

**SUBMITTAL TO THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT BOARD  
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

402B



**FROM:** General Manager-Chief Engineer

**SUBMITTAL DATE:**

July 3, 2012

**SUBJECT:** Whitewater River  
Project No. 6-0-00250  
Joint Funding Agreement  
Fourth District/Fourth District

**RECOMMENDED MOTION:**

1. Approve the Joint Funding Agreement (Agreement) between the District and the Coachella Valley Water District (CVWD);
2. Authorize the Chairman to execute the Agreement documents on behalf of the District; and

Continued on page 2

KEC:bjj

**WARREN D. WILLIAMS**  
General Manager-Chief Engineer

<b>FINANCIAL DATA</b>	F.Y. 2011-2012 District Cost:	N/A	In Current Year Budget:	Yes
	Current F.Y. County Cost:	N/A	Budget Adjustment:	No
	Net District Cost:	\$80,000	For Fiscal Year:	12-13

<b>SOURCE OF FUNDS:</b>	25160 947500 536200: Zone 6- Contribution to Non-County Agency	Positions To Be Deleted Per A-30	<input type="checkbox"/>
		Requires 4/5 Vote	<input type="checkbox"/>

**C.E.O. RECOMMENDATION:**

APPROVE

BY:   
Michael R. Shetler

County Executive Office Signature

**MINUTES OF THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT**

On motion of Supervisor Tavaglione, seconded by Supervisor Benoit and duly carried, IT WAS ORDERED that the above matter is approved as recommended.

**Ayes:** Buster, Tavaglione, Stone and Benoit  
**Nays:** None  
**Absent:** Ashley  
**Date:** July 3, 2012  
**xc:** Flood

Kecia Harper-Ihem  
Clerk of the Board  
By:   
Deputy

Prev. Agn. Ref.:

District: 4<sup>th</sup>/4<sup>th</sup>

Agenda Number:

11.2

ATTACHMENTS FILED  
WITH THE CLERK OF THE BOARD

FORM APPROVED COUNTY COUNSEL  
BY: NEAL R. KIPNIS  
DATE: 6/13/12  
FISCAL PROCEDURES APPROVED  
BY:   
JEANINE GREY  
FAN M. CHAND, FINANCE DIRECTOR  
6/14/2012  
Departmental Concurrence

Dept' Recomm.:  Consent  Policy  
Per Exec. Ofc.:  Consent  Policy

**FLOOD CONTROL AND WATER CONSERVATION DISTRICT BOARD SUBMITTAL  
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

**SUBJECT:** Whitewater River  
Project No. 6-0-00250  
Joint Funding Agreement  
Fourth District/Fourth District

**SUBMITTAL DATE:** July 3, 2012

**Page 2**

**RECOMMENDED MOTION:** (Continued)

3. Authorize the District's General Manager-Chief Engineer to increase the total amount of Consultant's compensation to a not-to-exceed amount of \$160,000 and thereby increase the District's total financial contribution from \$69,953.50 to a not-to-exceed amount of \$80,000.

**BACKGROUND:**

This Agreement is necessary to formalize the terms and conditions by which the District and CVWD will equally share in the cost of retaining a consulting engineering firm (Consultant) to update the hydraulic analysis and provide design recommendations for a reach of the Whitewater River that has been modified due to grading associated with the Cimarron Golf Course.

County Counsel has approved this Agreement as to legal form and the Agreement documents have been executed by CVWD.

**FINANCIAL:**

The District is funding 50% of the Consultant's costs. CVWD is funding the remaining 50% and is taking the role as "Lead Agency" in administering the contract with the Consultant. Sufficient funds will be included in the District's Zone 6 proposed budget for FY 2012-13.

KEC:blj

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CLERK'S COPY

to Riverside County Clerk of the Board, Stop 1010  
Post Office Box 1147, Riverside, Ca 92502-1147  
Thank you.

