

Bryan W. Shaw, Ph.D., P.E., *Chairman*  
Toby Baker, *Commissioner*  
Zak Covar, *Commissioner*  
Richard A. Hyde, P.E., *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

September 25, 2014

The Honorable Nelson W. Wolff  
Bexar County Judge  
Paul Elizondo Tower  
101 W. Nueva Street, Suite 1019  
San Antonio, Texas 78205-3482

Dear Judge Wolff:

Thank you for your recent letter concerning the regulatory performance of the Texas Commission on Environmental Quality (TCEQ) in the Eagle Ford Shale area. It is TCEQ's responsibility to ensure the health and safety of the citizens of Texas - a responsibility we take very seriously. We appreciate the working relationship TCEQ has had with your office and the citizens of Bexar County and look forward to continuing those efforts beyond this response letter.

### Monitoring

It is our hope that this response can provide some insight into the magnitude of TCEQ's air monitoring efforts in the Eagle Ford Shale area. In response to rapid development of the Eagle Ford Shale area, TCEQ began plans to install additional fixed-site volatile organic compound (VOC) monitors to help address questions about air emissions and air quality in the region. The automated gas chromatograph (AutoGC) located in Floresville began collecting data in July 2013, and the TCEQ is in the process of installing another fixed-site VOC monitor in Karnes County. In addition to the Floresville site, the TCEQ currently receives data from a VOC monitor in Laredo, as well as additional fixed-site monitors measuring other air pollutants such as ozone, nitrogen oxides, and particulate matter that are located in Laredo (Webb County), Eagle Pass (Maverick County), Cuero (DeWitt County), Victoria (Victoria County), and Fayetteville (Fayette County). Just outside of the Eagle Ford Shale area in Bexar County, the TCEQ receives data from 35 individual pollutant samplers located at 16 monitoring sites.

TCEQ's air monitoring and surveillance efforts throughout the state have proven that issues regarding air emissions from oil and gas operations are sporadic and localized in nature rather than area-wide and typically occur as the result of some mechanical or operational error.

TCEQ staff uses hand-held equipment such as optical gas imaging cameras (OGICs) to aid in the identification of emission sources during investigations. In addition to the OGIC, an array of equipment is available for surveying and monitoring sites, including: passivated, stainless steel canisters for the detection of VOCs; multi-sensor gas detectors; toxic vapor analyzers utilizing flame ionization or photoionization detection; and, hydrogen sulfide analyzers. All of the TCEQ regional offices that serve Eagle Ford Shale counties are fully supplied with these types of equipment, and they are used daily by our investigators.

Under certain circumstances, the TCEQ has used mobile monitoring to evaluate specific emission sources, or groups of sources, including at oil and gas facilities. For example, the TCEQ contracted with the University of Texas Center for Energy and Environmental Resources to conduct mobile monitoring upwind and downwind of the Eagle Ford Shale. Twelve monitoring trips were conducted with each trip collecting air quality upwind and downwind of the Eagle Ford Shale production area. Results of this study will soon be summarized and released.

In the Eagle Ford Shale area and Bexar County combined, the TCEQ annually evaluates more than 500,000 data points from air samples. In addition, the TCEQ annually evaluates over 11 million data points for more than 115 air toxics statewide. Concentrations from these monitors include contributions from oil and gas activities, as well as other emission sources. It is our goal to use real time monitoring data to identify possible issues and remedy them before there is a negative impact to public health. Data is available to the public via our website at <http://www5.tceq.state.tx.us/tamis/index.cfm?fuseaction=home.welcome>.

