2025 Toxic Tour

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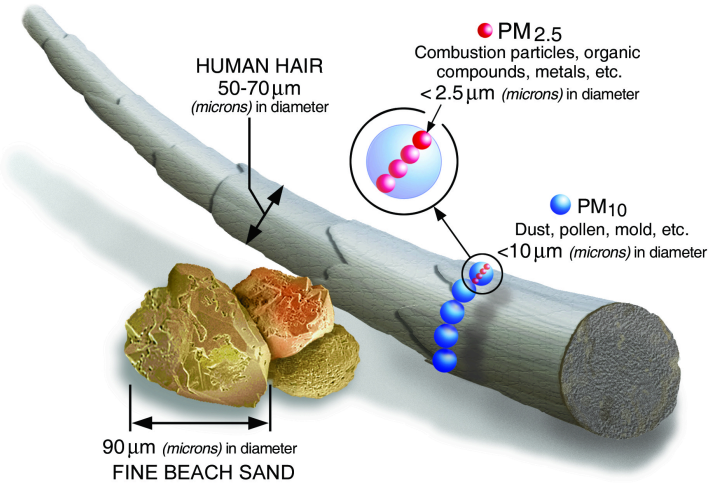
https://maps.app.goo.gl/XMYx4frWtYDWy6FGA
Map showing area affected by LACC toxins

The facilities covered by this tour release **fine particulate matter** ($PM_{2.5}$), **nitrogen dioxide** and nitrogen oxide (together known as "NOx", pronounced like "knocks"), **sulfur dioxide** (SO2), and over 25 different types of **other toxic air pollutants**. All of these pollutants can have serious health impacts, with some of the worst connected with PM2.5. You can learn more about the health effects of these different types of air pollutants at the links above.



A picture showing the size of PM2.5

In addition to being of high health concern, fine particulate matter is one of the pollutants that is most affordable to measure in your backyard. Micah 6:8 Mission has several Purple Air monitors in the area, but the Community For instance, if you scroll down on this link you will see the recent PM2.5 readings from the local Purple Air Monitors. Measuring other pollutants, like individual air toxics, is often very expensive and only done by researchers.

Although we do not know the exact contribution of all of these facilities to overall air pollution that can be measured with a Purple Air monitor, there is some information available about the amount of pollution released. This can be found in the individual facility permits and from the numbers reported to the LDEQ.

Based on facility reporting to the state, the top polluters in the major pollutant categories, PM2.5, NOx, and SO2, are Sasol (shown in orange in the figure on the next page), Entergy (blue), Westlake Chemical (pink), Louisiana Pigment Company (red), Louisiana Integrated Polyethylene (purple), and LACC (gray).

The term "air toxic" refers to a large list of chemicals that are hazardous to your health even in very small quantities. From the facilities on this tour, the toxics that increase cancer the most are **formaldehyde** and **ethylene oxide**. Based on reports to LDEQ, three facilities release ethylene oxide and the vast majority comes from Sasol (99.8%). Six facilities release formaldehyde: Sasol (48%), Westlake Chemical (19%), LA Integrated Polyethylene (18%), LA Pigment Co (12%), Westlake Styrene (2%), and Bio-Lab Inc (1%).

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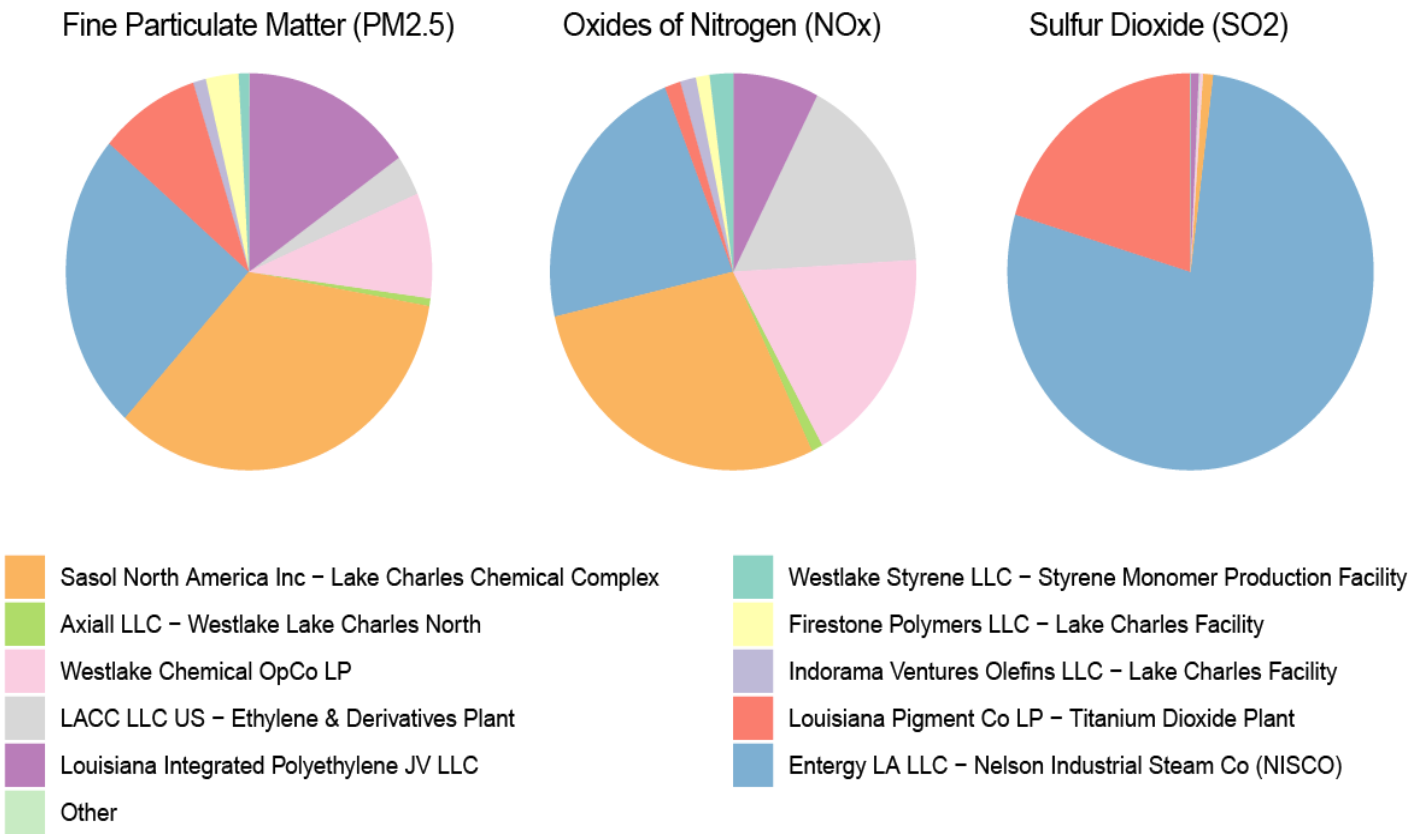
Contribution of Toxic Tour facilities to total local pollution releases



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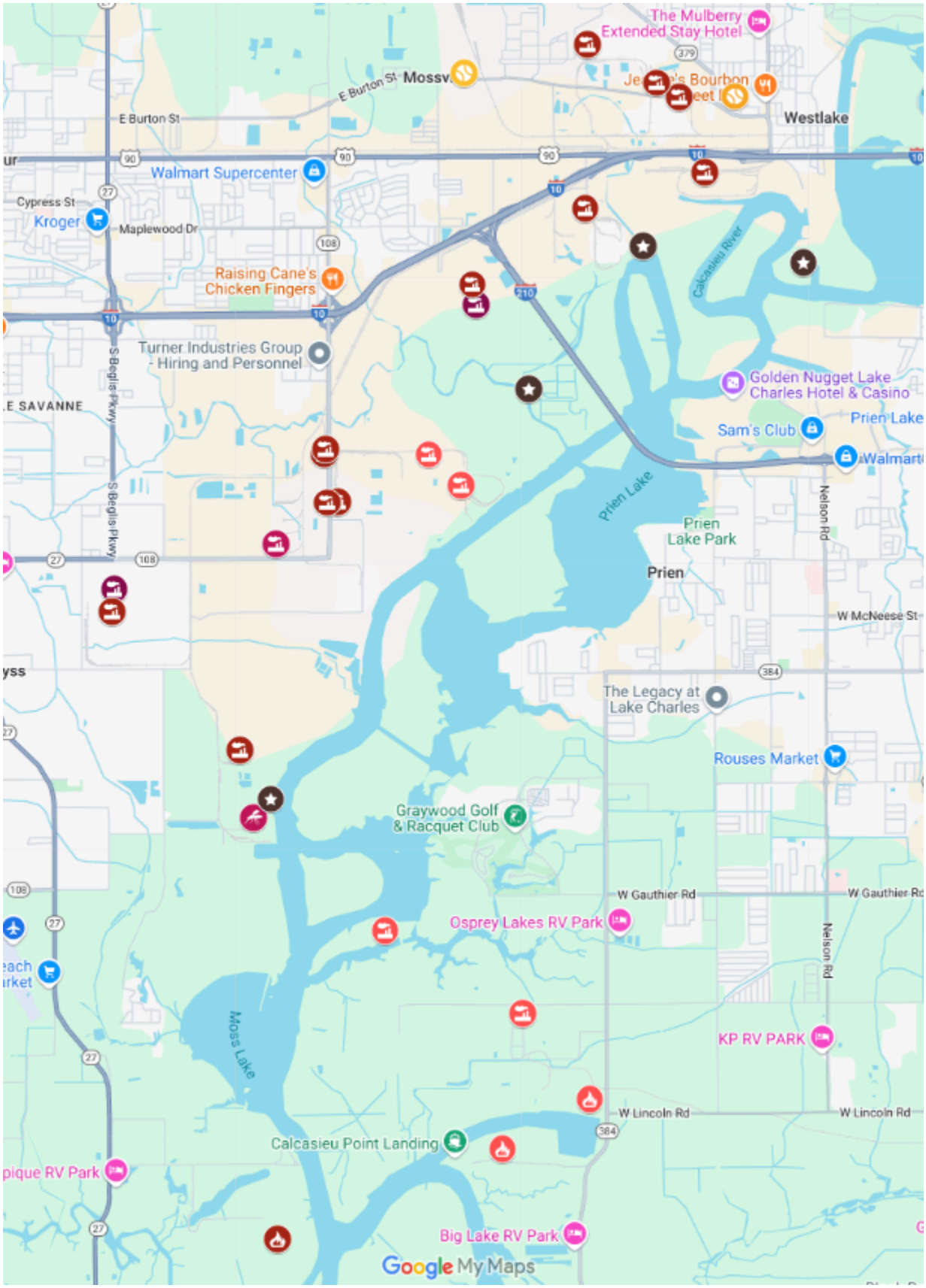
2025 Toxic Tour Sites



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One big missing piece of the air pollution puzzle is the cumulative concentration burden from these facilities. The numbers reported to LDEQ are the total mass emitted in the year: in other words, if you could capture all of the air pollution over the course of a year and put it on a scale, that's what it would weigh.

However, the numbers that the state actually measures are the hourly concentrations: in other words, the amount of a pollutant in the air people breathe at a given point in time. And the state has very few places where it takes those measurements, so it *doesn't have a record of the concentrations near each of these facilities* to show when pollution levels are high.

Air quality regulations–limits on the amount of pollution allowed in an area–are centered on concentrations. A facility can get permission to pollute more as long as they show that their facility will only contribute a small amount to the overall concentration, *but there is not a consideration of pollution from nearby facilities*. The mass emitted is not enough to tell you what the concentration will be, so with a lot of engineering expertise, companies can make an educated guess. That information is sometimes included in permits available from LDEQ's Electronic Data Management System, but it is nowhere near as reliable as measurements and is not consistently reported by all facilities.