JOINT FUNDING AGREEMENT

WHITEWATER RIVER

Project No. 6-0-00250

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THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER  
CONSERVATION DISTRICT, hereinafter called "DISTRICT" and the COACHELLA  
VALLEY WATER DISTRICT, hereinafter called "CVWD," hereby agree as follows:

RECITALS

CVWD and DISTRICT have each constructed levee improvements along  
segments of the Whitewater River within their respective jurisdictions in order to control flood  
flows and provide flood protection to those Coachella Valley communities located adjacent to  
the Whitewater River; and

CVWD and DISTRICT each seek to minimize the potential threat to life and  
property posed by Whitewater River flood events; and

In 1999, the Cimarron Golf Course, hereinafter called "GOLF COURSE," was  
constructed in the area of the Whitewater River flood control channel that is bordered on the  
easterly side by CVWD levee improvements and bordered on the westerly side by DISTRICT  
levee improvements; and

On September 9,2003, CVWD and DISTRICT entered into an agreement for  
Northwest Hydraulic Consultants to prepare a hydraulic study of the Whitewater River flood  
control channel in the vicinity of the GOLF COURSE; and

CVWD and DISTRICT wish to jointly participate in the preparation of an updated  
hydraulic analysis to reflect the updated topography of the GOLF COURSE for the purposes of  
determining the hydraulic design parameters for the flood walls necessary to prevent  
overtopping of the levees and to meet freeboard requirements outlined in Title 44 of the Code

of Federal Regulations, Section 65.10 (44CFR§ 65.10); and

JUL 03 2012 11.2

1 CVWD has assumed the role of "Lead Agency" in preparing and distributing a  
2 Request for Proposal to Northwest Hydraulic Consultants, Inc., a qualified consulting  
3 engineering firm retained by CVWD to provide on-call services, hereinafter called  
4 "CONSULTANT," to prepare an updated hydraulic analysis of the Whitewater River flood  
5 control channel in the vicinity of the GOLF COURSE; and

6 CVWD and DISTRICT have reviewed CONSULTANT'S proposal dated October  
7 26, 2011, attached hereto as Exhibit "A" and made a part hereof, to perform the updated  
8 hydraulic analysis; and

9  
10 CVWD and DISTRICT herein agree to share equally in the cost of retaining  
11 CONSULTANT to perform work as described in Exhibit "A" ("SCOPE OF WORK") and,  
12 further agree to accept CONSULTANT'S findings and conclusions as the design parameters for  
13 this particular reach of the Whitewater River flood control channel.

14 NOW, THEREFORE, BE IT RESOLVED that the parties hereto hereby mutually  
15 agree as follows:

16  
17 1. CVWD will direct CONSULTANT to proceed in accordance with the  
18 SCOPE OF WORK.

19 2. The SCOPE OF WORK provides a cost estimate of One Hundred Thirty-  
20 Nine Thousand Nine Hundred Seven Dollars (\$139,907.00) ("COST ESTIMATE") for the  
21 tasks ("TASKS") described therein. The COST ESTIMATE projects that the TASKS will cost  
22 One Hundred Twenty-One Thousand Six Hundred Fifty-Eight Dollars (\$121,658.00) with a  
23 fifteen percent (15%) contingency of Eighteen Thousand Two Hundred Forty-Nine Dollars  
24 (\$18,249.00). Notwithstanding the foregoing, CONSULTANT does not guarantee that the  
25 actual costs of the TASKS will be less than or exceed the COST ESTIMATE. CVWD shall  
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27 enter into a services agreement ("PSA") with CONSULTANT which shall provide, in part, that  
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1 CONSULTANT shall not perform any work which exceeds the COST ESTIMATE without  
2 CVWD's prior written consent. In the event CONSULTANT seeks to complete the TASKS  
3 for an amount in excess of the COST ESTIMATE, CVWD shall notify the DISTRICT of such  
4 fact and the estimated amount to complete the TASKS. DISTRICT'S General Manager-Chief  
5 Engineer shall have fifteen (15) business days from receipt of such notice to approve or  
6 disapprove the request, which approval shall not be unreasonably withheld. Unless this joint  
7 funding agreement is amended, the total amount of CONSULTANT'S compensation the  
8 DISTRICT's General Manager-Chief Engineer can approve shall not exceed One Hundred and  
9 Sixty Thousand Dollars (\$160,000.00). If DISTRICT disapproves, DISTRICT shall provide  
10 CVWD with specific reasons for disapproval, in writing, within the fifteen (15) business day  
11 period. In the event DISTRICT disapproves, nothing herein shall be construed as an obligation  
12 on the part of CVWD to fund any amount in excess of the COST ESTIMATE. Subject to any  
13 disapprovals set forth in this Section 2, DISTRICT and CVWD will equally share in the  
14 compensation paid to CONSULTANT.  
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17 In the event CVWD and DISTRICT mutually desire CONSULTANT to  
18 perform any extra work or otherwise modify or alter the SCOPE OF WORK, the proposed  
19 changes, hereinafter called "TASK ORDER," shall be fully described (including all changes to  
20 the scope of study, schedule and CONSULTANT'S compensation) and agreed to by the parties  
21 hereto in writing prior to transmitting the TASK ORDER to CONSULTANT.  
22

