Meeting of the Central Valley Flood Protection Board
April 25, 2014

Staff Report

Capital Conservation and Mitigation Bank
Perennial Marsh and Upland Habitat Creation for the Giant Garter Snake
Yolo County

1.0 – ITEM

Consider approval of Resolution No. 2014-10 and Draft Permit No. 18856 (Attachments B and C).

2.0 – APPLICANT

Capital Conservation and Mitigation Bank
Owners - Ronald D. and Clover A. Smith

3.0 – LOCATION

The project is located approximately 10.7 miles south of Interstate 80, 6.5 miles west of Clarksburg, and east of County Road 104 at the northern terminus of County Road 107 within the Yolo Bypass. The 137-acre site is one mile west of the west (non-flood control project) levee of the Sacramento Deep Water Ship Channel, and approximately 2.5 miles east of the Yolo Bypass west (flood control project) levee.
(Yolo County, see Attachment A).

4.0 – PROJECT DESCRIPTION

The applicant proposes to create approximately 130 acres of perennial marsh and upland habitat inside of the Yolo Bypass. The 137-acre Capital Conservation Bank Project includes water delivery channels, shallow wetlands, and raised areas suitable for the Giant Garter Snake.

5.0 - AUTHORITY OF THE BOARD

California Water Code § 8534, 8590 – 8610.5, and 8700 - 8710

California Code of Regulations, Title 23 (Title 23)

- § 6, Need for a Permit
- § 13, Evidentiary Hearings
- § 112, Streams Regulated and Nonpermissible Work Periods
- § 136, Supplemental Standards for Yolo Bypass and Sutter Bypass

6.0 – PROJECT ANALYSIS

The proposed project, known as the Capital Conservation and Mitigation Bank (CCB), will be the first phase of a potential two-phase Giant Garter Snake (GGS) Mitigation Bank. Phase 2, which will be located immediately adjacent and north of Phase 1, may be implemented following the successful completion of Phase 1 based on the market demand for GGS conservation credits. Application No. 18856 covers only Phase 1 of the CCB Project. Phase 2, if economically feasible, will be considered under a future encroachment permit application. If Phase 1 is approved the proposed CCB Project will provide federal conservation credits for projects affecting the GGS or its habitat within the north Delta and adjacent areas.

The proposed CCB project is located within the Yolo Bypass and will convert existing fallow agricultural land to perennial marsh and upland habitat for the GGS. The GGS habitat will be constructed by excavating on-site soils within the upper five feet and placing the excavated soils as compacted embankment fill slopes throughout the project site. Based on the proposed grading plan, the maximum height of embankment slopes is approximately 22 feet. The maximum gradient of embankment slopes will be approximately 8 horizontal to 1 vertical. The site will be converted to a mixture of shallow to deep water wetlands (0.5 to 3 feet deep) and upland areas (approximately 57 acres), some of which (3.8 acres) will be constructed to be above the U.S. Army Corps of Engineers' (USACE) design water surface elevation for the Yolo Bypass. No fill will be brought into the Yolo Bypass to construct the project. Grading plans (see Attachment D) show that approximately 3,300 cubic-yards of excess material from the project will be spread out evenly (1 to 2 feet) at two separate locations in the future Phase 2 area. In addition, an illegally placed equipment storage pad will be removed and spread evenly over the area. All three areas will be compacted and have hydroseed and hydromulch applied.

Wetland hydrology for the CCB will be supplied through a series of water supply channels. The water supply channel system would be graded to facilitate gravity flow and will be managed through a system of gates and flashboard risers. During dry periods water will be supplied from the Deep Canal that bounds the CCB to the south. The Deep Canal is directly connected to the Yolo Bypass Toe Drain and is tidally influenced. A low-lift pump station will pump water from the Deep Canal to the existing Highline Canal that bounds the project site to the west. The water delivery system will be designed to facilitate temporary de-watering of individual wetland cells to allow vegetation control and sediment removal if necessary. Approximately 480 cubic yards of rock will be placed in the inlet and outlet channels to control erosion.

Vegetation within the constructed wetlands will include tule and a variety of smaller, emergent plants. Tule will be the primary plant within the deeper (1 to 3 feet) portions of the wetlands. They will be planted along the margins of the water supply channels in scattered clumps throughout each wetland. The shallower upland margins of each wetland cell (less than 1 foot) will be planted with clusters of low-growing non-woody vegetation. A mixture of California-native perennial grasses and forbs will be planted in the constructed upland areas (See Attachment E). Approximately 620 cubic yards of rock will be strategically placed and/or partially buried in the upland areas to provide upland basking and refugia for the GGS until natural burrows develop.

Vegetation will be maintained within wetland habitats to provide GGS foraging and to ensure the project does not create an obstruction to flood flows in the Yolo Bypass. Methods to manage vegetation may include grazing and mowing, hand removal of invasive plants, herbicide application, and mechanical removal of vegetation using a hydraulic excavator. Other vegetation management activities such as thinning of tule and cattail will also occur on a periodic basis if necessary.