Video that gives you a sense of the tremendous amount of land these facilities have destroyed.

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1. Driftwood LNG LLC

1179 Burton Shipyard Road, Sulphur, LA
AI = 201334

Photograph courtesy of Southwings and Louisiana Bucket Brigade, Lori Cook photographer

Activity Description

The Driftwood LNG Facility will consist of five (5) natural gas liquefaction units with a total nominal design capacity of 27.6 million tons of LNG per year. Emissions are from turbines, thermal oxidizers, flares, generator engines, pump engines, heaters, storage tanks, loadings, and fugitive.

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Top Criteria Pollutants from 2023 Part 70 air permit

Pollutant	Before	After	Change
$PM_{10}/PM_{2.5}$	356.18	356.20	+ 0.02
SO_2	73.61	73.60	- 0.01
NO_X	1703.93	1,700.92	- 3.01
CO	6039.11	6035.08	- 4.03
VOC	555.57	554.45	- 1.12
CO_2e	9,513,442	9,512,841	- 601

Top Toxic Pollutants

Total TAPS = 525.6 tons per year

Ammonia(**474 tpy**); Benzene (4.5 tpy); Formaldehyde (10.78 tpy); n-Hexane (13.94 tpy); Toluene (11.48 tpy)

Permitting History

Driftwood LNG LLC construction permit 0520-00504-V0 and PSD-LA-824 issued July 2018

Most recent permit renewal November 2023

May 2025 Grist article about proposed LNG facility

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2. Rain CII Carbon

1920 Pak Tank Road, Sulphur, Louisiana
AI = 3439

Photograph courtesy of Southwings and Louisiana Bucket Brigade, Lori Cook photographer

Activity Description

The Lake Charles Calcining Plant (LCCP) processes multiple grades of petroleum coke into finished calcined coke products for use in titanium dioxide production and as anodes in the manufacture of aluminum. The raw green coke is shipped to the plant in calcined in one of two kilns. The kilns fire raw green wet petroleum coke, oxygen and natural gas at very high temperatures to remove water and volatile matter and to increase the density of the carbon. The calcined coke is cooled by water quenching and transferred to storage for shipment via trucks, barges, ships, and railroad cars.
Source: Part 70 air permit issued November 2022

Top criteria pollutants

from 2023 Part 70 air permit
PM10/PM2.5 (261 tpy/185 tpy); SO2 (11,088 tpy); NOx (1,162 tpy); VOCs (52 tpy)

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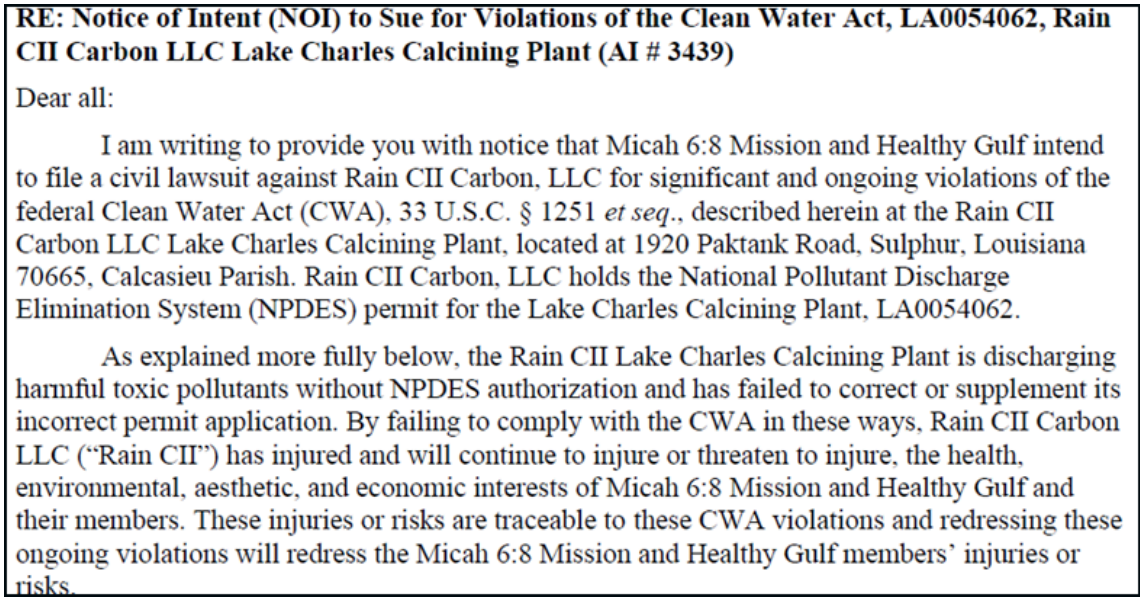
Top toxic pollutants

Top TAPs/HAPs from 2023 Part 70 air permit

Hydrochloric acid (77.64 tpy); Nickel and compounds (63.2 tpy); Total Reduced Sulfur (including hydrogen sulfide, carbo disulfide, and carbonyl sulfide) (4.65 tpy)

Permitting History

Original site was the Lone Star cement plant - repurposed in 1976 by Pak Tank Corp
1977 Gulf Oil entered into agreement with Pak Tank to build the Coke Calcining Facility
1984 Chevron obtained ownership of Lake Charles Calcining Plant and sold to BP Oil, Inc
1990 Conoco purchased LCCP from BP Oil
1996 Conoco sold to Venture Coke Company who then sold to Rain CII Carbon in 2005
November 2022 Part 70 Permit Renewal/Modification No. 0520-00048-V8



RE: Notice of Intent (NOI) to Sue for Violations of the Clean Water Act, LA0054062, Rain CII Carbon LLC Lake Charles Calcining Plant (AI # 3439)

Dear all:

I am writing to provide you with notice that Micah 6:8 Mission and Healthy Gulf intend to file a civil lawsuit against Rain CII Carbon, LLC for significant and ongoing violations of the federal Clean Water Act (CWA), 33 U.S.C. § 1251 *et seq.*, described herein at the Rain CII Carbon LLC Lake Charles Calcining Plant, located at 1920 Paktank Road, Sulphur, Louisiana 70665, Calcasieu Parish. Rain CII Carbon, LLC holds the National Pollutant Discharge Elimination System (NPDES) permit for the Lake Charles Calcining Plant, LA0054062.

As explained more fully below, the Rain CII Lake Charles Calcining Plant is discharging harmful toxic pollutants without NPDES authorization and has failed to correct or supplement its incorrect permit application. By failing to comply with the CWA in these ways, Rain CII Carbon LLC ("Rain CII") has injured and will continue to injure or threaten to injure, the health, environmental, aesthetic, and economic interests of Micah 6:8 Mission and Healthy Gulf and their members. These injuries or risks are traceable to these CWA violations and redressing these ongoing violations will redress the Micah 6:8 Mission and Healthy Gulf members' injuries or risks.

Figure – Environmental Integrity Project (EIP) Notice of Intent to Sue regarding LPDES permit
Source: Nov 2024 NOI filed

3. WR Grace Lake Charles

1800 Davison Road, Sulphur, LA
AI =1251

Activity Description

Grace manufactures fluid cracking catalysts (FCC) and hydroprocessing catalysts (HPC) at the Lake Charles Facility. In the FCC process, using proprietary technology, the facility reacts various raw materials to produce alumina and silica-alumina slurries, which are washed free of contaminants, dried, stored in silos, and shipped in bulk by either rail or truck. In the hydroprocessing catalyst (HPC) process, nitric acid and solutions of nickel, molybdenum, and alumina are mixed and extruded, then dried and calcined into pellets. the catalyst is then impregnated with nickel and molybdenum, and dried again. The dried HP catalyst is stored in super sacks prior to shipment.

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Source: LDEO Air Permit - 0520-00001-V13 – renewed April 2023

Top criteria pollutants

PM10/PM2.5 (200 tpy/198 tpy); NOx (533 tpy); VOC (17.68 tpy)

Top toxic pollutants

Total TAPs = 439.8 tpy; Ammonia (319 tpy); Hydrochloric acid (107 tpy)

Permitting History

- Part 70 Air Permit - 0520-00001-V13 – renewed April 2023

Figure – Snapshot of facility boundaries from Solid Waste Closure Plan
Source: 2024 12-17 Grace Closure 3 impoundments 326 pgs

Figure - Google Earth image (2023) showing completed new impoundment system.

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4. Westlake Petrochemicals

Westlake Chemical OpCo LP (Petro 1 and Petro 2)
900 Hwy 108, Sulphur, LA
AI = 6164

Activity Description

The Ethylene Manufacturing Complex consists of two units, Petro l and Petro 2. Each production unit has the ability to operate independently of the other production unit~ however, when both production units are operating, synergies between the two units are utilized to optimize ethylene production. The current capacities for each unit are approximately 1.6 billion pounds of ethylene product per year for Petro 1 and 1.6 billion pounds per year of ethylene product for Petro 2. The total production capacity for the Ethylene Manufacturing Complex is approximately 3.3 billion pounds per year of ethylene product.
Source: 2024 Part 70 air permit

Top criteria pollutants

PM10/PM2.5 (93 tpy/91 tpy); NOx (1,400 tpy); VOCs (317 tpy)

Top toxic pollutants

Total TAPs= 80 tpy: - Ammonia (10 tpy), 1,3-Butadiene 14 tpy), benzene (17 tpy), chloroform 5.94 tpy), toluene (5 tpy)

Permitting history

- Original air permit was issued in 1989
- Most recent Permit renewal and significant modification application in 2023
- Most recent renewal in 2024 Permit 0520-00145-V17

Ranking for criteria pollutants
PM2.5: 3rd out of 13
NOx: 3rd out of 13
SO2: 4th out of 13

September 29, 2021 Explosion at Westlake Chemical

at a chemical plant in Louisiana on Monday night, according to authorities. The explosion occurred at Westlake Chemical's Petro Complex 2 Unit located at LA Hwy 108 and LA Hwy 27 in Sulphur at around 11 p.m. Joe Andrepont, a spokesperson for Westlake Chemical, told KPLC that Petro Complex 2 Unit, which is used in the production of ethylene, was undergoing maintenance when the explosion occurred.

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Figure – Explosion at Westlake Petrochemicals

Another Saturday Afternoon (May 10, 2025) at Westlake Chemical with typical flaring

5. Westlake Styrene Monomer Facility

900 HWY 108, Sulphur, LA
AI = 18070 Part 70 air permit – Styrene Monomer Production Facility

Activity description

Styrene monomer production facility. The raw materials used in making styrene are obtained from crude oil or liquified petroleum gas (LPG). Styrene monomer is an intermediate material used in the production of plastic and synthetic rubber products. It is used in the production of resin blends; these resins are used in the manufacture of numerous glass-reinforced plastics products (e.g., boats, bathtubs, shower stalls, tanks, and drums, etc.).
Source: "Styrene Production, Use, and Human Exposure" by R. R. Miller, Ronald Newhook, and Alan Poolec; "Styrenics" INEOS Chemicals

Westlake Styrene LLC (Westlake), a subsidiary of Westlake Chemical Corporation, owns and operates the Styrene Monomer Production Facility. The Styrene Monomer Production Facility is adjacent to and under common control with the Ethylene Manufacturing Complex (Westlake Chemical OpCo, LP-AI 6164) and the Poly III Polyethylene Plant (Westlake Petrochemicals, LLC-AI 27518). Therefore, the Styrene Monomer Production Facility is a major source under Prevention of Significant Deterioration (PSD) regulations and a major source of toxic air pollutants (TAPs) and hazardous air pollutants (HAPs). The Styrene Monomer Production Facility consists of two processing units, the ethyl benzene (EB) unit and styrene units, and associated equipment for materials storage and wastewater treatment.

