# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

October 27, 2014

EPA Docket Center
William Jefferson Clinton (WJC) West Building (Air Docket)
Attn: Docket ID Number EPA–HQ–OAR–2010–0682
U.S. Environmental Protection Agency
Mailcode 28221T
1200 Pennsylvania Ave. NW.
Washington, DC 20460

Re: Title 40 Code of Federal Regulations Parts 60 and 63
Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards; Proposed Rule

Dear Sir or Madam:

The Texas Commission on Environmental Quality (TCEQ) appreciates the opportunity to respond to the U.S. Environmental Protection Agency's proposal published in the June 30, 2014, issue of the *Federal Register* entitled: "Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards; Proposed Rule."

Enclosed, please find the TCEQ's detailed comments relating to the rulemaking referenced above. If you have any questions concerning the enclosed comments, please contact Mr. Michael Wilson, P.E., Director, Air Permits Division, Office of Air, (512) 239-1922, or at mike.wilson@tceq.texas.gov.

Sincerely,

Richard A. Hyde, P.E.
Executive Director

Enclosure

**Texas Commission on Environmental Quality (TCEQ) Comments on Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards; Proposed Rule**

**Docket ID Number EPA–HQ–OAR–2010–0682**

## Background

On June 30, 2014, the U.S. Environmental Protection Agency (EPA) proposed amendments (79 FR 36880) to the national emission standards for hazardous air pollutants (NESHAP) for petroleum refineries (40 CFR Part 63, Subparts CC and UUU) to address the risk remaining after application of these standards promulgated by the EPA in 1995 and 2002 (60 FR 43260 and 67 FR 17773 respectively). The Federal Clean Air Act (FCAA) requires that the EPA periodically review and revise such standards to reflect current technology. The EPA also proposed amendments to the NESHAP for petroleum refineries based on an EPA review of developments in practices, processes, and control technologies for this source category. The EPA also proposed new requirements related to emissions during periods of startup, shutdown and malfunction to ensure that the standards are consistent with court opinions issued since promulgation of the standards. The EPA has also proposed a number of technical corrections and clarifications for the new source performance standards (NSPS) for refineries (40 CFR Part 60, Subparts J and Ja). Some of the specific changes which EPA has proposed include the implementation of a fenceline air monitoring program for benzene, additional controls on coking units, more stringent flare requirements, and expanded controls on storage vessels. In particular, the proposed monitoring of ambient air at each refinery fenceline is an approach that is unprecedented for a NESHAP regulation.

## TCEQ Comments on the Proposed Rules

*I. General comments; Overall justification for proposed changes to the standards.*

### A. The proposed amendments to Subparts CC and UUU to address residual risk have not been demonstrated to be necessary and are not adequately justified. Based on EPA's analysis, overall risk for this source category is clearly acceptable under the current standards.

According to the EPA's own analyses, risk is clearly acceptable under current control technologies and requirements. The EPA acknowledges this in the preamble, stating that "...currently-available emissions and monitoring data do not indicate that risks to nearby populations are unacceptable."[1] At 79 Fed. Reg. 36939, the EPA explicitly acknowledges that "...the risks remaining after implementation of the existing NESHAP for the Refinery MACT 1 and 2 source categories is acceptable." Table 10 (79 FR 36934) indicates that according to the EPA's own inhalation risk assessment, based on maximum cancer risk results, there is no population at an increased risk of cancer greater than the upper end of the EPA's acceptable risk range (i.e., 100 in a million or 1 in 10,000) based on either actual emissions or allowable emissions. The estimated

[1] 79 Fed. Reg. 36938

annual cancer incidence based on these *maximum* risk results is less than 1 case per year (0.3 and 0.6 cases per year based on actual and allowable emissions, respectively). These estimated maximum annual cancer incidence cases are entirely insignificant compared to the over 1,665,000 cases predicted to occur in 2014 (http://seer.cancer.gov/statfacts/html/all.html). Furthermore, Table 10 indicates that *maximum* estimated chronic hazards are acceptable, which the EPA acknowledges: "... TOSHIs [target organ specific hazard indices] are less than 1 for the entire source category."[2] In regard to acute hazard, even for the six worst-case refineries of the 142 major source refineries operating in 2010, acute hazards based on *worst-case* air dispersion modeling and exposure assumptions are also acceptable (79 FR 36940): "...our analyses did not identify acute risks at a level of concern... ." This is even more clearly true when more appropriate 1-hour ambient air comparison values are used for nickel, acrolein, and arsenic (https://www.tceq.texas.gov/toxicology/dsd/final.html).