23 Prior to transmitting any TASK ORDER to CONSULTANT, CVWD shall  
24 submit the proposed TASK ORDER to DISTRICT for review and approval. DISTRICT'S  
25 General Manager-Chief Engineer shall have fifteen (15) business days to approve or disapprove  
26 the TASK ORDER, which approval shall not be unreasonably withheld. Unless this joint  
27 funding agreement is amended, the total amount of CONSULTANT'S compensation the  
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1 DISTRICT's General Manager-Chief Engineer can approve shall not exceed One Hundred and  
2 Sixty Thousand Dollars (\$160,000.00). In the event DISTRICT disapproves the proposed  
3 TASK ORDER, DISTRICT shall provide CVWD with specific reasons for the disapproval, in  
4 writing, within the fifteen (15) business day period. In the event DISTRICT disapproves of the  
5 TASK ORDER, nothing herein shall be construed as an obligation on the part of CVWD to  
6 fund the TASK ORDER.

7  
8 3. CVWD shall pay CONSULTANT in accordance with the rates as set forth in  
9 Exhibit "B" (CONSULTANT'S schedule of fees and list of deliverables) and as may be  
10 amended from time to time in accordance with the terms of the PSA.

11 4. CVWD and DISTRICT personnel shall be available to meet with  
12 CONSULTANT as needed and shall review CONSULTANT'S submittals in a timely manner  
13 so as to expedite CONSULTANT'S progress.

14 5. CVWD and DISTRICT personnel shall coordinate their review of  
15 CONSULTANT'S work. All staff comments on the draft report shall be mutually agreed upon  
16 prior to providing the comments to CONSULTANT. Prior to the issuance of  
17 CONSULTANT'S final report ("FINAL REPORT"), both CVWD and DISTRICT shall  
18 indicate their concurrence with the report's findings in writing.

19  
20 6. Upon completion and acceptance by CVWD and DISTRICT of the FINAL  
21 REPORT, CVWD shall provide DISTRICT with two (2) original paper copies and one (1)  
22 electronic file of the FINAL REPORT.

23  
24 7. Upon DISTRICT'S receipt of the FINAL REPORT as set forth in Section 6,  
25 CVWD shall invoice DISTRICT an amount equal to fifty percent (50%) of the total  
26 compensation paid to CONSULTANT for the work performed under this Joint Funding  
27  
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1 Agreement ("AGREEMENT"). DISTRICT shall remit payment to CVWD within thirty (30)  
2 days after receipt of said invoice ("DUE DATE").

3 8. CVWD and DISTRICT shall each be responsible for their respective staff  
4 costs and expenses in the review of CONSULTANT'S work pursuant to this AGREEMENT.

5 9. CVWD shall indemnify, defend, save and hold harmless DISTRICT and  
6 County of Riverside (including their respective officers, districts, special districts and  
7 departments, their respective directors, officers, Board of Supervisors, elected and appointed  
8 officials, employees, agents, representatives, independent contractors, and subcontractors) from  
9 any liabilities, claim, damage, proceeding or action, present or future, based upon, arising out  
10 of or in any way relating to CVWD's (including its officers, employees, agents, representatives  
11 and independent contractors, except CONSULTANT, or any person or entity working by or  
12 through CONSULTANT) actual or alleged acts or omissions related to this AGREEMENT,  
13 performance under this AGREEMENT, or failure to comply with the requirements of this  
14 AGREEMENT, including, but not limited to: (a) property damage; (b) bodily injury or death;  
15 (c) payment of attorney's fees; or (d) any other element of any kind or nature whatsoever.  
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18 10. DISTRICT shall indemnify, defend, save and hold harmless CVWD  
19 (including its officers, employees, agents, representatives and contractors, except  
20 CONSULTANT, or any person or entity working by or through CONSULTANT) from any  
21 liabilities, claim, damage, proceeding or action, present or future, based upon, arising out of or  
22 in any way relating to District's (including its officers, Board of Directors, elected and  
23 appointed officials, employees, agents, representatives, independent contractors, and  
24 subcontractors) actual or alleged acts or omissions related to this AGREEMENT, performance  
25 under this AGREEMENT, or failure to comply with the requirements of this AGREEMENT,  
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1 including, but not limited to: (a) property damage; (b) bodily injury or death; (c) payment of  
2 attorney's fees; or (d) any other element of any kind or nature whatsoever.