An Interim Management Plan (IMP) has been developed for the short-term management, maintenance, monitoring, and reporting activities of the CCB (See Attachment F). The CCB owners and the CCB Manager will be responsible for implementation of the IMP. The IMP builds from the Long-Term Management Plan (LTMP, Attachment G) for maintenance of the CCB and will be in effect from the time the CCB is established until the non-wasting, perpetual endowment has been fully funded for one year, and all performance standards described in the CCB Habitat Development Plan have been met (see Attachment H). The LTMP will ensure that the CCB will be operated and maintained as designed in perpetuity. The non-wasting, perpetual endowment will provide funds for the ongoing operations and maintenance of the CCB in perpetuity. It is anticipated that the average annual cost of maintaining the CCB will be about $54,000. The endowment fund will be managed by the Wildlife Heritage Foundation (WHF).

America’s Habitats, owned by Mr. Dustin Smith, will be the interim CCB Manager and will be actively maintaining the site. Should the CCB Manager change or if America’s

Habitats defaults on the maintenance requirements the endowment fund holder, WHF, would be responsible for hiring another company to do the required work. The Central Valley Flood Protection Board can access these maintenance funds through WHF if it is determined that the CCB is not being maintained as specified in the LTMP.

6.1 – Hydraulic Analysis

A two dimensional hydraulic model (RMA2) developed by the USACE (2007a) for use in permitting and planning within the Yolo Bypass, was used as a basis for assessing the potential flood conveyance impacts of the CCB.

In addition to modeling existing conditions both CCB Phases 1 and 2 were modeled to assess the potential cumulative flood conveyance impacts on Yolo Bypass water surface elevations (WSE). Phase 1 consists of the southern portion (137 acres) of the total 320 acre parcel and is proposed to be constructed first. There are no formal plans to develop Phase 2 at this time but it was included in the modeling analysis to assess the potential cumulative impacts of the project as a whole.

A total of five scenarios were evaluated at the project design flow of 490,000 cubic feet per second (cfs) to assess the potential hydraulic impacts from the CCB project on the Yolo Bypass. Scenarios included 1) existing conditions, 2a) Phase 1 grazed, 2b) Phase 1 ungrazed, 3a) Phase 2 grazed, and 3b) Phase 2 ungrazed. The ungrazed versus grazed options considered the potential benefits of vegetation management on upland areas only.

Modeling results predict a maximum regional WSE rise of 0.01 feet that includes the eastern navigation levee of the Yolo Bypass for the ungrazed scenario. The regional impact is reduced in extent to a localized WSE rise of 0.02 feet (about ¼ inch) along the CCB property boundary for the project selected grazed scenario. Water velocity changes of ±0.5 feet per second (fps) are also localized near the project site (See Attachment I). The project will be managed to control vegetation and any associated adverse hydraulic impacts using a combination of methods to include grazing, mowing, hand removal of invasive plants, herbicide application, and mechanical removal of vegetation using a hydraulic excavator.

The hydraulic impact to the Yolo Bypass from the proposed CCB project is considered to be insignificant. It must however be noted that the Department of Water Resources' (DWR) December 2001 Flood Control System Status Report identifies the Channel Capacity Status of the Yolo Bypass in the project area as being potentially inadequate and the report suggested that additional evaluation was required (See Attachment J).

The applicant's hydraulic analysis was peer-reviewed by a hydraulic engineering firm (Pacific Hydrologic Incorporated) retained by Yolo County. The analysis concluded with a finding that, "Provided that annual grazing is maintained, construction of the Capital Conservation Bank will not significantly increase flood risks to the health and safety of the public, will not significantly increase the risk of flood damage to structures and properties, and will not significantly increase risks to off-site channel stability….". Per the LTMP the project woody vegetation will be removed and vegetation controlled by using a combination of mowing and livestock grazing.

6.2 – Geotechnical Analysis

A subsurface exploration was performed at the project site. Fifteen exploratory test pits were advanced to an approximate depth of five feet below the existing ground surface. Field density tests were performed using a nuclear gauge at an approximate depth of two feet below the existing ground surface at each test pit. The purpose of the investigation was to explore and evaluate the subsurface conditions at various locations at the site in order to develop geotechnical engineering recommendations for use in project design and construction.

6.3 – Permitted Yolo Bypass Restoration Projects

Permit No. 17280 – Wildlands (Pope Ranch) (issued 2001 - constructed): To create 387 acres of marsh habitat to include construction of berms, open channels, and roads within the Yolo Bypass. This GGS Mitigation Bank is adjacent to and west of the proposed CCB Project. All GGS credits have been sold for Pope Ranch.

Permit No. 18334 – Wildlands (Liberty Island) (issued 2010 - constructed): To degrade approximately 1,700 linear feet of the east-west levee at the northern end of Liberty Island within the Yolo Bypass, degrade approximately 2,390 linear feet of two smaller interior levees, create tidal channels, place spoil material immediately downstream in a north to south direction, seed with native grasses, and plant perennial marsh vegetation within the 186-acre Liberty Island Conservation Bank and Preserve.

