

Moved by Mr. Rich,

Seconded by Mr. White that,

WHEREAS, pursuant to 33.1-12(5) the Board may enter into contracts with the United States Government; and,

WHEREAS, it is proposed that an agreement be entered into between the Board, acting by and through the Virginia Department of Transportation, and U. S. Geological Survey, United States Department of the Interior, for the investigation of water resources in the Commonwealth to provide for the collection of flood information used in flood frequency determinations and to document flood data for future bridge sites; and,

WHEREAS, it is proposed that an agreement be entered into between the Board, acting by and through is the Virginia Department of Transportation, and U. S. Geological Survey, United States Department of the Interior, for the investigation of water resources in the Commonwealth to estimate flood hydrographs from small drainage basins and evaluation of the use of dimensionless hydrographs to estimate runoff volumes; and,

WHEREAS, subject to the availability and appropriation of funds the Board believes that it is appropriate to enter into these agreements.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby authorizes the Commissioner to enter into said agreements.

Motion Carried
8-21-97

Matthews, John H., P.E. (VDOT)

From: Long, Janice S. (VDOT)
Sent: Monday, October 06, 2014 4:11 PM
To: Matthews, John H., P.E. (VDOT)
Cc: Keen, Susan P.E. (VDOT); Bragdon, Jeffrey (VDOT)
Subject: RE: Fiscal Review: Cooperative Agreement - U.S. Geological Survey and VDOT

John,
I have no recommendations for changes to this agreement.

Janice S. Long, CIA, CPA

VDOT Controller
Fiscal Division
804-786-6373; FAX 804-225-3651
Janice.Long@VDOT.virginia.gov

From: Matthews, John H., P.E. (VDOT)
Sent: Tuesday, September 23, 2014 9:56 AM
To: Long, Janice S. (VDOT)
Cc: Matthews, John H., P.E. (VDOT); Keen, Susan P.E. (VDOT); Bragdon, Jeffrey (VDOT)
Subject: Fiscal Review: Cooperative Agreement - U.S. Geological Survey and VDOT

Ms. Long,
I am submitting for your review a copy of a cooperative agreement with the U.S. Geological Survey to maintain stream gages and collect data pertinent to the design of highway drainage structures. The agreement must be renewed annually. The cost to the Department is \$50,000 and will be funded from Location & Design's overhead budget. A copy of the agreement is attached.

This agreement is also being submitted to the Attorney General's office for review. In order to keep this program active we need comments from Fiscal Division back no later than Friday October 3, 2014.

If you have questions or additional information is needed please let me know. Thank you for your assistance.

<< File: 2014 USGS VDOT JFA.pdf >>

John H. Matthews, PE
Assistant State Hydraulic Engineer
Virginia Department of Transportation
Tel: 804-786-4031 Fax: 804-786-1788
John.Matthews@VDOT.Virginia.gov



COMMONWEALTH of VIRGINIA


Office of the Attorney General

Mark R. Herring
Attorney General

900 East Main Street
Richmond, Virginia 23219
804-786-2071
FAX 804-786-1991
Virginia Relay Services
800-828-1120
7-1-1

PRIVILEGED AND CONFIDENTIAL
ATTORNEY-CLIENT COMMUNICATION

TO: John H. Matthews, P.E., Assistant State Hydraulic Engineer
Virginia Department of Transportation, Location and Design Division

FROM: Lori L. Pound, Assistant Attorney General 
(804) 692-0549

DATE: October 7, 2014

RE: U.S. Department of the Interior, U.S. Geological Survey
Joint Funding Agreement for Investigation of Water Resources

The following is not an official opinion of the Attorney General nor endorsement of the terms/conditions of the captioned agreement. Our review addresses your legal authority to agree to the terms/conditions contained in the subject document. The wisdom of the agreement's terms/conditions is by law singularly addressed to your discretion. Accordingly, before executing the agreement incorporating any recommended changes to all copies thereof, please be certain that: (1) the agreement has been read and accepted by all appropriate personnel of the agency; (2) any funds needed have been duly authorized and set aside; (3) the agreement will be signed by a person authorized; and (4) any required procurement/capital outlay procedure has been followed, including obtaining required approvals (e.g., General Services/Department of Information Technology). Once the agreement is signed, be certain that all appropriate officials/employees are notified of conditions/terms concerning contract performance. Any uncertainty as to the foregoing should be raised with counsel before executing. Please retain this document in your contract file.

