in geographic information system (GIS) mapping and urban data science. I have extensive experience in developing data sets from property and other public records and turning them into maps and reports that are useful for understanding policy problems.

3. I have worked for the Louisiana Bucket Brigade on issues affecting communities in St. James Parish. In the course of this work, I have made many trips to St. James to interview residents and officials, research property records, and study local land uses. I have also conducted extensive public-records research concerning St. James Parish's property records and the work of the Parish on land-use planning.

4. Attached as "Exhibit 1," is a true and correct copy of a map I created as part of my work in St. James. It is entitled, "New and Existing Industrial Facilities St James." I created this map primarily from underlying public records data from St. James Parish, the Port of South Louisiana, and the U.S. Department of Agriculture. The map generally reflects the property boundaries of proposed and existing industrial uses in the Parish, as compared to agricultural, residential, and undeveloped uses.

5. Attached as "Exhibit 2," is a true and correct copy of the report, "A Plan without People," that I co-authored concerning St. James Parish's land-use planning process. I produced the maps included within the report, using maps already included in the Parish's draft 2011 land-use plan prepared by South Central Planning & Development Commission, the Parish's 2014 land-use plan, information from site-visits and interviews, and public records of property and land-use data.

[Signature Block Follows on Next Page]

I hereby certify under penalties of perjury that the foregoing representations are true to the best of my knowledge.

Justin Kray Date 8/9/19

State of Louisiana
Parish of Orleans

Sworn to and subscribed before me on 8/9/19
Date

by Corinne Van Dalen
Notary Public (print)

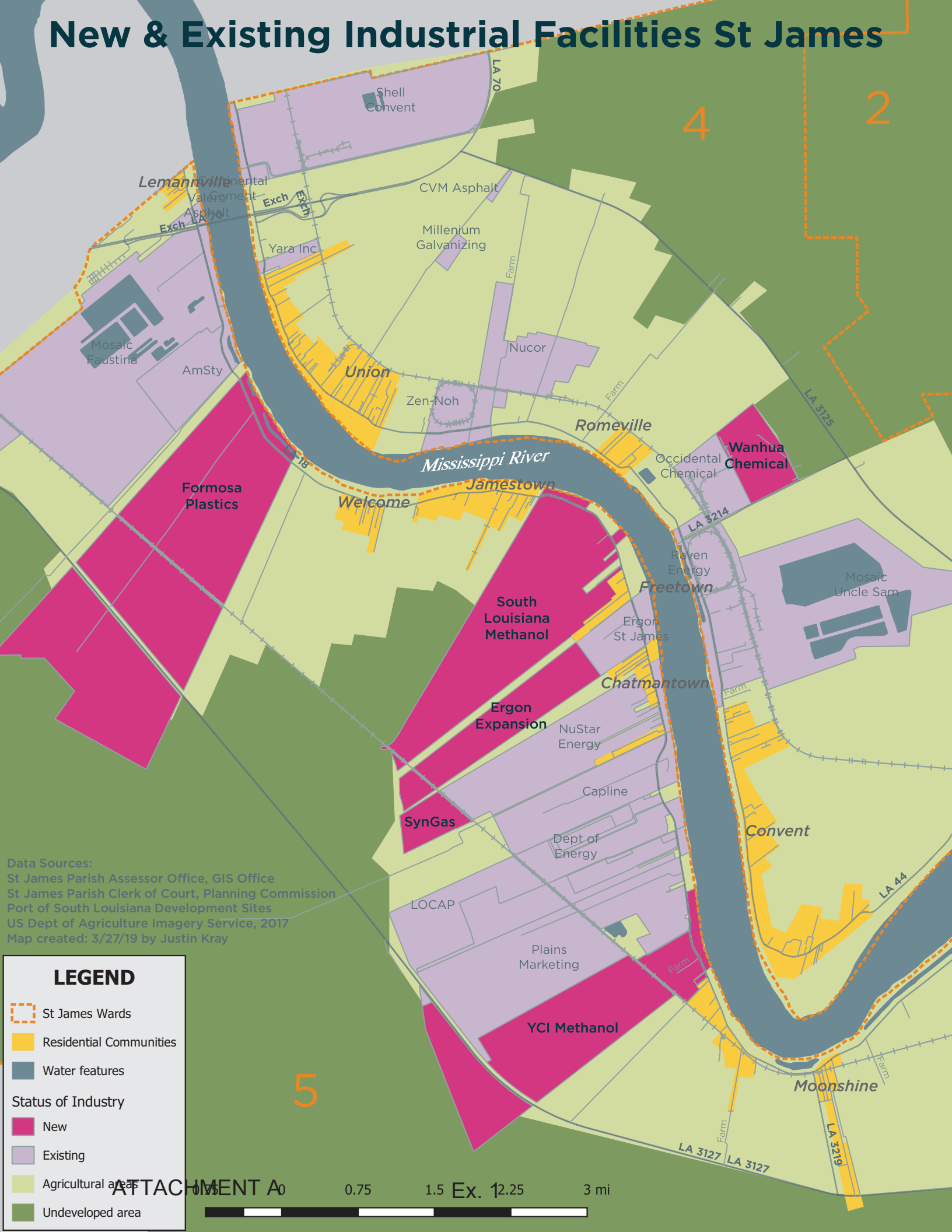
Signature of Notary Public

My commission expires upon death

CORINNE VAN DALEN
NOTARY PUBLIC
BAR ROLL # 21175, NOTARY ID # 33834
STATE OF LOUISIANA
MY COMMISSION IS FOR LIFE

ATTACHMENT A

New & Existing Industrial Facilities St James



Data Sources:
St James Parish Assessor Office, GIS Office
St James Parish Clerk of Court, Planning Commission
Port of South Louisiana Development Sites
US Dept of Agriculture Imagery Service, 2017
Map created: 3/27/19 by Justin Kray

LEGEND

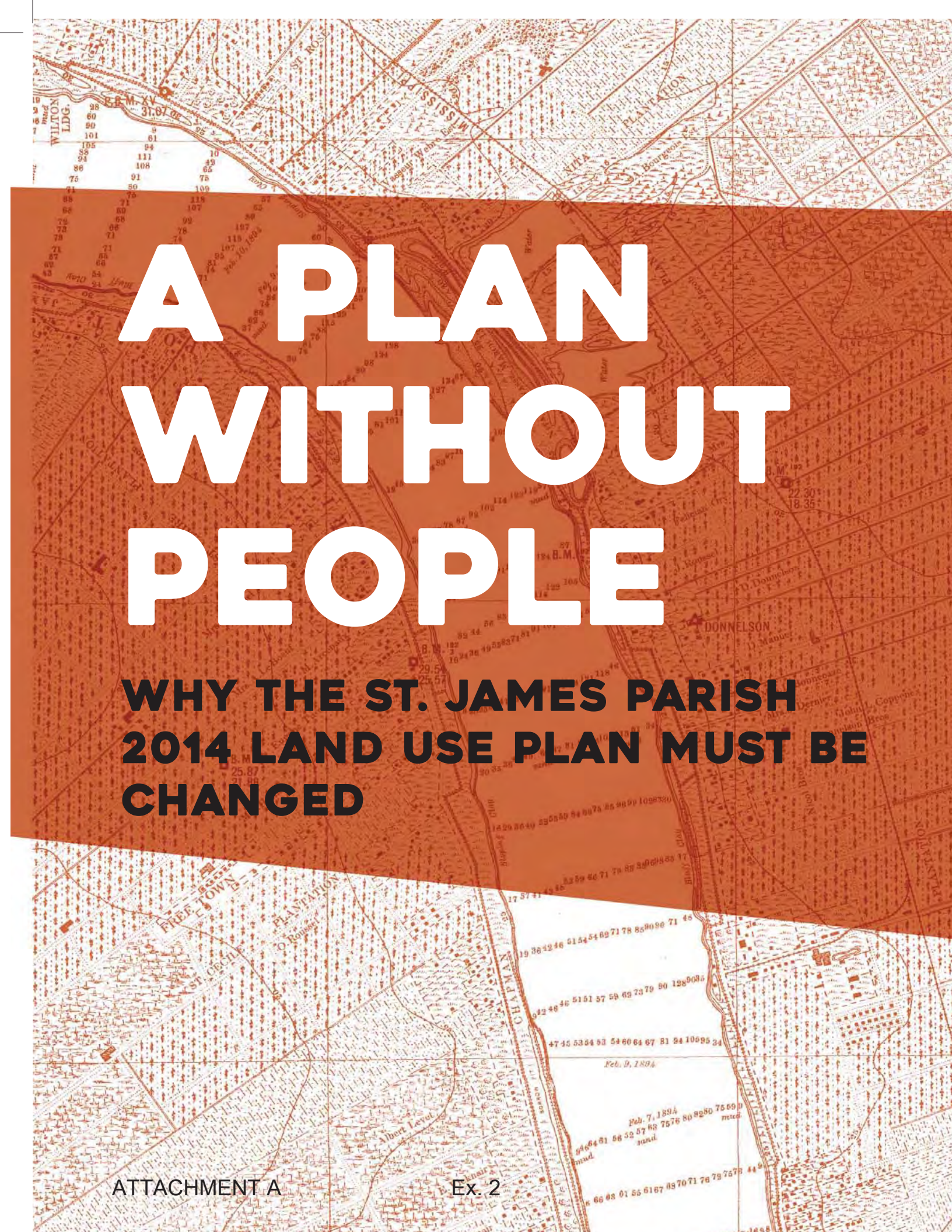
- St James Wards
- Residential Communities
- Water features

Status of Industry

- New
- Existing
- Agricultural areas
- Undeveloped area

0 0.75 1.5 2.25 3 mi

ATTACHMENT A Ex. 1



A PLAN WITHOUT PEOPLE

WHY THE ST. JAMES PARISH 2014 LAND USE PLAN MUST BE CHANGED

ATTACHMENT A Ex. 2

"I HAVE TWO PLANTS - ONE IN MY FRONT DOOR, ONE IN MY BACK DOOR - AND ST. JAMES PARISH 4TH DISTRICT IS THE ONLY PLACE I'VE EVER LIVED IN MY LIFE. AND IT'S LIKE A SLAP IN THE FACE FROM OUR POLITICIANS TO COME IN AND JUST LET ALL THESE PLANTS COME IN AND TAKE OUR LIVES. I HAVE WATCHED TOO MANY OF MY RELATIVES TO DIE FROM CANCER."

— Myrtle Felton, March against Death Alley, Governor John Bel Edward's Office, 6.3.19

Cover: Chart No 71, Survey of the Mississippi River, the Mississippi River Commission (1877)
Map Division, New York Public Library, NY, NY

Produced by RISE St. James and the Louisiana Bucket Brigade
Written by Anne Rolfes and Justin Kray
Researched by Justin Kray, Anne Rolfes and Kate McIntosh
Maps created by Justin Kray
Edited by Milton Cayette, Myrtle Felton, Harry Joseph, Sharon Lavigne, Gail LeBoeuf, Kate McIntosh and Barbara Washington

Thank you to the members of the Solidaire Network for funding this project.
Design and layout by Design Action Collective.

"I ENVISION ST. JAMES PARISH AS A PARISH OF FAMILIES AND FRIENDS. A PLACE TO LIVE, HAVE FUN AT FESTIVALS, FAMILY GATHERINGS. I DO NOT ENVISION ST. JAMES PARISH AS A PLACE FOR CHEMICALS."

— Ophelia Williams, St. James Parish Council meeting, 1.23.19

The 2014 St. James Parish Land Use Plan has paved the way for massive industrial development of St. James Parish, drastically changing the future for thousands of residents living in these historic communities.

The Parish government is steering industry into the 4th and 5th Districts and subjugating the interests of residents. In the 5th District, the communities under threat include Lemanville, Welcome, Freetown, Chatmantown, Barris, and Moonshine. In the 4th District, the communities of Union, Romeville, Convent and White Hall are on the chopping block.

If changes are not made, the St. James Parish Land Use Plan will bring massive industrial pollution to the entire parish and eliminate two of the three majority African American districts in St. James Parish within the next decade. **The purpose of this report is to prevent the destruction of the parish, especially the 4th and 5th Districts, and to expose the secretive way that the 2014 Land Use Plan was made.**

ATTACHMENT A Ex. 2

The stated reason for concentrating industry in the 4th and 5th Districts is that the population is dwindling and there is little new residential construction.[1] This description by parish officials fails to acknowledge the active role that the parish is playing by disinvesting in these communities while at the same time concentrating polluting industry there.

The parish is closing services - schools, a post office, and even an evacuation route – in the 4th and 5th Districts. The parish claims it cannot find funding for community services while permitting billions of dollars of new industrial construction. The Land Use Plan restricts what people can do with their property, limiting the subdivision and sale of residential property to family members. With restrictive laws, lack of services and an industrial onslaught, the Parish is making these areas uninhabitable.

"Now we're here in the Governor's office to have a plea with him, to let him know how we feel and to plea upon his heart. To let him know we are here, and we want him to play an integral part in dealing with the emissions and stopping more petrochemical plants and industries."

— Stephanie Cooper, March against Death Alley, 6.3.19

ST. JAMES PARISH DEMOGRAPHICS

	5th District	4th District	St. James Parish
Total Population	2,243	2,262	21,367
Black (%)	90%	64%	50%
White (%)	8%	36%	49%
Median Household Income	$30,263	$45,469	$52,055
Persons in poverty (%)	31.1%	26.0%	15.6%
Children in poverty (%)	61.2%	47.2%	25.5%

Source: US Census Bureau, American Community Survey 2017

RESIDENTIAL FUTURE INDUSTRIAL?

At the heart of the St. James Parish 2014 Land Use Plan is a category that makes no sense: Residential / Future Industrial. This category was used only in the 4th and 5th Districts. The purpose of land use is to protect people, to separate residential and industrial uses.

Not only does the category Residential / Future Industrial fail to protect 4th and 5th District residents, it targets these districts, facilitating an industrial takeover that threatens their health and renders their homes worthless.

1. *Justin Kray in conversation with Parish Attorney Victor Franckiewicz 3/22/19.*

REPORT FINDINGS

FINDING #1: THE 2014 LAND USE PLAN IS DECEPTIVE.

Talk to people in the 4th and 5th Districts, and they will tell you they were completely uninformed about the plan to industrialize their neighborhoods. Blaise Gravois, indicted in 2016 for actions benefitting private industry, is now Director of Operations and routinely chairs the parish Planning Commission meetings.[2] He claims that people in the 4th and 5th Districts requested the changes to the land use map.[3] But people in these districts will tell you that this designation is unwanted and was a complete surprise. **Who would support the conversion of their neighborhood to polluting industry?**

At the heart of the matter are two different land use plans: the "Comprehensive Plan 2031" which was published in 2011 by the South Central Planning and Development Commission but never introduced and passed as a land use plan, and the 2014 Land Use Plan which was adopted by the Parish Council.

Those who defend the 2014 Land Use Plan claim that there was an exhaustive public process for the plan. In truth, there is conflation between the 2011 planning process and the 2014 plan. If the 2011 and 2014 plans were the same, that would be fine. But the plans are not the same. There are significant changes between the 2011 and 2014 plans, and it is unreasonable to claim that the 2014 plan was publicly vetted under the 2011 process.

This conflation was cemented by the preamble to the 2014 Parish Land Use Plan:

> "WHEREAS, the Planning Commission review committee worked with the draft plan in detail, with a strong emphasis on the future land use plan as a tool for guiding the long term development of St. James Parish, and that committee recommended to the full Planning Commission a future land use plan **substantially similar** to the plan proposed in the draft comprehensive plan, and the committee also recommended regulations to implement the future land use plan;"[4]

CHANGES IN THE PLAN:

- Areas in the 4th and 5th Districts which were designated as "Residential" in 2011 are changed to "Residential / Future Industrial" in 2014.
- There are new restrictions on subdividing residential property within Residential / Future Industrial areas.
- The plan includes a buffer map that acknowledges and protects schools and churches in some parts of the parish while ignoring and omitting churches and schools in the 4th and 5th Districts.

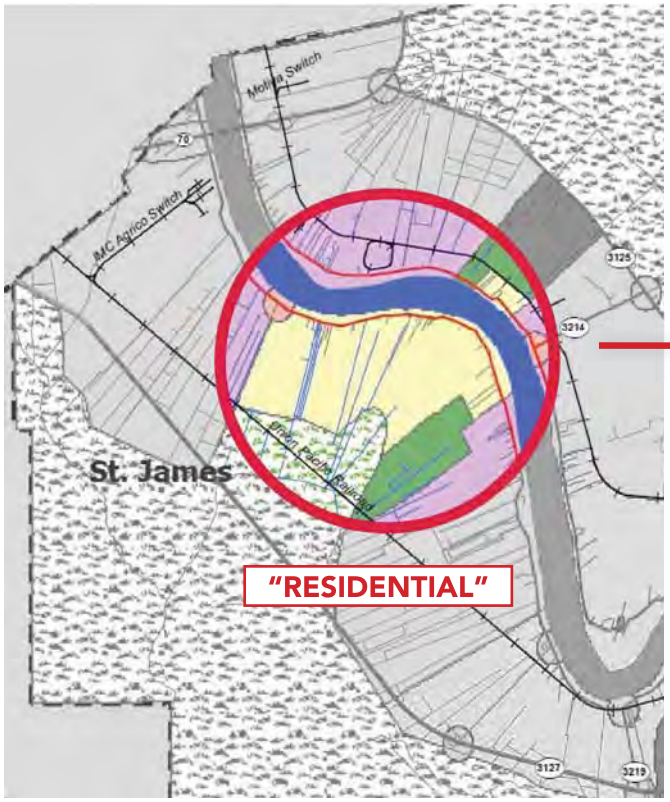
"If you ride around the parking lot you will see a license plate from every state except Louisiana. If you have five people that's working in the area at these plants, it is a miracle. But they keep saying they gonna give us jobs."

