Capture Lurking Blue Smoke

In Your Operation

by *AsphaltPro* Staff

Covering stockpiles helps keep moisture to a minimum, which reduces drying times and temps, thus reducing the risk of blue smoke generation. *Photos courtesy of Murphy Pavement Technology, Chicago.*

Baghouses, dust return systems, excellent production practices, well-maintained ductwork and other effective measures have changed the former sooty pictures of many decades ago into the clean, smoke-free hot mix asphalt (HMA) plants the asphalt industry can boast today. We're a clean industry. Despite our good work and care for the air, every once in a while, a bit of steam rises and a public relations nightmare can ensue. Your industry peers discuss that steam here and offer ways to capture any negative smoke that might lurk around your operation.

Not all emissions are bad. Water vapor might worry the neighbors, thus should be addressed, but it doesn't contain harmful compounds. Blue smoke is another issue.

"Blue smoke consists mostly of volatile organic compounds (VOCs), which are present in conventional and RAP mixes," Owen McCormick said. He is the president of Joseph McCormick Construction Co., Inc., Erie, Pa. He explained that more and more companies funnel the blue smoke vapor back to the burner. For that kind of solution, he recommends "well-designed duct systems with fan(s) and dampers to direct blue smoke back to burner for incineration."

In addition to the Butler-Justice blue smoke capture system on the market today, McCormick listed a variety of systems that can do the job he's suggested.

- Astec Fiber Bed System
- Scavenger System
- Media-Type Filtration System
- Vapor Recovery System
- Counterflow Dryer/Mixers

A producer in the northeast suggested that condenser systems the company has experienced on batch pants have proved "messy and expensive." Instead, "we would look at a hood/fan to discharge back to the burner/combustion area."

The ideas so far focus on the capture of blue smoke, but there are also ideas for reducing stray emissions. Most of the industry experts we contacted saw warm-mix asphalt (WMA) production as a positive fix for emission reduction.

"At N.B. West Contracting, we have seen that using Evotherm 3G warm mix additive allows us to turn down the temperature because the chemical additive 'ties up' the residual moisture in the mix," Steve Jackson said. He's the manager at N.B. West Contractors, Sullivan, Mo., which has a feature article detailing their WMA process and projects in the August/September issue of *AsphaltPro*. "Even with polymer modified asphalt we are able to drop our temperature 50 degrees Fahrenheit when making warm-mix asphalt."

As the experts at Terex show on page 16, temperature reductions also mean cost savings.

One way to reduce emissions that comes with cautionary warnings from industry experts is "turn the temperature down." This maneuver can have production and quality ramifications, thus should be considered carefully. For instance, Jay Winford Jr., the president of Prairie Contractors, Inc., Opelousas, La., warns producers that emissions may be a sign of fighting or burner problems at the plant. Turning down the temperature may solve the issue of smoke, but masks the other issues.

Chris Lange, the production manager at Brisbane City Works, Brisbane, Queensland, Australia, agreed that turning down the production temperature is an option, but suggested caution for the following reasons:

- Binder viscosity and ability to coat aggregate
- Compaction complications in the field
- Project specifications

Tim Murphy, the proprietor of Murphy Pavement Technology, Chicago, recommends against turning production temperatures down. "You lose wetting action of the virgin AC. Therefore you have a decreased ability to properly coat the aggregates uniformly."

As contractors know, lower mix temperatures result in a shorter work zone. "For conventional and RAP mixes, lower temperatures can cause poor workability, which could lead to

Here a high CFM fan pulls errant smoke off the slat conveyor for return to the burner and incineration. *Photo courtesy of Murphy Pavement Technology, Chicago.*

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compaction problems or difficulty," McCormick reminded readers. "The quality of the job would be greatly reduced."

Jackson concurred. "Turning the temperature down does not work when you are using Reclaimed Asphalt Shingles (RAS) and RAP in your mixes. Mixes that incorporate recycled products tend to be stiffer and more difficult to compact so higher temperatures are needed to achieve density. My other concern is that lowering the temperature will lead to tender mix behavior since the aggregate, shingles and RAP may not be effectively dried. The residual moisture could lead to the mix moving under the rollers during compaction."

One producer in the northeast reminded producers that job specs may not allow changes. That source suggested that the plant must adhere to the temperature range requirement for the job mix formula (JMF).

Another method for reducing blue smoke that comes with less contention is changing where material enters the drum.

"Introduce RAP/AC into the mix away from burner and hot exhaust gases," McCormick advised.

There are other best practices producers can put in place to reduce blue smoke emissions. As Jackson hinted above, controlling moisture is important for controlling blue smoke. Murphy continued that thought. "Manage moisture content by not crushing in the rain, by covering conveyor belts and by housing the RAP."

Winford suggested some simple maintenance. "I would adjust lighting, change RAP percentage and check that the burner is tuned up and operating properly with full combustion."

Additives are another area of concern for McCormick. "Whenever possible, avoid use of anti-strips. They cause increased blue smoke. It will alter the chemical composition of asphalt cement. Avoid excessive mix temperatures when running RAP and enclose areas where material is transferred into trucks or silos."

Overall, the asphalt industry has turned itself into an environmentally friendly community that works to produce a clean, safe, efficient product. When the occasional vapor escapes, water can be to blame. Or, in some cases, something volatile and organic can be involved. If you experience blue smoke, the tips your peers offer here can help solve that problem. AP