3 11. (a) All notices hereunder must be in writing and, unless otherwise  
4 provided herein, shall be deemed validly given if sent by personal service (including express or  
5 courier service, with proof of delivery), by electronic communication, whether by e-mail or  
6 facsimile (if confirmed by writing, sent by registered or certified mail, postage prepaid, return  
7 receipt requested), or by certified or registered mail, postage prepaid, return receipt requested,  
8 addressed as follows (or to any other mailing address which the party to be notified may  
9 designate to the other party by such notice):  
10

11 CVWD:  
12 Coachella Valley Water District  
13 Post Office Box 1058  
14 Coachella, CA 92236  
15 Attn: Steve Robbins,  
16 General Manager-Chief Engineer  
17 Facsimile: 760.398.3711  
18 e-mail:[srobbins@cvwd.org](mailto:srobbins@cvwd.org)

DISTRICT:  
Riverside County Flood Control  
and Water Conservation District  
1995 Market Street  
Riverside, CA 92501  
Attn: Warren D. Williams,  
General Manager-Chief Engineer  
Facsimile: 951.788.9965  
e-mail:[dustyw@rcflood.org](mailto:dustyw@rcflood.org)

17 (b) If the address or phone number where either party may be contacted is  
18 changed, such party will immediately notify the other party of such change. Any such  
19 communication, notice or demand shall be deemed to have been duly given or served on the  
20 date personally served, if by person, one (1) day after the date of confirmed dispatch, if by  
21 electronic communication, or three (3) days after being placed in the U.S. Mail, if mailed.

22 12. Any waiver by DISTRICT or by CVWD of any breach of any one or more  
23 of the terms of this AGREEMENT shall not be construed to be a waiver of any subsequent or  
24 other breach of the same or of any other term hereof. Failure on the part of DISTRICT or  
25 CVWD to require exact, full and complete compliance with any terms of this AGREEMENT  
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1 shall not be construed as in any manner changing the terms hereof, or estopping DISTRICT or  
2 CVWD from enforcement hereof.

3 13. If any provision in this AGREEMENT is held by a court of competent  
4 jurisdiction to be invalid, void or unenforceable, the remaining provisions will nevertheless  
5 continue in full force without being impaired or invalidated in any way.

6 14. This AGREEMENT is to be construed in accordance with the laws of the  
7 State of California.

8 15. This AGREEMENT is intended by the parties hereto as a final expression of  
9 their understanding with respect to the subject matter hereof and as a complete and exclusive  
10 statement of the terms and conditions thereof and supersedes any and all prior and  
11 contemporaneous agreements and understandings, oral or written, in connection therewith.

12 16. Any action at law or in equity brought by any of the parties hereto for the  
13 purpose of enforcing a right or rights provided for by the AGREEMENT, shall be tried in a  
14 court of competent jurisdiction in the County of Riverside, State of California, and the parties  
15 hereto waive all provisions of law providing for a change of venue in such proceedings to any  
16 other county.

17 17. This AGREEMENT is the result of negotiations between the parties hereto,  
18 and the advice and assistance of their respective counsel. The fact that this AGREEMENT was  
19 prepared as a matter of convenience by DISTRICT shall have no import or significance. Any  
20 uncertainty or ambiguity in this AGREEMENT shall not be construed against DISTRICT  
21 because DISTRICT prepared this AGREEMENT in its final form.

22 18. This AGREEMENT may be executed and delivered in any number of  
23 counterparts or copies, hereinafter called "COUNTERPART", by the parties hereto. When  
24 each party has signed and delivered at least one COUNTERPART to the other parties hereto,  
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1 each COUNTERPART shall be deemed an original and, taken together, shall constitute one  
2 and the same AGREEMENT, which shall be binding and effective as to the parties hereto.