— Rita Cooper, FaceBook Live 12.17.18

2. *Mitchell, David J. "Top official in St. James Parish pleads not guilty to malfeasance charge." The Advocate, November 14, 2016.*
3. *Justin Kray telephone conversation with Blaise Gravois 12/20/2018.*
4. *St. James Parish Council Proposed Ordinance 14-03, 3/5/2014*

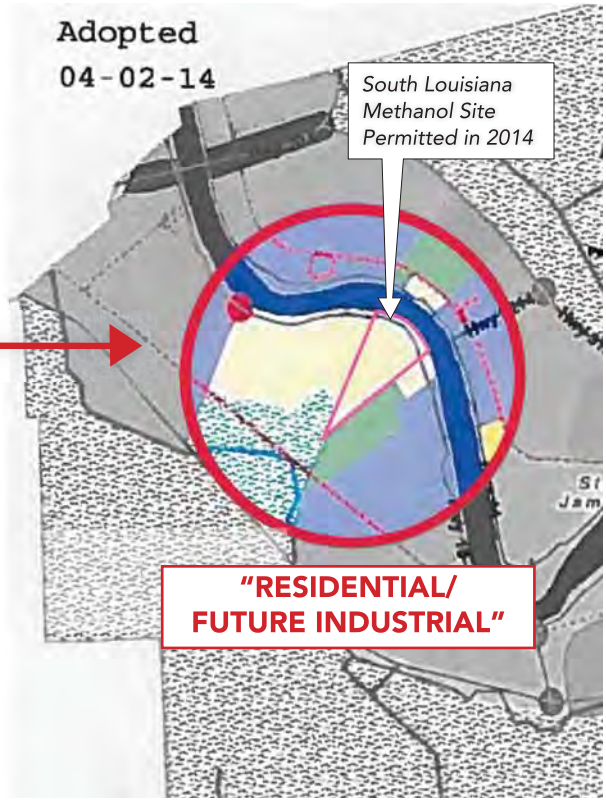
SAME COLOR - OPPOSITE MEANINGS

2011 PLAN (DRAFT)



2031 Comprehensive Plan (Draft dated 6/27/2011 authored by SCPDC)

2014 PLAN (OFFICIAL)



2014 Generalized Future Land Use Plan, dated 11/20/2013 (officially adopted by Parish Ordinance 14-03 on 4/2/2014)

This new Residential / Future Industrial category is deceptively similar on the 2014 map, represented in the same yellow/beige color that was Residential on the 2011 map.

FINDING #2: THE PROCESS FOR CREATING THE 2014 LAND USE PLAN WAS SECRETIVE AND RUSHED.

How did the Comprehensive Plan from 2011 become the 2014 Land Use Plan?

Public records requests for documents related to the process – including committee members, meeting dates & minutes, email correspondence – have turned up no results. There is simply nothing in the public record that shows how the decision was made to de-map longstanding residential communities.[5]

What we do know is that the process was rushed. The plan was introduced to the Planning Commission on November 20, 2013 and passed on April 2, 2014. There were two public hearings, but these were held within a two week span **after** the final plan had already been introduced by the St. James Parish Council. At the beginning of the first hearing in Vacherie, Council Chair Ketchens stated that "It's not a question and answer..." session.[6] Residents could voice their opinions but would get no answers. The plan was approved immediately after the second hearing in Convent.

Contrast this quick and secretive process with the year-and-a-half long, transparent planning that created the 2011 Comprehensive Plan.

PROCESS FOR THE 2011 COMPREHENSIVE PLAN	PROCESS FOR THE 2014 LAND USE PLAN
Seventy page report on the process and purpose of the plan: St. James Parish Government Comprehensive Plan 2031	Revised plan approved by Planning Commission on 11/20/13. No minutes available.
Nineteen Steering Committee Members created the plan (St. James Parish Government Comprehensive Plan 2031, p. 1)	Steering committee dissolved in 2012. No record of how plan revisions were created.[7]
Outreach about the plan to the community via flyers, personal invitations at civic meetings and letters to ministers (St. James Parish Comprehensive Plan 2031, p. 7)	No outreach about the plan
Nine public meetings and additional focus groups held over a 10 month span (St James Parish Government Comprehensive Plan 2031 p. 9-10)	Two public meetings in two weeks
Over 400 residents attended (St. James Parish Government Comprehensive Plan 2031, p. 7)	18 people attended the hearings; five were against it or asked for a delay (Minutes, 3.5.14 hearing and 4.2.14 St. James Parish Council Meeting).
"The St. James Comprehensive Plan evolved over an 18 month period." (St. James Parish Government Comprehensive Plan 2031, p. 6)	Five months from introduction at the planning commission to passage by the council

5. *Public Records Request. St. James Parish. 1/14/19, 2/5/19, 2/19/19, 2/28/19*
6. *St. James Parish Council. Proceedings of Public Hearing on the 2014 Land Use Plan. March 19, 2014.*
7. *Justin Kray telephone conversation with Blaise Gravois 5/22/19.*

TWO URGENT QUESTIONS:

Who resurrected the plan?

Who changed the plan?

There is no information in the public record about who restarted the process or who was involved in this change that resulted in the industrialization of the 4th and 5th Districts.

Barbara Washington lives in the 4th District, on the east bank of the Mississippi River near Occidental, Mosaic, and the proposed Wanhua chemical plant. She spoke at a rally of Cancer Alley communities in the Tchoupitoulas Chapel in St. John Parish. Here's what Ms. Washington said to the crowd.

"I started coming to the [RISE St. James] meetings on the east and the west bank [of the Mississippi River]. But the people were fearful and fear is torment. God has not given us the spirit of fear but of love, power and a sound mind.

My relatives work at the plants. But in the last ten years I sat down and wrote about 50 people that I know personally has died of cancer, my sister being one of them. She was 57 years old and she had metastatic lung cancer. And my prayer partner who went on to glory. She died from cancer.

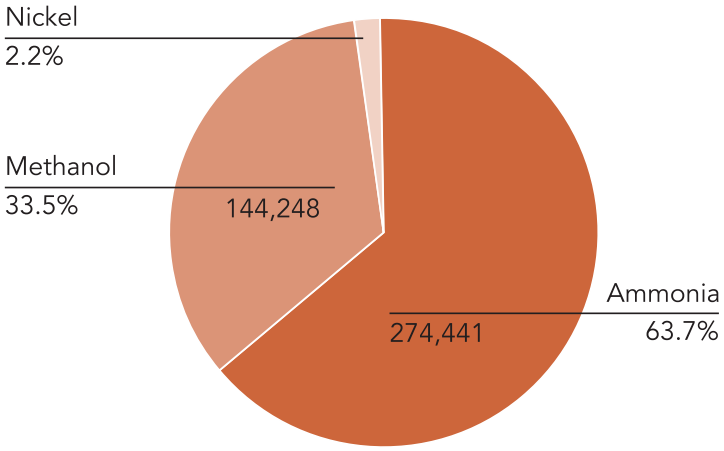
I get flak for this work I do. And I don't want this fight. I didn't want this fight. But every time I try to say I ain't fighting, my old ancestors' spirits rise up in me and say, "You've got to fight, you've got to fight."

My great-great-grandmother came out from slavery, and in 1874 she purchased 34 acres of land that is still in our family today. I can't just sit down and let industry come in and do this to us. It just can't happen. So I'm fighting. I'm fighting, and I'm going to keep on fighting.

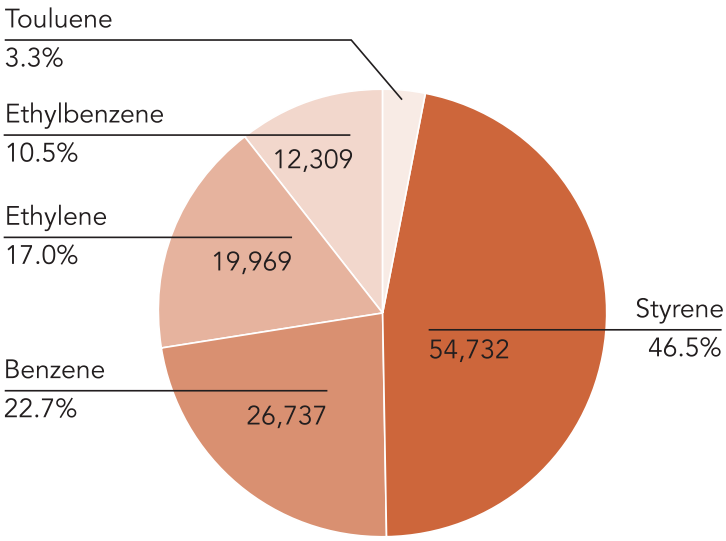
James Earl Jones said, his Daddy told him, "If you see a good fight, jump in."

I see a good fight, and I'm in. I'm in."

MOSAIC FAUSTINA PLANT EMISSIONS (POUNDS)



AMSTY EMISSIONS (POUNDS)



Source: "My Right-To-Know Application." EPA. Accessed May 23, 2019. https://www.epa.gov/toxics-release-inventory-tri-program/my-right-know-application.

The 5th District already bears an unfair burden of pollution.

With numerous pipelines, eight operating facilities, two under construction, and four slated for approval, the 5th District is choked with industry. Rampant air pollution is already making it impossible for residents to live healthy lives. Yet more industry moves in every year.

THE MOSAIC COMPANY, FAUSTINA AMMONIA PLANT

The plant released 215 tons of toxic chemicals in 2017 (Toxic Release Inventory).

Imagine the Statue of Liberty (225 tons) standing next to your house, but composed of toxic chemicals that dissipate and pollute the air with every gust of wind.

Ammonia burns the respiratory tract and skin.

Methanol causes nausea, blindness, and seizures.

AMERICAN STYRENICS

In 2017, AmSty emitted **59 tons of toxic chemicals** (Toxic Release Inventory).

Benzene exposure causes cancer and anemia.

Styrene exposure causes chronic fatigue and depression.

"I hate to see the land I grew up on contaminated the way it is. Enough is enough."

— Gail LeBoeuf , Facebook Live, 12.17.18

INDUSTRY IN THE 5TH DISTRICT

CORPORATION	STATUS
The Mosaic Company	Operating
Americas Styrenics	Operating
NuStar, L.P.	Operating
Ergon St. James, Inc.	Major Expansion Pending
Plains Marketing, L.P.	Operating
ExxonMobil Pipeline Company	Operating
Marathon Pipe Line, LLC	Operating
Capline Pipeline Company, LLC	Operating
Bayou Bridge, LLC	Operating
YCI Methanol One, LLC	Under Construction
South Louisiana Methanol	Under Construction
Formosa Plastics Corporation	Proposed
ACE Pipeline	Proposed
Linde Hydrogen Plant	Proposed
Syngas	Proposed

A SNAPSHOT OF OTHER 5TH DISTRICT COMPANIES:

Plains Marketing, L.P: Spilled over 12 million gallons of crude oil in St. James in March of 2017.[8]

Marathon Pipeline, LLC: Throughout the United States, spilled approximately one million gallons of hazardous liquids from its pipelines since 2006.[9]

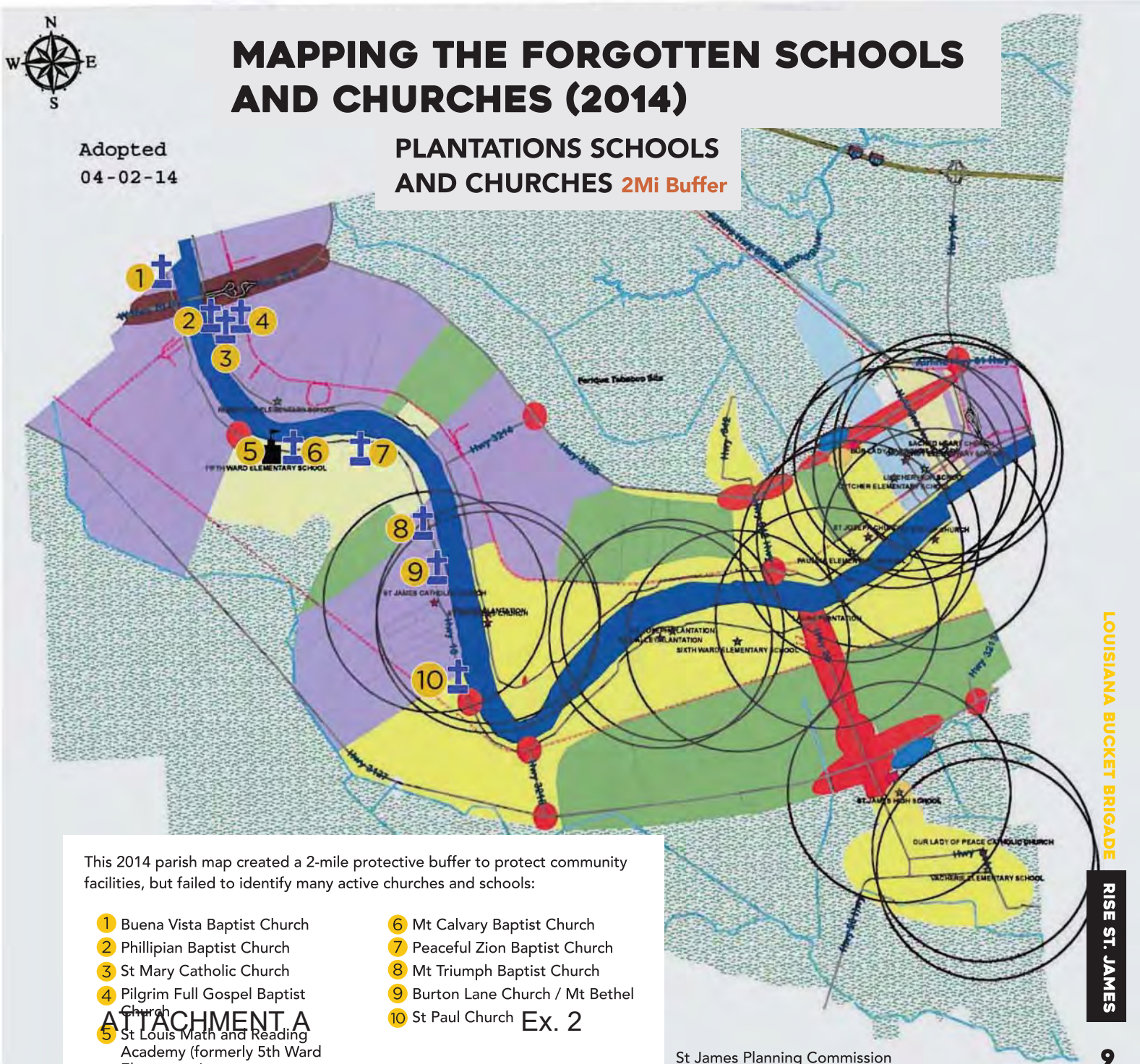
Proposed Formosa (FG): In January, Formosa's Texas plant was cited by the Texas Commission on Environmental Quality for releasing 200 tons of plastic pellets into Lavaca Bay and the Gulf of Mexico.[10]

8. *"2017 Reports." USCG National Response Center. Accessed May 23, 2019. http://nrc.uscg.mil/.*
9. *"Pipeline Incident 20 Year Trends." PHMSA. Accessed February 10, 2019. https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends.*
10. *Luck, Marissa. "Formosa's Texas plant fined $122,000 after plastic pellet spill." The Houston Chronicle, January 18, 2019.*

FINDING #3: AFRICAN AMERICAN INSTITUTIONS AND SERVICES ARE NOT EVEN NOTED IN THE BUFFER ZONE MAPS

This buffer map was adopted alongside the Land Use Plan in 2014. This map identifies areas (within the black circles) where additional review would be required before permitting new industry to locate nearby community facilities. The problem is that **this buffer map fails to include almost every church and school within the 4th and 5th Districts.**

If the schools and churches in the 4th and 5th District had been included, it would have created an opportunity for public input on the location of several major industrial facilities adjacent to



This 2014 parish map created a 2-mile protective buffer to protect community facilities, but failed to identify many active churches and schools:

1. Buena Vista Baptist Church
2. Phillipian Baptist Church
3. St Mary Catholic Church
4. Pilgrim Full Gospel Baptist Church
5. St Louis Math and Reading Academy (formerly 5th Ward Elementary)
6. Mt Calvary Baptist Church
7. Peaceful Zion Baptist Church
8. Mt Triumph Baptist Church
9. Burton Lane Church / Mt Bethel
10. St Paul Church

ATTACHMENT A Ex. 2

St James Planning Commission

residential areas, such as Formosa Plastics and South Louisiana Methanol. These new giant facilities are both within the 2-mile buffer range of Mt Calvary Baptist Church, Peaceful Zion Baptist Church Mt Triumph Baptist Church, and the 5th District Elementary school, now known as St Louis Math and Reading Academy.

Councilman Clyde Cooper represents the Fifth District

His Father was the first African American elected to the parish council, and though outnumbered, he is one parish official who has stood up to the petrochemical industry.

"I'm concerned. I'm a resident. But every time you [the parish council] have to make a pivotal decision when it comes to the black community, we don't get the support. On the Bayou [Bridge] pipeline you didn't vote with us. When it comes to serious stuff that's affecting the black community, when are we going to make the right decision that will help those communities?"

— Councilman Clyde Cooper, St. James Parish Council hearing on Formosa, 12.19.18

DOUBLE STANDARD CASE STUDY: PETROPLEX VS. SOUTH LOUISIANA METHANOL

On April 23, 2014, just twenty days after the St. James Parish Council approved the Land Use Plan, the Planning Commission held a special meeting to consider two applications for new industrial facilities adjacent to residential areas. The applicants:

1. Petroplex International, a company that sought to build a new tank farm in the 6th District.
2. South Louisiana Methanol, a large methanol plant to be built in the 5th District.

Attorney Vic Franckiewicz, who provides legal counsel on land use matters to the Parish, addressed the Commission. From the public record:

"[Franckiewicz] noted that the land purchased by Petroplex was made after the draft land use map was presented to the Planning Commission and the public. He concluded that the facility was in a non-conforming area and therefore, does not have a right to initiate construction without a review […] and an approval from the Parish Council."[11]

The Parish approved both applications, but then fought Petroplex in court to block its permit on the basis that the tank farm was a non-conforming use in a residential area. This reveals a willingness of Parish officials to use the land use plan to steer development away from certain residential areas of the Parish.