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Ethyl Benzene Unit - In the EB unit, fresh and recycled benzene are preheated and vaporized in the EB Reactor Feed Heater prior to combining with ethylene. Additionally, the option exists to combine an alkyl aromatics recycled stream with the benzene stream. The benzene and ethylene mixture is then fed into an alkylation reactor containing a proprietary fixed bed zeolite catalyst. Reaction heat is recovered via feed/effluent exchangers. Product from this reaction is transferred to the product recovery section of the EB unit.

Styrene Unit - At the styrene unit, recycled and fresh EB are mixed, vaporized, and, in the presence of superheated steam, catalytically dehydrogenated to styrene and hydrogen. Reaction steam condensate is steam-stripped to recover dissolved volatile organic compounds. Clean water is routed to the process condensate tank, and recovered organics are routed to the crude styrene recovery drum which will then be sent through phenylacetylene (PAR) reactors
Source: 2024 Part 70 minor modification

Top Criteria Pollutants

PM10/PM2.5 (11.7 tpy/11.5 tpy); NOx (124 tpy); VOCs (31 tpy)

Top toxic pollutants

Ethyl Benzene (3.42 tpy), Styrene (4.32 tpy), Benzene (3.42 tpy), Formaldehyde (1.88 tpy);

Permitting history

- Original air permit was issued in 1990
- Most recent renewal Part 70 Air Permit 2024
- Westlake Styrene Factsheet - 2025

Relative to other sources on the tour, this site contributes relatively low levels of particulate matter, nitrogen dioxide, or sulfur dioxide. However, due to its high levels of volatile organic emissions, the permit renewal process required air dispersion modeling in 2003. This modeling found that emissions from this facility raised nearby average benzene concentrations by 1.5 µg/m3 (12% of total limit, 12µg/m3); average butadiene by 0.68 (73% of total limit, 0.92); peak styrene by 930 µg/m3 (18% of limit, 5070µg/m3).

Ranking for criteria pollutants
PM2.5: 9th out of 13
NOx: 4th out of 13
SO2: 7th out of 13

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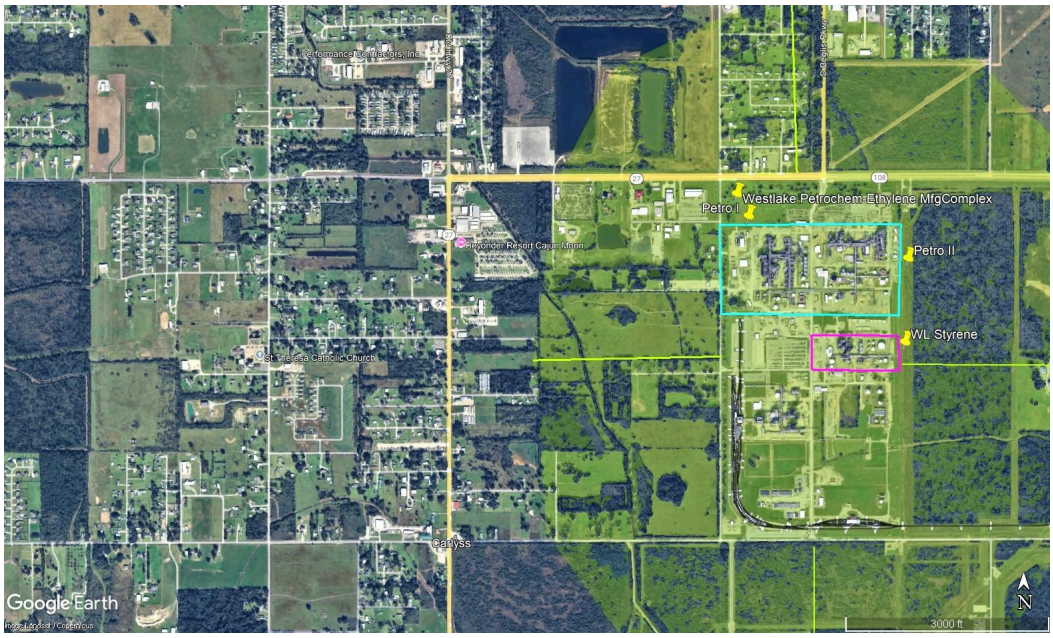

Figure - Community west of Westlake Complex - Westlake Styrene in pink outline.

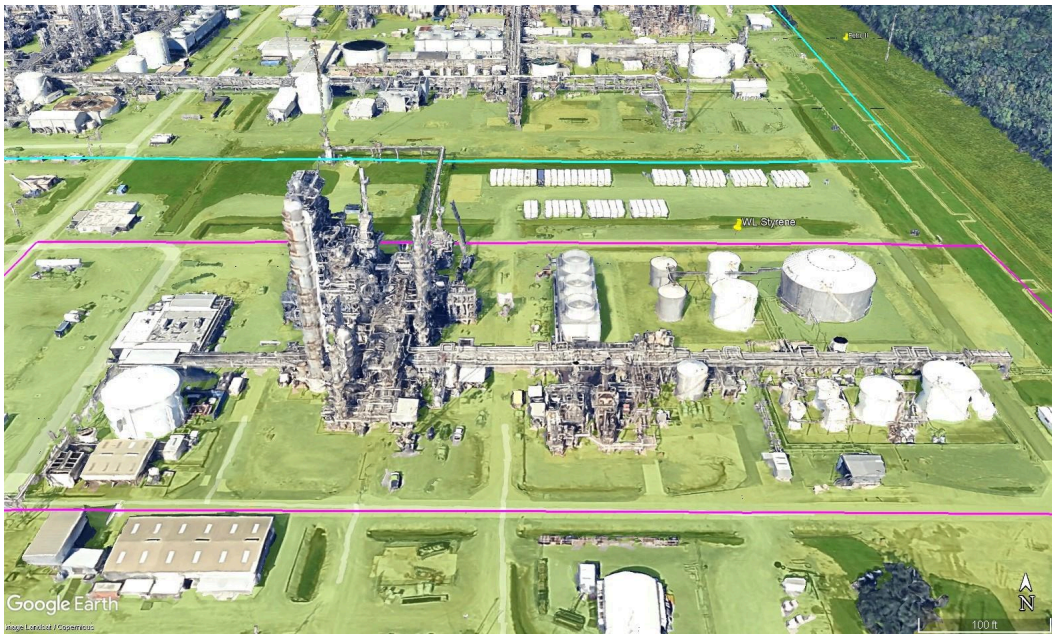

Figure - Google Earth Image showing Westlake Styrene (pink) south of Petro 1 (aqua outline)

6. Firestone Polymers LLC - Lake Charles Facility

1801 LA-108, Sulphur, LA 70665
AI = 1244

Activity description

Firestone is a synthetic rubber manufacturing facility which produces 12-15 grades of rubber by the solution polymerization process. Butadiene and styrene are polymerized in continuous reactors in a solution of hexane. After polymerization is complete, additives are combined with polymer and hexane is removed in stripping tanks and then routed to be purified/recovered.

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Top criteria pollutants
VOCs (242 tpy), NOX (129 tpy), PM10/PM2.5 (32 tpy/32 tpy)

Top toxic pollutants
n-Hexane (58 tpy), 1,3-Butadiene (13.47 tpy), Styrene (25.58 tpy),
Methyl Ethyl Ketone (0.02 tpy), Formaldehyde (0.52 tpy)
Permitting history

- Original air permit was issued in 1975 and only mentioned limits/monitoring of SO2
- Notable air permit for expanded activities in 1990
- Prior renewal was in 2023
- Part 70 Air Permit 0520-00007-V11 issued October 2024

Air dispersion modeling was conducted and reported in the 1990 permit, determining the facility would contribute a maximum peak 1-hr concentration of 96 µg/m3 1,3-butadiene (x% of limit, 524 µg/m3); 155 µg/m3 styrene (x% of limit, 5071); 2006 µg/m3 n-hexane (x% of limit, 4190); and 122µg/m3 cyclohexane (x% of limit, 24,524)

Ranking for criteria pollutants
PM2.5: 5th out of 13
NOx: 8th out of 13
SO2: 9th out of 13

7. LyondellBasell

Louisiana Integrated Polyethylene JV LLC
2201 Old Spanish Trail, Westlake, LA 70669
AI = 226602

Activity Description
The Lake Charles Chemical Complex in Calcasieu Parish, Louisiana began operating in 2001. It produces ethylene and petrochemicals used to manufacture soaps, detergents, shampoos, polyester fibers, and more. In January 2021, Sasol and LyondellBasell formed a 50/50 joint venture company named Louisiana Integrated Polyethylene JV. Through the joint venture, LyondellBasell acquired 50 percent of Sasol's 1.5 million ton ethane cracker, two 1 million ton low and linear-low density polyethylene plants, and all associated infrastructure.
Source: EIP Oil and Gas Watch

Sasol and LyondellBasell formed Louisiana Integrated Polyethylene JV LLC to own and act as the operating entity for various units/processes of the Lake Charles Chemicals Project (LCCP), including the Low Density Ethylene (LDPE) unit.
Source: 2025 Part 70 Operating Permit for LDPE unit

Top Criteria Pollutants
VOCs (175 tpy)

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Top Toxic Pollutants

Benzene (9.38 tpy)

Permitting History

- In 2014, Sasol Chemicals Lake Charles Chemicals Project was first permitted
- In 2021, this site was added and the original air permit filed
- Most recent renewal was in 2023
- Feb 2025 Part 70 Permit 3113-V5 Low Density Polyethylene Unit
- May 27 2025 Request for Variance to Flare Heavy and Light Aromatics

Ranking for criteria pollutants
PM2.5: 6th out of 13
NOx: 7th out of 13
SO2: 5th out of 13

From the Variance Request: Due to reliability issues with railcar delivery from a third party, Canadian Pacific Kansas City (CPKC), Louisiana Integrated Polyethylene JV LLC (LIP JV) is experiencing a disruption in loadout capabilities for light aromatic concentrate (LAC), heavy aromatic distillate (HAD), mixed C3 and mixed C4 coproducts produced by the Olefins Unit. The ongoing disruption in service stems from CPKC's internal integration of two customer service portals. This merger has introduced inconsistencies and technical issues across the platforms, directly impacting scheduling and communication processes critical to railroad logistics. Furthermore, Union Pacific Railroad (UP) has issued an embargo due to railroad congestion caused by CPKC's system effective May 27, 2025 to all customers, commodities, and car types at UP Westlake CPRS/CPRS Westlake UP. UP is unable to provide an indication on how long they anticipate the embargo will last as they are dependent on CPKC to clear the yards.

LIP JV has utilized all available storage vessels and currently lacks an alternative outlet for the coproducts. Therefore, LIP JV is requesting a temporary Variance to be able to flare the heavy aromatic distillate (HAD), mixed C3 and mixed C4 coproducts produced by the Olefins Unit using the Olefin Ground Flare (EQT 0094) and the light aromatic concentrate using both EQT 0094 and UOI Ethylene Storage Area Flare EQT 0170.