#### Eagle Ford Shale Aerial Surveys and Follow-up Investigations

Due to the sporadic and localized nature of issues related to air emissions from oil and gas operations, the TCEQ has also employed state-of-the-art technologies to assess and address emissions from them. For example, the TCEQ has performed two contractor-led aerial surveys or flyovers using a helicopter mounted with an OGIC capable of detecting sources of air emissions. This flyover survey technique is an effective screening tool that helps evaluate large geographical areas, allowing TCEQ investigators to focus their resources on potentially problematic areas. The TCEQ has conducted flyovers in 2011 and 2013 to specifically target oil and gas activities in the Eagle Ford Shale area. In the most recent survey, in summer 2013, the flyover collected 286 aerial video images. Over 10,000 individual tanks were surveyed specifically in the Eagle Ford Shale counties. Approximately five percent of the tanks were found to have some degree of emissions, either authorized or unauthorized. The TCEQ conducted 284 on the ground follow-up investigations at facilities in the Eagle Ford Shale counties with observed emissions to determine compliance with authorizations and regulations. A total of 31 notices of violation and eight notices of enforcement were issued as a result of fly-over follow-up investigations in the Eagle Ford Shale in 2013-2014.

#### Health and Odor Concerns

The primary air emissions associated with upstream oil and gas production are light alkanes such as ethane and propane. These compounds do not reach levels of concern from a health perspective until they displace enough oxygen in the atmosphere to be asphyxiates. The levels measured thus far in the air in Eagle Ford Shale are significantly below levels of concern for these compounds. All fixed-site and short-term canister air monitoring data and associated evaluations are posted on the TCEQ's Eagle Ford Shale webpage: <https://www.tceq.texas.gov/airquality/eagleford/eagle-ford-main>. Of this data, only one sample measured one compound above its odor threshold, and the remaining samples were all below levels of short-term health and odor concern.

The above listed webpage will not have information about Bexar County since it is not in the Eagle Ford Shale area. The TCEQ has evaluated data from a fixed-site VOC monitor in Bexar County on Old Highway 90 since it was installed in October 2006, and these data are available at

[http://www5.tceq.state.tx.us/tamis/index.cfm?fuseaction=report.view\\_site&tab=data&siteID=922&sampID=6637&showActiveOnly=0&showActMonOnly=1&formSub=1](http://www5.tceq.state.tx.us/tamis/index.cfm?fuseaction=report.view_site&tab=data&siteID=922&sampID=6637&showActiveOnly=0&showActMonOnly=1&formSub=1). Annual average concentrations of benzene, a hazardous air pollutant that is a good indicator of air quality, have

steadily declined since October 2006. Attached is a graph showing measured annual average concentrations of benzene for 2013 from TCEQ's statewide monitoring network. As you can see, all monitors are below our long-term air monitoring comparison value of 1.4 parts per billion. The Barnett Shale monitors (yellow bars) are among the lowest in the state, as are the Floresville and San Antonio (Old Hwy. 90) monitors. These low concentrations are the direct result of TCEQ's ongoing permitting, inspection, and enforcement programs.

#### Complaints and Investigations

One item that deserves mention is that Dr. Michael Honeycutt, director of our Toxicology Division, was quoted in the recent *San Antonio Express News* article. His quote, from a year and a half ago, refers specifically to odor complaints -- not the overall complaint process. To imply that the TCEQ assigns a lower priority to complaints based solely on geographic region without providing proper context is somewhat misleading. It is true that under a set of very defined circumstances that are unique to the Barnett Shale area we handle odor complaints differently in this area compared to the rest of the state. This decision was made several years ago due to the majority of complaints regarding oil and gas activities in the Barnett Shale being related to odor and the dense populations near these oil and gas facilities. For example, since September 1, 2012, 98 percent of the complaints in the Barnett Shale regarding oil and gas activities have been air related. However, in the Eagle Ford Shale since September 1, 2012, oil and gas complaints have been more varied with 68 percent of the complaints air related. We continually review our complaints process, and if modifications to that process are needed to meet the concerns of the public, we will address this accordingly.

The TCEQ responds to all complaints that are received, verbally, in writing, or via electronic mailbox, which allege a possible environmental, health or regulatory concern. Complaints received within TCEQ's jurisdiction are assigned a priority with a corresponding investigation deadline based on potential impact to human health and/or the environment. We consider this to be a core mission of the agency and take the handling of complaints very seriously.