By 2018, South Louisiana Methanol (SLM) was in a similar situation to Petroplex in 2014. By that time, the Land Use Plan in that part of the 5th District was amended to residential growth under the leadership of Councilman Clyde Cooper. Property records indicate that SLM did not start buying land for their project until after this change.

South Louisiana Methanol should have been held to the same standard as Petroplex and been considered a non-conforming use in a residential area.

"Why bring more chemical plants in when we're not taking care of what we already have here? Enough is enough. We put you [St. James Parish Councilmembers] in office to take care of people."

— Pastor Harry Joseph, St. James Parish Council Meeting, 12.19.18

11. St. James Planning Commission. Meeting Minutes. April 23, 2014.

ATTACHMENT A Ex. 2

FINDING #4 PARISH PREVENTS INDUSTRY FROM LOCATING IN WHITE NEIGHBORHOODS

Parish officials have kept out two industrial developments near white communities: Wolverine and Petroplex. But the same protection has not been offered to the 4th and 5th Districts.

The parish held two public meetings after the Land Use Plan was introduced. At one of those meetings, Councilman Amato affirmed the need to protect residents from industry.

The residents of District 3, which Councilman Jason Amato seeks to protect, are more than 80% white.[12] The Parish has not demonstrated the same willingness to protect the residents of Districts 4 and 5, which are majority African American (see demographics table on page 4).

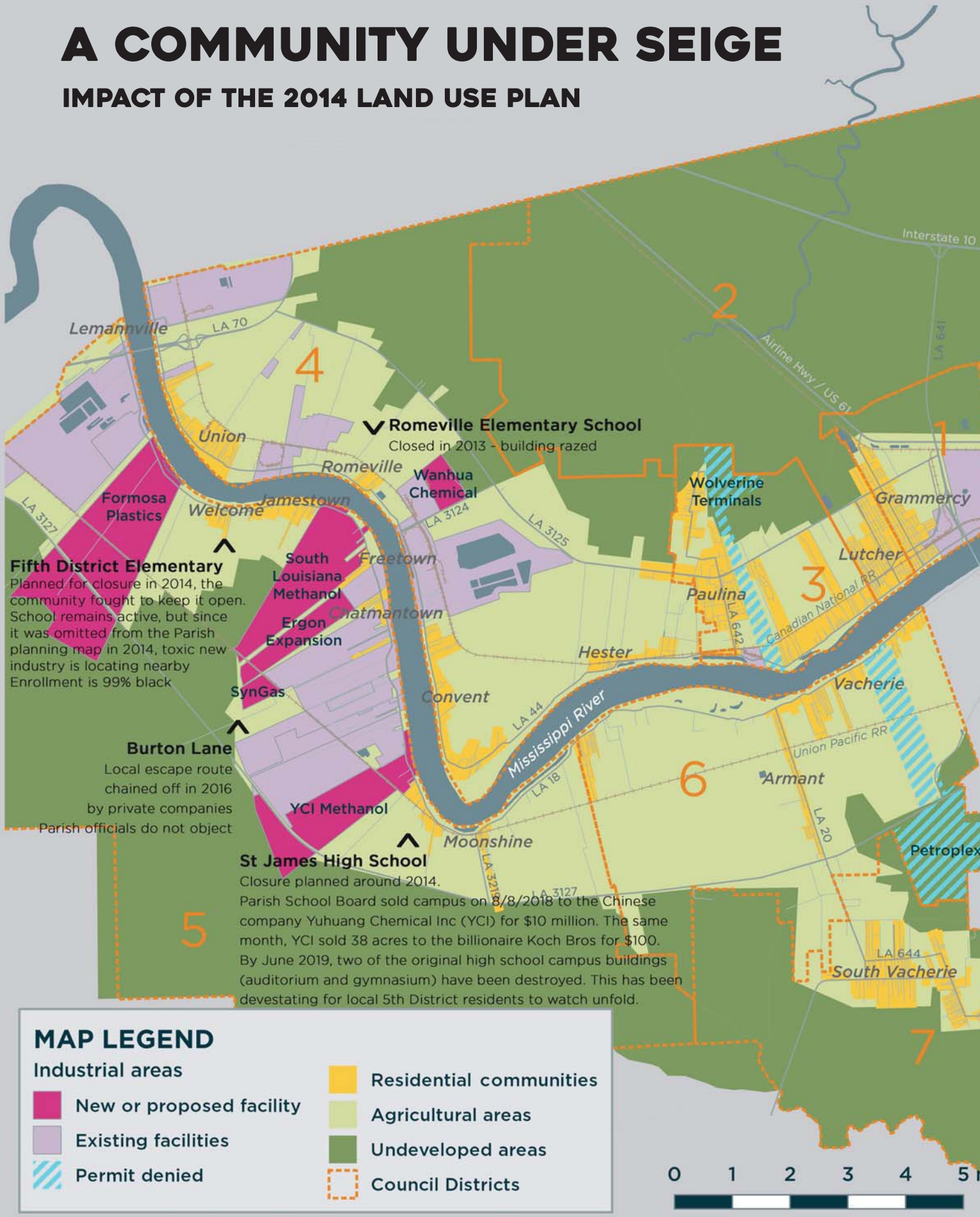
Minutes from 3.19.14 public hearing on the 2014 Land Use Plan held by the St. James Parish Council in conjunction with the St. James Parish Planning Commission

> "We talk about how do we, how do we grow, how do we keep our young people, our young residents in the community? It's easy. Go ride down in Mr. McCreary's district, District 3, Belleview Subidvision. Lots of young families. They'll tell you, man. It's a restricted subdivision and they feel pretty secure their property is gonna be valued from here on out, for twenty years plus that we can't put an industry next to them."
>
> — Councilman Jason Amato

12. US Census Bureau, American Community Survey 2017.

A COMMUNITY UNDER SEIGE

IMPACT OF THE 2014 LAND USE PLAN



ATTACHMENT A Ex. 2

Data Sources: St James Clerk of Court, GIS, Assessor, Operations; US Department of Agriculture (aerial imagery)
Map created by Justin Kray for RISE St James and Louisiana Bucket Brigade

Sharon Lavigne, Founder and President of RISE St. James, gave this speech at the Tulane Environmental Law Conference in the spring of 2019

"I was born in St. James Parish when Jim Crow still ruled. Racist laws made sure that many black Louisianans were unable to participate in democracy.

It has been more than 50 years since the Voting Rights Act and the Civil Rights Act, but the proposed Formosa Plastics Plant shows that democracy has not fully come to St. James Parish. If my community had a say, Louisiana would not be spending $1.5 billion to attract a foreign polluter. If my community had a say, we would not allow a plastics producing plant to bulldoze 3.5 square miles of wetlands and sugar cane fields. Formosa has a terrible track record as far as treating workers, their safety and our environment.

continued on next page

But nobody ever asked us. We were not even informed when in 2014 the northern part of the 5th District – my home – was zoned for industrial use.

Before industry took over my parish, we had clean air and productive land. My grandfather caught fish and shrimp in the Mississippi River. Our fig and pecan trees kept us well fed and even provided enough for us to sell. It was peaceful and quiet. Now the land and everything that grows on it is poison. Now our houses are flooding when there's heavy rain.

The Civil Rights Act and the Louisiana Constitution are supposed to protect black communities from this type of environmental racism. They have not in Cancer Alley. Our agencies are rubber stamping every permit that comes across their desks. When we call the Department of Environmental Quality about a terrible smell in the air they come out three days later and tell us they don't smell anything. Year after year, our Louisiana legislators have rejected demands for air monitors at industrial sites with a history of air permit violations.

From the moment I heard about Formosa, I was told that it was a done deal. The government had yet to issue any permits, but the state was already celebrating the announcement of the project. What they are actually celebrating is not just poisoning our air and drinking water, but also the air and water for residents of Lutcher, LaPlace, Metairie and New Orleans. Air and water do not stop at the parish line.

At several parish level hearings, every local resident who spoke, spoke out against the plant. They described how their children have trouble breathing, how they have to deal with skin rashes, nose bleeds, respiratory ailments, cancer. They pleaded with the council not to permit yet another humongous toxic plant. The plant's supporters seemed to be all Taiwanese executives and wealthy businessmen who live safely outside Cancer Alley. The parish voted to approve the project anyway.

This is our land, this is our home, and we are standing up together to defend it. St. James is rising."

BURTON LANE

In 2016, Burton Lane was closed without explanation. Burton Lane was the only local road connecting two major state roads, River Road to Highway 3127 in the 5th District. Burton Lane played an important role as a connecting street and evacuation route for residents in case of an industrial accident.

There has been lip service but no action on finding an alternative route; the parish government has discussed the problem for five years, but done nothing. Residents are now trapped by expanding industry and what is now a dead end road.

ATTACHMENT A Ex. 2

These parents and their children led the integration of the St. James public schools in the 1960s.

REPORT RECOMMENDATIONS

1. **Revoke parish permits granted since the Land Use Plan was adopted, including Formosa, the Ergon expansion, Syngas, South Louisiana Methanol, Wanhua, YCI, Linde and the ACE pipeline.** These permits were issued under a flawed, secretive land use plan that targets the black community. Other parishes have taken action to protect their residents from emissions. Jefferson Parish, for example, revoked a permit it had issued for a cyanide plant.[13]

2. **Draft and adopt an amendment to the land use map ordinance** to properly classify the residential areas of the 4th and 5th Districts as Residential and, where appropriate, Agricultural. These inhabited areas are home to over 4,000 residents, and without proper designation on the land use map, their communities have no protection from industrial expansion and construction.

3. **Investigate the murky process by which the 2014 Land Use Plan was created**, including how the plan was resurrected and changed. Louisiana's reputation for corruption includes shenanigans in small parishes. The Parish President and Director of Operations have been indicted for malfeasance in dealings with industry in the parish.[14] The 2014 Land Use Plan was a prime opportunity for corruption given the rich and powerful industries involved.

4. **Revoke the construction permit for South Louisiana Methanol plant.** The Parish can use the same reasoning used to deny Petroplex: SLM did not own the land at the time of a significant land use change.

5. **Reopen Burton Lane** and allow residents to resume their long time use of the road.

13. Broach, Drew. "Cyanide plant permit revoked by Jefferson Parish Council in extraordinary about-face." Nola.com, April 5, 2019.

14. Mitchell, David J. "St. James officials accept immunity deals for testimony in parish president's prosecution." The Advocate, May 7, 2018.

Planning Commission Member Dean Millet spoke at a 3/25/19 Planning Commission hearing on the proposed Wanhua Chemical Plant.

"I sat here, I watched Formosa come. I said you know what man, it's good for the parish. You know economics, they've always told me that through all my years--that the parish really needed the money and all that. I started to look back, got home, and felt a little guilty.

I ain't used to doing this, but I'm gonna tell you my heart. I'm talking from my heart right now. I got a family. I got children. I got grandchildren. I'm one of the few that can say proud to have my kids within five miles of me. I have four kids. All of them came home because they love St. James Parish. But so many of my friends are gone. Yes, they work in St. James Parish, but no, they don't wanna live in St. James Parish. They moved to some other parish. Yes we got great jobs, they got great jobs. They won't-- it's the impact, the environmental impact they putting on their families. That's what these people are scared of. Not that you're a bad company. We worked for them, we made a great living in the chemical plants, but yet, we know what went on.

Photo: Julie Dermansky

I don't know how to put it, but I got a strong tradition for family, and I'm proud to say that I'm not in favor of you all. Not because you're not a good company because I don't know, but because I believe in family. Okay. It means a lot to me. And it comes out from my heart, I'm talking from my heart now. I want my kids to stay home. I believe in tradition. I know what's happening in St. James Parish. That's all I got to say."

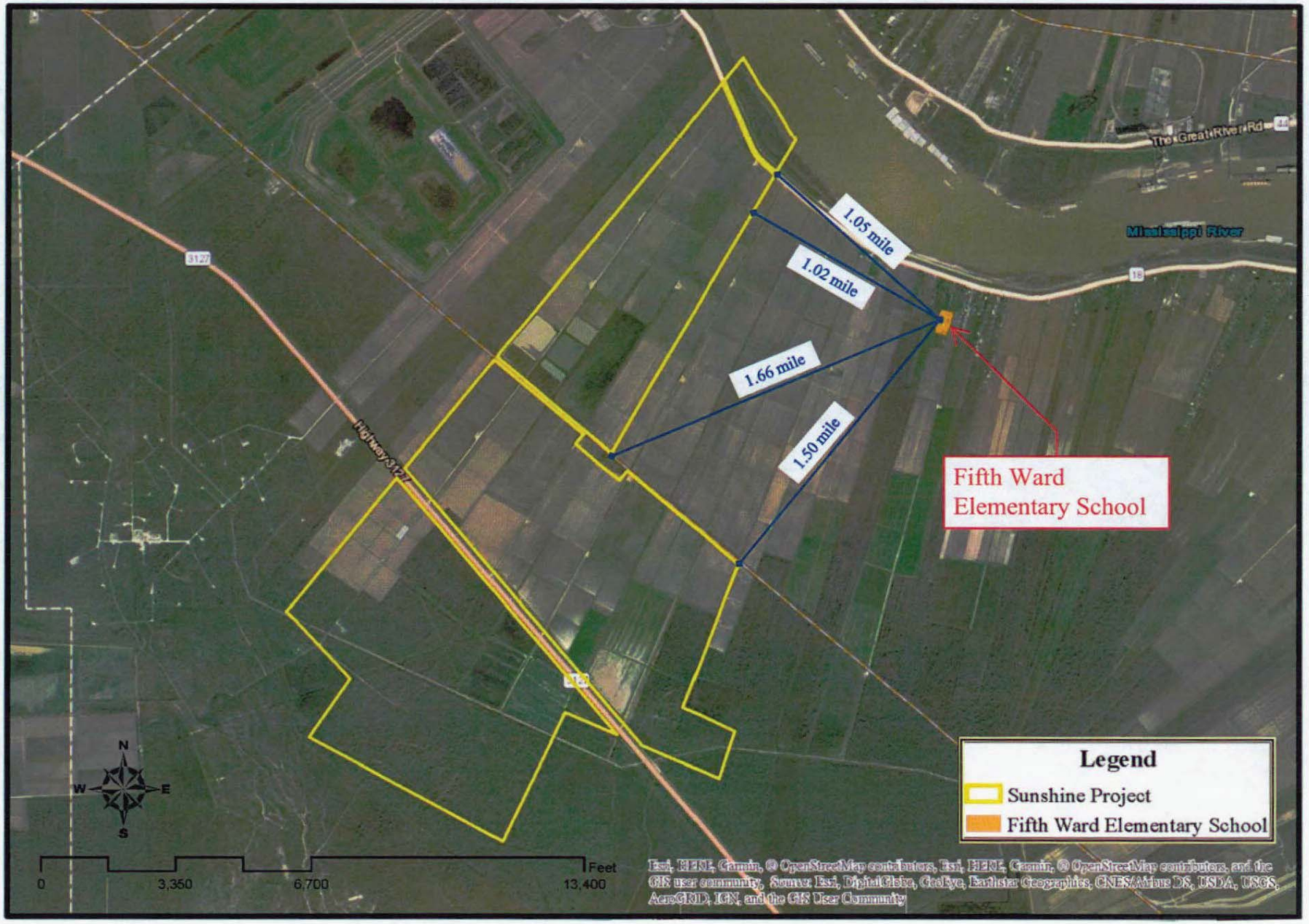
RISE ST. JAMES

LOUISIANA BUCKET BRIGADE

Clean Air. Justice. Sustainability.

ATTACHMENT A Ex. 2

Distance to Fifth Ward Elementary School



ATTACHMENT B

LOUISIANA DEPARTMENT OF ENVIORNMENTAL QUALITY

Proposed Prevention of Significant Deterioration Permit (PSD-LA-812)
14 Proposed Title V Permits (3141-V0 through 3154-V0)
Associated Environmental Assessment Statement
FG LA Chemical Complex (AI 198351)
Welcome, St. James Parish, Louisiana
Activity Nos.: PER20150001 through PER20150015

AFFIDAVIT OF CORINNE VAN DALEN

I, Corinne Van Dalen, state:

1. I am a person above the age of majority who is competent to make this affidavit. I have personal knowledge of the statements made below.

2. I reside and work in New Orleans, Louisiana. I am an attorney at Earthjustice, representing RISE St. James, Louisiana Bucket Brigade, and Sierra Club in the above-reference matter.

3. As part of my work, I submitted a Freedom of Information Act request to the U.S. EPA concerning issues related to my representation of my clients in this matter, which EPA designated as EPA-R6-2019-0078.

4. On July 18, 2019, EPA responded to my FOIA request designated EPA-R6-2019-0078. Attached as Exhibit 1 is a true and correct copy of that response.

I hereby certify under penalties of perjury that the foregoing representations are true to the best of my knowledge.

_____ Date 8/12/19
Corinne Van Dalen

State of Louisiana

Parish of Orleans

Sworn to and subscribed before me on August 12, 2019

by _____ Michael Brown Date 8/12/2019
Notary Public (print)

_____
Signature of Notary Public

My commission expires Upon Death

MICHAEL L. BROWN - ID NO. 138072 NOTARY PUBLIC COMMISSIONED FOR LIFE STATE OF LOUISIANA

ATTACHMENT C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1201 ELM STREET, SUITE 500

DALLAS, TEXAS 75270

VIA FOIAOnline

Ms. Corinee Van Dalen
Earthjustice
900 Camp Street Unit 303
New Orleans, LA 70130

RE: Freedom of Information Act (FOIA) Request: EPA-R6-2019-007083

Dear Ms. Van Dalen:

This letter concerns the above-referenced FOIA request, received by the U.S. Environmental Protection Agency (EPA or Agency) on July 5, 2019, in which you requested,

> "Request under the Freedom of Information Act ("FOIA"), 5 U.S.C. § 552. Specifically, we request all records in the possession, custody, or control of EPA Region 6 that refer or relate to FG LA, LLC's modeling protocol and consultation in connection with its Prevention of Significant Deterioration permit application and associated Class I increment modeling for its planned Chemical Complex in St. James, Louisiana."

