And the Good News Is…

Science Adds To Case Creosote-treated Wood Safe To Use

By Jim Gauntt

In the face of recent politically motivated (read: not scientifically based) legislative actions in New York and New Jersey that restrict new installations of creosote-treated marine and foundation piling, it is important to remain focused on the important facts.

First, it should be noted that when creosote-treated wood products are chosen for use in industrial applications, this use occurs because the life cycle economics and performance of the material combine to make it the best choice for the intended application.

Railroads, in particular, have a storied history with this fact. It is the reason that creosote-treated wood ties are still chosen today for more than 93 percent of all railroad track applications in the United States and Canada each year. Over the years, many have even pointed to the economy-of-use and long-life of treated wood as a reason that North American railroads remain one of the most cost efficient means of transporting freight in the world.

Second, creosote not only preserves the wood, but in doing so helps to conserve one of America's most important natural resources, the nation's forests. With each creosote-treated wood product lasting six to 10 times longer than the expected life of untreated wood in the same application, this remarkable preservative has over the years had an astounding effect on the wise use of renewable, but not unlimited, forest resources.

But, most importantly, it must be pointed out that creosote and creosote-treated wood remain safe to use when labeling and guidelines approved by the U.S. Environmental Protection Agency (EPA) and to the north, the Pest Management Regulatory Agency, which is part of Health Canada, are followed.

Numerous studies over the years by Dr. Kenn Brooks for both government and industry entities have shown creosote's benign nature and fate in the environment. Several aquatic studies, including the Sooke Basin Study for Environment Canada and the first of its kind study for Commonwealth Edison on the migration of poly-aromatic hydrocarbon (PAH) from creosote-treated wood crossties, document the fate of creosote in the environment. So much work has been done in this area that Brooks was able to construct a predictive model for PAH fate in the environment occurring from applications of creosote-treated wood.

The model and these Brooks studies clearly show that creosote-treated wood poses little or no risk to the environment when used according to best management practices (see www.rta.org, "Environmental Publications," and the Western Wood Preservers Institute website, www.wwpinstitute.org, "Aquatics," for complete studies, models and citations). These studies are valid as stand-alone entities, but it is noteworthy that they are yet undergoing another rigorous process with the expectation of publication in peer reviewed scientific journals.

Now some of the most significant worker-related research ever conducted confirms that creosote can be handled safely by those who work closest to it. One of these studies conducted by Dr. Otto Wong, an epidemiologist affiliated with Applied Health Sciences in California and Tulane University in New Orleans, concluded that there is no evidence that individuals who work with creosote have any increased risk of death from cancer. In fact, these studies by Wong and others, including the National Cancer Institute, show that those who work daily with creosote have no statistically significant evidence of increased risk of cancer or other adverse health effects (source: Creosote Council Fact Sheet Wong/Harris Study, www.creosotecouncil.org).

This recently published peer reviewed study (Wong and Harris, *Journal of Occupational and Environmental Medicine*, Vol. 47, pages 683-697, July 2005) was conducted with the help of more than 2,100 employees of 11 creosote-treating plants across the country. Some of the workers began working in these plants as early as the 1940s ▶

and 1950s. The study reached these very specific conclusions:

Mortality Of Workers Exposed To Creosote – Wong & Harris Study

- Average length of employment was 12.5 years.
- One-third of the study subjects were employed for more than 15 years.
- No evidence of increased cancer mortality relative to the general population.
- No evidence of increased mortality from non-malignant diseases.
- No evidence that workers exposed to creosote have a higher than average mortality rate from any cause.
- Results found to be consistent with European studies.
- Results found to be consistent with other U.S. studies.

This landmark research thus adds significant evidence to the body of safety-related research on creosote and makes it reasonable to assume that the potential risk to others who come in contact with creosote-treated wood, such as railroad workers and the general public, is negligible.

Furthermore, new additional research conducted at E.I. du Pont de Nemours and Company Haskell Laboratory for Health and Environmental Sciences for the Creosote Council, which is being prepared for peer review, challenges aggressive risk assessment models used in assessing dermal absorption of creosote. An *in vivo* (live) study of rats and a separate follow-up *in vitro* (test tube) study using rat and human cadaver skin were recently completed with liquid creosote.

The *in vivo* study showed that when in direct contact with the skin of a rat, liquid creosote could be absorbed systemically, but not as rapidly or as completely as previously estimated. It was observed and measured that after eight hours of direct dermal exposure only 8.85 percent of the applied creosote dose was absorbed during the subsequent three-week period in the test subjects. This is far less than had been previously postulated by others with an interest in transdermal exposure research.

The purpose of the *in vitro* study was to compare creosote absorption in identical test systems using skin samples of each species (rat and human). This study used the same ^{14}C -PAH/creosote test material as the *in vivo* rat-only study. The data from the *in vitro* study shows that over a similar eight-hour period creosote penetrated rat skin about 4.3 times faster than human skin, and that more creosote (about 4.4 times more) penetrated rat skin than human skin. Washing the skin samples after the exposure period removed 70.3 percent of the applied dose from human skin and 12.8 percent of the applied dose from rat skin. Thus the total absorbable creosote dose was 4.24 percent for human skin and 34.3 percent for rat skin. The conclusion from this study is that rat skin is approximately eight times more permeable to creosote than human skin.

Both studies taken together suggest that transdermal absorption of creosote on human skin is about 1.1 percent. This is substantially lower than the nearly 50 percent absorption rate estimated by US EPA and used in their draft creosote risk assessments.

So even though the misguided in New Jersey and New York may have capriciously limited the use of this outstanding product in marine and foundation piling, for those who operate in a world based on facts, not fiction, it's comforting to know that the science is firmly on the side of creosote's continued safe use. §