Office of the Mayor
City of Houston
Texas

Bill White
Mayor

December 20, 2007

National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries: Residual Risk Standards Docket, Docket ID No. EPA-HQ-OAR-2003-0146
EPA, Air and Radiation Docket and Information Center
Mail code: 2822T
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

cc: Robert Lucas
EPA, Office of Air Quality Planning & Standards
Sector Policies & Program Division, Coatings and Chemicals Group (E-143-01)
Docket ID No.EPA-HQ-OAR-2003-0146
Research Triangle Park, NC 27711
E-mail: lucas.bob@epa.gov

Re: National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries: Proposed Rule
Docket ID No.EPA-HQ-OAR-2003-0146
Comments

Via e-mail: a-and-r-docket@epa.gov
Via U.S. Mail, to the addresses noted above

Dear Administrator Johnson:

The above noted proposed rule was published in the Federal Register on Tuesday, September 4, 2007. (72 Fed. Reg. 50716). The deadline for filing comments was originally November 5, 2007. By letter dated September 20, 2007, the City of Houston ("City" or "Houston") requested a public meeting in Houston to discuss the proposal. EPA granted that request and the public meeting was held in Houston on November 27, 2007. On November 8, 2007, the deadline for submitting public comments was extended to December 28, 2007. (72 Fed. Reg. 63159).

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Background and Summary of Comments

In 1990, Congress amended the Clean Air Act. One of the sections that received the most attention was Section 112, which was meant to effectively regulate the emissions of hazardous air pollutants ("HAPs"), those air pollutants that are most dangerous to human health and the environment. Congress amended the Act by listing189 HAPs and directing EPA to promulgate standards that would reduce the emissions of those pollutants to the maximum extent possible. Congress provided for regulation of HAPs in two steps. The first step has become known as the "MACT" phase. MACT stands for "maximum achievable control technology" and the standards adopted have come to be known as the "MACT floor." The second step, which EPA must undertake 8 years after adoption of the MACT floor, is supposed to address "residual risk, "which was not addressed by the MACT floor rulemaking. It is this residual risk to health and the environment presented by emissions of HAPs from refinery sources, which is the subject of the current rulemaking by EPA. Under this step, EPA must consider the advances in technology[1], data, and the effect of the MACT floors to determine whether additional controls are necessary to meet the level of protection required by the Act. That is, EPA must ensure that the MACT standards provide an ample margin of safety from exposure to HAPs so that the lifetime excess risk of cancer to the individual most exposed to multiple HAPs from an industry category is less than one in one million.

As explained in the remainder of this comment letter, Houston asserts that the EPA has not met the requirements of the Administrative Procedure Act, the Clean Air Act, or Executive Order 12898 regarding Environmental Justice in Minority Populations and Low Income Populations. Notwithstanding the inadequacies of the current proposal, the City strongly recommends that EPA promulgate on an interim final basis all the control mechanisms included in the proposal in Option 2 for storage units and enhanced biodegradation units so that some emissions reduction may be achieved as soon as possible, while EPA takes the measures needed to propose additional rules to meet its legal obligations. Likewise, Houston supports the proposed requirements for cooling towers (which should have been included in the MACT floor requirements12 years ago), as well as the implementation of fence line monitoring so that EPA has a mechanism to verify data and to determine to some extent what the impact of the emissions is at the fence line. The City also proposes an "Option 3," which includes additional technological and other mechanisms to reduce HAP emissions to safer levels, and we urge EPA to propose additional rules incorporating Option 3 as soon as practicable.

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[1] The City agrees with and incorporates by reference the comments made by the National Resource Defense Council and others that the 8 year statutory review requires a review of technological advances and that EPA is required to implement improvements in control technologies that will result in increased HAP emission reductions. EPA has not conducted that review.

I. EPA has not fulfilled its obligations under the Clean Air Act to protect the health and safety of those people at risk of exposure to emissions of HAPs from the petroleum refining industry.

The City has focused this section of its comments on the following areas:

- There are significant errors in the emission inventory **data**, which render the risk assessment and technological recommendations unsupportable.
- There are significant errors in the **risk assessment**, and without a sound scientific underpinning, the proposed rule is fatally flawed.
- Based on the inadequacies of the data and the risk assessment, EPA has come to the wrong conclusions regarding the need for **additional controls** to ensure an ample margin of safety.
- Because of the fundamental flaws in the rulemaking record and risk assessment, promulgation of the rule as proposed would be **arbitrary and capricious**.

A. There are fundamental errors in the source, scope, and reporting bias of the emissions inventory data, which invalidate EPA's analysis and conclusions.

First, EPA has relied solely on industry-generated, self-reported and secondary source data for its emissions inventory. EPA had ample opportunity since the refinery MACT floor rule was made 12 years ago to have required monitoring, reviewed existing monitoring data, and required additional comprehensive information from the regulated industry pursuant to its powers under Section 114 of the Clean Air Act. It did none of these things. In addition, EPA's Office of Inspector General recently released an evaluation report regarding emissions data needed to conduct a residual risk assessment, using the refinery HAP rulemaking as one example. The Inspector General was highly critical of EPA's data collection efforts and recommended a series of actions, such as monitoring, that EPA should use to collect more reliable data. Earlier Inspector General reports included the same recommendations and are referred to in the Inspector General's current report. EPA has not adequately responded to those recommendations. See "Improvements in Air Toxics Emissions Data Needed to Conduct Residual Risk Assessment," Report no. 08-P-0020, October 31, 2007, incorporated by reference.

Second, the data used by EPA represents a chronic underreporting of refinery emissions. EPA's own statements in the preamble to the regulations acknowledge that much of the emissions data suffers from an underreporting bias. And EPA's proposal acknowledges that data from several refinery emission sources, such as cooling water towers, was underreported. These are large sources of emissions, and their exclusion invalidates EPA's conclusions.

A number of studies have concluded that there is an underreporting of emissions data, by factors as large as 15, when compared to actual measured emissions. The Texas Commission on Environmental Quality TCEQ found that emissions estimates for the

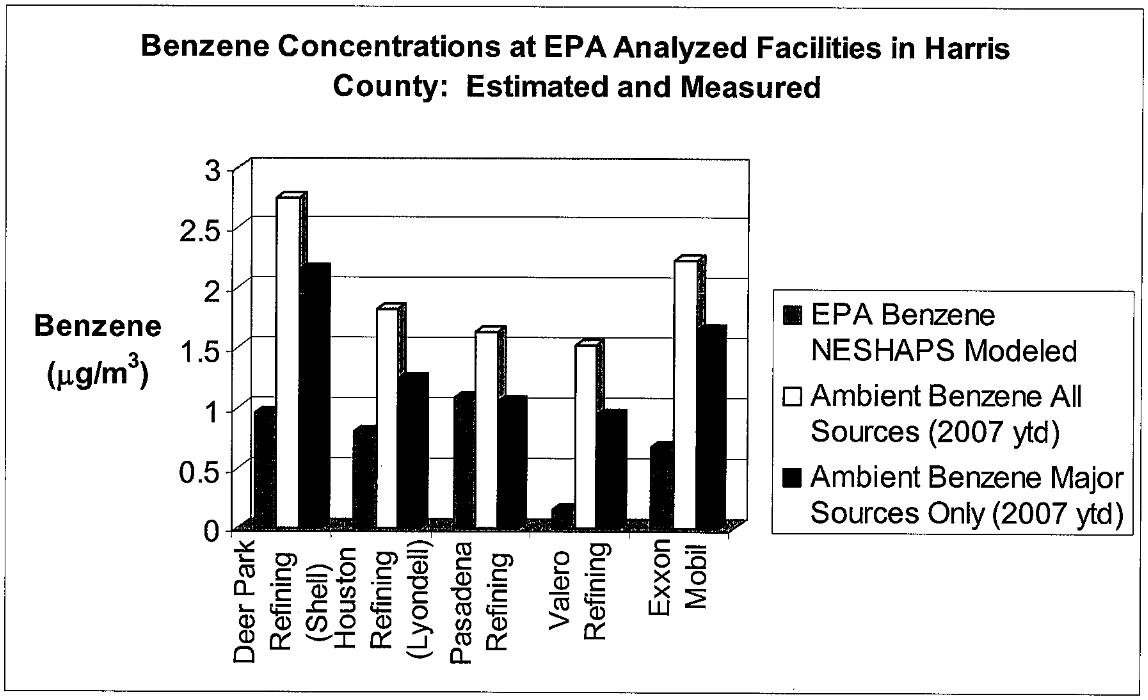
2000 emissions inventory were low by a factor of 2 to 15 for HRVOC emissions, when compared to Automated Gas Chromatograph monitoring data from the 1996 to 2001 time period. (Preliminary Emission Adjustment Factors Using Automated Gas Chromatography Data, TCEQ, Revised November 5, 2002, Page 3.) The December 1, 2004 Mid-Course Review State Implementation Plan (SIP) by TCEQ used an adjustment factor of 6 to increase the reported VOC emissions to reflect the actual ambient levels for ozone modeling purposes. And measured ethylene emissions in 2006 were one or two orders of magnitude higher than reported emissions rates for the 2004 emissions inventory. (Final Rapid Science Synthesis Report: Findings from the Second Texas Air Quality Study, TexAQS II Rapid Science Synthesis Team, for TCEQ, August 31, 2007, Page 51). A Differential Absorption Light Detection and Ranging (DIAL) study in 2005 of a refinery in Alberta, Canada indicated that the refinery's reported emissions rate estimates were low by a factor of 15. (Refinery Demonstration of Optical Technologies for Measurement of Fugitive Emissions and for Leak Detection, Alberta Research Council, Inc, for Environment Canada, Ontario Ministry of the Environment and Alberta Environment, March 31, 2006, Revised November 1, 2006, Page 17).