The EPA Region 6 has concluded its search and uploaded records responsive to your request to the FOIAonline system. You can access your records by going to FOIAonline at https://foiaonline.gov/foiaonline/action/public/home and searching by your FOIA request number.

This letter concludes our response to your request. You may appeal this response by email at hq.foia@epa.gov, or by mail to the EPA's National FOIA Office, U.S. EPA, 1200 Pennsylvania Avenue, N.W. (2310A), Washington, DC 20460 or through FOIAonline if you are an account holder. If you are submitting your appeal by hand delivery, courier service, or overnight delivery, you must address your correspondence to 1200 Pennsylvania Avenue, N.W., Room 5315, Washington, DC 20460. Your appeal must be in writing, and it must be received no later than 90 calendar days from the date of this letter. The Agency will not consider appeals *received* after the 90-calendar-day limit. Appeals received after 5:00 p.m. EST will be considered received the next business day. The appeal letter should include the FOIA tracking number listed above. For quickest possible handling, the subject line of your email, the appeal letter, and its envelope, if applicable, should be marked "Freedom of Information Act Appeal." Additionally, you may seek dispute resolution services from EPA's FOIA Public Liaison at hq.foia@epa.gov or (202) 566-1667, or from the Office of Government Information Services (OGIS). You may contact OGIS in any of the following ways: by mail, Office of Government Information Services, National Archives and Records Administration, Room 2510, 8610 Adelphi Road, College Park, MD 20740-6001**;** email, ogis@nara.gov; telephone, (202) 741-5770 or (877) 684-6448; or fax, (202) 741-5769.

ATTACHMENT C Ex. 1

FOIA Request EPA-R6-2019-007083

This is a final response to your request, and you may receive a final billing (if appropriate) from the Regional FOIA Office. If you have any questions concerning this response, you may contact the Regional FOIA Officer, Nancy Ho, who can be reached at r6foia@epa.gov.

Sincerely,

7/18/2019

X Suzanne Andrews

Suzanne Andrews

Signed by: Environmental Protection Agency

Acting Deputy Regional Counsel

ATTACHMENT C Ex. 1

LOUISIANA DEPART OF ENVIORNMENTAL QUALITY

Proposed Prevention of Significant Deterioration Permit (PSD-LA-812)
14 Proposed Title V Permits (3141-V0 through 3154-V0)
Associated Environmental Assessment Statement

FG LA Chemical Complex (AI 198351)
Welcome, St. James Parish, Louisiana
Activity Nos.: PER20150001 through PER20150015

AFFIDAVIT OF TODD CLOUD

I, Todd Cloud, state:

1. I have personal knowledge of the statements made herein.

2. I am a Consultant and Chemical Engineer in the field of Environmental Engineering and have 20 years of consulting experience in interpreting and implementing the 1970 Clean Air Act and subsequent amendments, including particular expertise in federal/major New Source Review (NSR), Prevention of Significant Deterioration (PSD), and air dispersion modeling (ISCST3, AERMOD, CALPUFF).

3. Exhibit 1 hereto is a true and accurate copy of my curriculum vitae.

4. I have reviewed the application and supporting materials associated with the Proposed Prevention of Significant Deterioration Permit (PSD-LA-812) and 14 Proposed Title V Permits (3141-V0 - 3154-V0), including the air analyses and modeling files.

5. Through my education, training, and experience, and my review of the relevant documents, I have formed opinions regarding the air quality analyses and modeling conducted for proposed permits for the FG LA Chemical Complex (AI 198351).

6. Through my education, training, and experience, I created two cancer risk plots using the Updated Toxic Air Pollutant Modeling Analysis submitted to LDEQ by Zephyr Environmental Corporation on December 11, 2018 (EDMS 11431688) in support of the FG LA Chemical Complex PSD permit application and specifically the AERMOD Output file FGLA-MG-13_2017_EO.GRF.

7. The first plot shows the location of ambient concentrations of Ethylene Oxide emanating from the proposed FG LA Chemical Complex that reside above the concentration at which the cancer risk is not less than 1 in 100,000.

8. The second plot shows the location of ambient concentrations of Ethylene Oxide emanating from the proposed FG LA Chemical Complex that reside above the concentration at which the cancer risk is not less than 1 in 1,000,000.

9. Exhibit 2 hereto is a true and accurate copy of my opinions regarding the air quality analyses and modeling conducted for proposed permits for the FG LA Chemical Complex (AI 198351). Exhibit 2 attaches true and accurate copies of the cancer risk plots that I describe in paragraphs 7 and 8 above.

I hereby certify under penalties of perjury that the foregoing representations are true to the best of my knowledge.

Todd Cloud Date 8/8/2019

State of Ga

County of Cobb

Sworn to and subscribed before me on 08/08/2019 Date

by Shirley Rush
Notary Public (print)

Shirley Rush
Signature of Notary Public

My commission expires Jan 21, 2022

SHIRLEY RUSH NOTARY PUBLIC EXPIRES GEORGIA JAN. 21, 2022 COBB COUNTY

ATTACHMENT D

Todd Cloud

Summary

Years of Experience

20+

Industries

- Pulp & Paper
- Wood Products
- Oil and Gas
- Upstream/Midstream
- Onshore

Types of Facilities

- Production Facilities
- Terminal
- Refineries

Areas of Expertise

- Federal/major New Source Review (NSR), state/minor NSR
- Prevention of Significant Deterioration (PSD)
- Reasonably Available Control Technology (RACT)
- Best Available Control Technology (BACT)
- Lowest Achievable Emission Rate (LAER) determinations
- Air dispersion modeling (ISCST3, AERMOD, CALPUFF)
- Auditing and compliance program development
- Notice of Violation (NOV) response and mitigation
- Expert witness and litigation support

Education

Bachelor, Chemical Engineering, Georgia Tech

Juris Doctorate, University of Georgia School of Law

Recent Project Experience

Sun Bio Materials (U.S.) Company
Arkadelphia, AR

Secured the Prevention of Significant Deterioration (PSD) pre-construction authorizations for $2,000,000,000 softwood pulp mill and linerboard manufacturing facility in Arkadelphia, AR. Supported pre-engineering and design efforts needed to secure air permit. Completed all federal Class II National Ambient Air Quality Standards (NAAQS) and PSD Increment air dispersion modeling demonstrations. Completed all federal Class I PSD Increment and Air Quality Related Values (AQRV) modeling demonstrations for Federal Land Manager (FLM) review and approval for three Class I areas. Negotiated Best Available Control Technology (BACT) emission limits as well as draft permit conditions. Supported Sun Bio through contentious public hearing process.

Harbor Island Crude Oil Terminal
Corpus Christi, TX

Secured the Prevention of Significant Deterioration (PSD) pre-construction authorizations for $1,400,000,000 crude oil storage terminal (200,000,000 bbl) and marine loading (160,000 bph) facility in Corpus Christi, TX. Supported pre-engineering and design efforts needed to secure air permit. Completed all federal Class II National Ambient Air Quality Standards (NAAQS) and PSD Increment air dispersion modeling demonstrations. Completed the state-only Effects Screening Level (ESL) air dispersion modeling risk assessments. Assessed best achievable control technologies (BACT) for all new or modified emission units.

Colombo Energy
Greenwood, SC

Reviewed, revised, and revamped all previously secured state-only pre-construction authorizations for a $140,000,000 wood pellet manufacturing facility (500,000 metric ton/year) located in Greenwood , South Carolina. Affirmed Prevention of Significant

Recent Project Experience (continued)

Deterioration (PSD) minor source status of facility pursuant to a concurrent enforcement action and plant divestiture. Completed all state Class II National Ambient Air Quality Standards (NAAQS air dispersion modeling demonstrations. Supported engineering and design efforts for additional air pollution controls on the pellet cooler operations. Completed the state-only air dispersion modeling air toxic risk assessments.

Sunoco Logistics Partners
Nederland, TX

Secured Texas minor New Source Review (NSR) pre-construction authorizations to modify the existing Nederland, TX marine terminal operations to accommodate 500,000 bpd ethane receiving, compression, storage and transport facility. Supported pre-engineering and design efforts needed to secure air permit Assessed best achievable control technologies (BACT) for all new or modified emission units. Completed all federal Class II National Ambient Air Quality Standards (NAAQS) and PSD Increment air dispersion modeling demonstrations. Completed Effects Screening Level (ESL) dispersion modeling risk assessments.

Fram Renewable Fuels
Various Locations, GA

Supported all aspects of Clean Air Act compliance for the combined 1,000,000 metric ton/year Fram Renewable Fuels operations in Baxley, GA (Appling County Pellets), Hazlehurst, GA (Hazlehurst Wood Pellets), Nahunta, GA (Archer Forest Products), and Telfair, GA (Telfair Forest Products) including (but not limited to) pellet certification compliance, construction permits, semiannual and annual Title V reporting, Tier 2 submittals, Toxic Release Inventory (TRI) reports, internal auditing and compliance program improvement, emission fees, emission inventories, Notice of Violation (NOV) response and mitigation, greenhouse gas (GHG) life-cycle and emissions reporting, etc.

Koch Pipeline Company
LP Clearbrook, MN

Secured all Minnesota Pollution Control Agency (MPCA) pre-construction authorizations pursuant to Minn. R. 7007.0750 to construct four (4) additional 300,000 barrel external floating roof tanks to an existing crude oil terminal in Clearbrook, MN. The existing volatile organic compound (VOC) emission calculation infrastructure was employed to estimate a revised facility VOC potential to emit (PTE) with four (4) additional tanks at the current terminal maximum throughput of 430,200 bbl/day.

Northern Tier Energy/Flint Hills Resources
Wausau, WI

Assisted client in determining what regulatory gaps existed upon purchase and restart of the gasoline storage tanks and loading rack at a mothballed gasoline terminal in Wausau, WI. The gap assessments concluded that, upon terminal restart, the site would likely lose its exemption from 40 Code of Federal Regulations (CFR) Part 60, Subpart XX Standards of Performance for Bulk Gasoline Terminals but would likely retain its exemption from 40 CFR Part 60, Subpart Kb Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels). With the gap assessments complete, the air permit application materials necessary to obtain Wisconsin Department of Environmental Resources (DENR) authorization to restart the terminal under the terms of Wisconsin's FESOP program codified at NR407 of the Wisconsin Administrative Code.

Todd Cloud

Professional Bio

Mr. Cloud has 20 years of consulting experience in interpreting and implementing the 1970 Clean Air Act (CAA) and subsequent amendments. Mr. Cloud's areas of expertise include (but are not limited to): federal/major New Source Review (NSR), state/minor NSR, non-attainment NSR, Prevention of Significant Deterioration (PSD), Reasonably Available Control Technology (RACT), Best Available Control Technology (BACT), and Lowest Achievable Emission Rate (LAER) determinations, air dispersion modeling (ISCST3, AERMOD, CALPUFF), auditing and compliance program development, Notice of Violation (NOV) response and mitigation, expert witness, and litigation support. Mr. Cloud also completes risk based analyses in the context of compliance and due diligence audits, identifies areas of CAA concern, prioritizes potential liabilities, and provides CAA risk management recommendations.

Professional History

- Wood Environment & Infrastructure Solutions, Associate Scientist, Atlanta, Georgia + Houston, Texas
- Sage Environmental Consulting, Senior Project Manager, Atlanta, Georgia, 2010–2014
- ERM, Project Manager, Atlanta, Georgia, 2006–2010
- SECOR International, Senior Consultant, Atlanta, Georgia, 2003–2006
- Trinity Consultants, Consultant, Atlanta, Georgia, 1998–2003

Publications / Presentations

- Todd Cloud and David Wilsford, "Under Construction, Round II: U.S.-Japanese Negotiations to Open Japan's Construction Markets to American Firms, 1988-92," Pew Case Studies, Georgetown University (1990)
- Todd Cloud, "Exploring the NSPS and PSD "Alternative Fuels" Exemption," Air Issues Review (June 2001)
- Todd Cloud, "NSR Reform – Where We Stand Today, Air Issues Review" (December 2001)
- Todd Cloud, "NSR Reform Update," Air Issues Review (May 2002)
- Todd Cloud, "PAL Permits: Friends for Life?," presented at the Air and Waste Management Association Southern Section Annual Meeting and Technical Conference, Nashville, Tennessee (August 2005)
- Todd Cloud, "Clean Air Act Regulatory Update," presented at the Georgia Environmental Conference, Savannah, Georgia (August 2012)
- Todd Cloud, "Requirements and Considerations in Designing Initial Performance Tests for Multi-Fuel Boilers – Panel Discussion, presented at the NCASI Southern Regional Meeting, Savannah, Georgia (June 2014).

Comments to
Louisiana Department of Environmental Quality
on the

Proposed Prevention of Significant Deterioration Permit (PSD-LA-812)
14 Proposed Title V Permits (3141-V0 - 3154-V0)
Associated Environmental Assessment Statement

FG LA Chemical Complex (AI 198351)

Welcome, St. James Parish, Louisiana
Activity Nos.: PER20150001 through PER20150015

August 5, 2019

Prepared for
RISE St. James, Louisiana Bucket Brigade, and Sierra Club

By Todd Cloud

1.1 Introduction

FG LA LLC (Formosa) proposes to construct and operate a chemical complex in St. James, Louisiana comprised of fourteen facilities to manufacture ethylene and propylene, ultimately producing high and low density polyethylene, propylene, and ethylene glycol. Formosa plans to construct the complex on the west bank of the Mississippi River between state Highway 18 (River Road) and state Highway 3127 on agricultural land. The site chosen for the complex is approximately 0.5 mile from the residential area of Union across the Mississippi River, and approximately one mile from residential areas downriver in St. James.

St. James Parish is currently designation "attainment" or "unclassifiable" for all criteria pollutants. As such, the Prevention of Significant Deterioration (PSD) program applies. Formosa submitted its original PSD application in September 2015 to the Louisiana Department of Environmental Quality (LDEQ). A revised PSD application was submitted in February 2018 and was supplemented various times over the next 12 months. The PSD application was deemed complete in January 2019. The proposed Formosa complex triggers PSD review for oxides of nitrogen (NOx), carbon monoxide (CO), sulfur dioxide (SO2), particulate matter (PM), particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), volatile organic compounds (VOC), and greenhouses gases (expressed carbon dioxide equivalent (CO2e)). LDEQ issued a proposed PSD permit and a Statement of Basis (SOB) for public comment in May 2019.

1.2 Documents Reviewed

The following documents were reviewed. **Bold entries** indicate documents specifically relied upon to formulate the opinions and conclusions presented herein.

- Application Completeness Letter (LDEQ/September 2015)
- Part 70 Application, Volume I – PSD Application (Zephyr Environmental Corporation (Zephyr)/September 2015)
- Part 70 Application, Volume II – Ethylene 1 (Zephyr/September 2015)
- Part 70 Application, Volume III – Ethylene Glycol 1 (Zephyr/September 2015)
- Part 70 Application, Volume IV – HDPE 1 (Zephyr/September 2015)
- Part 70 Application, Volume V – LLDPE (Zephyr/September 2015)
- Part 70 Application, Volume VI – Propylene (Zephyr/September 2015)
- Part 70 Application, Volume VII – Polypropylene (Zephyr/September 2015)
- Part 70 Application, Volume VIII – Logistics (Zephyr/September 2015)
- Part 70 Application, Volume IX – Utility 1 (Zephyr/September 2015)
- Part 70 Application, Volume X – Wastewater (Zephyr/September 2015)
- Part 70 Application, Volume XI – Ethylene 2 (Zephyr/September 2015)
- Part 70 Application, Volume XII – Ethylene Glycol 2 (Zephyr/September 2015)
- Part 70 Application, Volume XIII – HDPE 2 (Zephyr/September 2015)
- Part 70 Application, Volume XIV – LDPE (Zephyr/September 2015)
- Part 70 Application, Volume XV – Utility 2 (Zephyr/September 2015)
- FLM Consultation Letter (Zephyr/September 2015)
- **Air Quality Modeling Protocol (Zephyr/September 2015)**
- **Protocol Approval (LDEQ/September 2015)**