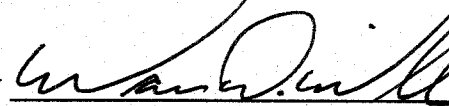
3 19. In the event of any legal action or proceeding arising from or related in any  
4 way to a breach of or enforcement or interpretation of this AGREEMENT, the prevailing party  
5 shall be entitled to recover from the other party reasonable attorneys' fees and court costs in  
6 such amounts as shall be allowed by the court.

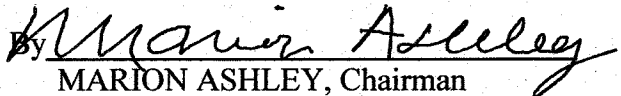
7 20. Within ten (10) business days of the parties identifying the existence of a  
8 dispute ("DISPUTE"), the General Managers of CVWD and DISTRICT shall meet and attempt  
9 to resolve the DISPUTE to their mutual satisfaction. Any such resolution shall be in writing  
10 and be binding on the parties.  
11

12 IN WITNESS HEREOF, the parties hereto have executed the AGREEMENT on

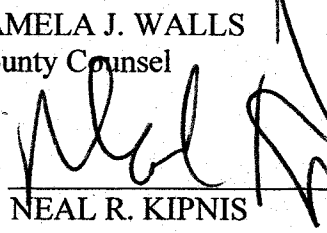
13 \_\_\_\_\_  
14 (to be filled in by the Clerk to the Board)

15 **RECOMMENDED FOR APPROVAL:** **RIVERSIDE COUNTY FLOOD CONTROL**  
16 **AND WATER CONSERVATION DISTRICT**

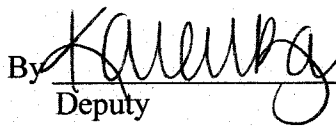
17 By   
18 **WARREN D. WILLIAMS**  
19 **General Manager-Chief Engineer**

By   
20 **MARION ASHLEY, Chairman**  
21 **Riverside County Flood Control and Water**  
22 **Conservation District Board of Supervisors**

23 **APPROVED AS TO FORM:**

24 **PAMELA J. WALLS**  
25 **County Counsel**  
By   
26 **NEAL R. KIPNIS**  
27 **Deputy County Counsel**

28 **ATTEST:**

**KECIA HARPER-IHEM**  
**Clerk of the Board**  
By   
**Deputy**

(SEAL)

JUL 03 2012 11.2

**RECOMMENDED FOR APPROVAL: COACHELLA VALLEY WATER DISTRICT**

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By \_\_\_\_\_  
STEVE ROBBINS  
General Manager-Chief Engineer

By \_\_\_\_\_  
PETER NELSON, President  
Coachella Valley Water District Board of Directors

APPROVED AS TO FORM:

ATTEST:

By \_\_\_\_\_  
REDWINE AND SHERRILL  
District Counsel

By \_\_\_\_\_  
JULIA FERNANDEZ  
Board Secretary

Dated: \_\_\_\_\_

Dated: \_\_\_\_\_

(SEAL)

Whitewater River Cost Sharing Agreement w/CVWD  
5/1/12  
KEC:blj



northwest hydraulic consultants

**Final Draft Scope of Work for  
Whitewater River Stormwater Channel (WRSC)  
Hydraulic Analysis for Cimarron Levee Certification**

**Northwest Hydraulic Consultants  
26 October 2011**

**BACKGROUND AND OBJECTIVES**

The Coachella Valley Water District (CVWD) and Riverside County Flood Control and Water Conservation District (RCFC&WCD) are planning to submit a request for accreditation to FEMA for the Cimarron Levees. These levees lie on the north and south sides of the Whitewater River Stormwater Channel (WRSC) and extend upstream from Ramon Road Bridge past the East Vista Chino low-water crossing to North Indian Canyon Drive along the right bank, a distance of 30,000 feet. The left bank levee extends north to the railroad near Interstate 10. In the project reach, the WRSC is about 1,200 feet wide at Ramon Road, 1,500 feet wide at East Vista Chino and 6,000 feet wide near North Indian Canyon Drive. The Cimarron Golf Course was built along the lower 8,500 feet of the WRSC in this reach in 2000.

This project will complete the hydraulic analyses necessary to define existing base flood elevations and determine if the levees meet the minimum FEMA freeboard requirements based on existing levee crest elevations. Previous studies (NHC 2006) had determined that base flood elevations encroached on levee freeboard; consequently, we anticipate that hydraulic analyses of modified conditions in the WRSC will also be required to demonstrate that the levees will meet minimum freeboard requirements after construction.

