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.

Transportation Pooled Fund Program Project #	Transportation Pooled Fund Program - Report Period:
TPF-5(256)	☐ Quarter 1 (January 1 – March 31) 2014 ☐ Quarter 2 (April 1 – June 30) 2014 ☐ Quarter 3 (July 1 – September 30) 2014 √ Quarter 4 (October 1 – December 31) 2014

Project Title:
HY-12 Storm Drain Hydraulic Analysis Program - Phase Two of Development Efforts

Name of Project Manager(s): *Kornel Kerenyi*	Phone Number: *(202) 493-3142*	E-Mail *kornel.kerenyi@fhwa.dot.gov*
Lead Agency Project ID:	**Other Project ID (i.e., contract #):**	**Project Start Date:**
Original Project End Date:	**Current Project End Date:**	**Number of Extensions:**

Project schedule status:

√ On schedule ☐ On revised schedule   ☐ Ahead of schedule   ☐ Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date

***Quarterly* Project Statistics:**

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date

Project Description:
Background:
 HY-12 is a computerized implementation of FHWA pavement drainage and storm drain hydraulic design approaches and methodologies. The primary technical references for this software are the FHWA publications "Hydraulic Engineering Circular 22: Urban Drainage Design Manual, Third Edition"; [Publication FHWA-NHI-10-009]"; "Hydraulic Design Series 2, Highway Hydrology, Second Edition"; [Publication FHWA-NHI-02-001], "Hydraulic Design Series 4, Introduction to Highway Hydraulics"; [Publication FHWA-NHI-08-090, 2008 Revision], and "Hydraulic Engineering Circular 24, Highway Storm Water Pump Station Design"; [Publication FHWA-NHI-01-007, 2001 Edition].

 In 2009 FHWA contracted with AQUAVEO to develop a 32-bit non-proprietary software product, designated as HY-12, for the analysis and design of storm drains associated with transportation systems. This HY-12 software will replace a 16 bit FHWA program called PFP-HYDRA. The contract with AQUAVEO did not require development of a graphical user interface, GUI, as part of software development.

 A stand-alone BETA version of HY-12 has been completed and successfully tested using the required input format of a text document using Notepad. The myriad of situational applications and user controlled options available through HY-12 provides a difficult and lengthy learning curve for efficient implementation with the current text document input format. Numerous State DOT Hydraulic Engineers have voiced their needs for a stand-alone HY-12 product with a graphical user interface to ensure an effective and efficient implementation.

 FHWA anticipated the HY-12 software would be implemented with only one phase to the development process; however, State DOT's have requested initiation of a second phase to develop a GUI for a more efficient and successful implementation.

Objectives:
 The objective of this research effort is to develop a graphical user interface, GUI, for the HY-12 storm drain software. The effort would be funded by FHWA and other State DOT contributors (PFP members).
Scope of Work:
 The anticipated scope of work consists of continued development efforts on the HY-12 software and an accompanying GUI.
   The project will consist of the tasks described below. Where possible the tasks may be developed concurrently. Some tasks may require technical review and approval by PFP members before any programming efforts.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

GUI
Task 1 – Kick-off meeting and progress meetings
   No additional meetings have been held since the kick-off meeting. We feel a progress meeting should be held in January.

Task 2 – Project work plan
   A draft of this plan is complete. It can be reviewed at progress meetings and modified as development continues.

Task 3 – Existing issue resolution (75% complete)
a. Remove extra lines from properties dialog. (Done)
b. Resolve problem with rational method runoff coefficient. (25%)
c. Compute rational method Tc values to floating point precision (25%)
d. Improve filename management (Not Yet Started)
e. Remove Storm Drain-FHWA (HYDRAIN) coverage from WMS. (Not Yet Started)
f. Convert the results plot to a modeless dialog. (Done)
g. Change "River Module" name to "Hydraulic Modeling Module". (Done)

Task 4 – Interface enhancements
a. Simplified Project Parameters dialog simple and advanced user interface option. (Done)
b. Simplified Link Properties dialog to edit several pipes in a single dialog spreadsheet. (Done)

c. Simplified Node Properties dialog to edit several access holes/inlets and other node attributes in a single spreadsheet. (Done)
d. Multiple Storm Drain Networks. (Not Yet Started)
e. Link/Node Elevation Profile View Editor. (50%)
f. Rewrite the copy protection in WMS to handle the "Free" version. (50%)

Task 5 – Tutorials
a. Illustrate how to model a storm drain network with a background map. (25%)
b. Illustrate how to model a storm drain network with a DGN or DWG file. (Not Yet Started)
c. Illustrate how to model a storm drain network without a background map. (Not Yet Started)

Task 6 – GUI tests and sample cases
Create GUI tests for various design scenarios. (25%)

Task 7 – Finalize GUI/Respond to comments
a. Deliver product and respond to feedback. (Not Yet Started)
b. Documentation updates. (30%)

GUI Enhancement and Pump Station

A hydraulics computation consultant started working on the Graphic User Interface (GUI) of HY-12. Tasks are listed below:

Product: The HY-12 model which simulates storm drain networks and urban drainage systems was developed between 2008 and 2010. A graphical user interface (GUI) to facilitate input data visualization and formatting as well as model result visualization and analysis is under development. The model sponsors have expressed an interest in adding functionality to both the model and the interface to benefit all potential users of HY-12.

In response to this, Aquaveo proposed the addition of a new module to the HY-12 engine as well as additional enhancements to the GUI. FHWA sponsors of HY-12 have requested a work description, cost estimate and schedule of delivery for these tasks. This document provides this information. These tasks include:

1. Add a pump station module to the HY-12 program to incorporate the following features):
2. Add file I/O support for pump stations and add them to the report output
3. Define graphical user interface components for pump station components and management.
4. Unit Tests and UI Tests for the pump module
5. Enhance the GUI for the HY-12 program.
6. Documentation of functions in both HY-12 and WMS
7. Develop and conduct a 2-hour webinar for a national audience to demonstrate the HY-12 GUI and provide a recording of this webinar for posting.
8. Project Meetings

Anticipated work next quarter:

- Continue working on tasks shown above

Significant Results:

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).

None to report.

Potential Implementation: