Chapter Calls for Meaningful Monitoring of the Flint Hills Burning

By Craig Volland, Air Quality Chair

This article is derived from our comments to KDHE and EPA Region 7 on KDHE’s annual plan for the ambient air quality monitoring network in Kansas. In April, burn-related ozone air quality standard exceedances were recorded in Chanute, Kansas, and in Omaha, Nebraska. KDHE has rejected our concerns, and we are now waiting to hear from EPA Region 7.

Current Air Monitoring Deficiencies.

Minimal Real-Time Alert Capability. Other than continuous ozone monitors in Topeka and Chanute to the east of the Flint Hills physiographic region capable of generating pollutant data for EPA’s Air Now air quality alert system, there is currently no coverage between Topeka and the Cedar Bluff monitoring station west of Hayes, a distance of some 230 miles. The Konza Prairie ozone monitor near Manhattan was capable of providing some coverage, but it was shut in 2013.

KDHE’s smoke management efforts are focused on convincing landowners to burn earlier in the year. Traditional practice has called for burning in early to mid-April. While this would help to reduce ozone formation, we have no data to conclude that it would necessarily reduce the emission and downwind secondary formation of PM2.5 fine particulate.

PM2.5. There is no timely coverage of any kind between Kansas City, Kansas, and the Cedar Bluff monitoring station west of Hayes, a distance of some 280 miles. It takes a month or more for results to be reported from filter-based monitors.

At present, we are, in effect, relying on continuous monitors located in Lincoln and Omaha, Nebraska, to indicate whether there is a threat to the health of the general public and to accurately record its scale. Since the plume typically reaches these cities early the next day, it is too late to warn citizens who live in small towns and rural areas in and around the northern Flint Hills of Kansas.

At our May 27 meeting on this subject, some EPA Region 7 and KDHE Bureau of Air personnel expressed skepticism that burning-related PM2.5 exceedances had occurred with significant frequency in the past. They are incorrect. Since 2002 fourteen such exceedances of the current standard of 35 ug/M3 have been recorded.

It is very likely that there have been other instances, but all the PM2.5 monitors in the vicinity of the Flint Hills have been filter-based and operated only every third day. For example, during the 2009 and 2010 burn periods, PM2.5 monitors in the vicinity of the Flint Hills were not operating on the same day that ozone exceedances were recorded in Wichita and Topeka which would have been indicative of heavy burning. Wichita hosts several PM2.5 filter-based monitors, but they all operate on the same day and thus provide no coverage on the intervening two days.

The same thing happened in 2015. The biggest burn day this year was April 10 that caused an ozone exceedance in Chanute on that day and ozone exceedances at two monitors when the plume reached Omaha the next day on April 11. All the relevant filter monitors in Kansas operated on April 9 and then again on April 12. So, just as in 2009 and 2010, all the filter monitors in the vicinity of the Flint Hills were not operating at the time that a PM2.5 exceedance most likely would have occurred.

We are mindful that KDHE has generally complied with EPA rules oriented toward monitoring ambient air in large population centers. The rules also provide for other monitors in areas believed to be relatively close to a violation. But how would KDHE & EPA know this in the vast areas of Northeast and North-Central Kansas that are downwind of the annual burning and rarely, if ever, monitored?
Conclusions

1. The intensive burning of rangeland in the Flint Hills occurs every year and can be reliably predicted to occur during a six-week period from March 15 to May 1.

2. The monitoring network is not designed to monitor a large area-source of dangerous pollutants that the Flint Hills becomes when rangeland is intensively burned on a large scale.

3. The network is not capable of measuring an exceedance of the ozone standard north of Wichita and west of Topeka associated with the Flint Hills burning, and is not capable of consistently warning the public on a timely basis.

4. The network is not capable of measuring on a timely basis an exceedance of the PM2.5 fine particle standard anywhere in the vicinity of the Flint Hills, and thus is not capable of adequately warning the public.

5. The network is not capable of providing public exposure data that would validate any assessment of health impacts in the vicinity of the Flint Hills.

6. The current monitoring plan violates the first principle of the Clean Air Act, i.e. to protect the public health.

7. The current monitoring network fails to provide equal protection to small-town and rural citizens downwind of the burning compared to the residents of large cities with robust monitoring capabilities.

According to the 2010 Kansas Statistical Abstract, some 613,000 people live in 24 Kansas Counties in the Flint Hills or immediately adjacent to the Flint Hills and in the path of the prevailing winds. This does not include Wichita or Sedgwick Co. This population will include children, the elderly, and people suffering from respiratory or cardiovascular disease who are particularly sensitive to air pollutants.

We have asked KDHE to revise the air quality monitoring system to remediate these deficiencies. KDHE states in their draft plan they are considering the location of continuous PM2.5 monitors in Wichita and Topeka. That would be helpful but does not go far enough. Considering the southerly winds typically extant during heavy burn days, continuous ozone and PM2.5 monitors are needed in Manhattan or Junction City to assess the plume moving due north of the burning and in Abilene or Salina to assess any plume moving to the northwest.

Some of the needed measurements could be accomplished with temporary or portable monitors that could be deployed elsewhere for special studies at other times of the year. However, a set of permanent monitors needs to be located in the vicinity of Manhattan and Junction City, which are known to be hit with heavy smoke most years. Some 24,000 students regularly attend Kansas State University in Manhattan. Ft. Riley near Junction City is a major military installation.

EPA is ultimately responsible for the enforcement of the Clean Air Act, and we expect the agency to provide a major share of financing for these improvements as may be appropriate.