The project deliverables will then include the following:

- Hydraulic analyses to define levee freeboard for existing conditions in the WRSC through the Cimarron levees, from the Ramon Road Bridge upstream to Vista Chino; and
- Hydraulic analyses required for a levee accreditation submittal to FEMA for the modified WRSC conditions in the areas where construction occurs between Ramon Road and Vista Chino.

Our scope addresses minimum freeboard analysis for FEMA accreditation. It does not address "with" and "without" levee analyses that are required under FEMA Procedure Memorandum No. 63. It is our recommendation that the requirement for these studies be defined after the minimum freeboard analysis is completed and after discussions with FEMA. The scope also does not address Embankment Protection, Operations and Maintenance, or other analyses that might be required by FEMA for the accreditation submittal.

## **APPROACH**

We recommend adopting the same approach to hydraulic modeling as in our previous study of the WRSC through the Cimarron Golf Course (NHC 2006). We will utilize a MIKE-21 hydraulic model to define water surface profiles and complete other tasks so they are consistent with current FEMA guidance. In our view, this will require the following general standards be met or that the following tasks be completed:

- Complete the hydrologic and hydraulic analyses with models that are accepted or approved by FEMA and meet their standards. We have adopted the MIKE-21 model as it is one of FEMA's accepted hydraulic models.
- Meet the analyses standards identified in FEMA's Procedure Memorandum No. 63, "Guidance for Reviewing Levee Accreditation Submittals" for minimum freeboard analysis.
- Teleconference with FEMA representatives to discuss the most up-to-date guidance for flood insurance studies

One aspect of the hydraulic analysis that is not well-defined at this point is where flow would enter the model at its upstream end. The WRSC is very broad and the results downstream may depend on the particular area where the flow enters. We anticipate some additional sensitivity modeling and discussions to best resolve this issue.

## **PROJECT AREA**

The project area includes the Whitewater River Stormwater Channel, between the north and south levees, from the Ramon Road Bridge upstream to Vista Chino.

## **INFORMATION PROVIDED BY CVWD AND RCFC&WCD**

The information provided by CVWD and RCFC&WCD that will be utilized in completing our tasks includes the following:

- Water surface elevations at Ramon Bridge will be provided by RCFC as part of their levee accreditation work upstream and downstream of the Cimarron levees
- Previous hydrologic studies for the Whitewater River Stormwater Channel (1980 WWR Basin ACOE report)
- Accreditation submittals for downstream levees
- 2008 topography by digital photogrammetric methods for the project area and appropriate check surveys to demonstrate the topography meets FEMA standards, to be provided by RCFC&WCD
- Proposed modifications to meet minimum freeboard standards for WRSC

## **DESCRIPTION OF TASKS**

Table 1 summarizes the tasks proposed to meet the above objectives. The tasks are sequential and the results of one task are often required to complete the next one satisfactorily. Further details on methods and approaches are provided under the subheadings that follow the table.

**Table 1: Proposed Tasks**

<b>Task</b>	<b>Description</b>
1	Site Visit, Background Review and Meetings
2	Model Topography or Geometry
3	2-D Model Development Existing Conditions
4	Freeboard Analysis for Existing Conditions
5	Modifications to WRSC to meet Minimum Freeboard
6	2-D Model Development Proposed Conditions
7	Reporting and Deliverables
8	Project Administration (Invoices, Progress Reports, etc)

**Task 1: Site Visit, Background Review, Coordination, and Meetings**

Under Task 1, we would visit the site, review accreditation documents for downstream levees that also provide protection to the floodplain adjacent to the Cimarron levees, and meet with the CVWD and RCFC&WCD to review our proposed approach. At this meeting we would coordinate with CVWD and RCFC&WCD's engineer for levee certification.

We also recommend a meeting or discussion with an appropriate FEMA representative to review the proposed approach and discuss any outstanding issues related to hydraulic analysis or hydraulic models.

**Task 2: Model Topography or Geometry**

Under Task 2, NHC would review the in-channel topography developed from RCFC&WCD, obtain drawings of bridges, low-water crossings, or other instream structures from CVWD or RCFC&WCD, and ensure that all topography required for the MIKE-21 model has been obtained and meets FEMA standards. If topography is not adequate, NHC will identify additional surveys to RCFC&WCD.