Note: A very similar variance request was made and then withdrawn by LACC (May-June 2025)

8. Indorama

Indorama Ventures Olefins LLC - Lake Charles Facility
4300 Hwy 108, Westlake
AI = 5337

Activity description

Indorama's Lake Charles site thermally cracks a mixture of ethane, propane, and steam in eight pyrolysis reactors to produce ethylene and propylene. Indorama Ventures Olefins (IVOL) is an ethylene manufacturing plant acquired to provide long-term ethylene supply integration, as part of the Integrated Oxides and Derivatives (IOD) strategy tied to IVL's advantaged shale gas feedstock in the US Gulf Coast. The unit was idled in early 2001 and acquired from Oxy under a joint venture entity, Indorama Ventures Olefins LLC, in September 2015.
Source: Indorama Ventures (src)

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Ethane and propane are thermally cracked in the presence of steam in eight cracking furnaces to produce ethylene and propylene, along with acetylene, hydrogen, methane, and other byproducts. These cracking furnaces act as pyrolysis reactors at 1500 °F.
Source: 2024 Part 70 air permit application

Top criteria pollutants:
PM10/PM2.5 (62 tpy/52 tpy); VOCs (500 tpy), NOx (245 tpy)

Top toxic pollutants
1,3 Butadiene (11.14 tpy), Benzene (17.84 tpy), Toluene, Ammonia, (41 tpy)

Permitting history
- Original air permit was issued in 1989
- Plant was shut down in February 2001
- Notable air permit wh
- en plant was re-opened in 2015
- Prior renewal was in 2023
- Most recent air permit minor modification in 2025 see permit application submitted in November 2024

Ranking for criteria pollutants
PM2.5: 8th out of 13
NOx: 5th out of 13
SO2: 6th out of 13

9. Westlake Polymers LP
Westlake Polymers - Polyethylene Mfg Complex
Cities Service Hwy, Sulphur, LA
AI 9061 Part 70 Operating Permit No. 0520-00127-V6
AI 9061 LPDES Permit No. LA0071382

Activity Description
Westlake polymerizes ethylene gas to polyethylene polymer using a high pressure process. Ethylene is pumped to an autoclave or tubular reactor by reciprocating compressors, and peroxides or other initiators are used to control the reaction rate. The polyethylene and unreacted ethylene from the reactor are sent to separating vessels. The ethylene is then recycled to the process, while the molten polyethylene is routed to an extruder for pelletizing.

Top criteria air pollutants
PM10/PM2.5 (37 tpy/18 tpy); NOx (68 tpy); VOCs (312 tpy)

Top toxic pollutants
Total TAPs 52 tpy; Vinyl Acetate (51 tpy)

Permitting History
- Feb 2025 Part 70 renewal/mod air permit 052-00127-V7
- 2023 12-21 Westlake Polymer Part 70 air permit public notice 730 pgs

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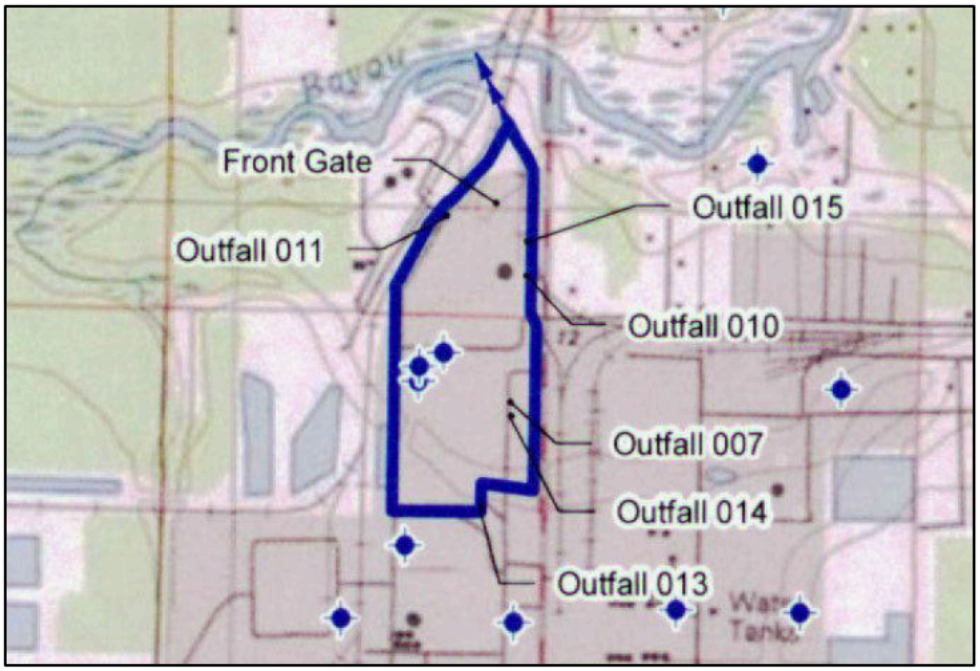

Figure – Westlake Polymers with facility boundary (blue line) – LPDES Outfall map.

10. Westlake Chemicals Gate 1

3137-3179 Cities Service Hwy, Westlake, LA

Figure – Location of Westlake Chemical Gate #1 (yellow arrow) located on the east side and towards the north end of Westlake Polymers Facility

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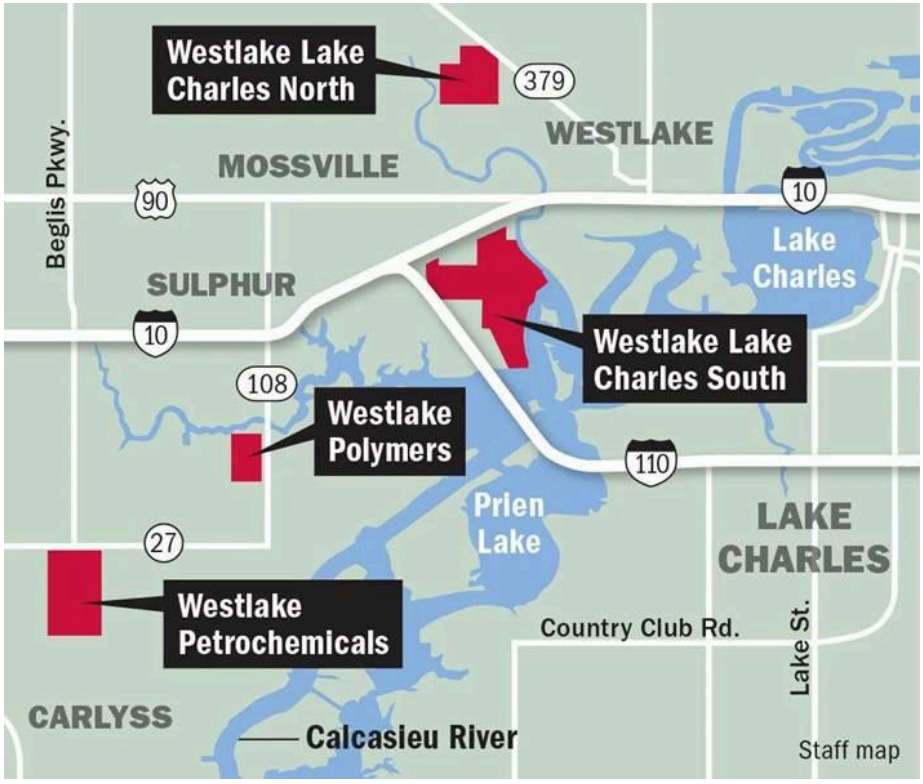

Figure – Snapshot of image from news article about recent Westlake facility explosions

11. LACC/LCLA-Ethylene & Derivatives Plant

Lotte Chemicals Louisiana LLC
2200 Bayou d'Inde Pass, Westlake, LA
AI = 203831

Activity description

The ethylene and derivatives plant uses ethane in an ethane cracking process to produce up to 1 million metric tons per year of ethylene product. In the ethane-steam cracking process, cracking furnaces are used to indirectly apply heat to a gaseous ethane-steam mixture to produce ethylene and hydrogen.

Ethylene product is transported mostly to internal consumers (the neighboring Westlake Lake Charles facilities and LCLA's MEG Plant) with a small amount being solid via pipeline to external customers. Ancillary products from the ethane cracking process include a propylene product, a mixed C4 product, and a pygas product, which are transported to customers via railcar. The ethane cracking process also generates a light off-gas stream that is utilized as a fuel gas by the ethane cracking furnaces.
Source: 2025 05-03 LACC Part 70 air permit and app

Top criteria pollutants

PM10/PM2.5 (60 tpy/56 tpy); NOx (1,130 tpy); VOCs (377 tpy)

Top toxic pollutants

Total TAPs 13 tpy -, 1,3-Butadiene (4.2 tpy),, sulfuric acid (0.67 tpy), benzene (3.58 tpy),, styrene (0.59 tpy), toluene (1 tpy)

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Permitting history

- Original air permit was issued in 1974
- Notable air permit when transferred from Eagle US2 LLC
- Most recent renewal was in 2023
- 2025 05-03 LACC Part 70 air permit and app

Ranking for criteria pollutants
PM2.5: none reported
NOx: none reported
SO2: none reported

13. Westlake - Lake Charles South

Westlake US #2 (previously Eagle US #2 and PPG Industries)

1300 PPG Dr, Westlake, LA
AI - 1255

Activity Description

Westlake US 2 LLC (Westlake) operates its Lake Charles South (LCS) Plant in Lake Charles, Calcasieu Parish, Louisiana. Westlake has been producing chlorinated derivatives of the ethylene molecule at this plant site since the 1960s. Using chlorine and ethylene as basic feedstocks, Westlake's Derivatives Plant currently has the capability of manufacturing the following Hazardous Organic NESHAP (HON)-regulated chlorinated organic products:

» Vinyl Chloride (VC)
» Ethyl Chloride (EC)
» Versa TRANS™ (Trans 1,2-Dichloroethylene or TRANS)
» Ethylene Dichloride (EDC)
» Methyl Chloroform (1 , 1, 1-Trichloroethane or MC)
» Trichloroethylene (Tri)
» Perchloroethylene (Per)

The HON Chemical Manufacturing Process Units (CMPUs) that compose Westlake's overall Derivatives Plant consist of several highly-integrated and interdependent chemical manufacturing processes. Because of changes in product market demand, it has become necessary for Westlake to alter the facility's current slate of chlorinated organic products to accommodate future market needs. Westlake refers to this effort as Project Sustainability.
Source: June 2024 Part 70 air permit application for Project Sustainability

Eagle US 2 LLC (Eagle) owns and operates the Lake Charles Complex (Complex), a chemical manufacturing facility which is organized into the following units/areas: VC Production Unit, Power/Utilities, Complex Support Facilities, Chlor/Alkali Plant, Membrane Unit, Derivatives Docks, Derivatives Shipping, Derivatives Plant Common Sources, Greater EDC Unit, Bottoms Plant, Per-Tri Unit, TE-2 Unit, and Incinerators Area.
Source: 2022-2023 Part 70 Operating Permit Renewal and Minor Modification Eagle US 2 LLC - Lake Charles Complex, TE-2 Unit

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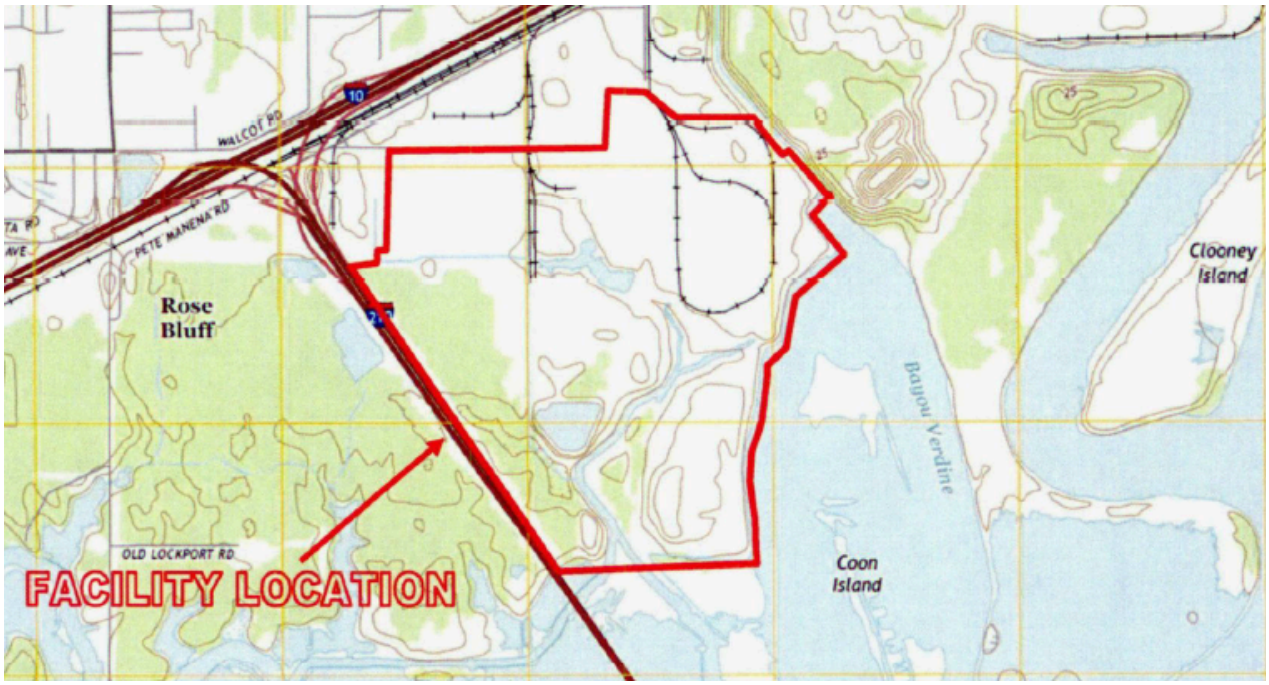