- EAS Submission Confirmation (Zephyr/October 2015)
- Public Notice Publication (Zephyr/October 2015)
- LDEQ/Zephyr Meeting Agenda (February 2016)
- Administrative Hold Email (Zephyr/June 2016)
- Expedited Review Requests – (Zephyr/October 2017)
- Part 70 Application, Volume I (Revision 1) – PSD Application (Zephyr/February 2018)
- Part 70 Application, Volume II (Revision 1) – Ethylene 1 (Zephyr/December 2017)
- Part 70 Application, Volume III (Revision 1) – Ethylene Glycol 1 (Zephyr/November 2017)
- Part 70 Application, Volume IV (Revision 1) – HDPE 1 (Zephyr/November 2017)
- Part 70 Application, Volume V (Revision 1) – LLDPE (Zephyr/November 2017)
- Part 70 Application, Volume VI (Revision 1) – Propylene (Zephyr/December 2017)
- Part 70 Application, Volume VII (Revision 1) – Polypropylene (Zephyr/November 2017)
- Part 70 Application, Volume VIII (Revision 1) – Logistics (Zephyr/December 2017)
- Part 70 Application, Volume IX (Revision 1) – Utility 1 (Zephyr/February 2018)
- Part 70 Application, Volume X(Revision 1) – Wastewater (Zephyr/February 2018)
- Part 70 Application, Volume XI (Revision 1) – Ethylene 2 (Zephyr/December 2017)
- Part 70 Application, Volume XII (Revision 1) – Ethylene Glycol 2 (Zephyr/November 2017)
- Part 70 Application, Volume XIII (Revision 1) – HDPE 2 (Zephyr/November 2017)
- Part 70 Application, Volume XIV (Revision 1) – LDPE (Zephyr/November 2017)
- Part 70 Application, Volume XV (Revision 1) – Utility 2 (Zephyr/February 2018)
- **Air Quality Modeling Protocol (Revision 1) (Zephyr/February 2018)**
- **Protocol Approval (Revision 1) (LDEQ/April 2018)**
- **NAAQS/PSD Increment Analysis (Zephyr/July 2018)**
- EAS Submittal (Revision 1) (Zephyr/July 2018)
- Part 70 Application, Volume III (Revision 2) – Ethylene Glycol 1 (Zephyr/August 2018)
- Part 70 Application, Volume IV (Revision 2) – HDPE 1 (Zephyr/June 2018)
- Part 70 Application, Volume IV (Revision 3) – HDPE 1 (Zephyr/August 2018)
- Part 70 Application, Volume IV (Revision 4) – HDPE 1 (Zephyr/September 2018)
- Part 70 Application, Volume V (Revision 2) – LLDPE (Zephyr/June 2018)
- Part 70 Application, Volume VII (Revision 2) – Polypropylene (Zephyr/June 2018)
- Part 70 Application, Volume VIII – Logistics (Zephyr/ August 2018)
- Part 70 Application, Volume IX (Revision 2) – Utility 1 (Zephyr/July 2018)
- Part 70 Application, Volume XII (Revision 2) – Ethylene Glycol 2 (Zephyr/August 2018)
- Part 70 Application, Volume XIII (Revision 2) – HDPE 2 (Zephyr/June 2018)
- Part 70 Application, Volume XIII (Revision 3) – HDPE 2 (Zephyr/August 2018)
- Part 70 Application, Volume IV (Revision 4) – HDPE 2 (Zephyr/September 2018)
- Part 70 Application, Volume XIV (Revision 2) – LDPE (Zephyr/July 2018)
- Part 70 Application, Volume XV (Revision 2) – Utility 2 (Zephyr/July 2018)
- **NAAQS/PSD Increment Analysis (Revision 1) (Zephyr/October 2018)**
- **TAP Impact Analysis (Revision 1) (Zephyr/December 2018)**
- Permitting Timeline Email Exchanges (Zephyr/October 2018)
- EIQ Updater (Zephyr/October 2018)
- FLM Notification Email Exchange (Zephyr/December 2018)
- BACT Email Exchange (Zephyr/December 2018)
- **EAS Submittal (Revision 2) (Zephyr/January 2019)**

- **Response to Air Quality Analysis Comments (Zephyr/January 2019)**
- BACT Email Exchange (Zephyr/March 2019)
- **Statement of Basis (LDEQ/June 2019)**

1.3 Spreadsheets Reviewed

- PM25 ActualEmissionsReport 2016.xlsx
- PM25 PermittedEmissionsReport 2016.xlsx
- PM10 ActualEmissionsReport 2016.xlsx
- PM10 PermittedEmissionsReport 2016.xlsx
- NOX ActualEmissionsReport 2016.xlsx
- NOX PermittedEmissionsReport 2016.xlsx
- CO ActualEmissionsReport 2016.xlsx
- CO PermittedEmissionsReport 2016.xlsx
- SO2 ActualEmissionsReport 2016.xlsx
- SO2 PermittedEmissionsReport 2016.xlsx
- OFF-PROPERTY SOURCES 2018.07.08.xlsx

1.4 Additional Sources

- Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (CASRN 75-21-8) (December 2016) in Support of Summary Information on the Integrated Risk Information System (IRIS) https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1025.

1.5 Findings and Observations

1.5.1 NAAQS and Class II Increment

- **ISSUE #1 –** The NAAQS and Class II Increment modeling efforts do not comport with the regulatory definition or EPA guidance with respect to the *treatment of ambient air*.

  - *Ambient air* is defined in LAC 33:III.111 as "the outdoor air or atmosphere which surrounds the earth," and in 40 CFR 50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has access." Pursuant to EPA's definition, the usual and customary treatment of ambient air begins at a fence line (i.e., controlled access) and not a property line. Louisiana regulations do not allow for a restrictive treatment of ambient air.

  - EPA's ambient air policy, consistent with its discretion available under the regulatory definition of ambient air, holds that an applicant may exclude from the modeling analysis only the atmosphere over land owned or controlled by the stationary source where the owner or operator of the source employs measures that are effective in deterring or precluding access to the land by the general

public. See, generally, Draft Guidance: *Revised Policy On Exclusions from "Ambient Air,"* USEPA (November 2018).[1]

- Anything short of continuous, patrolled fencing (such as three-strand barb-wire fence or "no trespassing" signs) are not considered adequate to precluding access to the land by the general public. It is highly unlikely that Formosa intends to fence off and actively patrol all 2,300 acres.

- Formosa's receptor grids begin at the property line and extend out, improperly excluding all Formosa property from the consideration of ambient air. By assessing ambient impacts using the property line, Formosa is drastically underestimating maximum pollutant impacts. The maximum pollutant impacts are underestimated even if receptor grids begin at the fence line.

- **ISSUE #2 –** The Class II Increment modeling efforts do not comport with 40 CFR Part 51, Appendix W or 33 LAC III.509(L) with respect to the *modeling of actual PM10 and PM2.5 emissions*.

  - Per LAC 33:III.509(L), all modeling of ambient concentrations shall be based on applicable air quality models, databases, and other requirements specified in Appendix W of 40 CFR Part 51 (Guideline on Air Quality Models).

  - 40 CFR Part 51, Appendix W, Section 8.2.2 provides that the new or modifying source shall be modeled with "potential" emissions in accordance with the emissions input data shown in Table 8-2. As part of a cumulative impact analysis, Table 8-2 allows modeling "actual" emissions from regional sources calculated using the specific formula provided.

  - This formula multiplies the maximum allowable emission limit (or federally enforceable permit limit) times the actual operating level and actual operating factor, both of which represent the average over the most recent 2 years. The typical result is a modeled emission rate below potentials but above actuals.

  - Formosa employed actual 2016 emissions in the Class II Increment PM10 modeling efforts for the following regional sources: the Americas Styrenics LLC - St James Plant (AI2384), the Mosaic Fertilizer LLC - Faustina Plant (AI2425), and the Mosaic Fertilizer LLC - Uncle Sam Plant (AI2532). Formosa also employed actual 2016 emissions in the Class II Increment PM2.5 modeling efforts for every single PM2.5 regional source.

  - Utilizing actual 2016 emissions does not comport with the 40 CFR Part 51, Appendix W, Section 8.2.2 requirement to model actual emissions (a) using the most recent 2 years of data and (b) calculated utilizing the 40 CFR Part 51, Appendix W, Section 8.2.2 formulas.

[1] https://www.epa.gov/sites/production/files/2018-11/documents/draft_ambient_air_guidance_110818.pdf

- **ISSUE #3 –** The Class II Increment modeling efforts do not comport with 40 CFR Part 51, Appendix W or 33 LAC III.509(L) with respect to the *modeling protocol approvals*.

    - Per LAC 33:III.509(L), all modeling of ambient concentrations shall be based on applicable air quality models, databases, and other requirements specified in Appendix W of 40 CFR Part 51 (Guideline on Air Quality Models).

    - 40 CFR Part 51, Appendix W, Section 9.2.1 provides a modeling protocol should be established to define the procedures to be followed, the data to be collected, the model to be used, and the analysis of the source and concentration data to be performed. The protocol should be written and agreed upon by the parties concerned. The protocol establishes a common understanding of how the demonstration required to meet regulatory requirements will be made.

    - Formosa submitted two modeling protocols addressing the NAAQS and Class II Increment modeling. The first modeling protocol was submitted in September 2015 while the second was submitted in February 2018. In both protocols, Formosa committed to using potential emissions in the NAAQS and Class II Increment modeling.

        - September 2015, Section 4.2.1: "If the results of the preliminary impact analysis indicate that a full-impact analysis is required, an inventory of off-property source will be obtained from the DEQ Emissions Reporting and Inventory Center (ERIC). The inventory will include **permit allowable emission rates** and stack parameter information for off-property sources located within 50 kilometers of the plant location." (emphasis supplied)

        - February 2018, Section 5.2.1: "If the results of the preliminary impact analysis indicate that a full-impact analysis is required, an inventory of off-property source will be obtained from the DEQ Emissions Reporting and Inventory Center (ERIC). The inventory will include **permit allowable emission rates** and stack parameter information for off-property sources located within 15 kilometers of the plant location." (emphasis supplied)

        - February 2018, Section 5.2.3: "In order to assure that the off-property data provides a reasonable representation of existing emissions and associated **potential** predicted ambient air concentrations..." (emphasis supplied)

    - Per the September 2015 and April 2018 LDEQ modeling protocol approval letters, any deviation from these protocol requires the submittal of an amended protocol and subsequent approval.

    - The change from potentials to actuals required amending the modeling protocol and submittal for agency review and re-approval. There is no indication in the record Formosa obtained LDEQ approval for the change in modeled emission rates.

- **ISSUE #4 –** The Class II Increment modeling efforts do not comport with 40 CFR Part 51, the LDEQ AQMP, and/or the usual and customary approach with respect to the *identification and documentation of PM2.5 increment consuming sources.*

    - Increment consumption is based on potential emission increases since the pollutant-specific baseline date. Increment expansion is based on actual emission decreases since the pollutant-specific baseline date. See New Source Review Workshop Manual, Section II.B National Ambient Air Quality Standards and PSD Increments (1990).

    - Three dates related to the PSD Increment concept are important in understanding how to calculate the amount of increment consumed by an emissions increase associated with a new source or modification: 1) trigger date; 2) major source baseline date; and 3) minor source baseline date.

        - The trigger date for PM2.5 (October 20, 2010) is the date that initiates the overall increment consumption process. The major and minor source baseline dates are necessary to properly account for the emissions that are to be counted toward the amount of increment consumed following the trigger date.

        - The major source baseline date for PM2.5 (October 20, 2011) is the date after which emissions increases associated with construction at any major stationary source consume the PSD increment.

        - The minor source baseline date is the earliest date after the trigger date on which a source or modification submits the first complete application for a PSD permit in a particular area. After the minor source baseline date, any increase in emissions from both major and minor sources consumes PSD increment for that area.

    - If a new source or modification subject to PSD review for PM2.5 causes modeled impacts that exceed the SIL, the applicant must evaluate within the SIA the increment consumption associated with the source's proposed emissions increase, along with other PM2.5 emissions increases or decreases from any sources in the area, which have occurred since the minor source baseline date established for that area.

    - If the minor source baseline date has not been established, then only PM2.5 emissions from the new source or modification and actual PM2.5 emissions changes at major sources after October 20, 2011 (i.e., the major source baseline date) would have to be included in the PSD Increment Analysis.

    - The Formosa PSD permit application is utterly devoid of any discussion of trigger date, major source baseline date, and minor source baseline date with respect to PM2.5.

- It is impossible from the record to review either Formosa's or LDEQ's decision making process with respect to what sources were included as PM2.5 increment consumers, expanders, or baseline sources.

- Formosa must review all permit actions since the major source baseline date for PM2.5 (October 20, 2011) and compile a source-by-source, stack-by-stack regional inventory identifying all baseline, expanding, and consuming emissions for LDEQ review and approval. Only then will there exist a sufficient record upon which meaning public comment can be based.

- **ISSUE #5 –** The NAAQS and Class II Increment modeling efforts do not comport with 40 CFR Part 51, the LDEQ AQMP, and/or the usual and customary approach with respect to the *speciation of PM2.5 as a subset of PM10 emissions*.

  - A complete NAAQS and Class II Increment potential emissions inventory was provided by LDEQ for PM10. PM2.5 emissions have only been regulated since 2010. As such, the NAAQS and Class II Increment potential emissions inventory for PM2.5 provided by LDEQ has little information. See PM25 PermittedEmissionsReport 2016.xlsx

  - PM2.5 is a subset of PM10. Formosa created a PM2.5 inventory using the PM10 inventory as a starting point to arrive at PM2.5 emission estimates. Formosa estimated in some cases PM2.5 emissions as less than 1/5 of PM10 emissions.

  - The Formosa PSD permit application is utterly devoid of any discussion of the PM2.5 speciation rationale. No documentation or justification of any kind was supplied by Formosa (either in the application, the September 2015 modeling protocol, the April 2018 modeling protocol, the initial July 2018 modeling submittal, the October 2018 modeling submittal follow-up, or the January 2019 modeling follow-up) supporting these speciation efforts.

  - Considering the combustion sources involved, PM10 and PM2.5 are generally equivalent. Formosa's technically suspect and wholly undocumented speciation efforts serve to drastically underestimate emissions and therefore ambient impacts. As part of the modeling protocol re-submittals, Formosa must justify any and all instances where PM2.5 emissions are less than PM10. Only then will there exist a sufficient record upon which meaning public comment can be based.

1.5.2 Class I Increment

- **ISSUE #6 –** Formosa did not consult or reach agreement with EPA Region 6 prior to determining the appropriate second level screening methods and techniques to complete the Class I Increment assessment as required by 40 CFR Part 51, Appendix W, Section 4.2(b)(ii).

  - There exists a two-step screening approach to address long range transport (beyond 50 kilometers) for purposes of assessing Class I PSD Increments.

- The first screening step relies upon the near-field application of AERMOD to determine ambient impacts up to 50 kilometers. Until recently, the second screening step relied upon the far-field application of CALPUFF to determine the significance of ambient impacts beyond 50 kilometers. If either screening step indicated impacts below the applicable Class I SIL, no further modeling efforts were required. Otherwise, a cumulative impact analysis for NAAQS and/or PSD Increments beyond 50 kilometers is necessary.

- EPA removed CALPUFF as a preferred model in 40 CFR Part 51, Appendix W for long range transport assessments. As such, while the first screening step (AERMOD up to 50 kilometers) remains unchanged, there no longer exists a preferred model or screening approach for the second screening step at distances beyond 50 kilometers.

- 40 CFR Part 51, Appendix W, Section 4.2(b)(ii) clearly states that applicants shall reach agreement on the specific model and modeling parameters for the second screening step on a case-by-case basis in consultation with the appropriate reviewing authority (LA DEQ) and EPA Regional 6. If a cumulative impact analysis for NAAQS and/or PSD Increments beyond 50 kilometers is necessary, the alternative model approval procedures in 40 CFR Part 51, Appendix W, Section 3.2.2(e) must also be followed.

- The Class I Increment screening efforts triggered mandatory consultation requirements under 40 CFR Part 51, Appendix W, Section 4.2(b)(ii).

1.5.3 Air Toxics

- The current air toxics assessment is limited to the air toxics listed in LAC 33:III.5105 et seq. These air toxics are a small subset of the total number of air toxics emitted from the proposed site. There exist over 40 additional air toxics from the combustion of natural gas alone. See AP-42, Chapter 1.4, Tables 1.4-3 and 1.4-4. https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf.

- For the subset of air toxics included in LAC 33:III.5105 et seq., the Minimum Emission Rate (MER) and Ambient Air Standards (AAS) are 20+ years old and simply do not reflect current data on risk as summarized in the Integrated Risk Information System (IRIS). https://www.epa.gov/iris

- Formosa did try to bring the ethylene oxide (EtO) assessment up to modern standards with a revised AAS of 0.02 microgram per cubic meter (ug/m3) annual average. However, this reflects an assumed acceptable cancer risk of 1 in 10,000.

- The attached plots have been generated using Formosa's own data showing the (substantially increased) exposed populations at 1 in 100,000 and 1 in 1,000,000 cancer risks.

1.6 Paths Forward

- LDEQ must require Formosa to submit for LDEQ's review and approval a new NAAQS and Class II Increment modeling protocol which corrects the following deficiencies:
  - Appropriately treats "ambient air" based on available guidance;
  - With respect to the NAAQS and PSD Increment regional inventory, estimate actual emissions (a) using the most recent 2 years of data and (b) calculated utilizing the 40 CFR Part 51, Appendix W, Section 8.2.2 formulas.
  - Reviews all permit actions since the major source baseline date for PM2.5 (October 20, 2011) and compile a documented inventory of baseline, expanding, and consuming sources;
  - Assumes PM10 emissions are equal to PM2.5 emissions unless speciation data exists in the literature for that type of source; and
- LDEQ must require Formosa to then remodel in strict accordance with the revised and agency-approved NAAQS and Class II Increment modeling protocol and address any NAAQS or Class II Increment violations that may result.
- Formosa must compile and submit for LDEQ and EPA Region 6 review and approval a Class I Increment modeling protocol in accordance with 40 CFR Part 51, Appendix W, Section 4.2(b)(ii).
  - Formosa must remodel in strict accordance with the revised and agency-approved Class I Increment modeling protocol.
  - If a cumulative impact analysis is necessary, Formosa must follow the alternative model approval procedures in 40 CFR Part 51, Appendix W, Section 3.2.2(e)
  - LDEQ must require Formosa to then remodel in strict accordance with the revised and agency-approved Class I Increment modeling protocol and address any Class I Increment violations that may result.
- LDEQ must require Formosa to then remodel in strict accordance with the revised and agency-approved Class I Increment modeling protocol and address any Class I Increment violations that may result.
- LDEQ must require Formosa to submit for LDEQ's review and approval a new air toxics assessment which corrects the following deficiencies with the current approach:
  - Expands the library of air toxics under consideration;
  - Utilizes acceptable ambient concentrations that reflect current toxicology knowledge and approach; and
  - For known or suspected carcinogens utilize either the 1 in 1,000,000 cancer risk threshold.