Once the topography has been reviewed and accepted, NHC will use it to develop the geometry for the existing conditions model.

**Task 3: 2-D Model Development Existing Conditions**

The water surface profiles will be derived from the MIKE-21 model developed for the reach topography under the following assumptions:

- The model will be run for the 100-year peak discharge in the WRSC, defined as the base flood. The peak discharge will be obtained from existing studies, as recommended by CVWD and RCFC&WCD.
- Downstream boundary conditions (Ramon Road Bridge) will be based on our previous study (NHC 2006) unless the local geometry has changed.
- Resistance, eddy viscosity and model time steps will be defined as described for our previous model (NHC 2006).

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Given the absence of water surface profiles or high water marks for model calibration and verification, we proposed a sensitivity analysis for the developed model. This will consist

of re-running the model with lesser and greater resistance to provide an estimate of the potential uncertainties in the 100-year water levels.

As demonstrated in our previous study, water surface elevations will vary across the WRSC during the 100-year peak. Consequently, we will extract profiles for the different model runs that show predicted water surface elevations along each levee and that show the maximum water level along a cross section perpendicular to the levees. The existing condition model shall be developed in a manner sufficient to use for design of modifications required to meet FEMA freeboard requirements.

**Task 4: Freeboard Analysis for Existing Conditions**

Based on the hydraulic analyses and levee crest topography, NHC will prepare a memorandum that compares the existing water surface slope profiles to those in NHC (2006) and compares existing conditions freeboard to the minimum standards in 44 CFR 65.10. The memorandum will identify those areas where freeboard improvements are required as the first step in developing proposed conditions.

**Task 5: Modifications to WRSC to Provide Minimum Freeboard**

NHC will review the freeboard improvements required for levee accreditation and will lead a meeting with CVWD and RCFC&WCD to define the modifications required for the WRSC for freeboard accreditation. These might include excavation, modifications to in-channel structures, or raising the levee crests.

Based on these discussions, NHC, CVWD and RCFC&WCD will develop a scenario for incorporation in a MIKE-21 model of proposed conditions that will be modeled. We have assumed in Task 6 that up to two different scenarios may be modeled in order to develop an appropriate proposed condition.

**Task 6: 2-D Model Development Proposed Conditions**

NHC will revise the topography in the existing conditions model as required to incorporate the modifications identified in Task 5. Once complete, the model will be re-run, sensitivity analyses prepared and the design water surface profile will be compared to levee crest elevations to confirm that minimum FEMA freeboard criteria are now met. If not, further revisions will be reviewed with CVWD and RCFC&WCD, a revised proposed condition adopted, and the model geometry revised and re-run.

Once complete, NHC will complete a proposed condition freeboard allowance to confirm that minimum conditions are met.

**Task 7: Reporting and Deliverables**

NHC will provide the following deliverables to be incorporated in the levee accreditation submission for the proposed condition:

- Description of model development, including a DVD with the MIKE-21 model
- Description of model results, including base flood elevations, water surface profiles, levee crest profiles and an analysis of freeboard

### **Task 8: Project Administration**

We have assumed regular discussions with the CVWD project manager and CVWD and RCFC&WCD staff, monthly progress reports, and some time for invoice preparation and other administrative tasks.

### **SCHEDULE**

Assuming that project work starts by the end of February 2011, we estimate that the existing conditions assessment (to Task 4) could be complete by the end of April. Lengthy model runs may prevent the project being completed within this time frame. Completion of the remaining tasks will depend on reaching agreement on the modifications to the WRSC that will be adopted to meet freeboard requirements.

### **ESTIMATED COSTS**

Table 2 (attached) provides a cost estimate for the tasks proposed above. The table provides hourly rates for the proposed staff, the estimated hours to complete the tasks and subtasks and an estimate of disbursements. Hourly rates are those in our most recent agreement with CVWD.

The disbursements assume that travel from Sacramento to Palm Springs and local meals, accommodations, and field expenses will be part of completing this project. Other disbursements are for obtaining topographic data, copying, printing and distributing reports and other documents.

### **KEY STAFF**

Joey Howard, P.E., will be the principal-in-charge for this study; Andrey Shvidchenko will be the senior engineer. Table 2 (attached) identifies the engineers, junior engineers, GIS analyst and senior engineering technician that will work on the project. We would be pleased to provide resumes for these staff if CVWD wishes.