Source: Sept 2024 Part 70 permit application Complex Support Facilities Permit 2359-V6

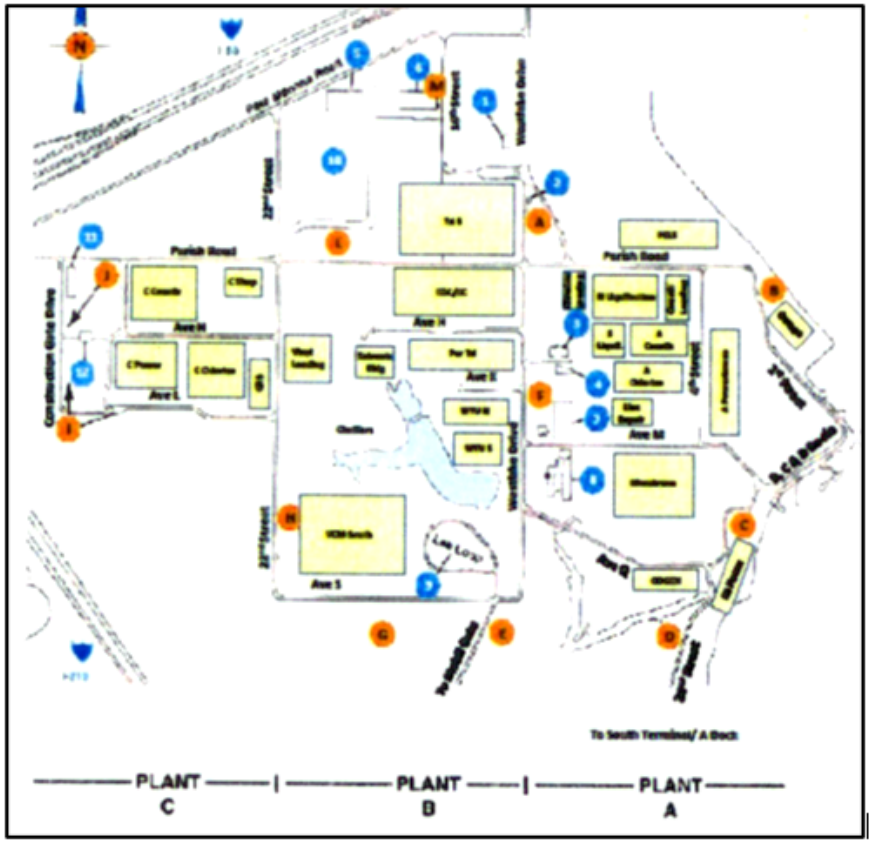

Figure - Westlake South (Westlake US 2) is composed of three sections: Plant A to the east, Plant B central, and Plant C to the west. *Source:* Contingency Plan

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Complex Support Facilities (Permit No. 2359-V6AA)
Power/Utilities Unit (Permit No. 2106-V8)
Chlor-Alkali Unit (Permit No. 2798-V5 & V6)
Membrane Chlor/Alkali Unit (Permit No. 3021-V6)
Greater EDC Unit (Permit No. 2350-V9)
Per/Tri Unit (Permit No. 2270-V6)
TE-2 Unit (Permit No. 2695-V16AA)
VC Production Unit (Permit No. 897-V10)
Bottoms Plant (Permit No. 2216-V6)
Derivatives Plant Common Sources (Permit No. 2269-V8)
Incinerators Area (Permit No. 2040-V11)
Derivatives Docks (Permit No. 2206-V5)
Derivatives Shipping Unit (Permit No. 2229-V4)

Figure – List of air permits for Westlake US 2
Source: 2024 Semi-Annual Deviation Report

Permitting History

- Jan 2022 Part 70 air permit TE-2 vinyl chloride unit
- Hazardous Waste Operating Permit LAD008086506-OP-RN-2
- June 2024 RCRA Permit Application "Project Sustainability"
- Nov 2024 Westlake asks LDEQ to pause on permitting "Project Sustainability"

Micah 6:8 Mission submitted public comments on the proposed RCRA permit "Project Sustainability" on September 3, 2024. The project was subsequently put on 'pause' by Westlake in November 2024.

January 25, 2022 Explosion at Westlake South news article/video

Figure – Snapshot from news feed showing explosive smoke plume.

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Figure - Google Earth shows the massive tank conditions after the explosion and fire.

14. BioLab

Bio-Lab Inc, a KIK Custom Product Company
910 I-10, Westlake, LA 70669
AI = 26073

Activity description

The original permit (Olin Company) described an isocyanurite manufacturing facility, including processing units, a finishing and packaging unit, and an on-site warehousing area.
An updated permit in 2000 for BioLab describes the facility as manufacturing halogenated biocides (trichloroisocyanuric acid and disodium isocyanurate)
Source: 1978 Air Permit

The BioLab Lake Charles Facility manufactures trichlorisocyanuric acid (TCCA), an inorganic halogenated biocide, and disodium isocyanurate (Na2Ca) at a production capacity of 160.8 MM lbs/yr. The manufacture of TCCA consists of adding neutralized cyanuric acid to a sodium hypochlorite solution in a reaction vessel and introducing gaseous chlorine into the mixture.
Source: 2024 Part 70 permit renewal application

Top Criteria Pollutants

PM10/PM2.5 (38.88 tpy); NOx (41.56 tpy)

Top Toxic Pollutants

Chlorine (21.71 tpy), ammonia (0.02 tpy), chloroform (0.02 tpy), hydrochloric acid (0.10 tpy)

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Permitting history

- Original air permit was issued in 1978
- Fire in 2020 with release of chlorine
- Most recent renewal was in 2021
- Part 70 Permit renewal application submitted 2024

Ranking for criteria pollutants
PM2.5: 7th out of 13
NOx: 10th out of 13
SO2: 8th out of 13

2020 Fire and Chlorine Release - Cat 4 Hurricane Laura

Source: Chemical Safety Board report issued 2023
YouTube video: https://www.youtube.com/watch?v=sqqIxWlCfd0&t=9s

From the CSB Report: On August 27, 2020, extreme winds from Category 4 Hurricane Laura caused severe damage to buildings storing chemical formulations comprised primarily of trichloroisocyanuric acid (TCCA) at the Bio-Lab, Inc. Lake Charles (Bio-Lab) facility in Westlake, Louisiana, located in the southwestern area of the state. TCCA-based formulations are chlorinating agents often used as a sanitizer to kill algae and bacteria in large volumes of water, predominantly swimming pools and hot tubs, and sold in tablet, stick, and granular forms. In large bodies of water, the TCCA formulation is soluble and breaks down slowly, releasing available chlorine in the water to sanitize contaminants. When a TCCA-based formulation instead comes in contact with or is wetted/moistened by a small amount of water and does not dissolve, it can experience a chemical reaction, generating heat and causing the decomposition of the chemical, which in turn produces toxic chlorine gas and can produce explosive nitrogen trichloride. After the buildings at the Bio-Lab facility were damaged by Hurricane Laura winds, rainwater contacted the TCCA-based formulation stored inside, initiating a chemical reaction and subsequent decomposition of the chemical. The heat produced from the reaction and decomposition initiated a fire, and the decomposition released a large plume of hazardous gases, including toxic chlorine, into the air. The plume of hazardous gases crossed the facility boundary and could be seen over a large portion of the nearby community.

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From the CSB video: The company did try to remove as much product as possible from the site prior to Hurricane Laura landfall, but trucks that were expected did not arrive and over 1 million pounds of product remained onsite. The facility triple stacked the dry product to protect from flood waters and evacuated all personnel. The hurricane ripped off the roof of the storage area and thus allowed water to fall on the plastic containers of product.

15. Phillips 66- Lake Charles Manufacturing Complex

Old Spanish Trail, Westlake, LA 70669
AI = 2538

Activity Description

Area A includes LSR/Naphtha Splitter (fugitives only); LVT Unit-low viscosity low toxicity solvents; Hydrodesulfurization Unit (hydrogen sulfide); Primary Tower (gasoline); Merox Unit (hydrogen sulfide); Cokers and Calciners; Gas Recovery Plant; North and South Flares; Sour Crude Tank Farm; and Cooling Towers.

Area B includes Alkylation Unit; Catalytic Polymerization Unit; Cryogenics; Vapor Recovery Unit; Fluid Catalytic Cracker; Sulfur Plants; Sour Water Strippers; Amine Regeneration; Crude Topping; Sulfuric Acid Plant; Sweeteners; South Flare; and Wastewater Treatment.

Area C includes Makeup Water Treatment; Crude Vacuum Units; Crude Topping Unit; HDS/Reformer (remove impurities); HDS/Fractionator; Hydrodesulfurization Units; Continuous Catalytic Reforming; SZorb Unit; and Cooling Towers.

Area D consists of Docks Groundwater Remediation System (ethylene dichloride); LPG Loading/Transfer System (fugitive emissions only); Marine Dock-3 loading docks (fugitive emissions); Marine Tank Farm (storage tanks and fugitives); Marine Vapor Recovery Unit (VOCs); and Tank Farm (floating roof tanks etc).

Excel Paralubes Area includes Utilities; Hydrowaxer/Hydrofinisher; Rail and Truck Loading; Lube Oil Hydrocracker; Amine Regenerator; Sour Water Stripper; Hydrogen Compressor; Saturate Gas Recovery; West Flare; Cooling Tower; and Tank Farm.

Permitted criteria pollutant and toxic air pollutant (TAP) emissions from the Lake Charles Refinery, in tons per year, are summarized in the table below.[6]

Permit No.	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	TAPs
2623-V20	178.93	153.77	645.18	602.65	249.09	337.76	346.142
2624-V26	119.43	91.80	1624.97	673.31	1082.59	416.75	366.07
2625-V17	71.26	69.87	102.99	336.90	349.67	280.95	26.42
2626-V19	1.24	1.24	4.32	32.37	57.13	638.52	115.52
2627-V13	23.85	23.79	315.00	206.59	347.36	178.73	25.15
	394.71	**340.47**	**2692.46**	**1851.82**	**2085.84**	**1852.71**	**879.302**

Figure – Total permitted criteria air emissions for Area A (2623), B (2624), C (2625), D (2626), and Excel Paralubes (2627).