The EPA's refined multi-pathway risk assessment case study[3] also clearly indicates an acceptable *worst-case* risk (e.g., "highly unlikely" worst-case total risk (inhalation + multipathway) of 10 in a million or 1 in 100,000) and acceptable *worst-case* hazard (< 1 for all target organs). Additionally, it demonstrated that less refined EPA multipathway screening risk results significantly overestimate risk, and that inhalation risk is the primary determinant of residual risk (results discussed above demonstrate acceptable inhalation risk/hazard). Thus, the demonstrated low multipathway risk does not "weigh heavily" into proposed decisions as stated by the EPA at 79 FR 36939. Finally, the EPA's discussion of facility-wide risk assessment results for 142 petroleum refiners (Table 11, 79 FR 36937) indicates clearly acceptable *worst-case* risk (70 in a million or 0.7 in 100,000) and petroleum refinery operation contributions to conservatively estimated *worst-case* hazard (i.e., less than 20% to conservatively estimated total hazards greater than 1).

### B. The existing standards also provide an ample margin of safety, further indicating that the proposed changes are not necessary or justified.

The EPA's own analyses have already demonstrated an ample margin of safety, despite EPA's proposition that additional controls are needed to provide one. Acute and chronic hazards are so low that the EPA chose to not quantitatively evaluate hazard reductions under the proposed changes (79 FR 36940). As previously stated, in regard to risk, there is no population at an increased risk of cancer greater than the upper end of the EPA's acceptable risk range (i.e., 100 in a million or 1 in 10,000). In fact, the overwhelming majority of the population evaluated had conservatively estimated lifetime risk less than the middle (i.e., logarithmic center of 1 in 100,000) of EPA's acceptable risk range, based on allowable (as opposed to actual) emissions (Table 10). The EPA acknowledged that "we consider the allowable emissions to be an upper bound, based on the conservative methods we used to calculate allowable emissions."[4] Actual risk would be much lower due to the EPA's use of upper-bound allowable (as opposed to

[2] 79 Fed. Reg. 36940
[3] 79 Fed. Reg. 36936
[4] 79 Fed. Reg. 36939

actual) emissions, conservative toxicity factors, worst-case exposure and meteorological assumptions, and similar factors which result in the overestimation of actual risk.

Lastly, the proposed requirements (e.g., storage vessels, delayed coking units) *would not* affect maximum individual risk and would only result in an estimated 2 to 15% reduction in the conservatively estimated cancer incidence for the source category. As EPA noted at 79 FR 36942, while new standards for delayed coking units would result in an estimated 15% reduction, this evaluation was conducted for informational purposes only and was not part of the EPA's evaluation of residual risk and ample margin of safety. Thus, the EPA is relying on an insignificant 2% theoretical reduction to conclude that new storage vessel requirements are needed, and that reducing theoretical risk by 2% causes a shift from an inadequate to an ample margin of safety. Such modest available reductions (2 to 15%) in theoretical upper-bound risk demonstrate that the existing standards are in fact already providing an ample margin of safety.

In summary, *the existing standards already provide an ample margin of safety* as evidenced by consideration of: (1) acceptable baseline risk results; (2) the recognition that these residual risk results represent upper-bound theoretical estimates which overestimate actual risks; (3) the fact that the overwhelming majority of the population evaluated has upper-bound risk estimates below the middle of the EPA's acceptable risk range; and (4) the inability of the EPA to demonstrate a more significant reduction in risk under the proposed actions.