Given that belief, any complaint that alleges a health related issue is considered our highest priority and is treated consistently in all regions of the state. In many cases, these types of complaints are handled immediately. Upon investigation, where emissions are deemed an immediate threat to public health and safety off-site of any facility, the TCEQ works with the county and/or local authorities of the impacted area to advise residents of conditions and precautions that may be necessary to protect human health.

Additionally, the TCEQ investigative staff will also contact the suspected responsible facility as soon as any emission issue is found to eliminate the potential threat. On a positive note, these types of occurrences are rare and demonstrate that many of the operations within this state are compliant with state and federal regulations and pose no negative impact to human health and the environment.

Any violations that are documented during complaint investigations are addressed using the agency protocols and are handled consistently statewide. Violations that have been documented to negatively impact public health and are directly linked to operations at a facility are also considered major violations and carry a more significant penalty than those not linked to public health.

In all cases, complainants who provide contact information to TCEQ are contacted both prior to and following a complaint investigation, as well as periodically throughout any subsequent

enforcement action, if applicable, until final disposition of the complaint. For further information on the complaint processes of the TCEQ please see <https://www.tceq.texas.gov/complaints/index.html>.

Complaints received which are not within the TCEQ's jurisdiction are formally referred to the appropriate federal, state or local authorities, and the complainants are provided contact information for the appropriate authority. Approximately 17 percent of the complaints received in the Eagle Ford Shale area are referred to other jurisdictions.

In addition to complaint investigations, TCEQ investigators also conduct routine compliance investigations of regulated entities. The TCEQ may also conduct reconnaissance investigations in areas where one or more of the following criteria apply: historic complaints have been received; flyovers (aerial surveys) of regulated facilities have been conducted; clusters of regulated facilities are located; follow-up of an ongoing investigation is required; and/or, other factors that indicate the need for an on-site presence outside of a normal frequency.

Since September 1, 2012, the TCEQ has conducted over 1,000 investigations (including complaint, routine compliance, and reconnaissance investigations) related to Eagle Ford Shale oil and gas activities. One hundred fifty-three of those investigations were conducted in response to 198 complaints received. (In some instances, a single investigation covered multiple complaints.) As a result of these investigations, 174 written notices of violation were issued. Since February 2010, 44 administrative orders have been issued by the TCEQ, totaling over \$540,000 in assessed fines and requiring corrective actions relating to Eagle Ford Shale oil and gas activities.

#### Ozone

Your letter also highlighted the amount of emissions from the Eagle Ford Shale in relation to the San Antonio-New Braunfels Metropolitan Statistical Area (MSA). Every emission, whether it is from automotive exhaust, agricultural tractors, a dry cleaner, an oil and gas site, or a refinery has some potential impact on air quality. However, the specific compounds emitted, emission amount, emission height, duration, frequency, time of day, location, meteorology, and other factors determine whether the emissions have a measurable or significant impact in regional air quality. Certain specific VOCs, such as isoprene and ethylene, have a high ozone formation potential. Light alkanes such as ethane and propane primarily emitted from oil and gas production have an extremely low ozone formation potential in an area where ozone formation is generally limited by nitrogen oxides (NOx) and other VOCs emitted by trees and vegetation. NOx limited means that decreasing NOx reduces ozone, while decreasing VOC has little or no effect on ozone. Therefore, the most common alkanes emitted by oil and gas are expected to have little impact on ozone levels in the Eagle Ford Shale area or in San Antonio. In fact, the highest San Antonio area ozone measurements are routinely north and northwest of downtown San Antonio, and some of the lowest measurements are south of San Antonio between the urban core and the Eagle Ford Shale. It is also important to clarify that the statement from the Alamo Area Council of Governments (AACOG) that "the Eagle Ford produced nearly seven times as much VOCs and almost one and half times as much NOx" only considers San Antonio emissions from on-road vehicular traffic. The total San Antonio MSA emissions include 190 tons per day (tpd) of NOx and 224 tpd of VOC while Eagle Ford Shale emissions are estimated at 111 tpd of NOx and 229 tpd of VOC according to the AACOG reports.

