**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

Lead Agency (FHWA or State DOT): FHWA

**INSTRUCTIONS:**

*Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.*

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| **Transportation Pooled Fund Program Project #***(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* | **Transportation Pooled Fund Program - Report Period:**XQuarter 1 (January 1 – March 31)□Quarter 2 (April 1 – June 30)□Quarter 3 (July 1 – September 30)□Quarter 4 (October 1 – December 31) |
| **Project Title:**Contaminant Release from Storm Water Culvert Rehabilitation Technologies: Understanding Implications to the Environment and Long-Term Material Integrity |
| **Name of Project Manager(s):**Bridget Donaldson | **Phone Number:**434-293-1922 | **E-Mail**Bridget.donaldson@vdot.virginia.gov  |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):** | **Project Start Date:**3/2/2016 |
| **Original Project End Date:**2/28/2018 | **Current Project End Date:**2/28/2018 | **Number of Extensions:**0 |

Project schedule status:

X On schedule □ On revised schedule □ Ahead of schedule □ Behind schedule

Overall Project Statistics:

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|  **Total Project Budget** |  **Total Cost to Date for Project** |  **Percentage of Work**  **Completed to Date** |
| $630,000.00 | $241,361.47 | 38% |

***Quarterly*** Project Statistics:

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| **Total Project Expenses****and Percentage This Quarter** | **Total Amount of Funds****Expended This Quarter** | **Total Percentage of****Time Used to Date** |
| $115.185.44 | $115.185.44 | - |

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| **Project Description**:Studies by a subset of DOTs have discovered that the installation of advanced polymeric materials such as spray-on coatings and cured-in-place lining (CIPP) processes can release toxic chemicals into the water conveyed by the culverts. Numerous additional anecdotal accounts from the U.S and other countries have been reported regarding adverse effects to the environment and wastewater facilities. DOTs lack information on the degree that chemical leaching affects polymeric material long-term structural performance. Recent studies have shown some of the chemicals released into the environment by culvert rehabilitation polymeric materials are product ingredients intended to promote material strength and durability.The primary project objectives are to determine the following: (1) The scope of the problem across 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. Results of this project will enable DOTs to make informed decisions with regard to culvert rehabilitation selection and specification development. |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**This Progress Report summarizes Year 1 progress.**Task 1: The problem scope across DOTs (i.e., the extent of use of these technologies and the scale of their impacts to water quality)*** Task complete
* Results were published in a peer-reviewed OPEN ACCESS *Journal of the American Water Works Association* paper.

*Critical Review: Surface Water and Stormwater Quality Impacts of Cured‐In‐Place Pipe Repairs* by Kyungyeon Ra, Seyedeh Mahboobeh Teimouri Sendesi, John A. Howarter, Chad T. Jafvert, Bridget M. Donaldson, Andrew J. Whelton, May 2018, Access at: <https://doi.org/10.1002/awwa.1042> * Results will be integrated as part of the final report

**Task 2: The effectiveness of existing construction specifications at minimizing contaminant release from rehabilitated culverts** * Field work complete, analyses ongoing.
* Some results were published in a peer-reviewed OPEN ACCESS *Journal of the American Water Works Association* paper.

*Critical Review: Surface Water and Stormwater Quality Impacts of Cured‐In‐Place Pipe Repairs* by Kyungyeon Ra, Seyedeh Mahboobeh Teimouri Sendesi, John A. Howarter, Chad T. Jafvert, Bridget M. Donaldson, Andrew J. Whelton, May 2018, Access at: <https://doi.org/10.1002/awwa.1042> * Results will be integrated as part of the final report

**Task 3: The degree to which the structural integrity and longevity of rehabilitated culverts are compromised by chemical leaching*** Optimizing methods for characterizing CIPPs removed from the field
* Field work complete, analysis ongoing
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| **Anticipated work next quarter**:Anticipated work for the remaining project period is outlined below. Year 3Task 1:* None, task complete

Task 2: * Interpret results for sites monitored, include results in report
* Conduct bench-scale experiments

Task 3: * Interpret results for sites investigated, include results in report
* Conduct bench-scale experiments

Planning ahead* Project team will draft a report to be delivered
* Project team will discuss next steps with member states
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| **Significant Results:**A critical review of available CIPP chemical emissions literature for the environment was conducted, presented, and published in a scientific journal. 32 DOTs were contacted as part of that study. Results presented were independently reviewed by experts in the field not affiliated with the authors or the DOT project. Therefore, the resulting publication was externally reviewed.Results of that effort are significant. A variety of recommendations were determined appropriate for DOTs to improve their ability to limit the possibility contractors contaminate the environment, cause fish kills, odor incidents, and long-term environmental contamination. All DOTs should consider implementing the recommendations. A summary of the report is shown below. Specific recommendations can be found in the report (cited above with a weblink).SUMMARY: Utilities, regulators, and health officials have raised environmental, occupational, and public health concerns regarding chemical emissions into air and water from CIPP installations. To better understand emissions into water, available literature was reviewed. Water contamination has been documented in 10 states and Canada because of the release of uncured resin, solvents, manufacturing byproducts, and wastes during and after construction. Odor, fish kill, and drinking water contamination incidents have been reported. The few field‐ and bench‐scale studies available show that a variety of volatile organic compounds (VOC) and semivolatile organic compounds (SVOC) have been released into water and contamination was detected for several months. CIPP waste was acutely toxic to aquatic organisms. Chemical release is likely influenced by formulation, installation, and environmental conditions. CIPP installation and inspection recommendations were suggested. Studies are needed to develop evidence‐based construction and monitoring practices to minimize risks. |
| **Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that** **might affect the completion of the project within the time, scope and fiscal constraints set forth in the** **agreement, along with recommended solutions to those problems).**Testing was to be conducted at a KDOT CIPP site, but upon discussion with KDOT and the CIPP contractor, the CIPP contractor indicated that they could not guarantee when they would do the CIPP installation during a 2 week period. The contractor was aware Purdue University would be conducting the testing for KDOT. As a result, Purdue University and KDOT were unable to confirm a date for travel to Kansas to conduct testing. Remaining activities involve completing the reports for field work as well as bench-scale experiments and reports. A final report will be prepared and delivered. |
| **Potential Implementation:** The project team has had discussions with member states about implementation.  |