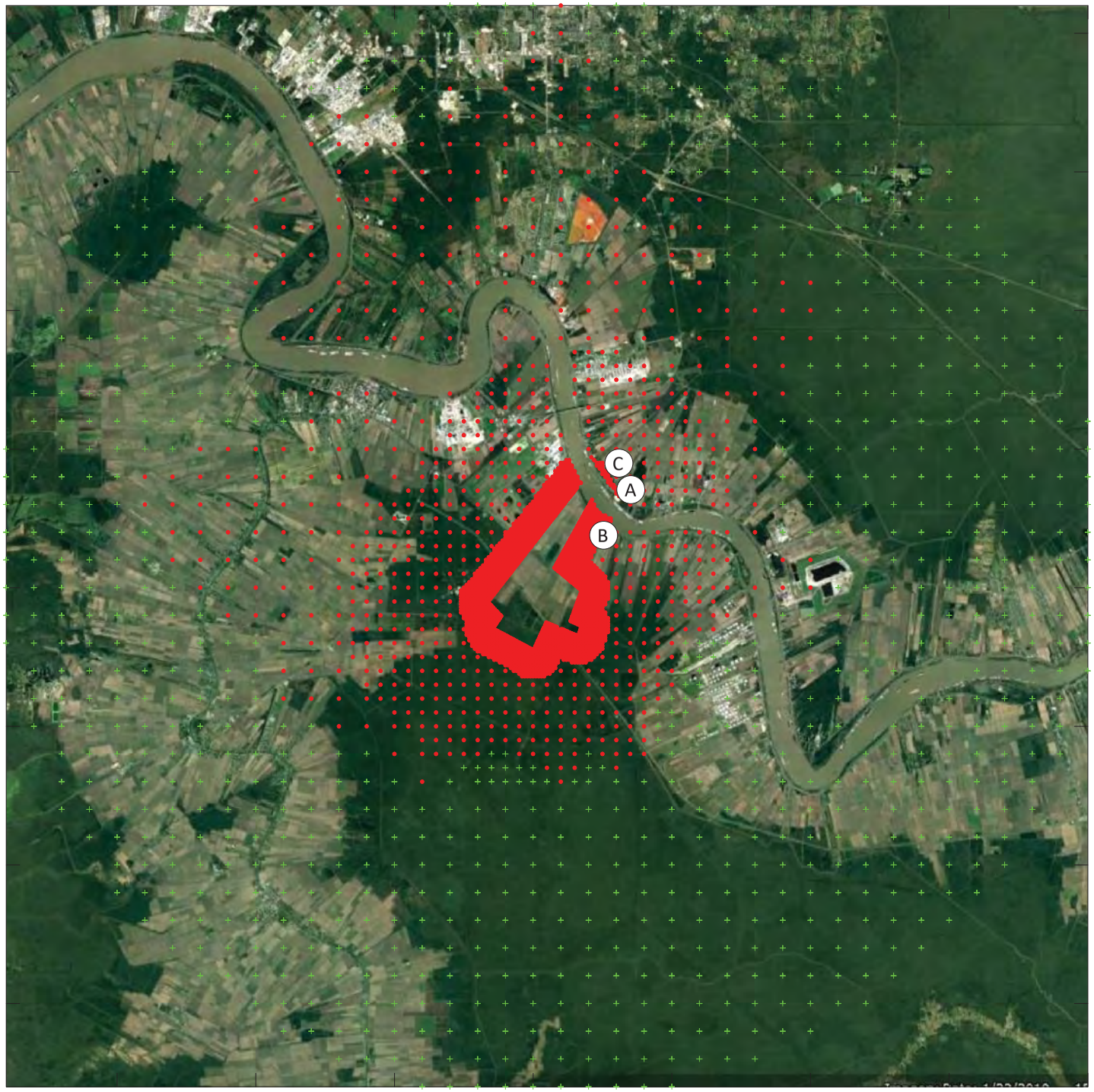
Map created by Todd Cloud, Chemical Engineer, using Updated TAP Modeling Analysis (December 11, 2018) submitted by Zephyr Environmental Corporation in support of the FG LA Chemical Complex PSD Application

AERMOD Output file
FGLA-MG-13_2017_EO.GRF

EtO Full lifetime IUR = 0.005 per EPA IRIS
1 in 100,000 cancer risk = 0.002 ug/m3

Total cancer risk based on human data.
Lymphoid cancer incidence and
breast cancer incidence in females.

A = Sugar Hill RV Park
B = Fifth Ward Elementary School
C = Union (Residential Community)



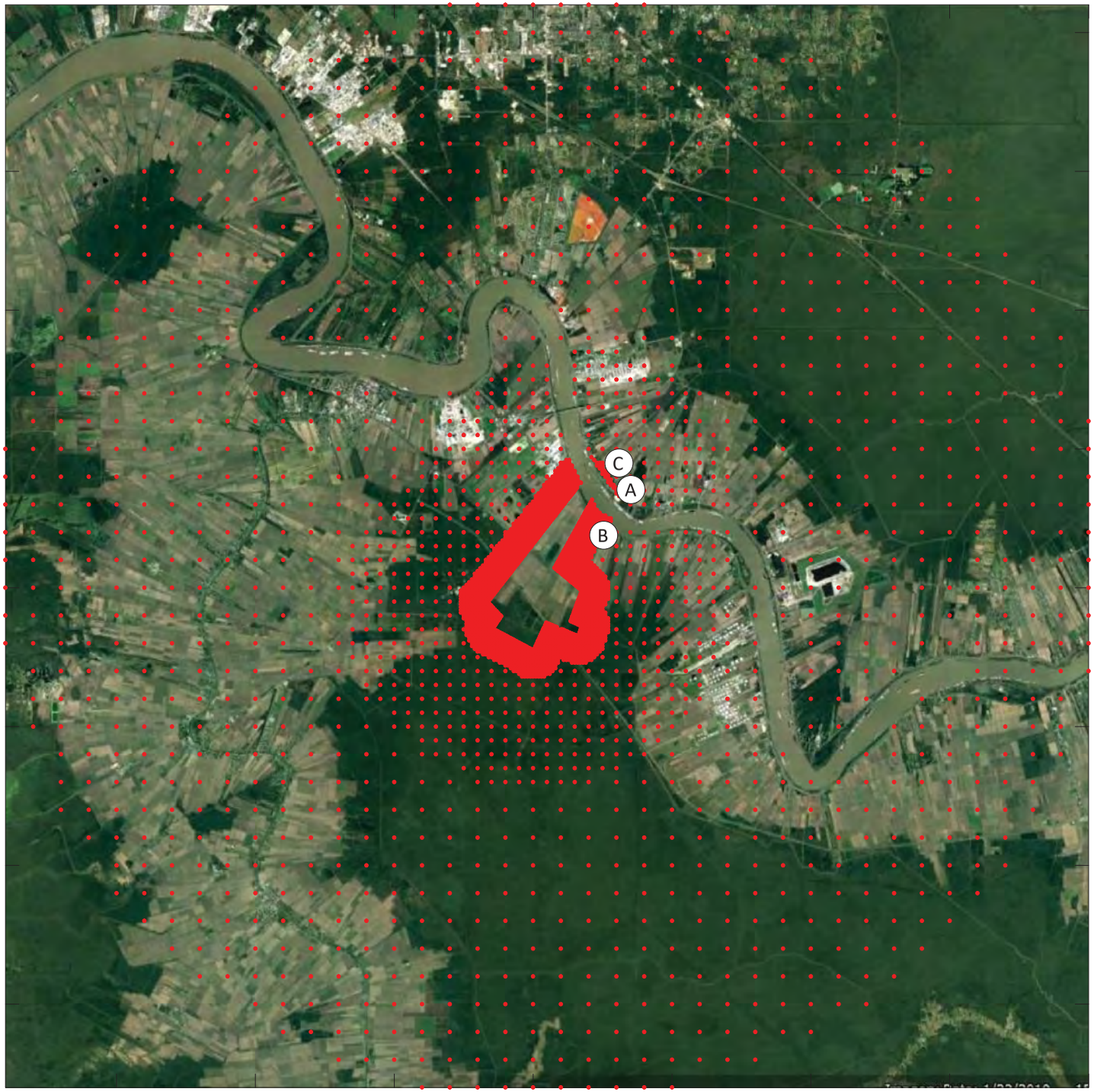
ATTACHMENT D

Map created by Todd Cloud, Chemical Engineer, using Updated TAP Modeling Analysis December 11, 2018 submitted by Zephyr Environmental Corporation in support of the FG LA Chemical Complex PSD Application

AERMOD Output file
FGLA-MG-13_2017_EO.GRF

EtO Full lifetime IUR = 0.005 per EPA IRIS
1 in 1,000,000 cancer risk = 0.0002 ug/m3

Total cancer risk based on human data. Lymphoid cancer incidence and breast cancer incidence in females.



A = Sugar Hill RV Park
B = Fifth Ward Elementary School
C = Union (Residential Community)

ATTACHMENT D

LOUISIANA DEPARTMENT OF ENVIORNMENTAL QUALITY

Proposed Prevention of Significant Deterioration Permit (PSD-LA-812)
14 Proposed Title V Permits (3141-V0 through 3154-V0)
Associated Environmental Assessment Statement

FG LA Chemical Complex (AI 198351)
Welcome, St. James Parish, Louisiana
Activity Nos.: PER20150001 through PER20150015

AFFIDAVIT OF DR. RANAJIT SAHU

I, Dr. Ranajit ("Ron") Sahu, Ph.D state:

1. I am a person above the age of majority who is competent to make this affidavit. I have personal knowledge of the statements made below.

2. I reside in Alhambra, California. I have worked for nearly thirty years in the fields of environmental, mechanical, and chemical engineering. For the last 18 years, I have been an independent consultant on environmental and energy issues, working on projects nationwide.

3. I have reviewed the applications and materials associated with the proposed Prevention of Significant Deterioration (PSD) permit, number PSD-LA-812, and the proposed 14 Title V permits, numbered 3141-V0 through 3154-V0, that have been drafted by the Louisiana Department of Environmental Quality for the FG LA Chemical Complex.

4. Through my education, training, experience, and review of relevant documents, I have formed opinions regarding the emissions, air quality modeling, control strategies, environmental impacts, and enforceability of the proposed PSD permit conditions and limitations and all applicable requirements. In the same way, I have formed opinions concerning the measures to ensure compliance in the proposed Title V permits.

5. Attached as Exhibit 1 is a true and correct copy of a report containing my opinions referenced in paragraph 4, which I have prepared on behalf of RISE St. James, Louisiana Bucket Brigade, and Sierra Club.

6. The materials, mathematical calculations, figures, and charts I reviewed and produced in the process of forming my opinions and preparing the report in Exhibit 1, are what an experienced air pollution consultant would rely upon in forming opinions regarding the emissions, control strategies, and environmental impacts of a proposed petrochemical complex like the FG LA Chemical complex.

7. Attached as Attachment A to Exhibit 1, is a true and correct copy of my curriculum vitae, with detailed information on my qualifications, work experience, and a list of my work as an expert submitting reports and participating as a witness in proceedings involving environmental matters.

I hereby certify under penalties of perjury that the foregoing representations are true to the best of my knowledge.

Date 8/9/19

Dr. Ranajit Sahu

State of California

County of Los Angeles

Sworn to and subscribed before me on August 9, 2019
Date

by Vuong Nguyen
Notary Public (print)

VUONG NGUYEN
Notary Public - California
Los Angeles County
Commission # 2281572
My Comm. Expires Mar 18, 2023

Signature of Notary Public

My commission expires 3/18/23

ATTACHMENT E

Technical Comments on the Proposed

FG LA Complex
(Welcome, St. James Parish, Louisiana)

PSD Permit: PSD-LA-812 and 14 Associated Title V Permits

by

Dr. Ranajit (Ron) Sahu

Consultant[1]

August 9, 2019

[1] Resume provided in Attachment A

TABLE OF CONTENTS

SECTION 1 – INTRODUCTION AND SUMMARY

In this comment report I provide technical comments on the proposed PSD and 14 Title V permits[2] for the Formosa plastics plants in St. James Parish, Louisiana. My comments are based on my review of the record for these proposed permits – i.e., permit applications including updates, Emission Inventory Questionnaires (EIQs), the proposed permits, correspondence between the Louisiana Department of Environmental Quality (LDEQ or DEQ) and the applicant and its consultants, technical analyses provided by the applicant including those for calculation of hourly and annual Potential to Emit (PTE) emissions for criteria and hazardous air pollutants, Best Available Control Technology (BACT), air dispersion modeling, cost calculations, and the DEQ's Statement of Basis and Preliminary Determination Summary documents.

My comments are also informed by my qualifications and experience as an engineer, with almost three decades as a consultant on chemical process industries, their emissions and impacts, applicable pollution control technologies and work practices, and monitoring and verification techniques. I have provided expert comments on Clean Air Act permitting actions in many jurisdictions, including several Louisiana Clean Air Act cases. In addition to my consulting work, I have taught university courses on air pollution, process hazard analysis, and hazardous waste management, including at UCLA, UC Riverside, Loyola Marymount University, University of Southern California, and my alma mater, Caltech. More information on my qualifications and past experience is provided in Attachment A to these comments.

Through my body of work, I have gained deep experience with the Federal and state rules and regulations governing Clean Air Act permitting, including those for New Source Review (NSR) – Prevention of Significant Deterioration (PSD) and Non-Attainment NSR (NNSR), the ambient air quality standards that must be met, and other standards such as the Federal New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAPs), Maximum Achievable Control Technology (MACT), screening values for various HAPs, and other state-only requirements.

1.1 Description of the Proposed Plant

As stated in the LDEQ Statement of Basis accompanying this proposed permitting action, FG LA, LLC is proposing to construct a chemical complex in Louisiana (the FG LA Complex). FG LA's proposed site is located in St. James Parish, Louisiana along the Mississippi River. The FG LA Complex will use ethane and propane to make ethylene and propylene, ultimately producing high- and low-density polyethylene, propylene, and ethylene glycol. The complex will also include support facilities, such as utilities (including a cogeneration power plant), a central wastewater treatment plant, logistics, and storage and loading operations.

Although not a technical comment, it was not clear why the facility is proposing 14 Title V permits. There is significant duplication in the emissions, BACT, regulatory analysis, monitoring and other aspects of these inter-related Title V permits. It is my opinion that just one single Title V permit

[2] The proposed Title V Operating Permits include: 3141-VO, 3142-VO, 3143-VO, 3144-VO, 3145-VO, 3146-VO, 3147-VO, 3148-VO, 3149-VO, 3150-VO, 3151-VO, 3152-VO, 3153-VO, and 3154-VO. The PSD Permit is PSD-LA-812.

would have been sufficient for the complex. And doing so would be more consistent with the goals of Title V, which was to provide the public with a single location for all applicable requirements. The proposed permitting action directly defeats that goal by fragmenting the Title V permits, with no explanation as to the necessity of doing so.

1.2 Organization of the Report

My report is organized as follows. I start with the estimated impacts of air pollutants as analyzed by the applicant and as accepted by the DEQ. I focus on those pollutants that even the applicant's analyses indicate are over or very close to the relevant standards. Next, I analyze the PTE emissions from many of the processes and sources at the proposed facility, showing that the PTE for most pollutants are under-estimated. While I agree that the facility is a major source of most pollutants, nonetheless a proper and accurate estimate of the PTEs for various pollutants is crucial because these emission estimates are a key input into the air impacts analysis models. Underestimation in emissions directly leads to underestimation of impacts. My comments then focus on the BACT analyses, including the improper rejection of certain BACT based on cost-effectiveness. That is followed by comments on the lack of enforceable monitoring/verification provisions in the proposed permits. The lack of proper monitoring and verification is made even more problematic because of the potential that the applicant underestimated its PTE emissions.

While I do not have a separate section addressing modeling issues, I note that the modeling analyses provided in the record contain significant deficiencies such as: lack of baseline site-specific data collection for pollutants and meteorological data; improper source characterization such as for flares (which are all modeled with a constant exit gas temperature and velocity, relying on dubious and unsupported "guidance" with no engineering basis; and the lack of monitoring to confirm the modeled non-attainment of $PM_{2.5}$ and NO_x as well as SO_2) in the modeling analyses presented by the applicant. I recognize that additional modeling comments are being presented by another expert, Mr. Todd Cloud. I have reviewed Mr. Cloud's modeling comments and I agree with his findings and conclusions concerning the shortcomings in the applicant's modeling efforts.

The goal of my review was not to identify and critique every single deficiency that I found. In the interests of time and resources, I chose to focus and prioritize my work for the more critical and important short-comings. Attachment B shows a chart of the current estimated PTE for various pollutants for various sources. In part, I used the chart in Attachment B to prioritize areas that I have focused on in these comments. Thus, I stress that there are still many additional deficiencies that I do not explicitly comment on – such as in the emissions calculations for the smaller sources or activities, including lack of support for many of the assumptions made in those calculations; the BACT analyses for certain activities such as for engines; the lack of enforceability of many of the permit conditions because of their vague wording; and the like.

1.3 Summary of Key Findings

My review of the permitting record for this facility shows that it is deficient in almost every key aspect that I have reviewed, other than its representation as a major source.[3] Major findings, in no particular order, are as follows:

(a) PTE estimates are unsupported in the majority of instances, relying on assumptions that are not subject to verification. This includes: reliance on unidentified vendor or manufacturer "guarantees;" engineering assumptions with little or no basis; and reliance on process assumptions which are subject to change (and are likely to evolve over the life of the plant in any case) since facility design is clearly not complete at the time of permit application in 2017-2018;

(b) PTE emissions are under-estimated based on a clear mis-application of US EPA AP-42 as the basis of many of the PTE calculations;

(c) PTE estimates in many other instances are under-estimated due to the use of unsupported and unverified assumptions of very high levels of control efficiency, such as for flares, vapor combustors, thermal oxidizers, etc.;

(d) BACT analyses for many of the pollutant/source combinations are deficient leading to less stringent limits proposed as BACT. Proposed BACT limits are not based on the proper application of the top-down method purported to be used by the applicant and DEQ. Rather that forward-looking and technology-forcing, as BACT (and LAER, applicable for NO_x as noted above) are intended to be, the analysis presented is simply rooted in the past and relies exclusively on prior BACT analysis at other facilities. It is simply not BACT for a facility, that once built, will last decades into the future;

(e) in cases where BACT technologies and work practices were rejected based on cost effectiveness considerations, there are significant flaws in the analysis as well as in the assumed cost-effectiveness thresholds;

(f) modeled air quality impacts for all pollutants including HAPs are under-estimated since they use under-estimated PTE emissions values are inputs. This means that health impacts on the surrounding community have not been properly estimated;

(g) modeled air quality impacts are also uncertain because of additional modeling deficiencies including improper source characterization; use of non-representative meteorological data; and use of non-representative monitoring data. On the last point, even though the facility and LDEQ have had almost 4 years since this permitting action began, no ambient monitoring has been conducted on site for any pollutant;

[3] I note that none of the emissions calculations or regulatory analyses tables contained in each of the 14 Title V permits was available to me for review in developing these comments in native Excel format – which was clearly how the consultant for the applicant had done the calculations and presented the regulatory review. This created an unnecessary roadblock in developing these comments. More importantly, it was clear to me that the LDEQ's review did not include any technical review of the emissions calculations and the like since the DEQ did not have the native Excel files either. It is fair to conclude that the DEQ's review was therefore inadequate.