Ample monitoring data on HAP emissions from refineries are available for Harris County, Texas, which includes 5 of EPA's reference refineries. This data shows a significant discrepancy between the modeled concentrations relied upon by EPA and the monitored concentrations that are attributable to refineries. Table 1 and Figure 1 below illustrate this point.

Table 1: Modeled vs. measured residual risk in for Harris County refineries

Harris County		Modeled Residual Risk (EPA)		Measured Concentration (2007 ytd) and Associated Risk			Contribution from Major Sources		
Facility Name	Site	Risk	Benzene (μg/m³)	Benzene (μg/m³)	Benzene Risk	Mulitplier total benzene risk is higher than Residual Risk	Dallas (μg/m³)	Difference between Houston ambient and Dallas (μg/m³)	Mulitplier major source benzene estimate from ambient data is higher than modeled
Deer Park Refining (Shell)	2	5.E-06	0.966	2.74	1.00E-05	2.1	0.58	2.16	2.2
Houston Refining (Lyondell)	5	4.E-06	0.8	1.82	9.00E-06	2.3	0.58	1.24	1.5
Pasadena Refining	19	5.E-06	1.092	1.63	8.00E-06	1.5	0.58	1.05	1.0
Valero Refining	21	8.E-07	0.16	1.53	8.00E-06	10.0	0.58	0.95	5.9
Exxon	138	3.E-06	0.684	2.23	1.00E-05	2.9	0.58	1.65	2.4

Figure 1: Benzene concentrations at EPA MACTI analyzed facilities in Harris County as modeled by EPA and as measured in ambient air



The measured benzene concentrations listed in Table 1 were estimated using 2007 ytd ambient benzene concentration data from local monitors spatially weighted by distance (Table 2). Dallas and Houston have similar vehicle miles traveled (Figure 2). The Dallas area ambient concentrations listed in Table 1 represent the portion of Houston benzene concentration attributed to onroad emissions.

Table 2: Ambient Benzene Concentrations at NESHAP Facilities

Spatial Weighting by Distance from Locaiton to Local Monitors

Shell	Distance (mile)	Weight	Mean (95th UCL) ppb	Weighted
Deer Park	2.8	0.187919	0.48	0.09
HRM 3	3.6	0.241611	0.48	0.12
Lynchberg	3.6	0.241611	1.82	0.44
Channelveiw	4.9	0.328859	0.65	0.21
total	14.9		facility (ppb)	**0.86**

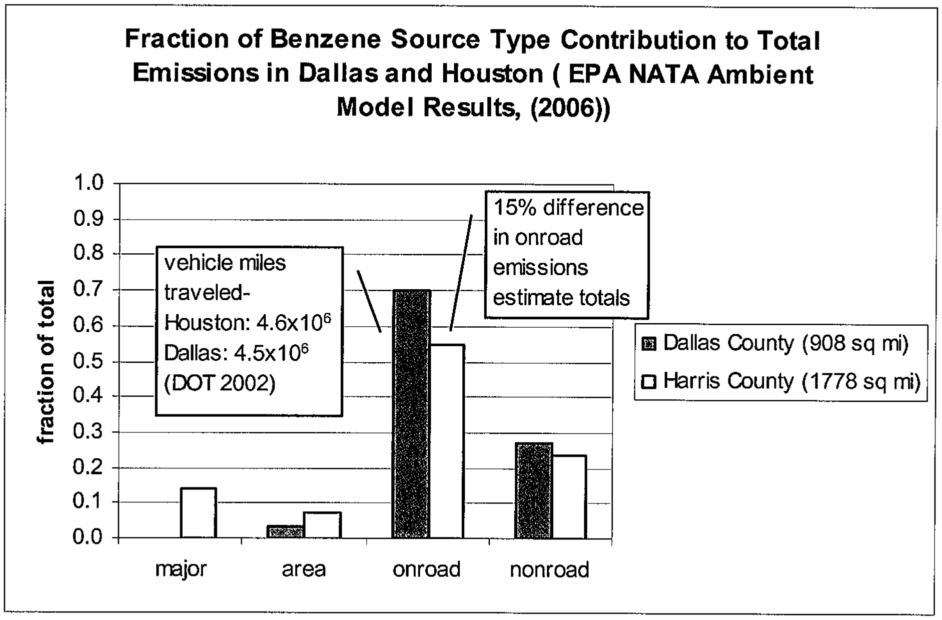
Lyondell	Distance (mile)	Weight	Mean (95th UCL) ppb	Weighted
Milby	0.8	0.093023	0.38	0.04
Cesar Chavez	1.8	0.209302	0.48	0.10
Clinton	1.8	0.209302	0.57	0.12
HRM-3	4.2	0.488372	0.65	0.32
total	8.6		facility (ppb)	**0.57**

Pasadena Refining	Distance (mile)	Weight	Mean (95th UCL) ppb	Weighted
Milby	3.1	0.256198	0.38	0.10
Cesar Chavez	3.6	0.297521	0.48	0.14
Clinton	2.8	0.231405	0.57	0.13
HRM-3	2.6	0.214876	0.65	0.14
total	12.1		facility (ppb)	**0.51**

Valero	Distance (mile)	Weight	Mean (95th UCL) ppb	Weighted
Milby	0.4	0.137931	0.38	0.05
Cesar Chavez	2.1	0.724138	0.48	0.35
Clinton	0.4	0.137931	0.57	0.08
HRM-3	0	0	0.65	0.00
total	2.9		facility (ppb)	**0.48**

ExxonMobil	Distance (mile)	Weight	Mean (95th UCL) ppb	Weighted
Deer Park	7.7	0.5	0.48	0.24
Wallisville	4.4	0.285714	0.24	0.07
Lynchberg	3.3	0.214286	1.8	0.39
	0	0	0.65	0.00
total	15.4		facility (ppb)	**0.69**

Figure 2: Fraction of benzene source type contribution to total emissions in Dallas and Houston



Third, EPA's emission inventory is incomplete. Many large emission sources, such as cokers, are excluded entirely. Data from malfunctions, startup and shutdowns (MSS) were not accurately collected. "Gaming the System: How Off-the-Books Industrial Upset Emissions Cheat the Public Out of Clean Air," Environmental Integrity Project, August 2004, available at http://environmentalintegrity.org/pub240.cfm. And many refineries did not submit any data at all.

B. There are errors in EPA's risk standard and assessment methodology, which invalidate its conclusions regarding the protection of public health.

First, EPA erroneously adopted a risk standard of 1 excess cancer case per 10,000 people, instead of the 1 in 1,000,000 standard clearly stated in the Clean Air Act. To support its risk standard, EPA apparently is relying on a regulation promulgated for benzene wastewater operations that was adopted before the current amendments to the Clean Air Act. This standard is not recognized as sufficiently protective of public health by the scientific community nor allowed by the Clean Air Act. If Congress had wanted to adopt this less protective standard, it would have put that standard in the Clean Air Act; it did not.[2]

Second, even if EPA were correct in adopting this less stringent risk standard, the proposed rule would still be fatally flawed because of the manner in which the risk was calculated. The residual risk assessment underestimates the true residual risk posed to nearby communities because the error and uncertainty inherent in evaluating risk from exposure to modeling of self reported emissions is compounded when multiple sources are present in a region.

The method used in the residual risk assessment to compensate for the margin of error associated with multiple aspects of evaluating risk posed from an individual facility is to evaluate the risk using conservative assumptions, but this conservatism is limited in scope. It includes eliminating mobility from the exposure model and assuming 70-year continuous exposure or, in the case of benzene, using the high end of the URE range. However, it does not include the impact on risk from error in emission estimates, which of course is compounded when multiple facilities are impacting an air shed each with their own emission estimate error. When facilities are in close proximity, both those within the same source category defined under MACTI as well as other HAP sources, the compounded error may be significant as the dilution attenuation capacity of the air shed is overridden. In short, the conservatism in the residual risk assessment methodology is better suited at compensating for errors in risk estimates in individually isolated facilities and ineffective when multiple MACTI defined facilities exist in close proximity. As discussed above, the emission inventory data used by EPA are underestimated by factors of up to 10. Although transport is a complicated process, roughly, increasing emissions by a factor increases ambient concentrations proportionally.

Table 2, Appendix 7, of the EPA Residual Risk Assessment Report lists the maximum predicted chronic risks in terms of maximum individual risk (MIR) by facility. Figure 3 below is the cumulative MIR by state and for Harris County. Although cumulative MIR is not a representation of risk to any individual, it is useful in highlighting the magnitude of disproportionate risk in Texas and Harris County compared with other states and locations. The state of Wisconsin has 1 facility and Texas has 30 facilities but the increased risk in Texas is more than 30 times the risk in Wisconsin.

Figure 4 below depicts the location of the 5 facilities in Harris County along with other benzene sources. Benzene is shown, as it is likely the biggest concern in Houston and source of error with respect to this risk assessment. All facilities are in east Harris county and three of the facilities are within 3 miles of each other. The document indicates (page 7, paragraph 2) that the model accounts for the effects of multiple facilities when estimating impacts at each block centroid. It is unclear if the results listed in Table 2 by

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[2] Other parties including the Natural Resources Defense Council and Professor Victor Flatt are submitting extensive comments regarding the EPA's erroneous use of the 1 in 10,000 standard. We agree with and incorporate by reference those comments.

facility account for the individual facility risk or the facility risk summed with background risk from other locations (or concentration). Regardless of the exact representation, given the uncertainties in the model and the close proximity of facilities errors are compounded. Figure 5 depicts the risk in east Harris County and for the three closest proximity sources in terms of cumulative MIR and cumulative MIR with upper bound error.

Figure 3: Cumulative Maximum Individual Risk as estimated in the Residual Risk Assessment for MACTI Facilities

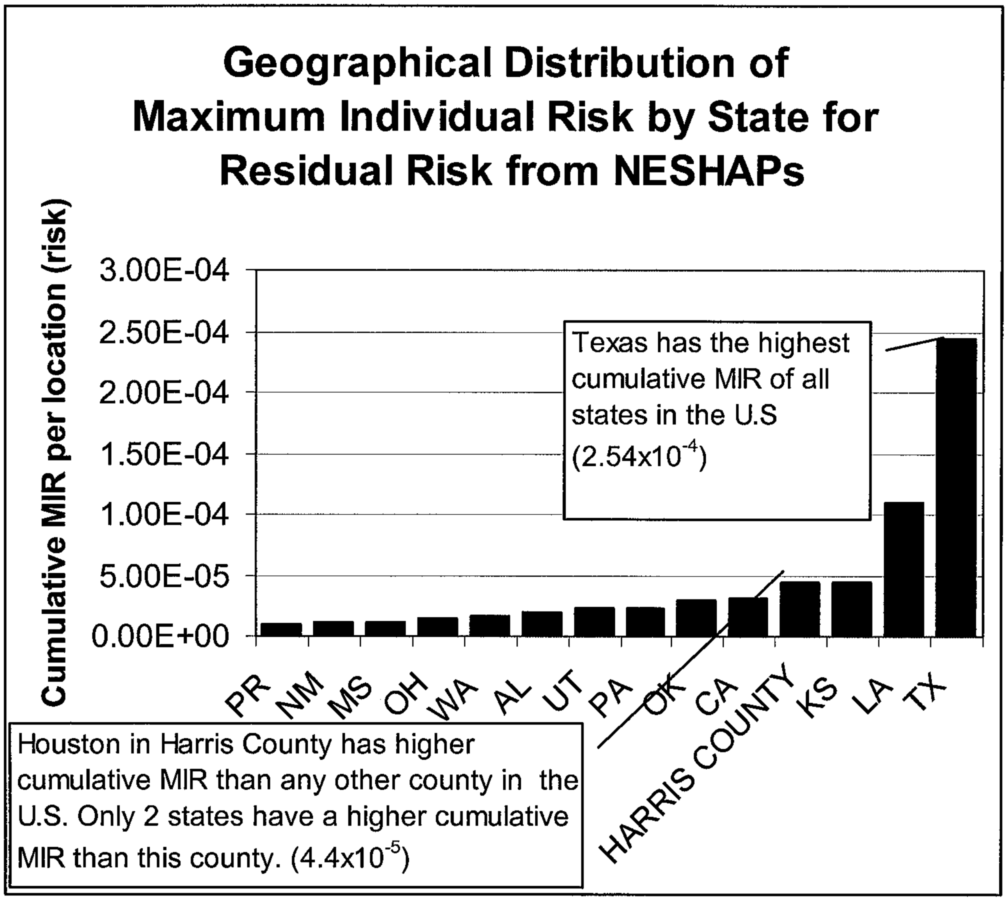


Figure 4: Geographical Location of the 5 MACTI Facilities in Harris County with respect to each other, other major benzene sources and ambient monitoring sites

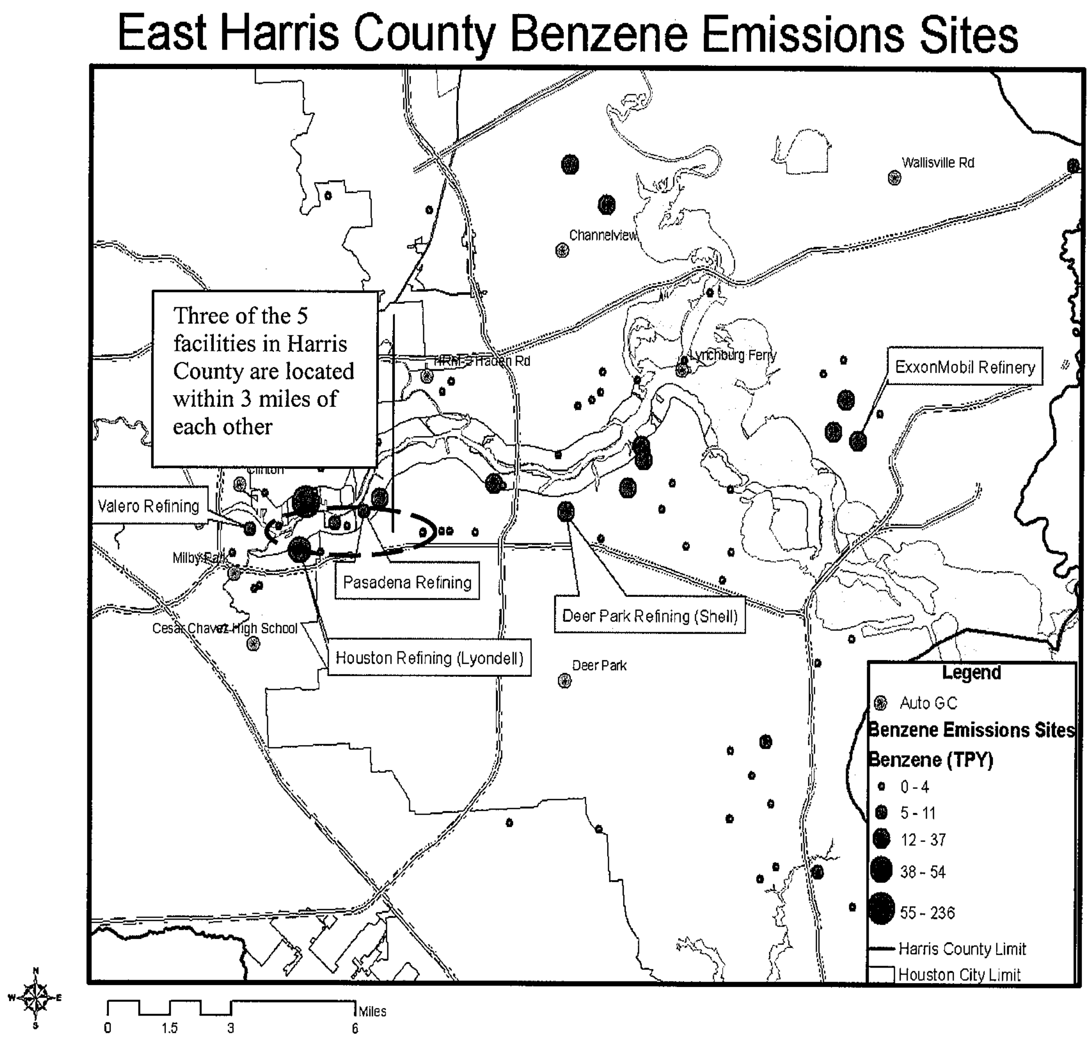
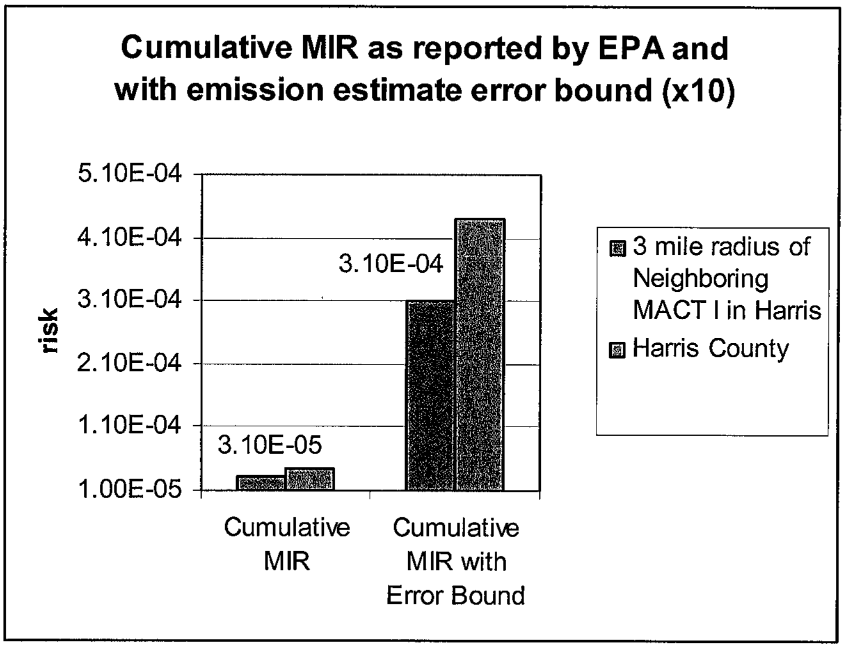


Figure 5: Cumulative Maximum Individual Risk in Harris County, Texas and for three closely located facilities as estimated in the Residual Risk Assessment for MACTI Facilities and bounded by error multiplier of 10



Third, Texas and Harris County are disproportionately impacted by underestimation mistakes in the residual risk assessment because we have the highest density of MACTI sites (Figure 6) and these sites pose the highest risk of all MACTI sites evaluated (Figure 7). The entire source category for the Residual Risk Assessment for MACT I Petroleum Refining Sources includes 153 facilities. Thirty of these facilities are in the state of Texas, and five in Harris County. In terms of benzene alone, there are actually 24 major source sites in the Houston Region with >10 tpy of benzene emissions according to the EPA and TCEQ emissions inventory data. Of the 24, 16 are in Harris County, 3 are in Galveston County and 5 are in Brazoria County. The results of EPA's Residual Risk assessment indicate that 50% of the top ten sites posing the greatest health risk from MACTI sites are in Texas.