### **REFERENCES**

- FEMA. 2010. Procedure Memorandum No. 63: Guidance for Reviewing Levee Accreditation Submittals. US Department of Homeland Security. October 1, 2010. 8 p.
- Northwest Hydraulic Consultants. 2006. Hydraulic Modeling of Whitewater Stormwater Channel at Cimarron Golf Course. Prepared for CVWD and RCFC&WCD. August 7.



**Table 2. NHC COST PROPOSAL**

PROJECT:

Whitewater River Stormwater Channel  
 Hydraulic Analysis for Cimarron Levee Certification  
 October 26, 2011  
 ljh

DATE:  
 BY:

Task No	Task Description	nhc Hours by Classification							nhc Labor Cost	Direct Cost by Task <sup>1</sup>	Task Cost	
		pe	spe	se	e	je	set	gis				wp
<b>Task 1: Site Visit, Background Review and Meetings</b>												
1a	Site Visit	8		8		8			\$4,052.88	\$2,000.00	\$6,052.88	
1b	Background Review and Meetings	4		4					\$1,604.64	\$0.00	\$1,604.64	
										Subtotal	\$7,657.52	
<b>Task 2: Model Topography or Geometry</b>												
2a	Obtain and Review Topography				4			8	\$1,211.76	\$0.00	\$1,211.76	
2b	Construct MIKE Model Geometry	4		4	8	24			\$5,142.32	\$0.00	\$5,142.32	
										Subtotal	\$6,354.08	
<b>Task 3: 2-D Model Existing Conditions</b>												
3a	Model Development	8		40	160				\$28,809.60	\$0.00	\$28,809.60	
3b	Sensitivity Analysis	8		16	40				\$9,609.36	\$0.00	\$9,609.36	
3c	Water Surface Profiles	8		8	16			8	\$5,931.36	\$0.00	\$5,931.36	
										Subtotal	\$44,350.32	
<b>Task 4: Existing Conditions Freeboard</b>												
4a	Prepare and Submit Memorandum	8		16	16			4	\$6,908.08	\$50.00	\$6,958.08	
										Subtotal	\$6,958.08	
<b>Task 5: Modifications to WRSC</b>												
5a	Identify and Review Alternatives	8		8	16			8	\$5,931.36	\$0.00	\$5,931.36	
5b	Define Proposed Condition	4		4	8			2	\$2,771.20	\$0.00	\$2,771.20	
										Subtotal	\$8,702.56	
<b>Task 6: 2-D Model Proposed Conditions</b>												
3a	Model Development	6		32	100				\$19,431.42	\$0.00	\$19,431.42	
3b	Sensitivity Analysis	6		16	40				\$9,148.46	\$0.00	\$9,148.46	
3c	Water Surface Profiles	6		4	8			8	\$3,780.74	\$0.00	\$3,780.74	
										Subtotal	\$32,360.62	
<b>Task 7: Reporting and Deliverables</b>												
4a	Prepare and Submit Deliverables	8		24	40			16	\$12,711.04	\$50.00	\$12,761.04	
										Subtotal	\$12,761.04	
<b>Task 8: Project Administration</b>												
9a	Progress Reports, etc	10						2	\$2,464.18	\$50.00	\$2,514.18	
										Subtotal	\$2,514.18	
<b>Totals</b>		96	0	184	456	32	0	48	12	\$119,508	\$2,150	\$121,658

15% Contingency \$18,249  
 TOTAL \$139,907

1. Direct costs include travel and accommodation, mileage charges, printing, miscellaneous and other charges

**Legend: nhc**

pe - principal engineer or geomorphologist  
 spe - senior project engineer  
 se - senior engineer  
 e - engineer

je - junior engineer  
 set - senior engineering technician  
 gis - GIS Analyst  
 wp - word processor

**Hourly Rates January 1, 2010 Cost Based Rates**

northwest hydraulic consultants	Hourly Rate
pe - Joey Howard	\$230.45
spe -	\$225.80
se - Andrey Shvidchenko	\$170.71
e - Brian Wardman, Brady McDaniel	\$125.86
je - Matt Moore, Jimmy Pan	\$105.45
set - Travis Shinkle	\$111.09
t - Dawn Lasprugato	\$88.54
wp -	\$79.84