 X

APPROVED AS TO FORM



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
1730 East Parham Road
Richmond, Virginia 23228

July 30, 2014

Mr. John Matthews
Virginia Department of Transportation
Location and Design Division
1401 East Broad Street, Room 609
Richmond, VA 23219

Dear Mr. Matthews:

Attached are two original copies of Joint Funding Agreement for published urban runoff regression equations, peak flow monitoring network maintenance, and preliminary maximum likelihood probabilities of peak flow events. Please sign all copies; return one signed original and retain the other for your records. Work cannot be continued or started until we receive the signed agreement.

Work performed with funds from this agreement will be conducted on a fixed-price basis. The Virginia Department of Transportation will be billed one-fourth of the agreement at the end of each quarter. The results of all work under this agreement will be available for publication by the U.S. Geological Survey.

We look forward to continuing our successful relationship.

Sincerely,

George E. Harlow, Jr.
Acting Director, USGS Virginia
Water Science Center

Enclosure

**U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

Customer #: 6000001626
Agreement #: 14ENVALM0000063
Project #: GC14LM00001000...
TIN #: 54-6001730
Fixed Cost Agreement YES

JOINT FUNDING AGREEMENT

FOR
INVESTIGATION OF WATER RESOURCES

THIS AGREEMENT is entered into as of the, 30th day of July, 2014 by the U.S. GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the VIRGINIA DEPARTMENT OF TRANSPORTATION, party of the second part.

1. The parties hereto agree that subject to availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation for published urban runoff regression equations, peak flow monitoring network maintenance, and preliminary maximum likelihood probabilities of peak flow events, herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50; and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) includes In-Kind Services in the amount of \$0.00

(a) by the party of the first part during the period

| Amount | Date | to | Date |
|-------------|--------------|----|---------------|
| \$48,225.00 | July 1, 2014 | | June 30, 2015 |

(b) by the party of the second part during the period

| Amount | Date | to | Date |
|-------------|--------------|----|---------------|
| \$50,000.00 | July 1, 2014 | | June 30, 2015 |

USGS DUNS number 137784646, TAS number 144/50804

(c) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.

(d) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

- 7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.
- 8. The maps, records, or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records, or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program and, if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at costs, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records, or reports published by either party shall contain a statement of the cooperative relations between the parties.
- 9. USGS will issue billings utilizing Department of the Interior Bill for Collection (form DI-1040). Billing documents are to be rendered quarterly. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30 day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717; Comptroller General File B-212222, August 23, 1983).

**U.S. Geological Survey
United States
Department of the Interior**

Virginia Department of Transportation

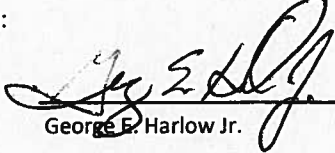
USGS Point of Contact

Customer Point of Contact

Name: Sam Austin
 Address: 1730 East Parham Rd.
 Richmond, VA 23228
 Telephone: 804-261-2620
 Email: saustin@usgs.gov

Name: Mr. John Matthews
 Address: Location & Design Division
 1401 East Broad Street, Rm 609
 Richmond, VA 23219
 Telephone: 804-786-4031
 Email: John.Matthews@VDOT,Virginia.gov

Signatures and Date

| | | | | | | | |
|------------|---|--------|---------|------------|-------|--------|-------|
| Signature: |  | Date: | 7/30/14 | Signature: | _____ | Date: | _____ |
| Name: | George F. Harlow Jr. | Name: | | Name: | | Name: | |
| Title: | Acting Director, USGS Virginia Water Science Cen... | Title: | | Title: | | Title: | |

| | | | | | | | |
|------------|-------|--------|-------|------------|-------|--------|-------|
| Signature: | _____ | Date: | _____ | Signature: | _____ | Date: | _____ |
| Name: | | Name: | | Name: | | Name: | |
| Title: | | Title: | | Title: | | Title: | |

**U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

Customer #: 6000001626
Agreement #: 14ENVALM0000063
Project #: GC14LM00001000...
TIN #: 54-6001730
Fixed Cost Agreement YES

JOINT FUNDING AGREEMENT

FOR
INVESTIGATION OF WATER RESOURCES

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(a) by the party of the first part during the period

| Amount | Date | to | Date |
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| \$48,225.00 | July 1, 2014 | | June 30, 2015 |

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| Amount | Date | to | Date |
|-------------|--------------|----|---------------|
| \$50,000.00 | July 1, 2014 | | June 30, 2015 |

USGS DUNS number 137784646, TAS number 144/50804

(c) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.