Figure 6: Geographical distribution of the 153 sites evaluated in the Residual Risk Assessment for MACTI Petroleum Refining Source Categories

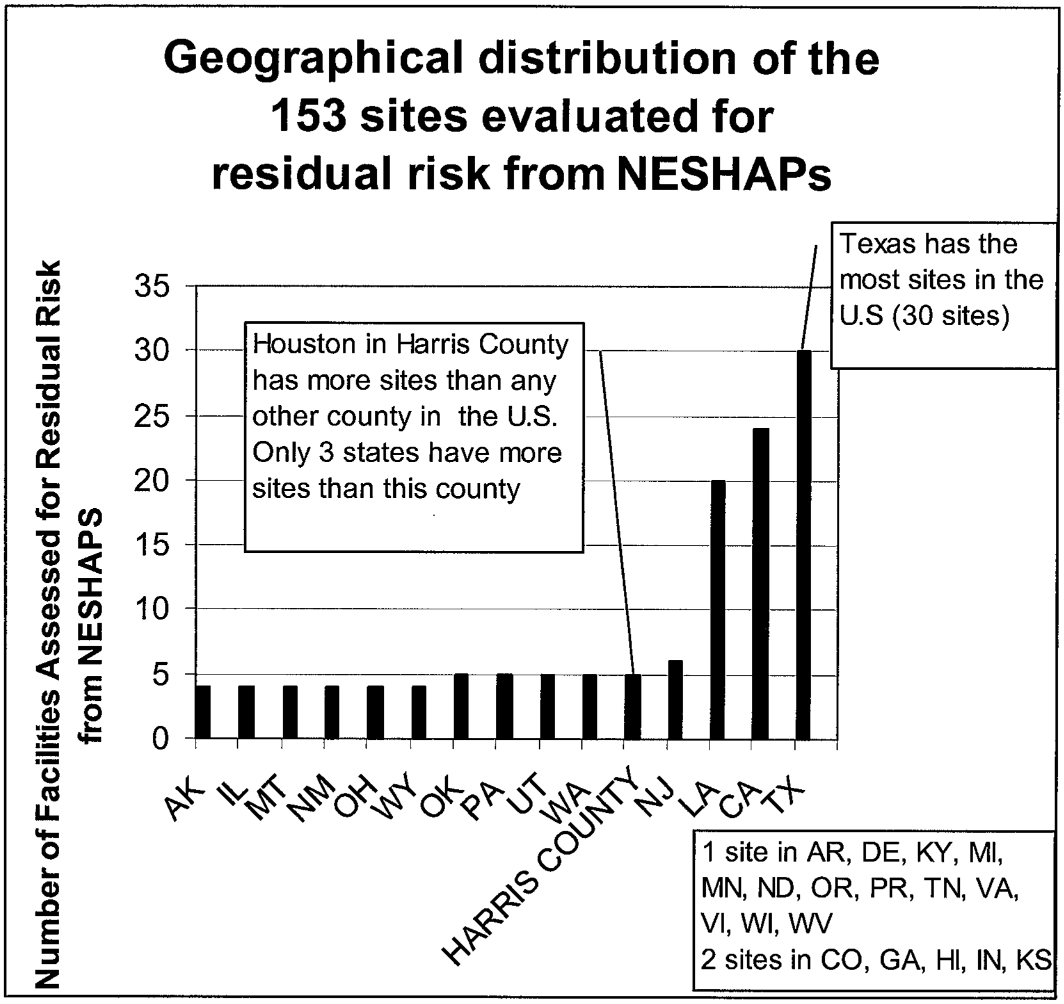
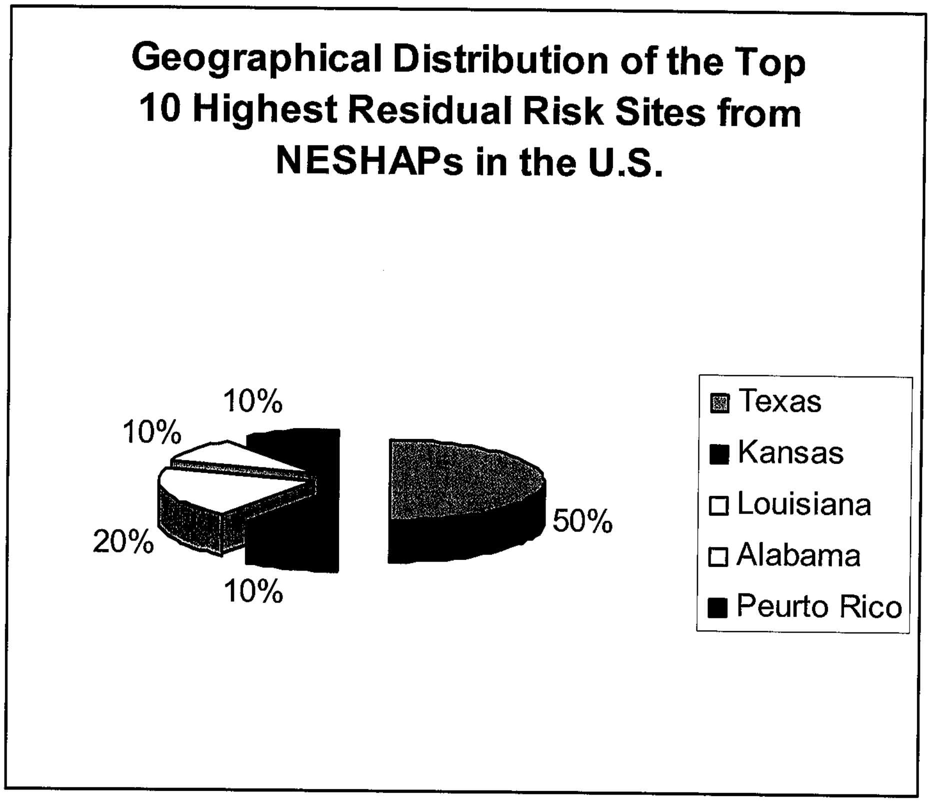


Figure 7: Geographical location of the top ten sites posing the greatest risk according to EPA's Residual Risk Assessment for MACT I Petroleum Refining Sources



Fourth, the residual risk assessment underestimates the true residual risk posed to the community because the census did not accurately estimate the number of people in the exposure area. A November 2007 study conducted on behalf of the City of Houston identified systematic undercounting in the census of population living in low-income areas. Four of the neighborhoods studied are in east Houston, near the refineries. The underreporting discrepancies between the 2000 census and the actual population were as follows: Lawndale (19%), Magnolia (18%), Denver Harbor (17%), Clinton Park (11%). Therefore, the incidence numbers are underestimated by as much as 19% depending upon the census tract in question. See Exhibit 1, Houston Neighborhood Market DrillDown, Social Compact Inc., November 2007, pg. 9. The EPA referenced refineries within the City of Houston, as well as the other Harris County sources, are in close proximity to large populations. The aerial maps in Exhibit 2 show these refineries and the surrounding areas. As those members of EPA staff witnessed at the Houston hearing, these refineries are in neighborhoods where thousands of people live, work and play for their lifetimes.

Fifth, the errors noted above contribute to a disparity in exposure to HAPs that adversely impacts low income and minority communities, contravening Executive

Order 12898. The City's data included with this rulemaking and census data as well as the testimony of Matthew Tejada, Executive Director, Galveston Houston Association for Smog Prevention (GHASP) at the hearing held in Houston on November 27, 2007 show that the low income, minority communities in the vicinity of these refineries, coupled with the disparity in emissions from refineries in other states, are more severely affected by these emissions. The ambient air quality data bears this out as well.

C. Because of the errors described above, the proposed rule is arbitrary, capricious, an abuse of discretion and not in accordance with the law.

The Administrative Procedure Act, 42 U.S.C. Sec. 7607 (d) (9) (A), mandates that rules promulgated by EPA and other federal agencies cannot be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law." Many cases have construed this standard and it is clear that because of the inadequacy of the data and risk assessment, the unsupportable interpretation of the residual risk, and the failure to consider the impact on low income and minority communities, this rulemaking does not meet that standard. [3]

II. Notwithstanding the deficiencies in the EPA's proposal as noted above, the City of Houston supports the rapid implementation of the control measures identified by the EPA concerning storage vessels, wastewater control, cooling towers, and fence line monitoring.

A. Storage Vessel Requirements

EPA Storage Vessel Proposals: EPA's Option 1 storage vessel proposal would not revise the current Refinery MACT (40 CFR 63, Subpart CC) requirements for storage vessels. Option 2 would remove the current exemption from the control requirements in 40 CFR 63.119(c)(2)(ix) and (x) for slotted guide poles on Group 1 floating roof tanks at existing sources. A Group 1 tank is a tank at a petroleum refinery for which control is required, based on the date the source was constructed or modified, the capacity of the tank, the vapor pressure of the stored material and the weight percent of total organic hazardous air pollutants (HAP) in the stored material. Existing sources were constructed or most recently reconstructed before July 14, 1994. A Group 1 tank at an existing source has a capacity equal to or greater than 46,760 gallons, a maximum true vapor pressure of at least 1.5 psia, an annual average vapor pressure of at least 1.2 psia and an annual average HAP liquid concentration greater than 4% by weight total organic HAP.

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[3] Houston adopts and incorporates by reference the comments of Victor B. Flatt, the A.L. O'Quinn Chair in Environmental Law at the University of Houston Law Center regarding the legal deficiencies in the EPA's proposal and recommends them to you for your consideration.

Eliminating this exemption would require the owner or operator of an existing source Group 1 storage vessel with an external floating roof to equip each slotted guide pole well with a gasketed sliding cover or a flexible fabric sleeve seal and to equip each slotted guide pole with a gasketed float or other device which closes off the liquid surface from the atmosphere. The proposed amendments also revise related inspection requirements in 40 CFR 63.646(e) and reporting requirements in 40 CFR 63.654(f)(1)(A)(1), (g)(1), and (g)(3)(iii)(A) to account for the requirements for slotted guide poles. EPA estimated that the slotted guide pole sleeve control option would reduce US HAP emissions by 1,046 tons per year (tpy) and US benzene emissions by 105 tpy. According to EPA's analysis, the annual cost for the Option 2 controls would be completely offset by the value of the organic products that would not be emitted because of the controls.