(h) for $NO_x$the applicant's own modeling clearly shows that the area in which the plant will be located is in non-attainment for the 1-hour NO_x National Ambient Air Quality Standard (NAAQS) – and therefore the proper construction permit should be a NNSR and not a PSD permit. Further, this means that the NO_x BACT analysis should be replaced by a NO_x Lowest Achievable Emissions Rate (LAER) analysis as required under the NNSR provisions; that emissions offsets of the proper amounts be acquired; and that all other applicable NNSR requirements be met;

(i) for $PM_{2.5}$ 24-Hour NAAQS, the applicant's own modeling clearly shows that the area in which the plant will be located is in non-attainment - and therefore the proper construction permit should be a NNSR and not a PSD permit. Further, this means that the $PM_{2.5}$ BACT analysis should be replaced by a $PM_{2.5}$LAER analysis as required under the NNSR provisions; that emissions offsets of the proper amounts be acquired; and that all other applicable NNSR requirements be met;

(j) compliance verification conditions in the permit are so weak as to be meaningless. Thus, there is simply no way to confirm actual emissions from this plant once it begins operations and whether actual emissions will exceed assumed emissions in the air impacts analysis. There is also no way to verify that applicable regulatory requirements are being met.

(k) monitoring conditions are also very weak. This includes source monitoring as well as monitoring in the community outside the fence line of the proposed plant; and

(l) this proposed facility will emit vast quantities of greenhouses gases (GHG) – i.e., carbon dioxide, CO_2; methane, CH_4; nitrous oxide, N_2O; as well as sulfur hexafluoride, SF_6 – the latter a potent GHG. Yet, the permit contains no quantitative (and, therefore, no enforceable) conditions to ensure that only the least quantities of these gases are emitted into the atmosphere. In effect, the BACT conditions limiting GHG from this proposed facility are toothless.

Individually, these are glaring deficiencies and collectively, they are fatal. Especially so for a plant that will be located in an area where the population in the surrounding area which will feel the brunt of the impacts is already subject to the impacts of many existing major sources of criteria and toxic air pollutants. The DEQ must address these and other comments and re-propose a new set of proper draft permits for this facility along with provisions for a new round of public comments.

SECTION 2 – RESULTS OF THE APPLICANT's MODELED AIR QUALITY IMPACTS

I begin with a summary of the applicant's own modeling analyses. As I discuss in these comments it is my opinion that the applicant's modeling of its impacts understate the potential impacts from the facility. Before explaining those modeling deficiencies, it is appropriate to summarize, as I do in this section, how close the applicant's modeling of air quality impacts already comes, in several cases, to the applicable thresholds. Thus, it is important to note the small margin for error the applicant left for itself, even under its own analysis. And any increases in projected emissions could easily lead to violation of several air quality standards. This alone is cause for concern.

Below, I show specific summary tables, taken from the DEQ's Preliminary Determination Summary. In each instance, I highlight, in red coloring, those instances where the applicant's modeling either exceeds or is so close to the applicable standard as to leave almost no margin for compliance unless all of the assumptions made by the applicant are true and verifiable – which is simply impossible in the permits as proposed.

2.1 Preliminary Screening

As the DEQ states, this preliminary screening was done in order to determine if refined modeling was required, as shown in the last column. While I agree with all of the "Yes" values in the last column, I disagree with the "No" for the SO_2 1-hour averaging period. The preliminary screening value of 7.48 ug/m^3 is, in my opinion, too close to the applicable Significant Impact Level (SIL) of 7.8 ug/m^3 given the underestimation of emissions which I discuss later. Therefore this is a critical error and refined modeling for SO_2 for the 1-hour averaging period should have been conducted. By not doing so, the record provides no additional information regarding whether or not the area around the facility – both before and after the proposed plant – meets the 1-hour SO_2 NAAQS. DEQ should require the applicant to conduct refined modeling for SO_2 for 1-hour averaging period, regardless of whether DEQ also orders changes based on the other significant deficiencies I outline in the sections that follow.

Pollutant	Averaging Period	Preliminary Screening Concentration (µg/m^3)	Level of Significant Impact (SIL) (µg/m^3)	Refined Modeling Required?
$PM_{2.5}$	24-hour	9.44	–	Yes
	Annual	1.68	–	Yes
PM_{10}	24-hour	11.03	5	Yes
	Annual	2.21	1	Yes
SO_2	1-hour	7.48	7.8	No
	3-hour	25.83	25	Yes
	24-hour	3.12	5	No
	Annual	0.2	1	No
NO_2	1-hour	74.05	7.5	Yes
	Annual	6.58	1	Yes

CO	1-hour	1310.13	2000	No
	8-hour	677.53	500	Yes

2.1 National Ambient Air Quality Standards

The following table shows the applicant's summary of the modeling conducted with regards to NAAQS compliance demonstration. As noted above, the modeling for the 1-hour SO_2 NAAQS is missing because it was eliminated without any technical judgement at the preliminary screening level.

Pollutant	Averaging Period	Background ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	Maximum Modeled Concentration+ Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
$PM_{2.5}$	24-hour	19.00	32.16	51.66	35
	Annual	8.20	3.59	11.56	12
PM_{10}	24-hour	76.00	24.21	100.21	150
SO_2	3-hour	27.10	65.57	92.67	1300
NO_x (NO_2)	1-hour	28.81	393.71	422.53	189
	Annual	7.54	20.37	27.91	100
CO	8-hour	1143.84	1548.91	2692.75	10,000

While the table shows on-paper compliance with the PM_{10}, $PM_{2.5}$ annual, PM_{10} 24-hour, SO_2 3-hour, NO_2 annual, and CO 8-hour NAAQS, simple examination of the results indicates that compliance with the $PM_{2.5}$ annual NAAQS has little margin (predicted modeled concentration plus background of 11.56 ug/m^3 versus NAAQS concentration of 12 ug/m^3). It is my opinion that even the slightest increase in, for example, the emissions of $PM_{2.5}$ would show exceedance of this NAAQS. And, I will show later that the PTE estimates for $PM_{2.5}$ which have been used in the modeling severely underestimate the PTE and therefore its modeled impacts. Since there is little to no margin for the $PM_{2.5}$ annual NAAQS compliance, and the PTE is underestimated, the DEQ should not have accepted this slimmest of "compliance" demonstration for this critical pollutant.

For $PM_{2.5}$ 24-hour and NO_x (NO_2) 1-hour NAAQS, the applicant's own modeling clearly shows NAAQS violations in the summary table above. While the applicant has provided supplemental modeling showing that its contributions to these modeled NAAQS violations are smaller than the respective SILs, it does not detract from (in fact it reinforces) the fact that the applicant's own modeling shows that for these two pollutants – the area around the facility is already in non-attainment for NO_x 1-hour and close to non-attainment for $PM_{2.5}$ 24-hour.

The straight-forward implication of this is that for $PM_{2.5}$ and NO_x, the proper type of construction permit is not the PSD permit (which is only for areas in attainment of the NAAQS) but rather a NNSR permit. Thus, proposing to issue a PSD permit, as the DEQ has noticed in this matter for $PM_{2.5}$ and NO_x is a fatal error. DEQ must, at a minimum, require the applicant to comply with NNSR permitting rules for the $PM_{2.5}$ 24-hour and NO_x 1-hour standards.

2.3 PSD Increments

These only apply to PSD pollutants. As noted in the previous sections, $PM_{2.5}$ (24-hour - definitely and annual – most likely), and NO_x 1-hour all show exceedances of their respective NAAQS or very close to exceedances of their respective NAAQS.

Not surprisingly, per DEQ's summary as shown in the table below, the modeled PSD increment consumption for several of the pollutants and averaging times, shown in red, are above or close to their Class II increment values. This includes the $PM_{2.5}$ 24-hour increment which is clearly exceeded and the NO_x annual increment which is close to being exceeded. While the applicant has provided modeling that purports to show small impacts from the facility on $PM_{2.5}$ 24-hour increment, there is simply no increment left to consume for $PM_{2.5}$ 24-hour averaging period. In other words, this reinforces the idea that this area is already in non-attainment for $PM_{2.5}$ 24-hour NAAQS.

Pollutant	Averaging Period	Modeled Increment Consumption ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)
$PM_{2.5}$	24-hour	12.96	9
	Annual	2.18	4
PM_{10}	24-hour	17.31	30
	Annual	5.30	17
SO_2	3-hour	65.57	512
NO_2	Annual	20.37	25

In summary, first, the applicant's own modeling demonstrates that the area around the proposed plant is in non-attainment for the $PM_{2.5}$ 24-hour and NO_x 1-hour NAAQS. Thus, NNSR and not PSD permitting applies for these pollutants.

Second, the applicant's modeling also shows that the area around the plant is close to non-attainment for the $PM_{2.5}$ annual NAAQS. Since I will discuss the significant underestimation of PTE emissions of all pollutants including $PM_{2.5}$, it is a certainty that proper modeling using correct PTE estimates would have shown that the area around the plant is non-attainment for the $PM_{2.5}$ annual NAAQS as well.

Third, the applicant's analysis shows that it should have conducted refined modeling for SO_2 1-hour NAAQS, given the very narrow margin by which it its modeling was below the applicable

SIL and given the underestimation in SO_2 emissions (exacerbated by no verification or compliance monitoring in the permits) which I will discuss later.

Finally, the applicant's modeling shows that the increment for $PM_{2.5}$ 24-hour is consumed and that for NO_x annual averaging is almost all consumed. For NO_x, this is a certainty given the significant underestimation of the NO_x PTE emissions which I will discuss later in these comments.

SECTION 3 – EMISSIONS

Although the facility is undisputedly a major source of air pollution, nonetheless accurate PTE estimates are essential because they are a key input in the air dispersion modeling that is required as part of the NSR analysis. As discussed in Section 2, even setting aside all of the technical deficiencies in the modeling (some of which are discussed in the Comment Report of Mr. Cloud, and others noted earlier in Section 1, the results of the modeling show that the impacts from the facility are close to or exceed critical thresholds for several pollutants including NO_x, $PM_{2.5}$, and SO_2, among others. For $PM_{2.5}$ and NO_x, I note that the applicant's own modeling shows that the area is in non-attainment of the NAAQS. Thus, a proper estimate of PTE is essential, and more accurate estimates likely would demonstrate further NAAQs violations and PSD increment consumption.

In this section, I will first discuss, in general terms, the deficiencies in the emissions calculations, generally leading to underestimation of emissions of all pollutants from the proposed facility – i.e. underestimation of the potential-to-emit (PTE) of various pollutants. I will then discuss some specific examples. As with my other analyses in these comments, I do not discuss each and every emission calculation but rather the general deficiencies and some specific examples. Taken as a whole, the PTE emissions estimates provided in the permitting record underestimate PTE emissions for every single pollutant, and as a result, the impact of the facility's emissions are also underestimated. This affects not only the impacts on criteria pollutants discussed in Section 2 but also the impacts from the many HAPs that will be emitted and which will increase the health impacts and risks in the surrounding communities.

The PTE underestimation is compounded by the lack of meaningful enforceability in the permit, which I discuss in Section 5.

3.1 Potential to Emit (PTE)

Under Louisiana regulations (and similar to the Federal definition) as approved in its State Implementation Plan (SIP) by the EPA, PTE is defined as follows:

> "Potential to Emit -- the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if:
>
> a. the limitation is enforceable by the administrator, when the potential to emit is being considered with regard to federally applicable requirements; or
>
> b. the limitation is enforceable by the DEQ Air Quality Division, when the potential to emit is being considered with regard to state applicable requirements."[4] (emphasis added)

[4] LAC 33:III Ch. 5 Section 502 – Definitions, available at https://www.epa.gov/sips-la/louisiana-sip-lac-33iii-ch-5-section-502-definitions

As the definition above makes clear, the fact that the PTE reflects the maximum capacity of a source to emit the pollutant in question is not arguable. And, that the PTE can only be limited by enforceable conditions, is also not arguable. My comments in this Section and the Section 5 show that the current permit analysis fails on both grounds.

3.2 General Discussion - AP-42 Is Not a Proper Basis for Estimating PTE

The EPA document commonly referenced as AP-42 has been widely used and cited as the basis for many of the PTE emissions estimates in the current permits. Although not an exhaustive list, examples of this include the following instances taken directly from the respective Title V permit applications:

ET1 and ET2 – Tank Emissions
Emissions from Fixed Roof Tanks
Reference 1: AP-42, Fifth Edition, Volume 1, Chapter 7.1 Organic Liquid Storage Tanks November 2006
Tank Maintenance - Emissions from Vacuum Truck / Truck Loading
Reference: AP-42. Fifth Edition, Volume 1, Chapter 5.2 Transportation and Marketing of Petroleum Liquids - January 1995
Tank Maintenance - Emissions from Floating Roof Landings
Reference: AP-42, Fifth Edition, Volume 1, Chapter 7: Liquid Storage Tanks - November 2006
Tank Maintenance - Emissions from Floating Roof Tank Refilling
Reference: AP-42, Fifth Edition, Volume 1, Chapter 7: Liquid Storage Tanks - November 2006

ETl and ET2 – Tank Truck Loading
AP-42, Fifth Edition, Volume 1, Chapter 5.2 Transportation and Marketing of Petroleum Liquids July 2008

ET1 and ET2 - Plant Fuel Gas Properties and PM_{10} , $PM_{2.5}$, S02, VOC and HAP Emission Factors
Note [2] The SO_2 emission factor is calculated by adjusting the AP-42 emission factor of 0.6 lb/MMscf, which is based on 2000 grains of sulfur and the % of NG blended
Note [4] HAP emission factors for non-metal HAP compounds with an emission factor rating of "C" or better, from AP-42 Table 1.4-3.

Utility 1 and 2 – Boilers (2) EFs

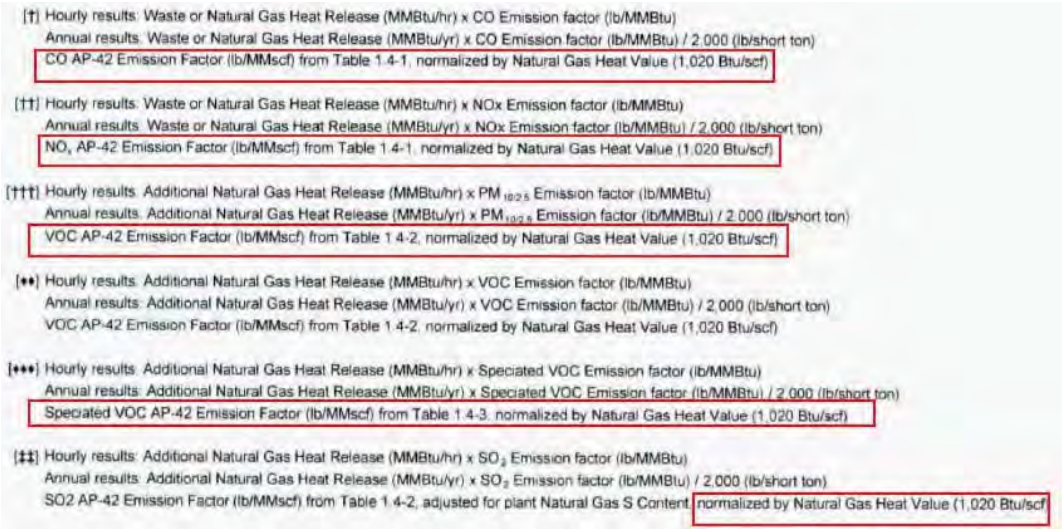
Sample Calculations - $PM/PM_{10}/PM_{2.5}$ (Total)

Hourly $PM/PM_{10}/PM_{2.5}$ (Total) emission rate (lb/hr) =	$PM/PM_{10}/PM_{2.5}$ emission rate, based on AP-42 (lb/hr) + $(NH_4)_2SO_4$ emission rate (lb/hr)
Hourly $PM/PM_{10}/PM_{2.5}$ (Total) emission rate (lb/hr) =	6.75 (lb/hr) + 0.06 (lb/hr)
Hourly $PM/PM_{10}/PM_{2.5}$ (Total) emission rate (lb/hr) =	6.81
Annual $PM/PM_{10}/PM_{2.5}$ (Total) emission rate (tpy) =	$PM/PM_{10}/PM_{2.5}$ emission rate, based on AP-42 (tpy) + $(NH_4)_2SO_4$ emission rate (tpy)
Annual $PM/PM_{10}/PM_{2.5}$ (Total) emission rate (tpy) =	29.57 (lb/hr) + 0.25 (lb/hr)
Annual $PM/PM_{10}/PM_{2.5}$ (Total) emission rate (tpy) =	29.82

PR-WHB
"…emissions from this activity are estimated using emission factors provided by AP-42 or the licensor.