### C. Conclusion: EPA should retain the existing standards, as allowed by the FCAA.

Because the residual risk is clearly acceptable, and the existing standards are already providing an ample margin of safety when the EPA's own analyses and assumptions are considered, the proposed amendments are unnecessary and unjustified. As the EPA explains in the preamble, "...the EPA may adopt standards equal to existing MACT standards if the EPA determines that the existing standards (i.e., the MACT standards) are sufficiently protective."[5] To be consistent with the finding of sufficient protection, the EPA should simply retain the existing standards without changes or additions.

## *II. Proposed fenceline benzene monitoring requirements.*

### A. The EPA's proposed fenceline monitoring is not required nor needed, is overly complex, and would require major resources to implement.

The EPA's proposed fenceline monitoring rules are not necessary to achieve the "ample margin of safety" residual risk criteria required by the FCAA, §112(f)(2), nor needed based on EPA's residual risk assessment or technology review.

First, EPA determined that risk related to petroleum refining activities is acceptable. Therefore, TCEQ believes that the proposed fenceline monitoring is an unnecessary

[5] 79 Fed. Reg. 36885

burden on industry and EPA staff that must review and approve monitoring and compliance plans; and the purported side benefits will not significantly improve the environment or reduce pollution. The FCAA, §112(d)(6) states that the Administrator shall review and revise emission standards *as necessary*, and as previously discussed in Section I of this document, the EPA has not demonstrated that fenceline monitoring or any other additional measures are *necessary* to achieve acceptable risk and an ample margin of safety. The EPA has not attempted to estimate the quantity of emission reductions that would be achieved by the proposed fenceline monitoring, and has not relied on any fenceline monitoring-related emission reductions in the determination that the proposed rules provide an ample margin of safety

In addition, while EPA states that the fenceline monitoring program is intended to ensure fugitive emissions are monitored, managed, and reduced, the EPA expects collected data to help EPA understand and identify emissions of benzene and related VOC fugitive emissions that are impacting nearby communities. Further, EPA states that required semiannual reporting of data will allow public access to data on benzene levels which is directly relevant to the potential health risks posed by a facility.[6] However, fenceline monitoring proposed under these standards is not an appropriate substitute for an EPA-funded national ambient air toxic monitoring network.

The TCEQ does not believe the proposed fenceline monitoring would be as simple to implement and comply with as EPA suggests. The collection and evaluation of data and the extremely complicated root cause and corrective analyses could greatly increase resources needed to meet EPA compliance requirements. For example, EPA suggests that additional monitoring systems (and development and approval of an additional site-specific monitoring plan) may be needed to account for off-property (background) sources that contribute to concentrations above the concentration action level. Detailed meteorological data would be required for both on-site and off-site wind flow. The proof of concept study conducted at the Flint Hills West Refinery in Corpus Christi, Texas,[7] suggested that a weakness of the passive sampler monitoring approach is the inability to apportion contributions to the measured concentration in locations with potential neighboring sources of benzene, complex local topography, or small-scale weather conditions in terms of space and time. For one sampling period, a high concentration at one of the monitors could have been caused by other sources and elevated ground levels of approximately two meters between monitor locations. The study suggests that in cases where additional source apportionment capability is required, the sampling approach can be selectively augmented through the use of time-resolved fenceline monitoring coupled with wind direction analysis. Discounting contributions from background sources, it would be very difficult to determine on-property culpable sources using hourly meteorological data since samples represent a 14-day concentration. In addition, the basic system does not contemplate on-site meteorological samplers, background samplers, or active samplers. Any enhancements of the basic monitoring program to obtain refined sampling, meteorological, or background data to conduct root cause or correction analyses, such as shorter sampling

[6] 79 Fed. Reg. 36938

[7] Thoma, E.D., Miller, C.M., Chung, K.C., Parsons, N.L. and Shine, B.C. Facility Fence Line Monitoring using Passive Samplers, J. Air & Waste Mange. Assoc. 2011, 61:834–842.

periods, using active sampling techniques, or employing additional monitors, would greatly add to EPA's cost estimates.[8]

