

August 25, 2014

Dr. Willie E. May  
Director  
National Institute of Standards and Technology  
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Stop 1070  
Gaithersburg, MD 20899-1070  
Via email: [wem@nist.gov](mailto:wem@nist.gov)

Dear Dr. May,

I am writing to express concern with the National Institute of Standards and Technology (NIST) study, “Corrosion of copper and steel alloys in a simulated underground storage-tank sump environment containing acid-producing bacteria<sup>1</sup>”. The report’s findings don’t reflect real-world conditions and are being misconstrued. There is also considerable misleading and inaccurate information regarding ethanol’s impact on the U.S. motor fuel market.

First, the NIST study fails to demonstrate any connection between the study’s test conditions and real-world UST system operating conditions that have experienced flash corrosion phenomena. Research did not include investigating the typical operating environment of a submersible turbine pump sump or underground storage tank. Therefore, the test method and test chamber could not “simulate” all of the possible operating environments for sump pumps. The NIST analysis may be useful when examining acidic corrosion pathways in a lab, but the findings are woefully inadequate and fail to correlate to today’s real-life fueling infrastructure, fuel composition and general storage environment.

Second, the implication in the study is that this corrosion occurs at every site. That is simply not true. The researchers know that the corrosion phenomenon appears to happen almost randomly, which is partially why the original research was conducted. This statement: “we know there are corrosion issues associated with the inside of some tanks.”, gives the appearance that steel tanks are failing from corrosion due to ethanol.

Third, there appears to be a fundamental lack of understanding of today’s liquid motor fuel market and retail fuel system environments in this study. Reference

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<sup>1</sup> J.W. Sowards, E.Mansfield, Corrosion of copper and steel alloys in a simulated underground storage-tank sump environment containing acid-producing bacteria. Corrosion Sci. (2014), <http://dx.doi.org/10.1016/j.corsci.2014.07.009>

assessments of biodiesel and biodiesel blends (References 3, 4) for the statement “the current fuel infrastructure was designed for unblended gasoline...” are immaterial as biodiesel is not blended into gasoline.

Fourth, we are seriously concerned with the test fluids utilized in the study. The extreme low pH used by NIST are nearly 50% less than the pH reported by the state field inspectors<sup>2</sup>. As one would expect, these low pH precipitate corrosion of several types, but there is no evidence that a constant supply of a 5% ethanol solution would be present in today’s fuel systems to sustain the microbial growth used to initiate the corrosion. There is no plausible pathway discussed in the study to link the synthesized corrosion conditions described to events taking place in the marketplace today.

Importantly, we are troubled by NIST’s accompanying press release, which misconstrued the study’s findings and thus served to undermine any of the report’s credibility. As a highly respected government organization, I was surprised by the sensationalism of the press release NIST Corrosion Lab Tests Suggest Need for Underground Gas Tank Retrofits, which mistakenly identified the need for “underground gas tank retrofits” while the study did not investigate retrofit equipment nor the ability of a retrofit mechanism to mitigate corrosion. Further, the tone and tenor of the press release served to vilify ethanol by pointing to irrelevant copper and steel analysis on acetobacter induced corrosion in the presence of ethanol.

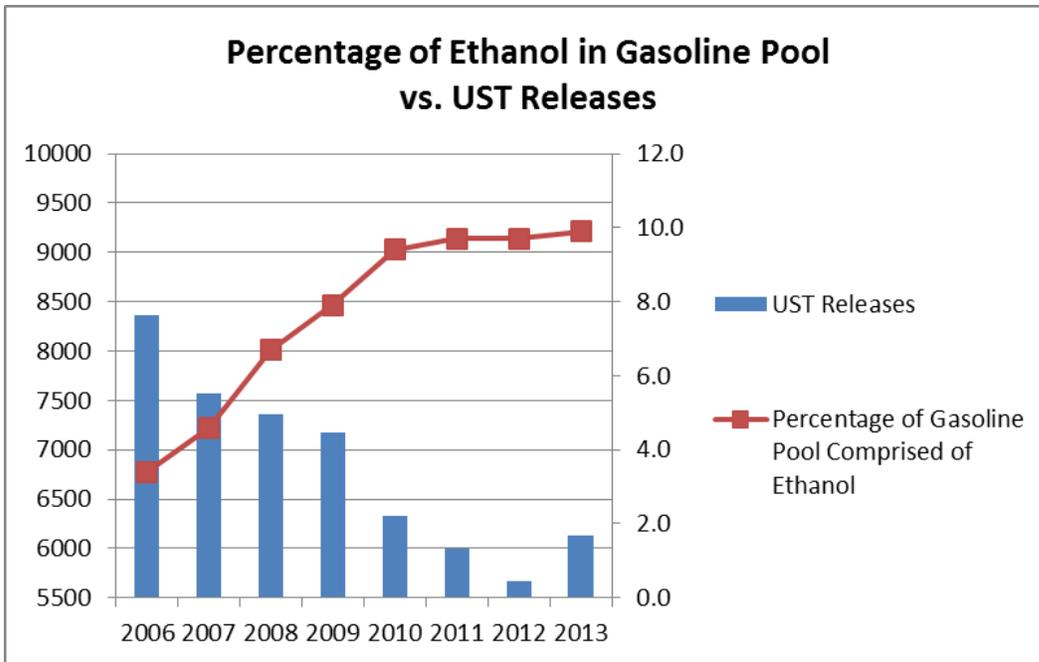
Today, nearly all unleaded gasoline in the United States contains 10% ethanol (by volume)<sup>3</sup> which means that nearly all of the filling stations receive, store and dispense ethanol blended fuels out of at least one storage tank. A strong indication of the successful compatibility of gasoline storage and handling equipment at retail is the year-end report from EPA’s Office of Underground Storage Tanks (OUST). For the last several years, EPA has documented record low numbers of UST releases.<sup>4</sup>

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<sup>2</sup> S. Pollock. Accelerated corrosion of UST equipment (an ethanol hangover) in 23<sup>rd</sup> National Tank Conference 2012.

<sup>3</sup> Renewable Fuels Association, Annual Industry Outlook, 2013.

<sup>4</sup> <http://www.epa.gov/oust/cat/camarchv.htm>



These record low petroleum releases from UST systems come exactly at the same time that ethanol's presence in gasoline is at an all-time high, demonstrating the success of ethanol's increasing role in the gasoline pool.

We look forward to your reply to our concerns and comments and hope that a more accurate reflection of ethanol's impact on USTs will be forthcoming from the agency.

If you should have any questions, please do not hesitate to contact me via email at [kmoore@ethanolrfa.org](mailto:kmoore@ethanolrfa.org) or via telephone at (309) 830-6154.

Respectfully,

Kristin Moore  
Vice President of Technical Services