It is also important to note that the emissions from activities in the Eagle Ford Shale are spread out over an area roughly 400 miles long and 50 miles wide, approximately the same size as the

state of West Virginia, and as such, are not concentrated in a small area. Given the geographic location of the formation and a roughly east and west orientation, there is little opportunity for the emissions to accumulate over a long portion of the formation given predominant wind patterns in this area. In summary, comparing emissions from the Eagle Ford Shale area that extends over 26 counties to those of the San Antonio MSA, does not necessarily correlate to an air quality issue or concern and our monitors appear to support this conclusion.

#### Outreach

Perhaps the most important lesson learned by the TCEQ since the start of our efforts with oil and gas activities in the Barnett Shale is the need for abundant and timely communication with all interested parties. The TCEQ has continued this effort to the Eagle Ford Shale. The TCEQ conducted three local government workshops in 2011 (Cotulla, Jourdanton, and Cuero) and met with 19 county judges that year. Most recently, in 2014, TCEQ staff met with county judges from Atascosa, DeWitt, Frio, Karnes, LaSalle, McMullen, Webb, and Wilson counties. Staff also attended public workshops hosted by Environmental Defense Fund in July and August 2014.

As part of this communication effort, the agency has created and maintains a multi-media website ([www.TexasOilandGasHelp.org](http://www.TexasOilandGasHelp.org)) that serves as a gateway into the TCEQ for the public, local governments, and industry. The webpage includes links to rules, monitoring data, how to file an environmental complaint, regulatory guidance, and frequently asked questions for the oil and gas industry, supporting industries and local governments impacted by oil and gas activities.

Given that compliance is also our mission, the TCEQ has also provided extensive compliance assistance to oil and gas operators and related industries. Since 2008, TCEQ-sponsored educational seminars and workshops have trained oil and gas company representatives, consultants, and engineers on air, water, and waste regulations that apply to their operations.

Senator Zaffirini has requested that the TCEQ and Texas Railroad Commission hold an open house in Karnes County this fall. If you desire, the TCEQ would be happy to conduct a workshop or open house in Bexar County or other areas that you might suggest regarding Eagle Ford Shale activities.

#### Funding for the Area

The TCEQ appreciates your interest in and leadership regarding air quality in Bexar County. Our agency has invested additional resources in Bexar County, AACOG, and the City of San Antonio as well as counties within the Eagle Ford Shale and is continuing to make this an agency priority. For example, to even better understand and proactively improve air quality in the area, the TCEQ and AACOG are currently implementing additional projects that would:

- At the request of the City of San Antonio, develop a list of local voluntary or mandatory control measures available to reduce ozone precursors in the city, including control strategy, cost, and expected emission reductions;
- Compile information on costs associated with ozone non-attainment status (to be performed by TCEQ and shared with AACOG);
- Purchase ozone analyzers to replace broken units;
- Provide an updated evaluation of the estimated emissions from San Antonio area industrial fuel combustion sources; and,
- Provide an updated emission inventory of conventional oil and gas well sources.

The Honorable Nelson W. Wolff

Page 6

September 25, 2014

In total, the San Antonio area received more than \$1.2 million of funding from the TCEQ in fiscal years 2013 and 2014 for air quality projects.

Richard A. Hyde, P.E., TCEQ Executive Director, or I will be glad to meet with you to further discuss our current and planned future actions regarding this issue and as always stand ready to answer any questions you may have.

Sincerely,

A handwritten signature in blue ink that reads "Bryan W. Shaw". The signature is written in a cursive, slightly slanted style.

Bryan W. Shaw, Ph.D., P.E., Chairman  
Texas Commission on Environmental Quality

Enclosure

# 2013 Average Benzene Concentrations at Air Monitoring Sites in Texas

(Values shown are arithmetic means of hourly autoGC measurements where available\*; otherwise 7-month arithmetic means canister samples)

# Incomplete data set; monitor had less than 75% data return