Another area of concern is a proposed benzene concentration action level under §63.658 which is not related to EPA's risk assessment and proposed as an incentive for owners or operators to act on the information provided by the samplers. If the action level is exceeded, the owner or operator is required to conduct a root cause analysis. As discussed elsewhere in TCEQ's comments, the proposed action level is not based on an appropriate risk-based methodology. The EPA proposes an annual concentration action level of 9 $\mu g/m^3$ based on the highest modeled concentration of reported benzene emissions from 142 facilities.[9] The concentration estimates of the remaining 141 facilities support TCEQ's conclusion: 1 facility at 5 $\mu g/m^3$; 19 facilities with estimated concentrations from 2 - 4 $\mu g/m^3$; 32 facilities from 0.6 - 1 $\mu g/m^3$; and 89 facilities with estimated concentrations from 0.001 - 0.05 $\mu g/m^3$. These predicted low benzene concentrations from almost all of the refineries makes it apparent that a complex fenceline monitoring program is not needed based on predicted concentrations, and fenceline monitoring would add significant cost for sites with predicted minimal impacts.

Finally, based on information provided in the docket and the complexity of proposed reporting, recordkeeping, fenceline monitoring provisions, and sampler deployment and VOC (benzene) sample collection rule requirements, TCEQ believes that this monitoring approach would cost significantly more than EPA estimates and would not provide the timely action that EPA seeks to find and fix problems. Based on EPA's analysis, there is no reason to require any facilities to incur costs that they would most likely pass on to customers.

### B. The proposed fenceline monitoring benzene concentration action level has no basis in acceptable residual risk or risk assessment and is arbitrary.

The proposed annual concentration action level of 9 $\mu g/m^3$ (2.8 ppb) has no basis in risk assessment or an acceptable regulatory risk level, and therefore is arbitrary. Rather, the benzene action level is simply set at the maximum modeled annual refinery fenceline concentration (assuming compliance with the proposed additional control requirements) without consideration of the risk-based decision-making principles which act as the primary factors guiding risk-based regulatory action (e.g., without using acceptable regulatory risk levels as the primary determinant of target fenceline concentrations or whether any action is needed in the first place). In fact, in discussing the action level "analysis" at 79 FR 36926, the EPA admits that "...this analysis does not correlate to any particular metric related to risk."

### C. Notwithstanding TCEQ's previous comments that a fenceline monitoring program is not required or needed, TCEQ offers the following suggestions.

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[8] 79 Fed. Reg. 36978.

[9] EPA-HQ-OAR-2010-0682-0208. Fenceline Ambient Benzene Concentrations Surrounding Petroleum Refineries.

Rather than fenceline monitoring, if the EPA believes that additional benzene reductions are absolutely necessary, the EPA should consider changing existing regulations to encourage more frequent visual or imaging-assisted monitoring of fugitive sources in order to identify emission releases and implement corrective action in a timely manner. The EPA should also allow the use of optical gas imaging devices to find emission releases that should not be occurring so they can be repaired or corrected sooner. The EPA should not link the use of these optical gas imaging devices to an approved and operating passive monitoring system.

The EPA should consider waiving the fenceline monitoring program for sites with modeled concentrations at or below the concentration action level or a threshold used by a state to demonstrate protectiveness for a permit action, and for sites with monitored concentrations at or below the concentration action level after a maximum of 12 months.

### D. The EPA should retain the authority to approve fenceline benzene monitoring and corrective action plans.

The EPA solicited comments on the proposal to retain, rather than delegate, monitoring approval authority. If the proposed requirements are adopted, the EPA should retain the authority to approve fenceline benzene monitoring and corrective action plans that will be submitted by petroleum refinery sources. Delegating this authority to state, local, and tribal agencies would cause an undue burden to these agencies and result in significant resource implications to collect, review, and approve these plans, as well as the data that accompanies the plans.

## *III. Comments and Recommendations on Other Proposed Requirements* [10].

### A. The proposal to regulate delayed coking unit decoking operations needs additional clarification, and appears premature, as the actual emission potential has not been reasonably defined.

