Education and Discovery
At the Interface of Technology, The Environment, and Public Health

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Lyles School of Civil Engineering Advisory Board
Mission:
Develop the next generation of scientists and engineers knowledgeable to solve the growing number of complex infrastructure, public health, and environmental challenges.

Education Actions
- FASTCE
- NESCC and ILSI Expert Panels
- Industrial workshops & conferences

Research
- Infrastructure materials
- Polymer degradation
- Aquatic chemistry
- Water distribution
- Water quality & treatment
Education: Many Utility, Consulting, Regulatory, Infrastructure Design and Construction Professionals Lack a Basic Understanding of Plastics

Typical Water Infrastructure University Course Content
Water and wastewater treatment
Water distribution modeling
Water chemistry
Environmental science
Hydraulics
Timber, concrete, asphalt, steel
Statics, Dynamics, Deforms
Construction management
Soil mechanics
Corrosion science

Needed Expertise but Not Available
Polymer Chemistry
Polymer Engineering
Surface Science

We lead plastics training workshops to educate professionals
OUR PROJECT GOAL: To better understand and predict building drinking water quality and health risks posed by declining water usage and low flows.

- Educational Institutions
- Architecture and Building Design Firms
- Water Utilities
- Construction, Water, Health, and Environmental Associations and Networks
- Technology Companies
- Government Agencies
An important aspect of our work includes direct engagement with the public and practicing professionals.
WE WILL determine:
(1) The scope of the problem across departments of transportation (DOTs) (i.e., the extent of use of these technologies and the scale of their impacts to water quality);
(2) The effectiveness of existing construction specifications at minimizing contaminant release from rehabilitated culverts; and
(3) The degree to which the structural integrity and longevity of rehabilitated culverts are compromised by chemical leaching.
Contamination and Decontamination of Potable Water Infrastructure, 2014-2017
RAPID Response: Chemical Air Emissions from Cured-in-Place-Pipe (CIPP) Water Pipe Repair Activity, 2016-2017

1) Conduct air sampling and analysis for Indiana and California CIPP pipe repair sites
2) Examine the resin’s chemical composition
3) Characterize materials emitted and their magnitudes
4) Identify any worksite safety issues
What are the Cured-in-Place-Pipe (CIPP) Risks to Human Health and the Environment?

Trenchless technology: “No Dig” “No Excavation”
Resin impregnated tube hardened in a broken pipe
Curing method: Hot water, Steam, UV light
Deliberate curing time: Hours to many days
Chemical Plumes Generated by CIPP can Escape the Pipe Being Repaired and Enter Nearby Buildings

Existing CIPP Chemical Emission Air Data is Very Limited

Discharge into residential area
Contractor and Utility Quotes about CIPP

“Styrene vapor of at most few ppm”
“Is not a human health risk”
“Is safe for people and animals”
“No hazardous conditions posed”
“50 ppm styrene is safe exposure level”
“Open windows to allow ventilation”
“Place plastic bags filled with water and wet towels over drains/sinks/toilets”
“Pour 1 gallon, 1-2 cups water down drains”
“Some people are offended by this odor and are fearful of it; even though the concentrations they smell present no harm”
Engineer’s CODE OF ETHICS, Fundamental Canon I
Engineers, in the fulfillment of their professional duties, shall: Hold paramount the safety, health, and welfare of the public.