(d) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

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- 7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.
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**U.S. Geological Survey
United States
Department of the Interior
USGS Point of Contact**

Virginia Department of Transportation

Customer Point of Contact

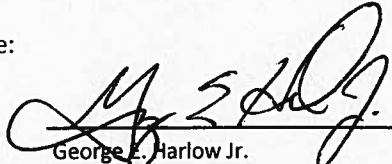
Name: Sam Austin
Address: 1730 East Parham Rd.
Richmond, VA 23228

Telephone: 804-261-2620
Email: saustin@usgs.gov

Name: Mr. John Matthews
Address: Location & Design Division
1401 East Broad Street, Rm 609
Richmond, VA 23219

Telephone: 804-786-4031
Email: John.Matthews@VDOT,Virginia.gov

Signatures and Date

| | | | | | | | |
|------------|--|--------|---------|------------|-------|--------|-------|
| Signature: |  | Date: | 7/30/14 | Signature: | _____ | Date: | _____ |
| Name: | George E. Harlow Jr. | Name: | _____ | Name: | _____ | Title: | _____ |
| Title: | Acting Director, USGS Virginia Water Science Cen... | Title: | _____ | Title: | _____ | Title: | _____ |

| | | | | | | | |
|------------|-------|--------|-------|------------|-------|--------|-------|
| Signature: | _____ | Date: | _____ | Signature: | _____ | Date: | _____ |
| Name: | _____ | Name: | _____ | Name: | _____ | Title: | _____ |
| Title: | _____ | Title: | _____ | Title: | _____ | Title: | _____ |

Joint Funding Agreement between USGS and VDOT

USGS Contact: Samuel H. Austin, Hydrologist
Mobile Phone Number: (804) 461-0689
e-mail address: saustin@usgs.gov

VDOT Contact: John H. Matthews, PE
Phone Number: (804) 786-4031
e-mail address John.Matthews@VDOT.Virginia.gov

Duration: 1 year. July 1, 2014 through June 30, 2015.

Funding: \$98,225 (VDOT: \$50,000; USGS: \$48,225).

Sources of Funding: Virginia Department of Transportation (VDOT), US Geological Survey(USGS).

This Joint Funding Agreement is intended to support hydrologic and hydraulic studies of interest to the USGS, and to further serve the mission of VDOT to efficiently design and maintain the Commonwealth's network of roadways. This agreement covers two (2) ongoing efforts by USGS, and includes continuation of a study to explore developing guidance regarding hydrologic methods necessary to apply a new technique for estimating Bridge Scour in the HEC-18 5th ed. 2012 that takes advantage of cohesive soil properties and weathered rock.

1. Bridge Scour Pilot Study

Statement of Need: The long-term sustainability of Virginia's road systems requires cost effective design and construction of safe highway bridges. The scour of bridge piers inherently affects bridge safety and design costs. The National Cooperative Highway Research Program (NCHRP) Report 516 states that scour at bridges founded in or on cohesive soil is a complex phenomenon that is not completely understood, and that conventional approaches to scour prediction, developed from laboratory experiments in cohesion-less materials, are generally regarded as overly conservative when applied to cohesive soils. Accurate and accepted methods for predicting scour depths in cohesive soils that account for the soil's greater scour resistance are needed, and are not yet available to practicing engineers. Lack of an accurate predictive method often results in an overly conservative and sometimes unnecessarily costly bridge foundation. Research investigating the relationship between properties of cohesive material and the erosive power of flowing water is needed to improve the prediction of scour in cohesive soils (NCHRP Report 516, 2004). As a step toward meeting this need, this pilot study seeks to (1) identify potential rates of streambed scour at bridge pier locations, and (2) estimate potential cumulative streambed scour over the design lifespan of a new bridge. This comprehensive projection of anticipated specific bridge pier scour rates and cumulative scour may provide significant bridge construction cost savings, while ensuring design and construction of a safe highway bridge.

Scope of Work: The US Geological Survey Virginia Water Science Center (USGS) will provide compilation, calculation, and summation of hydrologic properties necessary to determine potential rates of streambed scour. The USGS will also provide hydrologic statistics, statistical methods, and modeling methods to assist in estimating future cumulative streambed scour at bridge pier locations over the projected design lifespan of

a new bridge. The Virginia Department of Transportation (VDOT) will help identify non-hydrologic elements needed to determine potential rates of streambed scour. These include bridge location and design specifications, attributes of cohesive soils associated with bridge piers, and preferred methods and specifications for estimating soil scour.