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Area A Top toxic pollutants

Total TAPs = 346 tpy; Sulfuric acid (300 tpy) Hydrogen Sulfide (14.47 tpy); n-Hexane (5.89 tpy)

Area B Top toxic pollutants

Total TAPs 366 tpy – Ammonia (203 tpy); Hydrogen Cyanide (47 tpy); n-Hexane (10 tpy) Sulfuric Acid (67 tpy)

Area C Top toxic pollutants

Total TAPs 26.42 tpy; Benzene (1.68 tpy); Cresol (3.51 tpy); Hydrogen Sulfide (2.71 tpy); n-Hexane (2.52 tpy); Toluene (4.49 tpy); Xylene (4.63 tpy)

Area D Top toxic pollutants

Total TAPs 115 tpy – Benzene (18.75 tpy); Methyl Tertiary Butyl (MTBE) (18.4 tpy); n-Hexane (20 tpy); Toluene (11.47 tpy)

Excel Paralubes Area Top toxic pollutants

Total TAPs 14.32 tpy – n-Hexane (4.58 tpy); Naphthalene (3.28 tpy) Cresol (1.6 tpy); Hydrogen Sulfide (6.28 tpy)

Permitting History

- 2023 12-13 Phillips 66 LC Refinery Area C Part 70 permit 2625-V17 (Area C)
- 2024 08-05 Phillips 66 LC Refinery Area A Part 70 permit 2623-V20 (Area A)
- 2024 08-05 Phillips 66 LC Refinery Area B Part 70 permit 2624-V26 (Area B)
- 2024 08-05 Phillips 66 LC Refinery Area D Part 70 permit 2626-V19 (Area D)

17. SASOL - Sasol Lake Charles Chemical Complex and Research and Development Laboratory

2201 Old Spanish Trail, Westlake, LA 70669
AI = 3271

Activity description

This facility, including a barometric cooling tower, was “grandfathered” in 1969 and received >20 permits between then and the consolidated permit in 1984. The1984 permit listed a large number of miscellaneous storage tanks which released air pollution through evaporation as well as Batch oxy reactors and oxy heaters. *See table of all current air permits for SASOL below*

The Ethylene Unit - Ethane is thermally cracked in the presence of diluted steam in one of seven cracking furnaces. From the furnaces, the cracked gas is cooled in the quench section, compressed, purified in the caustic wash column, dehydrated, and then further cooled down. The gas is separated in a series of distillation columns to recover ethylene, coproducts, and byproducts, including heavy aromatic distillate, light aromatic concentrate, methane off-gas, hydrogen off-gas, mixed propane and propylene, and mixed C4’s. Ethylene product is transported by pipeline to the Alcohol Unit, to the offsite ethylene storage domes, or to customers. *Source:* May 2025 Part 70 permit application 1105 pgs Ethylene Unit permit 2743-V10

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Top criteria pollutants

Ethylene Unit permit 2743-V10

PM10/PM2.5 (108.8 tpy); NOx (598 tpy); VOCs (257 tpy); GHG (CO2e-820,330 tpy)

Top toxic pollutants

Ethylene Unit permit 2743-V10

n-Hexane, n-Butyl Alcohol, Ammonia, Glycol ethers, 2,2,4-Trimethylpentane, Chlorine, Benzene, Chloroform, Methanol, Acetaldehyde, Ethylene oxide, Toluene, Ethylene glycol, 1,3-Butadiene, Xylenes

The following table lists all of the SASOL permits and permitted emissions

Section IV (Facility Background and Current Permit Status) of the SOB provides a listing of all permits under which the Lake Charles Chemical Complex operates so that permitted rates of the entire facility can be readily determined if so desired.[11]

Permitted criteria pollutant and toxic air pollutant (TAP) emissions from the Lake Charles Chemical Complex, in tons per year, are summarized in the table below.[12]

Permit No.	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	TAPs
2325-V11	1.68	1.68	0.80	27.20	124.01	180.12	53.638
2565-V12	184.18	184.18	15.06	115.43	121.11	131.78	57.151

Permit No.	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	TAPs
2743-V10	107.70	107.70	77.84	582.67	329.49	405.02	68.414
2825-02	90.01	90.01	90.03	90.10	90.09	90.01	25.000
2865-V12	35.58	35.58	5.28	181.51	503.32	1550.08	260.110
2894-V6	16.75	16.75	12.70	117.06	114.62	233.98	35.521
2895-V5	0.12	0.12	0.10	1.56	0.34	111.50	17.817
2896-V11	5.02	5.02	57.86	81.57	60.72	110.95	27.220
2901-V5	29.05	29.05	11.13	792.96	321.14	53.09	8.92
3088-V4	1.21	1.21	–	–	–	42.97	4.300
3115-V4	3.16	3.16	3.64	21.44	60.89	104.92	20.211
3117-V4	2.10	2.10	0.27	21.10	17.20	61.07	6.946
3124-V2	0.59	0.59	2.66	16.66	8.00	3.27	0.062
3160-V1	0.16	0.16	0.03	2.17	1.82	0.14	0.050
	477.31	**477.31**	**277.40**	**2051.43**	**1752.75**	**3078.90**	**585.360**

Figure – 2025 list of Lake Charles Chemical Complex air permits and emission limits.

Permitting history

- Original air permit was issued in 1974
- Notable air permit in 1984 consolidated all earlier permits
- Priort renewal was in 2023 - Comonomer Unit #1
- Recent renewal and modification Jan 2025 - Ethoxylation Unit
- Public Notice permit renewal/mod Ethylene Unit May 2025 - comments June 18, 2025

Ranking for criteria pollutants

PM2.5: 1st out of 13

NOx: 1st out of 13

SO2: 3rd out of 13.

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17. Westlake North - Axiall LLC

Westlake Chemicals and Vinyls Co LP – VCM-E Plant

1600 VCM Plant Rd, Westlake, LA 70669
AI = 4013

Activity description

This plant, which was purchased from Sasol in 1999, produces vinyl chloride monomer. It includes cracking furnaces as well as a cooling tower and storage tanks that release pollution through evaporation.

Lake Charles North facility is a Vinyl Chloride Monomer ("VCM") manufacturing facility owned and operated by Westlake Chemical but permitted under the name of prior owner Axiall, LLC.
Source: 2022 USEPA Title V Inspection Report

Top toxic pollutants

1,2-Dichloroethane, vinyl chloride, hydrochloric acid, 1,1,2-Trichloroethane, Benzene

Permitting history

- Original air permit was issued in 2002 following purchase from Sasol
- Most recent renewal was in 2023

Ranking for criteria pollutants
PM2.5: 10th out of 13
NOx: 9th out of 13
SO2: 8th out of 13

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Other Sites of Interest

A. Magnolia LNG proposed Exporting Terminal

3930 Henry Pugh Blvd, Lake Charles, LA
AI = 185639

Activity Description

Magnolia LNG is proposing to develop an LNG facility capable of producing a nominal capacity of approximately 8.0 million metric tonnes per annum (mtpa) of LNG using its highly efficient and patented Optimized Single Mixed Refrigerant (OSMR) technology. The natural gas will be treated, liquefied, and stored on-site in two full containment LNG storage tanks with a net pumpable capacity of approximately 160,000 cubic meters (m3) each.
Source: 2016 State preconstruction and Part 70 permit No. 0520-00481-V0

Top criteria pollutants

PM10/PM2.5 (30 tpy/30 tpy); NOx (737 tpy); VOCs (73 tpy); CO2e (2,506,994 tpy)

Top toxic pollutants

Total TAPs 25.84 tpy; Formaldehyde (9.36 tpy); Ammonia (3.85 tpy); Toluene (1.80 tpy); n-Hexane (2.67 tpy)

Permitting History

- 2016 03-21 Magnolia LNG Construct-Part 70 permit
- 2015 FERC Environmental Impact Statement (EIS)

Figure – Artist's rendering of proposed Magnolia LNG facility
Source: https://magnolialng.com/

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November 30, 2023 - Sierra Club Victory Drives Magnolia LNG to Withdraw Key Application to the Department of EnergyB. Lake Charles LNG proposed Exporting Terminal

8100 Big Lake Rd, Lake Charles, LA 70605
AI = 212290

Photograph courtesy of Southwings and Louisiana Bucket Brigade, Lori Cook photographer

Activity Description

Lake Charles LNG Export Company LLC proposed to construct a new terminal at 8100 Big Lake Road approximately three miles southwest of Lake Charles for exporting Liquefied Natural Gas (LNG). The site is located adjacent to the existing Lake Charles LNG Receiving Facility, which is owned and operated by Lake Charles LNG Company LLC. Both facilities are under the common control of Energy Transfer, LP.

Proposed operations include receipt of natural gas feed via pipeline with subsequent removal of mercury and acid gas and dehydration of the gas stream. Dry sweet natural gas is further processed by de-methanization, de-ethanization, and then compressed, and cryogenically sub-cooled to LNG. Emissions sources include compressor gas turbines, thermal oxidizers, flares, diesel-fired emergency generator engines, and fire water pump engines.
Source: 2023 12-06 LDEQ Air Inspection Lake Charles LNG

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Top criteria pollutants

PM10/PM2.5 (184 tpy/184 tpy); NOx (732 tpy); VOC (142 tpy)

Top toxic pollutants

Total HAPs (21 tpy); Formaldehyde (8 tpy); n-Hexane (9.5 tpy); TAPs - Ammonia = 387 tpy

Permitting History

- 2023 08-31 Lake Charles LNG PSD Construction Permit
- Feb 2025 Most recent Part 70 permit renewal application

A Title V air permit for the exporting terminal (No. 3127-V0) was first issued to Trunkline LNG Company, LLC under Agency Interest (AI) No. 3351 on 05-01-2015. A separate Agency Interest Number was created for the exporting terminal, and the Title V Air Permit (3127-V0) was transferred from AI 3351 to AI 212290 effective 06-18-2018. Permit No 3127-V0 was renewed with an issue date of 09-03-2020. Upon renewal, the permit number was changed from 3127-V0 to Permit No 0520-00509-V0 to coincide with the transfer to AI 212290. *Source*: 2023 12-06 LDEQ Air Inspection Lake Charles LNG

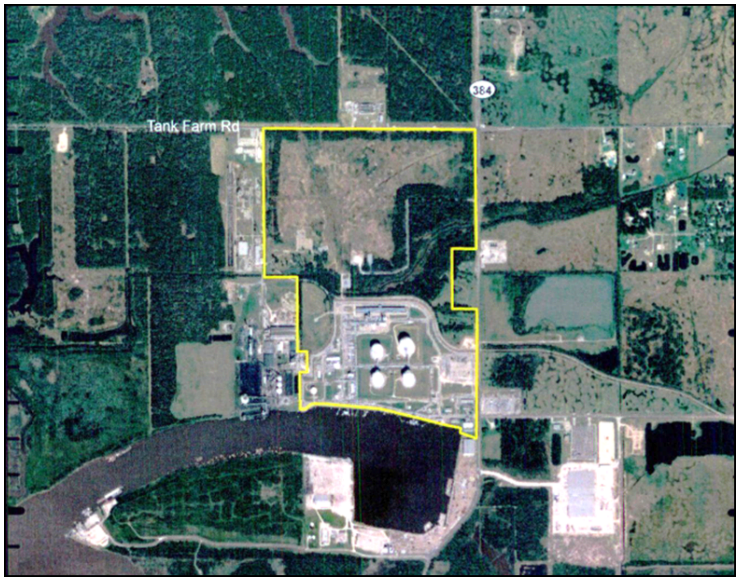

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Figure – Lake Charles LNG facility boundary (from 2019 Permit Renewal Application)

Figure – Google Earth image showing the Lake Charles LNG build out.

C. Alcoa Primary Metals - Carbon Products

3901 W Tank Farm Rd, Lake Charles, LA 70605
AI = 192612 or 192494

Figure – Location of Alcoa Primary Metals north of the Lake Charles LNG facility

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Figure – Location of Alcoa Primary Metals on W Tank Farm Rd

D. Calcasieu Refining Co.

4359 W Tank Farm Rd, Lake Charles, LA 70605
AI = 3585

Activity Description

The Lake Charles Crude Oil Refinery consists of two Atmospheric Distillation Units, two Vacuum Tower Units, and associated process equipment, a storage terminal, product loading operations, and support utilities (boilers and wastewater treatment). The refinery separates crude oil into various petroleum fractions, including but not limited to liquefied petroleum gas, naphtha, kerosene, diesel, and vacuum tower bottoms.