The proposed requirement to degas the delayed coking drum to the blowdown system until the coking drum pressure is reduced to 2 pounds per square inch gauge (psig) for a 5 minute average appears premature since the test data was inconclusive and incomplete. The lower pressure, 2 psig, achieved in practice, while logically better than higher pressures, has not been fully or effectively evaluated for the total potential emissions associated with decoking.

Initial steam vent testing was clearly problematic and does not appear to have been coupled with any emission testing of the draining, deheading, or coke cutting, which will include cutting through hot spots. The testing did not lend itself to emission rate differentiation with respect to the size of the drum or the pressure released.

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[10] These comments are provided notwithstanding TCEQ's overall opposition to the proposed changes, as explained under Sections I and II of this document.

There is not a clear indication from the data reviewed to indicate if the emissions associated with decoking are within an order of magnitude of the actual emission rates occurring. Additional analysis to provide a reliable emission potential range and clear measurable effect of the proposed control on the emission potential would be necessary to establish a valid determination of impact and risk prior to the implementation of a control approach of lowering the unregulated decoking pressure from 15 psig to 2 psig.

**B. The proposed definition of Delayed Coker Vent is confusing and should be revised.**

If the proposed rules are adopted, the TCEQ recommends revising the definition as follows:

*Delayed coker vent* means a vent that is typically intermittent in nature, and usually occurs ~~only~~ primarily during the cooling cycle of a delayed coking unit coke drum when vapor from the coke drums cannot be sent to the fractionator column for product recovery, but instead is routed to the ~~atmosphere through the~~ delayed coking unit's blowdown system for the controlled separation of the condensates from the vent stream. The emissions from the decoking operations, which include the final direct atmospheric venting from the coke drum, deheading, draining, or decoking (coke cutting), are not considered to be delayed coker vents.

This definition would better clarify that the vent associated with the blowdown system is the miscellaneous process vent and the final steam release vent is not a miscellaneous process vent as intended.

**C. The category of Miscellaneous Process Vents should not include in situ sampling systems.**

The inclusion of "In situ sampling systems (onstream analyzers)" as miscellaneous process vents is a confusing approach to address analyzer vents as desired given the preamble discussion of "In situ sampling system." A clearer regulatory approach would be to define "In situ sampling systems" and leave them as excluded from the category of miscellaneous process vents; while separately defining onstream analyzer vents which would be covered as a miscellaneous process vent.

**D. The proposed change to the Subpart CC definition of Miscellaneous Process Vents which eliminates the exception for episodic or non-routine releases from startup, shutdown, malfunction, maintenance, and depressuring operations, may create untenable or wasteful control requirements.**

The TCEQ, in permitting emissions from planned maintenance, startup and shutdown activities, has found that the refining industry varies in the level of control and approach applied to clearing and cleaning process vessels for internal inspection and repair. The TCEQ agrees with the concept of depressuring, clearing and cleaning to control where the stream remains reasonably controllable, but TCEQ believes this vent reaches a point

of diminishing return and can become cost-prohibitive to control. The EPA notes similar issues with controlling the decoking of delayed cokers (79 FR 36902-3) and wastewater streams (79 FR 36919). In general, for application of Best Available Control Technology, TCEQ finds that a limitation of 10,000 ppmv of VOC or less than 10% of the Lower Explosive Limit are reasonable lower bounds for application of control to the vent when trapped liquids are removed and the process equipment contained material where the process fluid VOC could exert a partial pressure greater than 0.5 psia. For these periodic, non-routine events the steaming, water-washing, and ventilating activities necessary for vessel entry produce a diminishing concentration vent stream that becomes impractical to control. The EPA should look more closely at what is achieved in practice, and set reasonable limits on what must be controlled.

**E. The proposed requirements for flare control have not been demonstrated in a sufficiently broad range of refinery operations, do not allow exemptions or reduced monitoring requirements for emergency flares, and do not address the necessity of daily visible emission monitoring or the difficulty of performing visible emission readings during inclement weather conditions.**

The proposed flare control standards include changes to address potential problems with steam and assist air flame disruption, using higher flare gas combustion potential and more detailed and complex monitoring to assure compliance. While the principles appear reasonably sound and environmentally conservative, the proposed rule does not contain references that demonstrate the proposed approach can be utilized successfully in practice. The TCEQ requests that the EPA provide actual refinery flare operating data that confirms that affected flares can achieve the proposed standards under the range of process conditions and control scenarios found in the refining industry.