USGS Deliverables:

1. Daily period-of-record stream discharge time series from two USGS gaged study sites.
2. Trend analyses of two USGS gaged study site time series.
3. Flow frequency distribution and descriptive statistics of two USGS gaged study site time series.
4. A Design Unit Hydrograph for each of two USGS gaged study sites.
5. Estimates of hydraulic geometry coefficients for each of two USGS gaged study sites (Leopold and Maddock, 1953).
6. A draft Monte-Carlo simulation tool for probabilistic discharge–scour scenario analyses at each of the two USGS gaged study sites.
7. A draft simulation tool for deterministic analysis of discharge–scour scenarios at each of two USGS gaged study sites.
8. A draft fact sheet highlighting pilot study objectives and anticipated outcomes.
9. Draft text for later use in a published USGS Scientific Investigations Report (SIR).

USGS deliverables 1 through 3 will be available 4 months from the identification of each USGS gaged study site. Deliverables 4 and 5 will be available 6 months from the identification each USGS gaged study site. Deliverables 6 through 9 will be available 11 months from the identification of each USGS gaged study site.

VDOT will help identify:

1. Bridge design specifications.
2. Attributes of cohesive soils associated with bridge piers.
3. Preferred methods and specifications for estimating soil scour.

2. Gage Cost Sharing

Statement of Need: To facilitate the development of the urban regression equations and to provide data on smaller watersheds than USGS typically monitors, VDOT has provided cost sharing funds for the operation of seventeen (17) gages (List attached). VDOT will continue this effort under this JFA.

Scope of Work: The USGS will monitor and maintain seventeen (17) annual peak flow monitoring sites during 2014 as part of the VDOT-USGS Cooperative Program Annual Peak Flow Monitoring Network.

Deliverables:

- Data available upon request

| Station Number | Station Name | Cooperator Cost | USGS Matching Funds | Annual Operating Cost |
|----------------|--|-----------------|---------------------|-----------------------|
| 01629945 | CHUB RUN NEAR STANLEY, VA | \$1,010 | \$920 | \$1,930 |
| 01632970 | CROOKED RUN NEAR MOUNT JACKSON, VA | \$1,010 | \$920 | \$1,930 |
| 01633650 | PUGHS RUN NEAR WOODSTOCK, VA | \$1,010 | \$920 | \$1,930 |
| 01661800 | BUSH MILL STREAM NEAR HEATHSVILLE, VA | \$1,010 | \$920 | \$1,930 |
| 01667600 | CEDAR RUN TRIB NEAR CULPEPER, VA | \$1,010 | \$920 | \$1,930 |
| 01668300 | FARMERS HALL CREEK NEAR CHAMPLAIN, VA | \$1,010 | \$920 | \$1,930 |
| 01670300 | CONTRARY CREEK NEAR MINERAL, VA | \$1,010 | \$920 | \$1,930 |
| 02017700 | CRAIG CREEK TRIB NEAR NEW CASTLE, VA | \$1,010 | \$920 | \$1,930 |
| 02027700 | BUFFALO RIVER TRIB NEAR AMHERST, VA | \$1,010 | \$920 | \$1,930 |
| 02030800 | STOCKTON CREEK NEAR AFTON, VA | \$1,010 | \$920 | \$1,930 |
| 02038000 | FALLING CREEK NEAR CHESTERFIELD, VA | \$1,010 | \$920 | \$1,930 |
| 02042250 | BAILEY BRANCH TRIB AT SPRING GROVE, VA | \$1,010 | \$920 | \$1,930 |
| 02044200 | FALLS CREEK TRIB NEAR VICTORIA, VA | \$1,010 | \$920 | \$1,930 |
| 02076200 | BEARSKIN CREEK NEAR CHATHAM, VA | \$1,010 | \$920 | \$1,930 |
| 02076700 | BLACKS CREEK NEAR MOUNT AIRY, VA | \$1,010 | \$920 | \$1,930 |
| 03167300 | MIRA FORK TRIB NEAR DUGSPUR, VA | \$1,010 | \$920 | \$1,930 |
| 03473500 | M F HOLSTON RIVER AT GROSECLOSE, VA | \$1,010 | \$920 | \$1,930 |
| Total Cost | | \$17,170 | \$15,640 | \$32,810 |

Project Funding:

| | <u>VDOT</u> | <u>USGS</u> | <u>Total</u> |
|--------------------------------------|-------------|-------------|--------------|
| Bridge Scour Pilot Study: | \$32,830 | \$32,585 | \$65,415 |
| VDOT-USGS Monitoring Network: | \$17,170 | \$15,640 | \$32,810 |
| Grand Total: | \$50,000 | \$48,225 | \$98,225 |

References:

NCHRP Report 516, 2004, Pier and Contraction Scour in Cohesive Soils, Transportation Research Board, 500 Fifth Street, NW, Washington, DC, 20001, 118p.

Leopold, L.B. and Maddock, T., 1953, The hydraulic geometry of stream channels and some physiographic implications, US Geological Survey Professional Paper 252., 64p.