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To the members of the House Committee on Environmental Regulation.

April 26, 2022

Via hand delivery.

Re: Public Citizen Testimony for Interim Committee Hearing

Dear Chairman Landgraf and members of the committee:

Public Citizen appreciates the opportunity to testify at this interim committee hearing of the Committee on Environmental Regulation.

I. HB 4472 – TERP should invest in particulate matter reductions.

The Texas Emissions Reduction Plan (TERP) is the cheapest way to reduce air pollution in Texas. As of 2020 the program had eliminated 187,406 tons of nitrogen oxide (NO_x) pollution at a cost of \$7,326 per ton of NO_x. The largest program within TERP, the Diesel Emissions Reduction Incentive (DERI) program, has a cost effectiveness of \$6,265 per ton of NO_x. TERP revenue is around \$260 million per year. All of that money should be spent each year to reduce air pollution and improve public health.

Throughout its life, the focus of TERP has been NO_x pollution because Texas does not meet federal Clean Air Act standards for ozone (NO_x is a precursor to ozone). State law also allows TERP to be used to reduce particulate matter (PM) pollution. *See* Health and Safety Code § 386.051. We recommend more TERP funds be invested in particulate matter reduction. There are two reasons for this approach.

A. Texas may soon fail to meet particulate matter standards.

This summer the U.S. Environmental Protection Agency (EPA) will reexamine the health standard for particulate matter.¹ Many urban areas of the state barely meet the current fine particulate matter (PM_{2.5}) annual standard of 12 µg/m³. It is likely the federal government will reduce this standard, possibly to 10 µg/m³. If this happens, some areas of Texas, such as Houston, are likely to be designated in nonattainment of the new standard.

Over the years, addressing nonattainment areas has been the primary purpose of TERP. We suggest that more resources are put toward reducing PM pollution now so that Texas can avoid or limit nonattainment designations for PM. This approach will also yield considerable public health benefits.

¹ See <https://www.epa.gov/newsreleases/epa-reexamine-health-standards-harmful-soot-previous-administration-left-unchanged>.



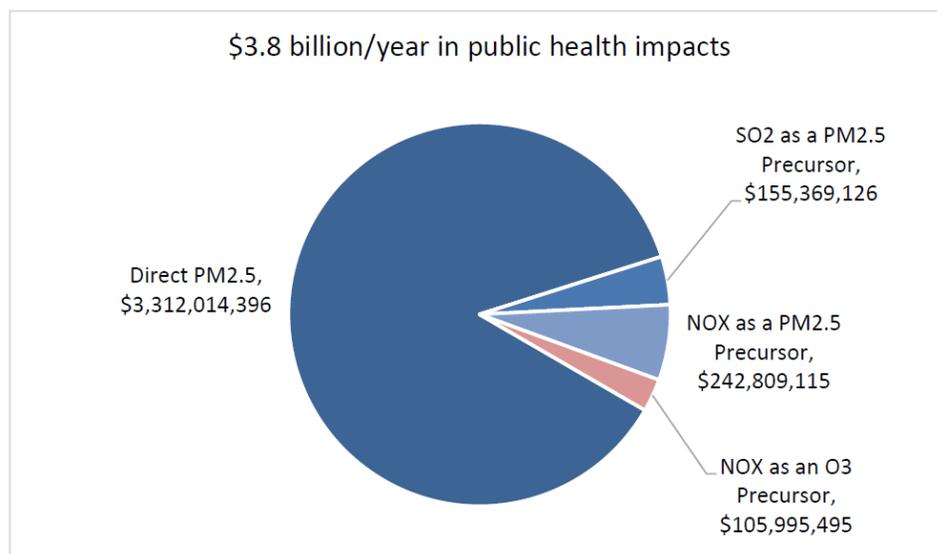
B. A focus on particulate matter will bring considerable public health benefits.

Air pollution is deadly. Every year 17,000 Texans die from air pollution.² Particulate matter is by far the most dangerous pollutant in Texas. Particulate matter is associated with a wide range of health impacts including:

- Death,³
- Heart Attack,⁴
- Stroke,⁵
- Diabetes,⁶
- Impairment of brain development,⁷
- Low birth weight.⁸

A focus on particulate matter over ozone in TERP would provide greater public health benefits. This analysis of health impacts in Central Texas by the Capitol Area Council of Governments (CAPCOG) illustrates this point.⁹

Figure 1. Estimated Monetized Impacts of Regional Emissions of NO_x, SO₂, and PM_{2.5}



² See http://acmg.seas.harvard.edu/publications/2021/vohra_2021_ff_sup.pdf.