City of Houston's Recommendations for Storage Vessels: Houston supports adoption of Option 2 which would require that external floating roof storage vessels at existing source refineries meet the requirements of 40 CFR 63.119 (c)(2)(ix) and (x). However, Option 2 does not go far enough. Removing only two exemptions for external floating roof tank slotted guide poles at existing source refineries will not impact most of the Group 1 floating roof tanks in Houston and other ozone non-attainment areas because most external floating roof tanks at existing source refineries in ozone non-attainment areas already comply with the slotted guide pole requirements. Additionally, EPA should take action to better control emissions from storage tanks because refinery emissions measurement studies in Canada and Europe using Differential Absorption Light Detection and Ranging (DIAL) and other remote sensing technologies indicate storage tank emissions from refineries represent roughly half of a typical refinery's benzene and volatile organic compounds (VOC) emissions[4], and benzene concentrations in and around the Houston area are too high.

The Texas Commission on Environmental Quality (TCEQ) has been implementing the requirements for control of emissions from slotted guide poles since 1990 in Texas ozone non-attainment counties, under State Implementation Plan (SIP) rules. In 1990, the Texas Air Control Board (TACB), a predecessor agency for TCEQ removed a floating roof tank slotted guide pole control exemption from Regulation V (Control of Air Pollution from Volatile Organic Compounds, 30 TAC 115). The TACB issued guidance to regional staff in 1993 and 1994 clarifying that the exemption from controls for slotted guide poles was removed from the rule in 1990 (TACB Inter-Office Memorandum dated April 20, 1993 and Enforcement Policy Memorandum dated July 11, 1994). Prior to 1990, floating roof tanks (with capacities greater than 25,000 gallons) in Texas ozone non-attainment areas with slotted guide poles storing VOC with vapor pressures greater than 1.5 psia and less than 11 psia, were not required to be equipped with a gasketed

[4] Refinery Demonstration of Optical Technologies for Measurement of Fugitive Emissions and for Leak Detection, Alberta Research Council, Inc, for Environment Canada, Ontario Ministry of the Environment and Alberta Environment, March 31, 2006, Revised November 1, 2006, http://www.arc.ab.ca/ARC-Admin/UploadedDocs/Dial%20Final%20Report%20Nov06.pdf, Pages 10, 13 and 20-22.

sliding cover or flexible fabric sleeve seal and a gasketed float or other device. Most if not all Group 1 tanks in Texas non-attainment areas are already complying with Option 2.

A comparison of the Texas SIP control requirements for storage tanks to the current and proposed EPA Refinery MACT storage tank requirements shows that the EPA Refinery MACT storage tank requirements for **new** sources are more stringent than the SIP VOC control requirements for storage tanks in ozone non-attainment and near-non-attainment areas in Texas. The Texas requirements for existing sources, however, are more stringent than the EPA Refinery MACT storage tank requirements for existing sources. The TCEQ regulations do not make a distinction between older sites (referred to as existing sources in the EPA Refinery MACT regulation) and newer sites (referred to as new sources in the EPA Refinery MACT regulation). The current and proposed additional control requirements for Group 1 tanks with floating roofs at existing source refineries are less stringent than the SIP VOC control requirements for floating roof tanks in ozone non-attainment and near-non-attainment areas in Texas because the existing Group 1 source storage tanks are exempt from numerous control requirements that apply to new sources. The EPA should therefore eliminate the other floating roof tank control requirement exemptions for existing source refineries; from the record, it does not look like EPA even considered eliminating these other exemptions. These controls are already in widespread use in ozone non-attainment and near-non-attainment areas in Texas. These minor changes should result in additional HAP reductions.

The existing source Refinery MACT control requirements for floating roof tanks should be at least as stringent as the SIP VOC control requirements for storage tanks in ozone non-attainment and near-non-attainment areas in Texas. The proposed controls associated with Option 2 for external floating roof tanks at existing refineries are not as stringent as these requirements. Even Option 2 would only eliminate 2 of the 21 existing source floating roof tank control requirement exemptions found in 40 CFR 63.119 and 40 CFR 63.646(c). The record does not show that EPA even considered eliminating the other 19 exemptions. EPA should eliminate each existing source control requirement exemption for storage tanks

EPA Should Adopt More Stringent Inspection and Repair Requirements for Floating Roof Storage Vessels: Remote sensing studies conducted in Europe and Canada indicate that storage tank VOC and benzene emissions at refineries typically represent roughly half of a refinery's total benzene and VOC emissions and that benzene and VOC emissions from refineries typically exceed estimated levels by an order of magnitude[5]. European studies[6,7] indicate that when refinery storage tank emissions

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[5] Refinery Demonstration of Optical Technologies for Measurement of Fugitive Emissions and for Leak Detection, Alberta Research Council, Inc, for Environment Canada, Ontario Ministry of the Environment and Alberta Environment, March 31, 2006, Revised November 1, 2006, http://www.arc.ab.ca/ARC-Admin/UploadedDocs/Dial%20Final%20Report%20Nov06.pdf, Pages 10, 13, 18 and 20-22.

[6] Frisch, L. 2003. Fugitive VOC-Emissions Measured at Oil Refineries in the Province of Västra Götaland in South West Sweden - A Success Story Development and Results 1986–2001. County Administration of

exceed estimations these emissions are frequently associated with floating roof tank seal problems. EPA should therefore improve the Refinery MACT storage tank inspection and repair requirements found in 40 CFR 63.120 because these minor changes should result in significant HAP reductions.

The refinery MACT requires annual visual inspections of the seals and floating roof through manholes and roof hatches for each Group 1 internal floating roof tank with a single seal system. A more detailed inspection of the internal floating roof, seals, gaskets and slotted membranes is required each time the internal floating roof tank is emptied and degassed, and at least every 10 years. For internal floating roof tanks with double seal systems either an annual visual inspection through the manholes and roof hatches coupled with a more detailed 10-year inspection, or a more detailed 5-year inspection without the annual visual inspection is required. A visual inspection of internal floating roofs and seals through a manhole or roof hatch is not an effective method to identify leaks. Annual inspections of all internal floating roof tanks, regardless of the seal type should be required, and EPA should require infrared camera (IR) inspections of all internal floating roof tank openings where leaks may occur, including seals, hatches, gaskets, fittings and slotted membranes, during each annual internal floating roof tank inspection. Many refineries are already using IR cameras. Incorporation of this more effective technology is consistent with the obligation imposed by the Clean Air Act to review technological developments every 8 years.

External floating roof tanks must have primary seal gap measurements once every 5 years and annual secondary seal gap measurements. The fittings and seals of an external floating roof tank must be inspected every time an external floating roof tank is emptied and degassed, and problems identified during the fitting and seal inspections must be repaired before the tank is refilled. Visual inspections of external floating roofs and seals should be required annually. The more detailed inspections of the floating roof seals and fittings should be required at least every ten years, not just when the tank is being emptied and degassed, which could exceed the ten-year period. EPA should require infrared camera inspections of all external floating roof tank openings where leaks may occur, including seals, hatches, gaskets, fittings and slotted membranes, during each annual secondary seal gap measurement inspection.

Problems identified during the annual, 5-year or 10-year inspections must be repaired within 45 days, with up to two 30-day extensions, if a tank cannot be repaired or emptied within the noted time. If emissions are detected with the IR camera during annual

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Västra Götaland, Report No. 2003:56. http://www.clu-in.org/programs/21m2/projects/rapport200356-Final_VOC.pdf, Pages 28 and 20-22.

[7] Kihlman, M., J. Mellqvist, and J. Samuelsson. 2005. Monitoring of VOC Emissions from Refineries and Storage Depots Using the Solar Occultation Flux Method, 102 pp. http://www.fluxsense.se/reports/SOF%20Refinery%20report-%20KORUS%20%202005%20%20high%20res.pdf, Page 72.

inspections, this inspection should be followed up by a more detailed inspection of the location where emissions originated. EPA should eliminate the 30-day extensions to the 45-day repair time when problems are noted during the annual, 5-year or 10-year inspections.

EPA Should Require Controls for Floating Roof Landing Emissions from Storage Vessels: TCEQ has documented that air emissions from storage tank floating roof landings have been underreported and are significant[8]. TCEQ estimates that more than 6,000 tons-per-year of VOC emissions were emitted and not reported during years 2002 to 2004 because of under-reported emissions from floating roof tank landings. TCEQ has identified that roof landings associated with normal operations are not consistent with good practices for minimizing emissions. TCEQ is requiring sources to quantify emissions from floating roof landings and where appropriate to incorporate these emissions into associated authorizations. This information is readily available and EPA should address floating roof landing emissions from Group 1 floating roof tanks at refineries by limiting tank roof landings.

40 CFR 63.119(b)(2) for internal floating roof tanks and 40 CFR 63.119(c)(4) for external floating roof tanks require that when the floating roof is resting on the leg supports, the process of filling, emptying or refilling be continuous and accomplished as soon as possible. The rules do not limit the number of times the tank roof can be landed. Under the Refinery MACT requirements, a tank's floating roof could be landed on a daily basis, or even more frequently, as long as the landing was associated with maintenance, inspections, petroleum liquid deliveries or transfer operations. In this rulemaking, EPA should include a requirement that prohibits floating roof tank landings associated with petroleum liquid deliveries or transfer operations unless emissions during these landings are properly controlled. Uncontrolled roof landings associated with deliveries and transfers should not be allowed, as these activities are not consistent with good practices for minimizing emissions. Facilities operating Group 1 tanks should use emissions controls when tank landings are associated with deliveries and transfers because deliveries and transfers should be considered part of normal operations, and normal operations should be well planned and controlled, in a manner consistent with good practices for minimizing emissions.