Top criteria pollutants

PM10/PM2.5 (24 tpy/20 tpy); NOx (128 tpy); VOCs (160 tpy)

Top toxic pollutants

Total TAPs 25 tpy – Benzene (4.37 tpy) n-Hexane (8.47 tpy); Toluene (5.15 tpy); Xylene (3.19 tpy)

Permitting History

- 2020 12-04 Calcasieu Refinery Part 70 Public Notice Docs
- 2024 Part 70 permit No. 0520-00050-V19

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E. Lake Charles Methanol II - Proposed

3464 Bayou D'Inde Road, Sulphur, LA
AI = 196978

Activity Description

Feedstock natural gas will be preheated by steam in a fuel gas-fired preheater before being routed through a catalytic and adsorbent desulfurization unit. Here. sulfur compounds will be converted to hydrogen sulfide (H2S). The desulfurized gas (methane) will be mixed with steam, further heated in the process heater, then reformed in the pre-reformer and oxygen-fired autothermal reformer to produce synthesis gas, which will be comprised primarily of hydrogen (H2), carbon monoxide (CO), and carbon dioxide (CO2). The synthesis gas will then be directed to the methanol synthesis loop to produce methanol. Produced methanol from the synthesis loop and distillation operations will be transferred to a terminal for offsite delivery via railcars, trucks. and/or marine carriers.
Source: 2024 10-23 LC Methanol II Title V Permit Basis of Decision

Top criteria pollutants

PM10/PM2.5 (30 tpy/27 tpy); NOx (73 tpy); VOCs (74 tpy)

Top toxic pollutants

Total TAPs 81 tpy = Methanol (64 tpy); Ammonia (14 tpy); n-Hexane (3 tpy)

Permitting history

- 2024 11-01 Lake Charles Methanol II NPDES permit app
- 2024 Micah 6:8 Mission public comments on LPDES permit
- 2024 10-23 LC Methanol II Title V Permit 0520-00492-V3

Figure – Close up snapshot of the proposed location (2 areas outlined in blue).

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Figure - Google Earth image of proposed terminal (yellow pin) next to old coke piles

G. Louisiana Pigment Co.

3300 Bayou D'Inde Rd, Westlake, LA
AI = 11496

Activity Description

Louisiana Pigment produces Titanium Oxide (TiO2), a white pigment used as a whitener and opacifier in paints, plastics, paper, ceramics, and a wide range of consumer products. It is produced using a chloride process involves reducing titanium bearing ore with chlorine and carbon in a solids-gas fluidized bed reactor (chlorinator) to produce a gas stream that contains titanium tetrachloride, other metal chlorides and off-gases. The metal chlorides are separated from the titanium tetrachloride and the pure TiCl4 is condensed and then superheated in the presence of superheated oxygen to produce titanium oxide and chlorine gas.

Top criteria pollutants

PM10/PM2.5 (85 tpy/77 tpy); SO2 (754 tpy); NOx (137 tpy); VOC (17 tpy)

Top toxic pollutants

Carbonyl Sufide (6.55 tpy); Hydrogen Chloride (5.17 tpy); Hydrogen Sulfide (2.88 tpy)

Permitting history

- Original air permit was issued in 1989
- 2023 Part 70 Permit Renewal 0520-00142-V15
- 2025 05-09 LA Pigment Title V renewal-mod permit app

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- 2025 01-15 Solid waste permit renewal application

Ranking for criteria pollutants
PM2.5: 4th out of 13
NOx: 6th out of 13
SO2: 2nd out of 13

Ownership
Kronos Louisiana Inc (KLA) owned 50% and Venator Investments, Ltd owned 50%. On July 16, 2024 Venator conveyed 50% partnership interest to KLA and a 1% partnership interest was concurrently contributed to Kronos LPC, LLC. As of July 16, 2024 the sole owner of Louisiana Pigment Company, LP (LPC) is Kronos Louisiana Inc (KLA).
Source: August 2024 Notice of Change in Partnership and news article

K. Entergy Nelson Power Station

3500 E Houston River Rd, Westlake, LA 70669
AI = 19588

Activity description
Entergy Louisiana LLC (Entergy) owns and operates the Roy S. Nelson Electric Generating Plant (Nelson Plant) located at 3500 Houston River Road in Westlake, LA. The facility has been in operation since 1960. Ownership and operator status transferred from Entergy Gulf States Louisiana LLC to Entergy Louisiana LLC on October 1, 2015.

Entergy is currently permitted to operate three steam generating units (Unit 3 Boiler, Unit 4 Boiler, and Unit 6 Boiler). The facility is also permitted to operate to auxiliary boilers (Unit 4 Auxiliary Boiler and Unit 4 Natural Gas Auxiliary Boiler). The Unit 6 Boiler burns coal as its primary fuel, with No. 2 and No. 4 fuel oils as secondary fuels. Unit 6 Boiler has a maximum heat rating capacity of 6216 MMBtu/hr (550 MW). It has an electrostatic precipitator (ESP) with flue gas conditioning for control of particulate matter emissions and Separated Overfire Air Technology and a Low NOx Concentric Fireing System for NOx control. Steam from the Unit 6 boiler is used to drive steam turbines, which in turn generate rotary motion that is used to drive electric generators.

All boilers, other than the Unit 6 Boiler, are no longer in service and are being deleted from the Title V and Acid Rain permits.
Source: 2022 10-05 Entergy Power Plant Part 70 permit

Top criteria pollutants

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Permitted emissions in tons per year from the Nelson Plant are as follows:

Pollutant	Before	After	Change
PM_{10}	2,867.42	1,537.26	-1,330.16
$PM_{2.5}$	1,823.45	1,430.60	-392.85
SO_2	55,240.54	32,671.32	-22,569.22
NO_X	19,368.68	10,891.98	-8,476.70
CO	7,349.20	5,119.92	-2,229.28
VOC*	348.01	158.24	-189.77

Figure – Emission reductions due to removing the boilers from the Title V permit

Top toxic pollutants

Total VOC TAPs 29.5 tpy – Formaldehyde (12 tpy); Benzene (2 tpy)
Total non-VOC TAPs 702 tpy – Sulfuric Acid (597 tpy); Hydrochloric Acid (70 tpy); Hydrofluoric Acid (28 tpy)

Permitting history

- Original air permit was issued in 1990
- Prior renewal was in 2021
- 2022 10-05 Entergy Power Plant Part 70 permit 0520-00014-V5

Ranking for criteria pollutants
PM2.5: 2nd out of 13
NOx: 2nd out of 13
SO2: 1st out of 13

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Glossary

Air Toxics: Health Effect Summaries

1,1,2-Trichloroethane

Most health information on 1,1,2-trichloroethane comes from animal studies. Breathing high levels—whether short- or long-term—has been shown to cause liver damage, drowsiness, slower movement, and damage to lung tissue and nasal cells. When swallowed in large amounts, it can harm the liver, kidneys, stomach, nervous system, and immune system.

1,2-Dichloroethane

Exposure to high levels of 1,2-dichloroethane—whether inhaled, ingested, or absorbed—can cause nausea, vomiting, blurred vision, difficulty breathing, and damage to the liver or kidneys. In extreme cases, it may lead to death. Animal studies confirm similar effects, including liver and kidney toxicity and nervous system impacts.

1,3-Butadiene

Breathing high levels of 1,3-butadiene for a short time may cause nausea, dry mouth and nose, headache, and decreased blood pressure and pulse rate. In laboratory animals, 1,3-butadiene causes inflammation of nasal tissues, changes to lung, heart, and reproductive tissues, neurological effects, and blood changes. The Department of Health and Human Services (DHHS), IARC, and EPA have determined that 1,3-butadiene is a human carcinogen. Studies have shown that workers exposed to 1,3-butadiene may have an increased risk of cancers of the stomach, blood, and lymphatic system

2,2,4-Trimethylpentane (iso-octane)

2,2,4-Trimethylpentane—commonly known as **iso-octane**—is a volatile organic compound used as a primary component in gasoline to improve engine performance and reduce knocking. It evaporates easily and can be inhaled from fuel vapors.

Short-term exposure to high levels of iso-octane vapors can cause headaches, dizziness, fatigue, nausea, and loss of coordination. Inhalation of very high concentrations may lead to central nervous system depression. Prolonged or repeated exposure—primarily in occupational settings—can affect the liver, kidneys, and blood. Skin contact can cause irritation and defatting (drying out of the skin). It is also flammable and poses explosion risks in confined spaces.

Acetaldehyde

The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema, and respiratory tract in humans. Acute inhalation of acetaldehyde resulted in a depressed respiratory rate and elevated blood pressure in experimental animals. Symptoms of chronic intoxication of acetaldehyde in humans resemble those of alcoholism.

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Ammonia

Ammonia is found throughout the environment in the air, soil, and water, and in plants and animals including humans. Exposure to high levels of ammonia can cause irritation and serious burns on the skin and in the mouth, throat, lungs, and eyes. At very high levels, ammonia can even cause death. No health effects have been found in humans exposed to typical environmental concentrations of ammonia. Exposure to high levels of ammonia in air may be irritating to your skin, eyes, throat, and lungs and cause coughing and burns. Lung damage and death may occur after exposure to very high concentrations of ammonia. Some people with asthma may be more sensitive to breathing ammonia than others.

Benzene

Benzene is a well-known carcinogen. Breathing high levels can cause dizziness, drowsiness, confusion, unconsciousness, and even death at extremely high concentrations. Long-term exposure, even at lower levels, can affect bone marrow and lead to anemia, immune system suppression, and an increased risk of leukemia. Reproductive effects have been reported for women exposed by inhalation to high levels.

Carbonyl Sulfide - Carbon Disulfide (CS_2)

Carbon disulfide is a flammable, colorless liquid with a sweet, ether-like odor, used in the production of rayon, cellophane, and rubber chemicals. Breathing high levels can cause dizziness, headache, anxiety, vision changes, and in severe cases, coma. Long-term exposure has been linked to nerve damage, reproductive harm, and effects on the cardiovascular system. Workers exposed over time have shown memory problems, mood changes, and slower reaction times. It can also irritate the eyes, skin, and lungs.

Chloroform

The major effect from acute (short-term) inhalation exposure to chloroform is central nervous system depression. Chronic (long-term) exposure to chloroform by inhalation in humans has resulted in effects on the liver, including hepatitis and jaundice, and central nervous system effects, such as depression and irritability.

Chlorine

Exposure to low levels of chlorine can result in nose, throat, and eye irritation. At higher levels, breathing chlorine gas may result in changes in breathing rate and coughing, and damage to the lungs. In general, people who suffer from respiratory conditions such as allergies or hay fever, or who are heavy smokers, tend to experience more severe effects than healthy subjects or nonsmokers.

Cresol

Ambient air contains low levels of cresols from automobile exhaust, power plants, and oil refineries. Acute (short-term) inhalation exposure by humans to mixed cresols results in respiratory tract irritation, with symptoms such as dryness, nasal constriction, and throat irritation. Mixed cresols are also strong dermal irritants. No information is available on the chronic (long-term) effects of mixed cresols in humans, while animal studies have reported effects on the blood, liver, kidney, and central nervous system (CNS), and reduced body

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weight, from oral and inhalation exposure to mixed cresols. Several animal studies suggest that o-cresol, m-cresol, and p-cresol may act as tumor promoters. EPA has classified o-cresol, m-cresol, and p-cresol as Group C, possible human carcinogens.