³ See <https://www3.epa.gov/region1/airquality/pm-human-health.html>

⁴ See <https://www.thelancet.com/action/showPdf?pii=S2542-5196%2819%2930262-1>.

⁵ See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6176083/>.

⁶ See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5583950/>.

⁷ See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5017593/>.

⁸ See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3055585/>.

⁹ Hoekzema, Andrew, “CAC Meeting 8/12/2020 Item 6: Consider Participation in EPA’s Particulate Matter Advance Program” CAPCOG Clean Air Coalition (3 Aug. 2020).



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Particulate matter is responsible for nearly 90% of the health impacts due to air pollution in Central Texas. For this reason—and for the potential for PM nonattainment designations in the near future—we recommend that TERP increase its spending to reduce particulate matter pollution.

II. SB 900 – the rulemaking should address floating roof tank vulnerability to high volumes of rain.

Public Citizen’s recommendations for SB 900 were originally presented in comments to the Senate Committee on Natural Resources & Economic Development on April 8, 2021. This testimony focuses on one point from that testimony: the vulnerability of floating roof tanks to high volumes of rain. This problem was not addressed by SB 900 but does have a proposed solution.

In 2017 Hurricane Harvey revealed a previously unknown vulnerability of storage tanks to high volumes of rain.¹⁰ At least nine companies experienced storage tank failures due to excessive rain during Hurricane Harvey. These incidents combined released more than three million pounds of air pollution. A summary of these events as reported to the TCEQ’s Air Emissions Event Reporting Database is below.

¹⁰ Jordan Blum, “Failure of floating-roof oil tanks during Harvey raise concerns” Houston Chronicle (11 Oct. 2017) available at <https://www.houstonchronicle.com/business/energy/article/Failures-of-floating-roof-tanks-during-Harvey-12269513.php>. See also as attached.



Incident Number ¹¹	Company	Pollution released (lbs)	Cause
267578	Arkema Crosby Plant	23,608	Two tanks capacity exceeded, spill into containment dike, dike leak into floodwaters.
267063	Crude Product Port Neches	1,368	Product on internal floating roof.
266294	ExxonMobil Baytown Refinery	185,808	Partial roof submergence.
266754	Galena Park Terminal	2,471,401	Two tanks floated and released contents into floodwater.
266570	Marathon Petroleum Texas City Refinery	7,927	Tilting roof due to excessive rain.
266263	Phillips 66 Pasadena Product Terminal	119	Two external floating roof tanks experienced product draining into secondary containment.
266269	KM Liquids Pasadena Terminal	144,601	Partial submergence of two external floating roofs.
266266	Shell Oil Deer Park	67,933	Contents spilled on tank roof, "cause unknown."
266275	Valero Partners Houston	235,412	Partial sinking of tank roof.
	TOTAL	3,138,177	

The House Committee on Environmental Regulation held a hearing on April 25, 2018 to hear testimony on Harvey response and cleanup efforts.¹² At that hearing testimony was given by, among others, Harris County Pollution Control Services Director Bob Allen.¹³

Mr. Allen testified about a weakness in the design of floating roof tanks in Harris County. There are roughly 400 external floating roof tanks in Harris County. The county identified nine tank failures during Harvey and questioned the tank owners about a cause. Some companies responded that the drains on the roofs of their floating roof tanks were too small. Mr. Allen testified that while industry standard is a four-inch drain, companies with six-inch drains on their tanks did not experience tank failures during Harvey, even after forty-five inches of rain.

¹¹ Events reports retrieved from the TCEQ's Air Emissions Event Reporting Database at <https://www2.tceq.texas.gov/oce/eer/> (9 Jan 2021).

¹² See <https://capitol.texas.gov/tlodocs/85R/schedules/pdf/C2602018042509001.PDF>.

¹³ Mr. Allen's testimony begins at 2:34:00 http://tlchouse.granicus.com/MediaPlayer.php?view_id=40&clip_id=15092.



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In his testimony, Mr. Allen recommended that new tanks be required to have larger drains, and that existing tanks could be required to enlarge their tank drains during their next turnaround.

The drain size of floating roof tanks is not proscribed by TCEQ,¹⁴ which does not maintain construction standards for oil and gas infrastructure. The controlling authority is American Petroleum Institute Standard 650: “Welded Tanks for Oil Storage” API STANDARD 650, ELEVENTH EDITION, JUNE 2007 (citing 40 CFR 195.132(b)(3), Design and construction of aboveground breakout tanks).¹⁵

API 650 speaks to floating roofs, rain, and drains twice, specifically:

“Floating roofs shall have sufficient buoyancy to remain afloat...for the following conditions: (a) 250 mm (10 in.) of rainfall in a 24-hour period” API 650, C.3.4.1 (2007).