B. Wastewater Control Requirements

EPA Proposal for Wastewater Control Requirements: EPA is proposing two regulatory options for wastewater controls. Option 1 requires no revisions to the Refinery MACT rule. Option 2 proposes to revise the wastewater provisions in the Refinery MACT rule to add a specific performance standard and monitoring requirement. The

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[8] Texas Commission on Environmental Quality, Adopted Eight-Hour Ozone SIP Narrative (2006-027-SIP-NR), Chapter 5, Ongoing Work and Future Initiatives, http://www.tceq.state.tx.us/assets/public/implementation/air/sip/hgb/hgb_sip_2007/06027SIP_adoCh5, Page 5-7.

proposed Option 2 amendments require owners or operators to operate and maintain wastewater treatment systems to achieve minimum treatment efficiency for benzene of 90 percent. The owner or operator would be required to conduct an initial performance demonstration. Based on the demonstration results, facilities would establish operating parameter limits. The operating parameters would be monitored at least once a week. Exceeding an operating parameter limit would be a deviation that must be reported in the periodic (semiannual) report required by 40 CFR 63.654.

City of Houston Recommendations for Wastewater Control Requirements: Option 2 is a much needed improvement for the MACT refinery wastewater requirements. The proposal includes a mechanism to demonstrate that treatment is effective for removing benzene from wastewater and identifies criteria that should be monitored to demonstrate that the effectiveness of the treatment process is sustained over time. However, one weakness of the current refinery MACT wastewater requirements is that the Group 1 threshold, the amount of benzene in the wastewater over time that triggers control requirements, and certain exemptions from control, are based on annual benzene loading. This approach results in many wastewater facilities in refineries escaping controls altogether.

EPA should reduce the benzene loading control threshold for wastewater facilities in refineries below the current 10 megagram per year level (40 CFR 61.342) to 5 megagrams per year, eliminate the exemption from controls for up to 2 megagrams per year of benzene wastewater loading (40 CFR 61.342(c) (3) (ii)) and require periodic monitoring to demonstrate that the benzene loading control thresholds are not exceeded. Enhanced benzene loading rate monitoring for sites and streams that claim to be under the benzene loading control threshold will make the regulation more readily enforceable.

C. Cooling Towers Requirements

EPA Proposal for Cooling Tower Requirements: EPA is proposing work practice standards for cooling towers that would require the owner or operator of new and existing source refineries to monitor for leaks in the cooling tower return lines from heat exchangers in organic HAP service. Both proposed options require the identification of the source of a leak within 30 days after receiving the sample results that indicate the presence of a leak. Both proposed options require that identified leaks be repaired within 30 days of identifying the source of the leak, unless certain criteria have been satisfied. One criterion for delaying repair in both options is where the emissions from shutdown and startup would exceed the monthly emissions from waiting until the next scheduled shutdown to make the repair. The other situation where repairs could be delayed beyond 30 days from the date of the leak source identification is if necessary parts are not reasonably available. When necessary parts are not reasonably available, up to a 90-day extension beyond the 30 days, or total of 120 days, from the date of the leak source identification would be allowed.

Option 1 for Cooling Towers: The owner or operator of cooling towers receiving cooling water from heat exchangers in organic HAP service at existing source refineries would be required under Option 1 to sample and analyze the cooling water return lines for organic HAP on a quarterly basis using EPA Method 8260B, Gas Chromatography/Mass Spectrometry (GC/MS), or use surrogate monitoring methods more frequently. The proposed Option 2 existing source cooling water leak threshold is a total organic HAP concentration exceeding 1 part per million by weight (ppmw) in a cooling water. Surrogate monitoring options include monitoring chlorine or bromine usage at least once each day, monitoring free chlorine at least twice each day, monitoring oxidation reduction potential (ORP) at least six times per day, monitoring hydrocarbons in the cooling water using an online analyzer at least twice each day or monitoring volatile organic compounds (VOC) using an air stripping El Paso Method type approach at least once each month. Initial correlations of a selected surrogate monitoring method would need to be conducted using EPA Method 8260B to identify operating limits based on the 1 ppmw in the cooling water leak threshold. The owner or operator of existing source refineries that elect to use a surrogate monitoring method would need to sample and analyze for total organic HAP in the cooling water return line(s) using EPA Method 8260B each time the surrogate operating parameter limit indicates the total organic HAP concentration in a cooling water return line exceeds 1 ppmw.

Option 1 would require owners and operators of cooling towers receiving cooling water from heat exchangers in organic HAP service at new source refineries to monitor the concentration of HAP from each cooling tower system on a quarterly basis and to identify and repair leaks when a potential mass emission leak rate of 10 pounds per day (lbs/day) or greater of any single HAP or 100 lbs/day or greater of total HAP are measured. The only available monitoring method for new source refineries under this option would be to sample and analyze the cooling water return lines for organic HAP using EPA Method 8260B.

Option 2 for Cooling Towers: Under Option 2, owners and operators of cooling towers receiving cooling water from heat exchangers in organic HAP service at new and existing source refineries must monitor the concentration of HAP in the cooling water return line(s) using EPA Method 8260B on a monthly basis. Both new and existing source refineries would be required to identify and repair leaks when a potential mass emissions leak rate of 10 lbs/day or greater of any single HAP or 100 lbs/day or greater of total HAP is measured.

City of Houston Recommendations for Cooling Towers: The City supports Option 2. Option 1 is not acceptable because the cooling towers at existing source refineries would not be required to be well controlled, since significant leaks would not need to be corrected and a very large leak could develop shortly after a quarterly monitoring and go undetected for nearly three months. Houston estimates that under Option 1, if a leak was measured just below the 1 ppmw in cooling water threshold for leak repair at an existing source refinery, assuming an 8000 GPM cooling water circulation rate, this would represent approximately 4 lbs/hr of benzene emissions, if benzene was the only

VOC/HAP in the cooling water. Over a year, this would lead to more than 16 tons of benzene emissions. For Option 2, a leak rate of just under 10 lbs/day of benzene, annual emissions of benzene would be less than 2 tons. Option 1 is inconsistent with a MACT for refinery sources because the high leak definition and infrequent monitoring could result in excessive emissions of hazardous air pollutants from existing sources and the controls are easily implemented. The additional controls in Option 2 as well as the City's recommendations are easily implemented. Because of the delays already caused by this rulemaking, EPA should require that these changes be implemented in 18 months, not 3 years, or at the time of the next turnaround, whichever occurs first.

D. Fence Line Monitoring

The City also supports the EPA's efforts, even at this late date, to obtain more fence line monitoring data. EPA's proposal should be expanded to include other HAPS in addition to benzene.

Fence line monitoring around a refinery should be required by the Refinery MACT regulation, because it is the only way to measure impacts from organic HAP leaving the site. The use of diffusive tube sampling for benzene, discussed in the EPA memorandum dated July 27, 2007, which is part of the record, would represent some improvement over the current lack of required fence line monitoring, to assess the general magnitude of uncertainty regarding emissions estimates from refineries. EPA should therefore promulgate at least a benzene fence line monitoring requirement. However, fence line monitoring for other significant HAPS should be required because the technology is readily available and the monitoring should use other methods, as described below.

The system proposed by EPA, while relatively inexpensive when compared to other monitoring technologies, would not provide refinery operators with timely monitoring data to allow for an effective response to elevated levels that are detected. Where emissions sites, like a refinery and a chemical plant, are located close to one another, or even along the same fence line, as is frequently the case in the Houston area, the proposed diffusive tube sampling data would not be useful in determining which site is responsible when elevated levels are detected, because samples are collected over a lengthy time period, such as weeks or months. The diffusive tube sampling would also not timely warn operators when fence line concentrations reach levels of concern, which is especially important when residential neighborhoods are located next to refineries, as is the case in the Houston area.

EPA should therefore require shorter sampling periods, such as hourly, coupled with wind speed and direction measurements, when benzene and other HAP impacts from more than one site may affect a refinery's fence line monitor, or when residential neighborhoods are located near refineries. Advanced monitoring technologies that can measure benzene and other HAP concentrations at the ppb level at hourly or more frequent intervals are available. Two such advanced monitoring techniques include automated gas chromatography (AutoGC) and ultraviolet-differential optical absorption spectrometry (UV DOAS). TCEQ and some plants are currently operating AutoGC monitors at several ambient air monitoring stations throughout Texas, and these monitors provide hourly concentration data for various HAP compounds in the ambient air. UV DOAS is a commercially available technology that has the capability to measure benzene or other aromatic compound concentrations along a site's fence line. The advanced fence line monitoring will provide the source operator with an opportunity to timely react to elevated levels and correct problems, as opposed to waiting weeks or months to react to data that might not even conclusively indicate which site is responsible.

Current emissions estimation techniques have repeatedly been shown to under-report actual emissions by a factor of 3 to 100. EPA should therefore require short term advanced remote sensing monitoring technologies, that will allow for mass emissions flux measurements of VOC and benzene, such as Differential Absorption Light Detection and Ranging (DIAL) and Fourier Transform Infrared (FTIR) monitoring, coupled with long term diffusive tube, UV DOAS or AutoGC monitoring, so that realistic emissions rates can be reported and used for regulatory development, health effects and photochemical modeling purposes. The remote sensing techniques also are useful tools for identifying emissions sources that are contributing to elevated ambient air levels of HAP and ranking emissions reduction actions.

III. Option 3: The City of Houston proposes that the EPA initiate additional rulemaking immediately to promulgate rules to reduce the adverse public health impact posed by HAP emissions from petroleum refineries.

A. Additional Controls

Flares: The use of flares as an emission control device instead of equipment that should only be used in limited emergency safety circumstances is one example. Some states have adopted this approach for flares and EPA should adopt the most stringent requirements for emission sources as part of its requirements to insure an ample margin of safety from these emissions for exposed populations. The NRDC comments previously cited and incorporated by reference provide additional detail regarding flares and cokers as well as measures that EPA should adopt to control the emission of HAPs. This is not new technology and it should be incorporated into the MACT requirements.