Ethyl Benzene

Short-term exposure to high levels of ethylbenzene can cause throat and eye irritation, dizziness, and hearing loss. Animal studies have shown liver and kidney damage, as well as tumors, with long-term exposure. The International Agency for Research on Cancer (IARC) classifies it as a possible human carcinogen.

Ethylene glycol

Ethylene glycol is a clear liquid used in antifreeze and de-icing solutions. Exposure to large amounts of ethylene glycol can damage the kidneys, nervous system, lungs, and heart.

Ethylene oxide

Exposure of the general population to ethylene oxide usually involves levels that are lower than those known to cause health problems. People living near industrial facilities that release ethylene oxide to the outdoor air may be exposed to higher levels of ethylene oxide than people who do not live near these facilities. Workers exposed to high levels (generally tens of thousands of times higher than the general population is exposed to) of ethylene oxide in the air for short periods of time reported lung irritation. Workers exposed to high concentrations of ethylene oxide for short and long amounts of time reported having effects such as headaches, memory loss, numbness, nausea, and vomiting. Some studies of the highest exposed workers who were exposed to ethylene oxide over an average of 10 years or longer had higher risks of certain types of cancer, such as some blood cancers and breast cancer. Similar cancers were also found in animal studies. Some studies of workers have not found increases in cancer. The Department of Health and Human Services (HHS) has determined that ethylene oxide is known to be a human carcinogen.

Formaldehyde

Exposure to formaldehyde—especially in the air—can cause irritation of the eyes, nose, throat, and skin. In people with asthma or other respiratory conditions, it can worsen symptoms. It is a known human carcinogen, linked to cancers of the nasal cavity and leukemia. Long-term exposure can increase the risk of respiratory illnesses and immune system effects. The Department of Health and Human Services (HHS) determined in 2011 that formaldehyde is a known human carcinogen based on sufficient human and animal inhalation studies.

Glycol ethers

Glycol ethers have many uses; these include use as solvents and as an ingredient in cleaning compounds, liquid soaps, and cosmetics. Acute (short-term) exposure to high levels of the glycol ethers in humans results in narcosis, pulmonary edema, and severe liver and kidney damage. Chronic (long-term) exposure to the glycol ethers in humans may result in neurological and blood effects, including fatigue, nausea, tremor, and anemia. No information is available on the reproductive, developmental, or carcinogenic effects of the glycol ethers in humans. Animal studies have reported reproductive and developmental effects from inhalation and oral exposure to the glycol ethers. EPA has not classified the glycol ethers for Carcinogenicity.

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Hydrochloric acid (hydrogen chloride)

Hydrogen chloride is irritating and corrosive to any tissue it contacts. Brief exposure to low levels causes throat irritation. Exposure to higher levels can result in rapid breathing, narrowing of the bronchioles, blue coloring of the skin, accumulation of fluid in the lungs, and even death. Exposure to even higher levels can cause swelling and spasm of the throat and suffocation. Some people may develop an inflammatory reaction to hydrogen chloride. This condition is called reactive airways dysfunction syndrome (RADS), a type of asthma caused by some irritating or corrosive substances. Depending on the concentration, hydrogen chloride can produce from mild irritation to severe burns of the eyes and skin. Long-term exposure to low levels can cause respiratory problems, eye and skin irritation, and discoloration of the teeth. Swallowing concentrated hydrochloric acid will cause severe corrosive injury to the lips, mouth, throat, esophagus, and stomach.

Hydrofluoric acid (HF)

HF is highly corrosive to tissues, skin, and bone. It can penetrate the skin and cause deep tissue damage. HF can disrupt the balance of calcium and magnesium in the body, potentially leading to cardiac arrhythmias and other systemic complications. HF vapors can cause respiratory irritation, coughing, and potentially pulmonary edema. HF exposure to the eyes can cause severe damage and blindness. Skin contact with HF at lower concentrations may not produce pain immediately, which can lead to delayed recognition of the burn and more severe damage.

Hydrogen cyanide

Cyanide is used in a number of industries and is found at low levels in air from car exhaust. Cyanide is extremely toxic to humans. Chronic (long-term) inhalation exposure of humans to cyanide results primarily in effects on the central nervous system (CNS). Other effects in humans include cardiovascular and respiratory effects, an enlarged thyroid gland, and irritation to the eyes and skin. No data are available on the carcinogenic effects of cyanide in humans via inhalation. Animal studies have suggested that oral exposure to cassava (a cyanide-containing vegetable) may be associated with malformations in the fetus and low fetal body weights. EPA has classified cyanide as a Group D, not classifiable as to human Carcinogenicity.

Hydrogen sulfide

Just a few breaths of air containing high levels of hydrogen sulfide can cause death. Lower, longer-term exposure can cause eye irritation, headache, and fatigue.Studies in humans suggest that the respiratory tract and nervous system are the most sensitive targets of hydrogen sulfide toxicity. Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Respiratory distress or arrest has been observed in people exposed to very high concentrations of hydrogen sulfide. Exposure to low concentrations of hydrogen sulfide may cause headaches, poor memory, tiredness, and balance problems. Brief exposures to high concentrations of hydrogen sulfide can cause loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in some individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function.

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Methanol

Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. Exposure may occur from ambient air and during the use of solvents. Acute (short-term) or chronic (long-term) exposure of humans to methanol by inhalation or ingestion may result in blurred vision, headache, dizziness, and nausea. No information is available on the reproductive, developmental, or carcinogenic effects of methanol in humans. Birth defects have been observed in the offspring of rats and mice exposed to methanol by inhalation. EPA has not classified methanol with respect to carcinogenicity.

Methyl ethyl ketone

Studies in humans breathing methyl ethyl ketone (also known as 2-butanone) found nose, throat, and eye irritation. Other health effects seen in people breathing methyl ethyl ketone include headache, tiredness, and feeling of being drunk. Poor coordination has been found in lab animals exposed to high concentrations of 2-butanone. Kidney effects have been seen in lab animals that breathe 2-butanone or are orally exposed to it. Serious health effects in animals have been seen only at very high levels. When breathed, these effects included birth defects, loss of consciousness, and death. The levels of 2-butanone typically found in the environment are lower than levels known to cause harmful health effects.

Methyl tertiary butyl ester (MTBE)

Methyl tert-butyl ether is used as a gasoline additive. Exposure may occur by breathing air contaminated with auto exhaust or gasoline fumes while refueling autos. Respiratory irritation, dizziness, and disorientation have been reported by some motorists and occupationally exposed workers. Acute (short term) exposure of humans to methyl tert-butyl ether also has occurred during its use as a medical treatment to dissolve cholesterol gallstones. Chronic (long-term) inhalation exposure to methyl tert-butyl ether has resulted in central nervous system (CNS) effects, respiratory irritation, liver and kidney effects, and decreased body weight gain in animals. Developmental effects have been reported in rats and mice exposed via inhalation. EPA has not classified methyl tert-butyl ether with respect to potential carcinogenicity.

n-Butyl Alcohol (n-Butanol)

A literature review and health effects evaluation were conducted for n-butanol, a chemical that occurs naturally in some foods, which is an intermediate in the production of butyl esters and can be used as a gasoline additive or blend. Studies evaluating n-butyl acetate were included in the review as n-butyl acetate is rapidly converted to n-butanol following multiple routes of exposure. The primary n-butanol health effects identified were developmental and nervous system endpoints. In conducting the literature review and evaluating study findings, the following observations were made: (1) developmental findings were consistently identified; (2) neurodevelopmental findings were inconsistent; (3) evidence for nervous system effects was weak; (4) comparing internal doses from oral and inhalation exposures using physiologically based pharmacokinetic models introduces uncertainties; and (5) a lack of mechanistic information for n-butanol resulted in the reliance on mechanistic data for ethanol, which may or may not be applicable to n-butanol. This paper presents findings from a literature review on the health effects of n-butanol and proposes research to help reduce uncertainty that exists due to database limitations.

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n-Hexane

Breathing air containing high concentrations of *n*-hexane caused highly-exposed workers a feeling of numbness in their feet and hands. This was followed by muscle weakness in the feet and lower legs. If exposure continued, the symptoms grew worse. In some workers, paralysis of the arms and legs developed. When the affected workers were examined by doctors, the nerves controlling the muscles in their arms and legs were found to be damaged. The medical term for this condition is "peripheral neuropathy" (peripheral means outside the brain and spinal cord; neuropathy means nerve damage). Fortunately, once the workers were removed from exposure to *n*-hexane they recovered within 6 months to a year, although some of the more severely affected did not fully recover for 1-2 years.

Naphthalene

Naphthalene is used in the production of phthalic anhydride; it is also used in mothballs. Acute (short term) exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion. Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Hemolytic anemia has been reported in infants born to mothers who "sniffed" and ingested naphthalene (as mothballs) during pregnancy. Available data are inadequate to establish a causal relationship between exposure to naphthalene and cancer in humans. EPA has classified naphthalene as a Group C, possible human carcinogen.

Styrene

Breathing styrene can cause tiredness, dizziness, nausea, and irritation of the eyes and respiratory tract. Long-term exposure in animals has led to liver, lung, and kidney damage, as well as effects on the nervous system. It is classified as a possible human carcinogen and may increase the risk of leukemia and lymphoma.

Sulfuric Acid

Sulfuric acid is a highly corrosive liquid used in industrial processes like oil refining, fertilizer production, and chemical manufacturing. When released into the air as a mist or vapor, it can cause severe irritation of the eyes, nose, throat, and lungs. Short-term exposure may lead to coughing, difficulty breathing, and burns to the skin or eyes. Long-term exposure—especially in workplaces—can cause chronic respiratory problems, including bronchitis and permanent lung damage. It is also known to worsen asthma and other pre-existing respiratory conditions.

Toluene

Short-term exposure to toluene can cause headaches, dizziness, and confusion. High concentrations may lead to unconsciousness and death. Chronic exposure can damage the nervous system, kidneys, and liver. Toluene also affects fetal development and may cause developmental delays in children born to mothers with high exposure.

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Vinyl Acetate

Vinyl acetate is primarily used as a monomer in the production of polyvinyl acetate and polyvinyl alcohol. Acute (short-term) inhalation exposure of workers to vinyl acetate has resulted in eye irritation and upper respiratory tract irritation. Chronic (long-term) occupational exposure did not result in any severe adverse effects in workers; some instances of upper respiratory tract irritation, cough, and/or hoarseness were reported. Nasal epithelial lesions and irritation and inflammation of the respiratory tract were observed in mice and rats chronically exposed by inhalation. No information is available on the reproductive, developmental, or carcinogenic effects of vinyl acetate in humans. An increased incidence of nasal cavity tumors has been observed in rats exposed by inhalation. In one drinking water study, an increased incidence of tumors was reported in rats. EPA has not classified vinyl acetate for carcinogenicity.

Vinyl chloride

The levels of vinyl chloride typically found in the environment are lower than levels known to cause health problems.
Breathing high levels of vinyl chloride can cause you to feel dizzy or sleepy. Breathing very high levels can cause you to pass out, and breathing extremely high levels can cause death. Some people who have breathed vinyl chloride for several years have changes in the structure of their livers. People are more likely to develop these changes if they breathe high levels of vinyl chloride. Some people who work with vinyl chloride have nerve damage and develop alterations in immunity. The lowest levels that produce liver changes, nerve damage, and alterations in immunity in people are not known. Some workers exposed to very high levels of vinyl chloride have problems with the blood flow in their hands. Their fingers turn white and hurt when they go into the cold. Highly exposed workers have also developed a specific type of cancer known as angiosarcoma of the liver. The effects of drinking high levels of vinyl chloride are unknown. If you spill vinyl chloride on your skin, it will cause numbness, redness, and blisters.

Xylenes

No health effects have been noted at the background levels that people are exposed to on a daily basis. High levels of exposure for short or long periods can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

Fine Particulate Matter

Health Impacts of Particulate Matter.docx

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