“Emergency Roof Drains...shall be sized to handle the rainfall specified by the Purchaser.” API 650, C.3.8.2 (2007).

API 650 says nothing about roof drain sizes of four inches or otherwise.

The guideline to construct for “10 in. of rainfall in a 24-hour period” is out of date. API 650 relies for its rainfall estimates on Technical Paper-40,¹⁶ which in turn relies on rainfall data from 1961 and before.¹⁷

¹⁴ See [30 TAC 115.112](#).

¹⁵ 40 CFR 195.132(b)(3), “Vertical, cylindrical, welded steel tanks with internal pressures at the tank top approximating atmospheric pressures...must be designed and constructed in accordance with API Standard 650.”

¹⁶ Hershfield, David M. “Technical Paper 40: Rainfall Frequency Atlas of the United States” U.S. Department of Commerce, Weather Bureau (May 1961) *available at* https://www.nws.noaa.gov/oh/hdsc/Technical_papers/TP40.pdf (“TP40”).

¹⁷ See API Standard 650 at 2-4.



Houston has experienced ten storms of ten inches or more in the last twenty years:

Date	Storm	Rainfall	Frequency	Fatalities	Damage (est.)
Aug. 27, 2020	Hurricane Laura ¹⁸	10-15”	25 year	42	\$19 billion
Sept. 19, 2019	T. S. Imelda ¹⁹	24-36”	100 year	5	\$5.1 billion
Aug. 27-29, 2017	Hurricane Harvey ²⁰	60.5” ²¹	100 year	89	\$125 billion
Apr. 18, 2016	<i>Tax Day Flood</i> ²²	17”	100 year	8	\$2.9 billion
Oct. 31, 2015	<i>Halloween Flood</i> ²³	10-15”	25 year	2	\$30 million
May 25, 2015	<i>Memorial Day Flood</i> ²⁴	10”	25 year	31	\$2.8 billion
July 14, 2012	n/a ²⁵	10”	25 year	-	-
Apr. 28, 2009	n/a ²⁶	10”	25 year	1	-
Sept. 13, 2008	Hurricane Ike ²⁷	11”	25 year	112	\$36.9 billion
June 8, 2001	T. S. Allison ²⁸	30-40”	100 year	43	\$12.7 billion

If the rulemaking to implement SB 900 relies on API standards, it will not protect tanks from future storms. We recommend a new standard, perhaps one based on a larger roof drain size as Mr. Allen suggested in his 2017 testimony. Another option is to require geodesic roof tanks in areas prone to heavy rains.

¹⁸ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). <https://www.ncdc.noaa.gov/billions/>, DOI: 10.25921/stkw-7w73.

¹⁹ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). <https://www.ncdc.noaa.gov/billions/>, DOI: 10.25921/stkw-7w73.

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²¹ “National Hurricane Center Tropical Cyclone Report: Hurricane Harvey” (9 May 2018) available at https://www.nhc.noaa.gov/data/tcr/AL092017_Harvey.pdf.

²² NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). <https://www.ncdc.noaa.gov/billions/>, DOI: 10.25921/stkw-7w73.

²³ See <https://www.weather.gov/media/hgx/climate/summary/2010Top10.pdf>.

²⁴ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). <https://www.ncdc.noaa.gov/billions/>, DOI: 10.25921/stkw-7w73.

²⁵ See <https://www.cbsnews.com/news/100-year-rainfall-event-drenches-houston-area/>.

²⁶ See https://www.weather.gov/hgx/pns_memorable_events2000s.

²⁷ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). <https://www.ncdc.noaa.gov/billions/>, DOI: 10.25921/stkw-7w73.

²⁸ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). <https://www.ncdc.noaa.gov/billions/>, DOI: 10.25921/stkw-7w73.



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Thank you for the opportunity to provide this testimony. If you would like to discuss our position further, I can be reached at ashelley@citizen.org, 512-477-1155.

Respectfully,

Adrian Shelley
Texas Director, Public Citizen

CC: Rep. Alex Dominguez, Rep. Jay Dean, Rep. Vikki Goodwin, Rep. Kyle J. Kacal, Rep. John Kuempel, Rep. Penny Morales Shaw, Rep. Geanie W. Morrison, Rep. Ron Reynolds