Elevated Flares Should Not Be Considered a Maximum Achievable Control Technology: EPA's NESHAP regulations, including the Refinery MACT regulation, indicate elevated flares are acceptable control devices for organic HAP, provided the flare meets the requirements of 40 CFR 63.11(b). Instead, flares should be considered a source of emissions and emissions from flares should be minimized, consistent with safety concerns. The important requirements under 40 CFR 63.11(b) for a flare are: no more than 5 minutes of visible emissions during 2 consecutive hours are allowed, a thermocouple or equivalent device must be used to detect the presence of a flame, a minimum heat content of the gas to be combusted must be maintained and a maximum exit velocity of the gas at the flare tip must not be exceeded. The minimum heat content and the maximum exit velocity are dependent on the type of the flare, whether it is steam assisted, air assisted or unassisted.

The refinery MACT regulation allows miscellaneous process vents, pressure relief valves, storage tank emissions, gasoline loading racks, marine vessel loading, compressor seal vents and emissions from oil water separators to be controlled using an elevated flare, as long as the flare meets the requirements of 40 CFR 63.11(b). The problem is that the assumed destruction efficiency of an elevated flare (98%) is low in comparison to the other available control devices that can be implemented to comply with the Refinery MACT. Studies have shown that the assumed destruction efficiency of 98% for an elevated flare is significantly higher than the actual destruction efficiency (see Reducing Emissions from Plant Flares, Paper #61, April 24, 2006, by Industry Professionals for Clean Air, which is attached. Studies, including a study conducted by EPA in 1983[9], have also shown that the actual destruction efficiency of flares significantly drops during times of significant crosswinds and when excessive steam is applied to the flare tip.

In most situations, the vent gases from the above noted sources can be recovered and re-processed, if not otherwise controlled with a device that has higher destruction efficiency than an elevated flare. A combination of a flare gas recovery system and an elevated flare for time periods during which the amount of hydrocarbons exceed the capability of the flare gas recovery system (such as malfunctions, emergencies, startups and shutdowns), have been shown to be an excellent method for control of refinery HAP emissions and are clearly available technology. Many refineries on a voluntary basis have used flare gas recovery systems because the value of the recovered gases can typically pay for the cost of a flare gas recovery system in a short period. Additionally, many EPA Consent Decrees with refineries and the South Coast and Bay Area Air Quality Districts in California have been requiring some form of flare gas recovery for several years, demonstrating that flare gas recovery is available and cost effective. EPA should reduce residual risk from refinery sources subject to the Refinery MACT regulation by eliminating the option of controlling routine emissions from various refinery sources with an elevated flare and adopt controls that are readily available and consistent with the requirements of the Clean Air Act.

EPA Should Require Vapor Recovery and Monitoring for Delayed Coker Units:
A DIAL study conducted recently in Canada indicates that delayed Coker Units was responsible for as much as a quarter of a refinery's benzene emissions, when the delayed Coker Units do not have some form of vapor recovery[10]. EPA should therefore set HAP

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[9] EPA, Flare Efficiency Study, EPA-600/2-83-052 (1983).

[10] Refinery Demonstration of Optical Technologies for Measurement of Fugitive Emissions and for Leak Detection, Alberta Research Council, Inc, for Environment Canada, Ontario Ministry of the Environment

emissions standards for delayed Coker Units at refineries, require monitoring of vapors from delayed Coker Units, and require vapor recovery on delayed Coker Units that do not comply with the emissions standards.

EPA Should Promulgate Emissions Standards for Periods of Startup, Shutdown, and Maintenance: Emissions from refinery startup, shutdown and maintenance activities are significant, especially when the activities are not well planned and controlled. Recent events at refineries in the Houston area that occurred during startup and shutdown activities resulting in deaths, injuries and calls for sheltering in place highlight the need for EPA to require emissions from startup, shutdown and maintenance activities at refineries to be well controlled. EPA should require compliance with the Refinery MACT emissions and work practice standards at all times, including during startup, shutdown and maintenance activities, unless EPA identifies specific scenarios during startup, shutdown or maintenance activities where it is not possible for refineries to comply with the emissions and work practice standards. For each of these specific scenarios EPA should promulgate alternative emissions and work practice standards to ensure that emissions are well controlled. These startup, shutdown and maintenance emissions and work practice standards should ensure that new refineries control startup, shutdown and maintenance activity emissions at least as well as the best controlled refineries and that existing refineries limit emissions during startup, shutdown and maintenance activities to no more than the levels achieved by the best performing 12% of existing refineries' during startup, shutdown and maintenance activities.

B. Additional Actions

EPA Should Require Compliance with Applicable Standards at All Times: EPA's NESHAP regulations, including the Refinery MACT regulation, provide an exemption from emissions standards during periods of malfunctions. A malfunction is defined in 40 CFR 63.2 as "any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions." Releases of HAP from refineries during malfunctions that exceed permit limits or other standards cause unacceptably high ambient levels of benzene and other HAP compounds. Emissions that exceed a regulatory standard or a permit limit, even when caused by a "malfunction," should be treated as violations of the applicable emission limitation. However, EPA may exercise its enforcement discretion regarding the imposition of a penalty for sudden and unavoidable malfunctions caused by circumstances entirely beyond the control of the owner or operator. Removing the malfunction exemption will provide added incentive for refineries to prevent periods of excess emissions and will enhance the enforceability of the MACT requirements.

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and Alberta Environment, March 31, 2006, Revised November 1, 2006, http://www.arc.ab.ca/ARC-Admin/UploadedDocs/Dial%20Final%20Report%20Nov06.pdf, Page 13.

EPA Should Adopt the Strategies in the City of Houston' Regional Benzene Air Pollution Reduction Plan: The City developed a voluntary benzene reduction plan for major source benzene emitters in the greater Houston region. The plan is contained in Exhibit 3. The control strategies identified in the plan are technologically and economically feasible and in fact are in use at facilities in the United States today. The EPA should propose rules incorporating these strategies as soon as possible.

The EPA should consider additional strategies for reducing refinery HAP emissions because the MACTs have not reduced refinery contributions to ambient air concentrations of HAPs: Ambient air data indicate that the MACT program is not effective, at least in Houston, because the concentrations of benzene in ambient air contributed from major sources shows no downward trend at some locations and limited improvement at others during the past five years. As control measures came on line in the past five years, improvements in air quality should have been seen. The only recent improvements appear to be associated with reductions in onroad mobile emissions.

A statistical assessment of 10 years of all of the available benzene 1 hr automatic gas chromatograph (auto gc) data in the Houston Region was assessed. All concentrations are in ppbV. Each year was evaluated in terms of 8 statistical measures: mean at 95th upper confidence, arithmetic mean, maximum, median, median of concentrations above the $1x10^{-5}$ limit health limit, % of time above $1x10^{-4}$ health limit, % of time above $1x10^{-5}$ health limit and % of time below $1x10^{-6}$ health limit. The trend of each of the statistics was evaluated using the EPA recommended Mann Kendall test for trend at the 5% significance level.

Table 3 below is a brief summary of some of the overall results. The first column is a list of the auto gc sites ordered from most contaminated to least contaminated. This ordering is based on the 2007 year to date (ytd) average rank of 6 statistical measures of the air (mean 95th upper confidence, maximum, median, median of concentrations above the $1x10^{-5}$ limit, % of time above $1x10^{-4}$, and percent of time above $1x10^{-5}$). Only seven of the eight statistics evaluated at each site were used in this ranking; the arithmetic mean rank was not used because it duplicates the mean rank at 95%. The health levels are derived from the EPA OAQPS unit risk levels.

A trend test (Mann Kendall) was conducted for each of the seven statistics at monitors with adequate data (□=0.05). The five-year trend analysis indicates a sum of 16 of the 60 statistics evaluated show improvement. Six of the ten locations show no statistically significant improving trend in any statistic. The site demonstrating the most improving trend in the last 5 years is HRM-3. Lynchberg and Channelview, the most contaminated sites to date in 2007, show no significant improvement in any statistic evaluated in the past 5 years and the next most contaminated site, Clinton, shows only slight improvement with two of six of the evaluated statistics showing improvement.

All of these sites are in the Houston region. Clinton, Milby and Cesar Chavez are in the city limits, HRM-3 is just outside of the city limits and Channelview, Deer Park 2, and Lynchberg are nearby.