PR-RCHTR (Reactor Charge Heater)
Emission factors for $PM/PM_{10}/PM_{2.5}$ and HAPs are taken from AP-42

HDPE1 Thermal Oxidizer A and B



EG1-Thermal Oxidizer
NO_x AP-42 Emission Factor (lb/MMscf) from Table 1.4-1, normalized by Natural Gas Heat Value (1,020 Btu/scf)

RTO 1 and RTO 2
Note [2] Natural gas combustion emission factors from Tables 1.4-1 and 1.4-2 of AP-42 Chapter 1.4, Natural Gas Combustion (July 1998)

LLD-TO A and B
NO_x AP-42 Emission Factor (lb/MMscf) from Table 1.4-1, normalized by Natural Gas Heat Value (1,020 Btu/scf)

Polypropylene - Thermal Oxidizer
NO_x AP-42 Emission Factor (lb/MMscf) from Table 1.4-1, normalized by Natural Gas Heat Value (1,020 Btu/scf)

Logistics - Vapor Combustor A and B
NO_x AP-42 Emission Factor (lb/MMscf) from Table 1.4-1, normalized by Natural Gas Heat Value (1,020 Btu/scf)

Logistics- Uncontrolled Truck Loading Emissions, EPN LOG-TRK
AP-42, Fifth Edition, Volume 1, Chapter 5.2 Transportation and Marketing of Petroleum Liquids - July 2008

Logistics - Uncontrolled Railcar Loading Emissions, EPN LOG-RC
AP-42, Fifth Edition, Volume 1, Chapter 5.2 Transportation and Marketing of Petroleum Liquids - July 2008

Logistics - Uncontrolled Ship Loading Emissions, EPN LOG-SHP
AP-42, Fifth Edition, Volume 1, Chapter 5.2 Transportation and Marketing of Petroleum Liquids - July 2008

Logistics - Uncontrolled Barge Loading Emissions, EPN LOG-BG
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These examples illustrate the variety of ways that the AP-42 was either directly used or was the basis for the PTE calculations in many instances in the present permitting analysis.

I discuss why that is not appropriate in the following discussion.

3.2.1 AP-42 Is Designed, At Best, to Provide Estimates of Average Emissions and Not PTE

As the U.S. EPA itself explicitly acknowledges, there are many flaws and short-comings inherent to its use of AP-42; the EPA accordingly cautions users to take those flaws into account. These caveats, however, are neither recognized nor respected in FG LA's applications or in DEQ's analysis record, and, as a result, the PTE emissions estimates – the critical foundation of the proposed permits -- are deeply flawed. The persistent bias introduced by this inappropriate reliance on the AP-42 is that resulting emissions projected are major underestimates.

The primary limitation on the use of AP-42 for PTE calculations is that its factors are designed only to approximate average emission rates, not the maximum emission rate necessary to appropriately calculate PTE for permitting purposes. As stated by U.S. EPA:

> "In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average)."[5] (emphasis added)
>
> "Emission factor ratings in AP-42…provide indications of the robustness, or appropriateness, of emission factors for estimating average emissions for a source activity."[6] (emphasis added)
>
> "Emission factors in AP-42 are neither EPA-recommended emission limits . . . nor standards. . . Use of these factors as source-specific permit limits and/or as emission regulation compliance determination is not recommended by EPA. Because emission factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor."[7]

[5] AP-42 Introduction, p. 1. Available at https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors

[6] *Ibid*., p. 2.

[7] *Ibid*, p. 2 (emphasis added).

And, additionally:

> "Average emissions differ significantly from source to source and, therefore, emission factors frequently may not provide adequate estimates of the average emissions for a specific source. The extent of between-source variability that exists, even among similar individual sources, can be large depending on process, control system, and pollutant. . . As a result, some emission factors are derived from tests that may vary by an order of magnitude or more. Even when the major process variables are accounted for, the emission factors developed may be the result of averaging source tests that differ by factors of five or more."[8]

Based on the above, it is clear that AP-42 emission factors are inappropriate for developing PTE estimates, since PTE, per the definition provided earlier, is supposed to represent the "potential" or high-end emission estimate value. In contrast, AP-42 emission factors represent "average" and not maximum emission rates.

Thus, in each instance that the applicant's PTE calculations rely on AP-42 emission factors – such as in the examples listed previously– the resultant PTE emissions (all other criticisms aside) are unquestionably underestimates. This has material consequences as previously discussed since the PTE estimates are a key input in the modeling impacts analysis. DEQ should require FG LA to redo all PTE emissions estimates that rely on AP-42 factors, instead using data that more accurately reflect the source's maximum emissions rate. This can include modifying AP-42 based emission factors or methods.

3.2.2 The Reliability of AP-42 As Reflected in Rankings Should Be Considered

Even if it were proper to rely on the AP-42 factors to calculate PTE, which it is not, FG LA's reliance on low-ranked and/or inaccurate AP-42 factors should be rejected by DEQ. Neither the applicant nor the DEQ mentions or discusses the reliability (i.e., accuracy) of AP-42 emission factors.[9] AP-42 uses a rating system, quoted below, to provide the user with the accuracy of a particular emission factor:

> "Each AP-42 emission factor is given a rating from A through E, with A being the best. A factor's rating is a general indication of the reliability, or robustness, of that factor. This rating is assigned based on the estimated reliability of the tests used to develop the factor and on both the amount and the representative characteristics of those data. In general, factors based on many observations, or on more widely accepted test procedures, are assigned higher rankings. Conversely, a factor based on a single observation of questionable quality, or one extrapolated from another factor for a similar process, would probably be rated much lower….
>
> The AP-42 emission factor rating is an overall assessment of how good a factor is, based on both the quality of the test(s) or information that is the source of the factor and on how well the factor represents the emission source. Higher ratings are for factors based on many unbiased observations, or on widely accepted test procedures. For example, ten or more source tests on different randomly selected plants would likely be assigned an "A" rating if all tests are conducted using a single

[8] *Ibid*., p. 3.

[9] This is true with one exception. For some of the HAP calculations such as from the combustion of natural gas, the applicant simply does not include any of the HAPs that have AP-42 ratings below C. Omitting these pollutants altogether is highly inappropriate, as I discuss later.

valid reference measurement method. Likewise, a single observation based on questionable methods of testing would be assigned an "E", and a factor extrapolated from higher-rated factors for similar processes would be assigned a "D" or an "E". AP-42 emission factor quality ratings are thus assigned:

A — Excellent. Factor is developed from A- and B-rated source test data taken from many randomly chosen facilities in the industry population. The source category population is sufficiently specific to minimize variability.
B — Above average. Factor is developed from A- or B-rated test data from a "reasonable number" of facilities. Although no specific bias is evident, it is not clear if the facilities tested represent a random sample of the industry. As with an A rating, the source category population is sufficiently specific to minimize variability.
C — Average. Factor is developed from A-, B-, and/or C-rated test data from a reasonable number of facilities. Although no specific bias is evident, it is not clear if the facilities tested represent a random sample of the industry. As with the A rating, the source category population is sufficiently specific to minimize variability.
D — Below average. Factor is developed from A-, B- and/or C-rated test data from a small number of facilities, and there may be reason to suspect that these facilities do not represent a random sample of the industry. There also may be evidence of variability within the source population.
E — Poor. Factor is developed from C- and D-rated test data, and there may be reason to suspect that the facilities tested do not represent a random sample of the industry. There also may be evidence of variability within the source category population."[10]

Note, in particular, the very poor reliabilities of "D" and "E" rated factors. As I will show in the examples below, the applicant and DEQ have used unreliable D and E rated factors in numerous instances to estimate the PTEs of many pollutants.

3.3 Specific Examples Where PTE is Underestimated

In this section I will review and identify, with respect to specific facility emission sources, critical problems in developing the PTE estimates. This includes the use of AP-42 as a basis for identifying the potential to emit for both criteria and toxic pollutants. And, it addresses non-AP-42 assumptions made in the calculations as well.

3.3.1 Combustion Sources

As noted, the applicant has used and the DEQ has accepted emission factors for criteria pollutants such as NO_x, $PM/PM_{10}/PM_{2.5}$ as well as HAPs from AP-42. Tables 1.4-1, 1.4-2, and 1.4-3/1.4-4, taken from AP-42 show emission factors for NO_x, CO, PM, as well as HAPs and are reproduced below.[11] None of the factors used are A-rated. The PM condensable and PM total factors are rated D, "below average". The VOC factor is rated as C. With few exceptions, most of the emission

[10] *Ibid*., pp. 8-10.
[11] AP-42, Ch. 1 Natural Gas Combustion, Tables 1.4-1 through 1.4-3, https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf

factors for the HAP that the facility will emit from combustion of natural gas are rated D or E – "below average" or "poor."

I have previously noted that for HAPs the applicant has only included those HAPs with rating of C or better in its calculations. While it certainly confirms that the applicant is aware of the importance of the AP-42 ratings, it raises two major issues.

First, simply omitting HAPs with ratings of D and E underestimates the HAP PTE. Ratings of D or E do not mean that those HAPs are not emitted, the practical effect of simply omitting them from the inventory altogether, as the applicant has done. It means that better estimates of the emissions are needed – and one practical way to do that is to look for other sources of emission factors for these HAPs. It also means that the permits should contain conditions requiring testing to verify the emissions factors for all HAPs, including those rated D and E from fuel combustion sources. In effect, by simply not including HAPs rated D and E in AP-42, the emissions estimates for HAPs are unequivocally and indefensibly underestimated. DEQ is obligated to require FG LA to produce estimates of these HAP too, based on more accurate sources.

Second, omitting HAPs with C and D ratings raises an issue of inconsistency. As the tables from AP-42 that are reproduced below show, the total PM emission factor (7.6 lb/MMscf, Table 1.4-2) is rated D. Yet, this D rated factor is used for PM estimates while other D rated factors from Table 1.4-3 are not considered for HAP estimates. I ask the DEQ to explain this inconsistency.

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylcholanthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
207-08-9	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D
74-98-6	Propane	1.6E+00	E

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

3.3.2 Flares – VOC and HAP Emissions

Poor AP-42 emissions factors aside, estimated VOC emissions from flaring are significantly underestimated. Specifically, because the PTE calculations for each of the flares assumes that VOCs in the flares gases will always either be destroyed at a rate of 99% (for small-molecules such as methane, ethane, methanol, acetylene, ethylene, propane, propylene, methyl acetate, etc.) or 98% (rest of the VOCs). This is true regardless of the waste gas flow to the flare. The table below lists the flares as well as their flow rates as stated in the EIQs.

Figure Sahu 1 – Flare Parameters Summary

Flare Location	Condition	Waste Gas Flow Rate	Waste Gas Flow Rate Unit of Measure [a]	Propylene (mol %) [b]	VOC (DRE), %	Nitrogen Content in Waste Gas Stream (mol %) [b]	NO_x Emission Factor (lb/MMBtu)	Modeled Temp (K)	Modeled Exit Velocity (m/s)
ET1	Normal	36377	MMscf/hr	29.93	98 // 99	0.16	0.068	1273	20
ET1	MSS	6073352	MMscf/hr	4.69	98 // 99	0.01	0.068	1273	20
ET2	Normal	36377	MMscf/hr	29.97	98 // 99	0.16	0.068	1273	20
ET2	MSS	6086539	MMscf/hr	4.67	98 // 99	0.01	0.068	1273	20
Propylene	Normal	294	scf/hr	28.69	98 // 99	-	0.068	1273	20
Propylene	MSS	344424	scf/hr	37.68	98 // 99	-	0.068	1273	20
Polypropylene	Normal	17875	lb/hr	50.26	98 // 99	30.35	0.068	1273	20
Polypropylene	MSS	169038	lb/hr	60.52	98 // 99	21.08	0.068	1273	20
HDPE1	Normal	66548	scf/hr	-	98 // 99	64.82	0.068	1273	20
HDPE1	MSS	751864	scf/hr	-	98 // 99	84.8	0.068	1273	20
HDPE2	Normal	66548	scf/hr	-	98 // 99	64.82	0.068	1273	20
HDPE2	MSS	751864	scf/hr	-	98 // 99	84.8	0.068	1273	20
EG1	Normal	1205407	scf/hr	<0.01	98 // 99	1.31	0.068	1273	20
EG1	MSS	2928705	scf/hr	0.08	98 // 99	4.74	0.068	1273	20
EG2	Normal	947613	scf/hr	-	98 // 99	1.1	0.068	1273	20
EG2	MSS	2928705	scf/hr	-	98 // 99	4.77	0.068	1273	20
LDPE	Normal	6000	scf/hr	2.04	98 // 99	-	0.068	1273	20
LDPE	MSS	1124062	scf/hr	4.12	98 // 99	0.58	0.068	1273	20
LLDPE	Normal	1040815	scf/hr	-	98 // 99	62.23	0.068	1273	20
LLDPE	MSS	719075[c]	scf/hr	-	98 // 99	41.63	0.068	1273	20

[a] I presume that the waste gas flow rates for Ethylene 1 and 2 are correct. The EIQ states that the flows are in MMscf/hr.
[b] Propylene and nitrogen concentrations are taken from the hourly waste gas composition, for sake of consistency.
[c] For the LLDPE flare, I note that the flow rate under MSS conditions is listed as being lower than under normal conditions. This is inconsistent with all of the other flares – where MSS flows are typically greater than normal flows.

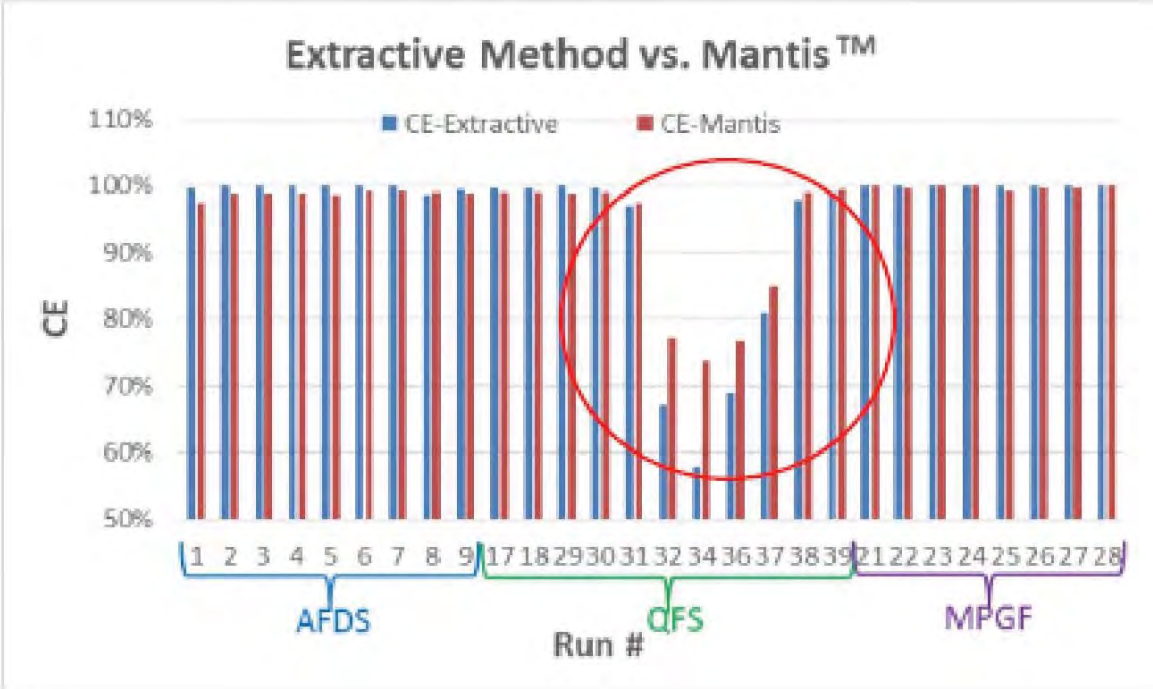
As the table above clearly shows, flow rates can vary dramatically between the flares and based on mode (i.e., normal operations and what the applicant has termed as maintenance/startup/shutdown (MSS) operations). VOC emissions vary dramatically as well between the flares and modes or operation, as noted in the emissions calculations. With no design details in the public record whatsoever for the various flares, and the great variation in flow rate and emissions composition between normal and MSS conditions, assuming the same set of destruction efficiencies for each flare is simply without technical merit and support. While the application references an October 2000 Texas Commission on Environmental Quality (TCEQ) Guidance document in support of the flare efficiency assumptions, a review of active TCEQ guidance documents does not show any such document.[12] A 2004 guidance document for flares is shown and that document showed no technical support for its recommendations.

It is well known that flare DE (and combustion efficiency (CE), a closely related term) depends on many factors which cannot be controlled in actual operating conditions. See for example, a technical review of flare emissions prepared by EPA.[13] Even when flares have been tested under ideal conditions, their destruction and combustion efficiencies can vary widely. The chart below is excerpted from some controlled testing done on flares to compare CE using two techniques – extractive sampling and Video Imaging Spectral Radiometry (VISR), using a product called MANTIS.[14]

[12] https://www.tceq.texas.gov/permitting/air/memos

[13] https://www3.epa.gov/airtoxics/flare/2012flaretechreport.pdf 13
https://www3.epa.gov/airtoxics/flare/2012flaretechreport.pdf

[14] https://www.providencephotonics.com/events



As the chart shows CE, (and by extension, DE, which closely tracks CE), even under controlled conditions, can drop from high values to very low values (55% or so in this case). So, simply assuming that destruction efficiency levels will always be 98% or 99%, as has been done for the applicant's proposed flare calculations, is not realistic and the evidence establishes that achieving such rates is not feasible or not consistently achievable, such as with rapidly varying flow rates and waste gas compositions.

Compounding the problem, while flares are difficult to test using conventional means, that is generally the case for stack flares. All of the flares in the proposed facility are ground flares, with stacks – which could therefore be tested and also equipped with continuous emissions monitoring devices, which I address later. Yet, the permit simply ignored the need for verification of the assumed flare DE values assumed for every flare/condition. Such neglect is unacceptable because the assumed destruction efficiency makes a large impact on the estimated emissions. Consider, as an example, a flare whose VOC emissions have been estimated to be 100 pounds/year using a DE of 99%. If that flare achieved not 99% but just 98% DE, its emissions would double to 200 pounds/years. If the DE dropped to 95%, the VOC emissions would rise to 500 pounds/year, or five times more than in the DE was 99%. . In calculating PTE, the applicant should have used the lowest achievable DE in all cases, because it would help represent the maximum emissions rate for that source. Since there is no reason to believe, based on actual flare monitoring data noted above, that even well designed and well operated flares can achieve 98/99% DE under all circumstances and that actual DE's can be far lower, it is clear that VOC (and associated HAP) emissions PTE have been dramatically underestimated by the applicant and impermissibly accepted by the DEQ.