Proposed §63.670(b) requires pilot flame monitoring, but no requirements for the presence of a flare flame (when no compounds that produce clear flames are combusted) or other indicators of flare combustion. Although it appears the EPA is presuming the proposed flare waste gas stream monitoring requirements will guarantee increased flare combustion efficiency, the air-assisted flare monitoring parameters do not appear to have been extensively tested in practice. Air-assist fans or blowers are often not capable of performing fine adjustments in air assist rates, therefore increasing the potential of over-assist under routine waste gas combustion conditions. The EPA should investigate alternatives to the proposed air flare monitoring requirements to ensure the presumed combustion efficiency for air-assisted flares in routine service.

The proposed rule does not appear to exempt flares that function strictly as emergency safety and control devices and do not receive routine waste gas streams. The TCEQ recommends that the EPA either exempt or significantly reduce the monitoring requirements for flares only in emergency service, especially those flares that have been retrofitted with flare gas recovery systems or have had a testable combustion device (e.g., incinerator) installed prior to the flare. When emergency flares are operating close to their designed capacity, the potential for over-assist is greatly reduced. If an

exemption for emergency flares is not possible, the proposed monitoring requirements should be amended to a flowmeter for the waste gas stream for emergency flares.

The revised visible emission (VE) requirements for flares at §63.670(h) require daily VE readings but do not address the rationale why daily visible emission monitoring using Method 22 is necessary or the ramifications of inclement weather interfering with or inhibiting the mandatory daily VE reading. The TCEQ suggests that the rule allow for some relief when weather inhibits observation during appropriate observation hours.

**F. Certain key definitions and parameters associated with the proposed flare requirements need clarification or additional justification.**

The EPA uses the term "premix assist air" in the proposed rule language. The definition of "premix assist air" provided in proposed §63.641 is unclear. Assist air is typically supplied at the flare tip, not prior to the tip, to avoid creating a potentially explosive mixture inside of the flare.

The definition of the term "perimeter assist air" in proposed §63.641 is unclear. Most air-assisted flares send the air assist along the axis of the flare, not necessarily around the perimeter of the flare. The assist air is then mixed with the vent gas for combustion at the flare tip. Additional clarification is requested on this term.

EPA's suggestion that the diameter of an air-assisted flare impacts the determination of excess aeration is not clearly explained (preamble section IV.A.3.d, *Refinery Flare Operating and Monitoring Requirements,* 79 FR 36907). The EPA should provide additional information clearly detailing how the EPA developed the dilution parameters for flares using perimeter assist air in Table 3 (79 FR 36908).

The utilization of flare vent gas combustion potential measurement data from time periods exclusively before the 15-minute block periods of measured flow data as prescribed in the rule at §63.670(l)(2), appears misleading and problematic. If data is evaluated for compliance during 15-minute blocks, the flare vent gas combustion potential data should logically be from the same time block. Depending on the complexity of the flare system, an approach to use continuous calorimeter data in concert with chromatographic data should be encouraged to avoid compliance determinations based on single data samples.

The proposed flare requirements at §63.671(e)(2)(ii) and §63.671(e)(3)(ii) address gas chromatograph calibration to C7 hydrocarbons and beyond, whereas the proposed Table 12 proposes a pentane+ or C5+ component property. The TCEQ requests that the EPA clarify any mandatory need for calibration past C5.

All refineries will likely have hydrogen and olefins present in the vent gas. The rationale for the requirement of a minimum combustion zone net heating value of 380 British thermal unit (Btu)/standard cubic foot (scf) in proposed §63.670(e)(1)(i) for flares with hydrogen-olefin interaction is unclear. Additional explanation and evidence for the 380 Btu/scf requirement is requested.