Table 3: Benzene concentration trend results

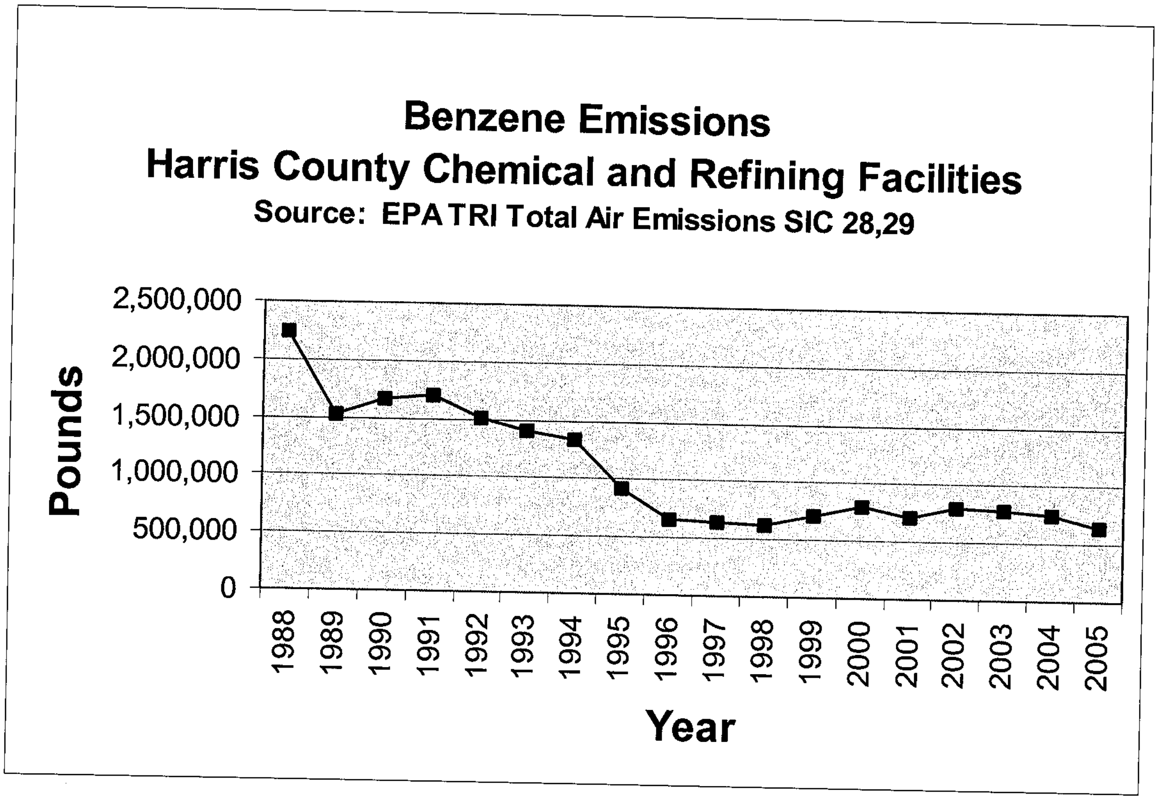
Benzene Trend Test Results Which Show Improvement

Order of Most Contaminated	2007 contamination rank	10 yr Trend	7 yr Trend	5 yr Trend	Improvement detected?
Lynchberg	10.7			0/7	no
Channelview	10.7		0/7	0/7	no
Clinton	9.9	5/7	1/7	2/7	yes
HRM-3	8.4			5/7	yes
Cesar Chavez	7.9				
Milby	7.4				
Deer Park 2	7.0	4/7	2/7	0/7	yes
Mustang Bayou	4.7			5/7	yes
Wallisville	4.0			0/7	no
Tx City 34th	3.6			6/7	yes
Lake Jackson	1.9			0/7	no
Danciger	1.3			2/7	yes

ordering based on average rank of 7 statistical indicators
trend summary is the number of trend statistics showing statistically significant improvement in trend of air quality out of 7 trend tests on different statistics ($\alpha=0.05$)
[shaded] = not enough data

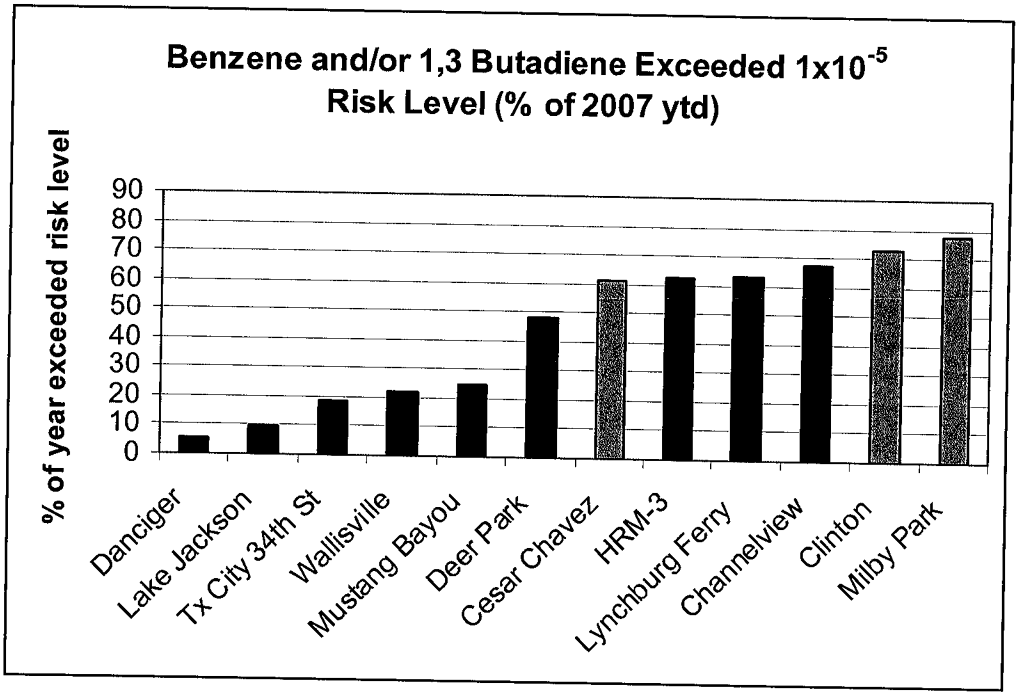
Although declines in benzene concentrations from the 1980s to the late 1990s are significant in the data record they are not attributable to MACTI standards because they were not yet in effect (Figure 8). Although linear regression used on non-normally distributed skewed data may be biased, it is a useful quick tool keeping in mind the limitations. Linear least squares regression of benzene concentrations of the past 7 years of data in Dallas, Clinton and Deer Park, Houston have approximately equivalent slopes (-0.02). Because Dallas has the same recent (7 year) decreasing slope as sites in Houston, the slope seems more attributable to reductions in emissions from fleet turnover and LEV standards than to MACTI as Dallas has no major sources.

Figure 8: Benzene Emission Trends in Harris County, 1988-2005



Regardless of what the source of the contamination is in the ambient air, EPA has not protected the environment or the health of Houstonians. Data indicate that ambient air concentrations of benzene exceed the $1x10^{-5}$ risk level up to 80% of the time during 2007 (Figure 9).

Figure 9: Percent of 2007 that benzene and/or 1,3 butadiene exceeded $1x10^{-5}$ risk level



Houstonians and Texans are disproportionately burden by the failure of the MACTs the control HAPS: In the Houston area specifically and Texas generally, the MACT standards do not afford the same level of protection to residents here as elsewhere. The disproportionate burden imposed upon Texans by the high concentration of refineries is exacerbated because of the disproportionately high volume of toxic emissions per production unit from Texas refineries compared to those in other states.

An analysis of self-reported data from the 2005 Toxic Release Inventory and the 2005 Energy Information Administration's Annual Refinery Report shows that Texas refineries emit significantly more OSHA carcinogens per barrel of refined product than refineries operated by the same companies in other states. (See Exhibit 4). Texas refineries represent 30% of the nation's refining capacity and 48% of the associated OSHA carcinogen emissions. California refineries represent 8% of the refining capacity, and 3% of the associated emissions; Louisiana refineries represent 18% of the refining capacity and 17% of the associated emissions; refineries in all other states combined represent 43% of the refining capacity and 31% of the associated emissions. For refineries operated by Shell, Valero, ExxonMobil, ConocoPhillips and CITGO, the Texas-based refineries emit more OSHA carcinogens per barrel refined than their refineries in California, Louisiana, Oklahoma, New Jersey, Montana, Illinois, and Washington. The same disparities exist when the data for benzene alone is examined. These disparities indicate that the MACT standards are not adequate to control emissions across the nation.

Conclusion

For all the reasons stated above, the proposed rules, if promulgated, would be arbitrary and capricious and would not meet the standards of the Administrative Procedure Act, 42 U.S.C. Sec. 7607 (d) (9) (A), the Clean Air Act, or Executive Order 12898. Under these circumstances, the City of Houston urges EPA to (1) adopt the additional controls proposed on an interim final basis while it collects the data it needs to perform an acceptable risk assessment, (2) conduct a risk assessment in accordance with the statute, and (3) propose additional controls as required under the Clean Air Act as discussed above, as soon as practicable.

Thank you for the opportunity to comment on this important proposal. I look forward to working with you to improve the regulations so that significant reductions in hazardous air pollutants in Houston and the nation can be reduced to better protect our citizens.

Sincerely,

Bill White

Bill White
Mayor

cc: Richard Greene, EPA Administrator Region 6
Elena Marks, Houston--Director of Health and Environmental Policy
Karl Pepple, Houston—Director of Environmental Programming
Arturo Michel, Houston—City Attorney
Arturo Blanco, Houston—Bureau of Air Quality Chief
Paulette Wolfson, Houston—Senior Assistant City Attorney

EXHIBITS

Comments: Proposed Rule Petroleum Refinery NESHAP, Docket ID No. EPA-HQ-OAR-2003-0146

Exhibit 1
Houston Neighborhood Market DrillDown: Catalyzing Business Investments in Inner City Neighborhoods, Social Compact Inc., November 2007
http://www.houstontx.gov/environment/drilldown.pdf

Exhibit 2
Aerial Maps of Harris County, Texas, Refineries
Shell Refining Deer Park http://www.box.net/shared/pgr2qi75i5
Pasadena Refining http://www.box.net/shared/6srfzps4nb
Houston Refining http://www.box.net/shared/nehoabny4r
ExxonMobil Baytown Refining http://www.box.net/shared/5m6e6sxva5
Valero Refining Houston http://www.box.net/shared/he7exhl83i
Ship Channel Overview http://www.box.net/shared/hqa9gaemou

Exhibit 3
Houston Regional Benzene Air Pollution Reduction: A Voluntary Plan for Major Sources, City of Houston, February 2007
http://www.houstontx.gov/environment/reports/benzenereductionplan.pdf

Exhibit 4
Toxic Emissions: Texas vs. Other States, City of Houston, 2007
http://www.houstontx.gov/environment/reports/toxicsemissions.ppt