Permit No. 18723 – Wildlands (Liberty Island) (issued 2012 – not yet constructed): To degrade approximately 4,200 linear feet of the east-west private levee along Shag Slough within the Yolo Bypass, excavate minor breaches and small channels, widen and deepen the existing breach on the east-west levee, excavate a bench and plant tule plugs along a portion of the northern project boundary, and seed existing levee upland areas with native and naturalized species.

7.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies are shown below:

- DWR Flood Maintenance Office (FMO) has not submitted a formal response to the proposed project at the writing of this staff report. If the FMO chooses to endorse the project with conditions, the conditions will be incorporated into the permit as Exhibit A.

  FMO has expressed concerns about mitigation bank projects such as the proposed CCB and their potential impacts on FMO's ability to effectively carry out its maintenance responsibilities as specified under California Water Code sections 8361 and 12878.

- The USACE comment letter has been received for this application. The USACE District Engineer has no objection to the project, subject to conditions. The letter is incorporated into the permit as Exhibit B.

8.0 – CEQA ANALYSIS

Board staff has prepared the following CEQA findings:

The Board, as a responsible agency under CEQA, has reviewed an Initial Study/Mitigated Negative Declaration (IS/MND) (SCH Number: 2013042067, April 2013) and Mitigation Measures for the Capital Conservation Bank Project prepared by the lead agency, Yolo County. These documents, including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at http://www.cvfpb.ca.gov/meetings/2014/04-25-2014.cfm under a link for this agenda item. These documents are also available for review in hard copy at the Board and the Yolo County offices.

Yolo County determined that the project would not have a significant effect on the environment on March 11, 2014 and adopted Resolution 14-20. A Notice of Determination was filed on March 17, 2014 with the Yolo County Clerk. Board staff independently reviewed the MND and has determined that there will not be significant effects because the applicant has incorporated mandatory mitigation measures into the project plans to avoid identified impacts or to mitigate such impacts to a point where no significant impacts will occur. These mitigation measures are included in the project

proponent's IS/MND and address impacts to air quality, agricultural resources, biological resources, and cultural resources. The description of the mitigation measures are further described in the adopted IS/MND.

9.0 – WATER CODE SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

   The Board has considered all the evidence presented in this matter, including the original and updated applications and supporting documents, this Staff Report and attachments, all other evidence presented by any individual or group, and all letters and other correspondence received by the Board and in the Board's files related to this matter.

2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

   The accepted industry standards for the earth work proposed and water delivery channels under this permit as regulated by Title 23 have been applied to the review of this permit.

3. Effects of the decision on facilities of the State Plan of Flood Control, and consistency of the proposed project with the Central Valley Flood Protection Plan as adopted by Board Resolution 2012-25 on June 29, 2012:

   There will be no adverse effect on facilities of the State Plan of Flood Control as the hydrologic and geotechnical impacts from the proposed project are localized and considered to be insignificant. Although the proposed project is located within the Yolo Bypass (approximately 2.5 miles east of the west levee and approximately one mile west of the Sacramento Deep Water Ship Channel Levee) it is compatible with the stated goals of the 2012 Central Valley Flood Protection Plan as the project may provide GGS mitigation credits for future projects.

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

The proposed project is located within the Yolo Bypass and habitat for the GGS is primarily perennial marsh. The proposed garter snake conservation mitigation bank is consistent with the Yolo County General Plan, the open space provisions of the Williamson Act, and the applicable County development regulations, including the Yolo County ordinance regulating habitat mitigation projects and the Flood Hazard Development ordinance. In addition, the project is not reasonably expected to significantly conflict with the Yolo Natural Heritage Program (HCP/NCCP).

10.0 – STAFF RECOMMENDATION

Staff recommends that the Board adopt (in substantially the form provided):

- Board CEQA findings,

- Resolution No. 2014-10 to conditionally approve Board Encroachment Permit No. 18856 subject to any additional conditions that may be warranted by testimony of the Department of Water Resources, Division of Flood Management, Flood Maintenance Office, or others, at the public hearing.

and direct the Executive Officer to take the necessary actions to prepare and execute the permit and any related documents and to file a Notice of Determination with the State Clearinghouse.

11.0 – LIST OF ATTACHMENTS

A. Location Maps and Photos
B. Resolution No. 2014-10
C. Draft Permit No. 18856
D. Grading Plan
E. Planting Plan
F. Interim Management Plan
G. Long Term Management Plan
H. Habitat Development Plan
I. Hydraulic Report
J. Flood Control System Status Report Graphic

Design Review:	Gary W. Lemon P.E.
Environmental Review:	Andrea Buckley
Document Review:	Mitra Emami P.E., Eric Butler, P.E. (Acting Chief Engineer)
Legal Review:	Leslie Gallagher, Chief Counsel

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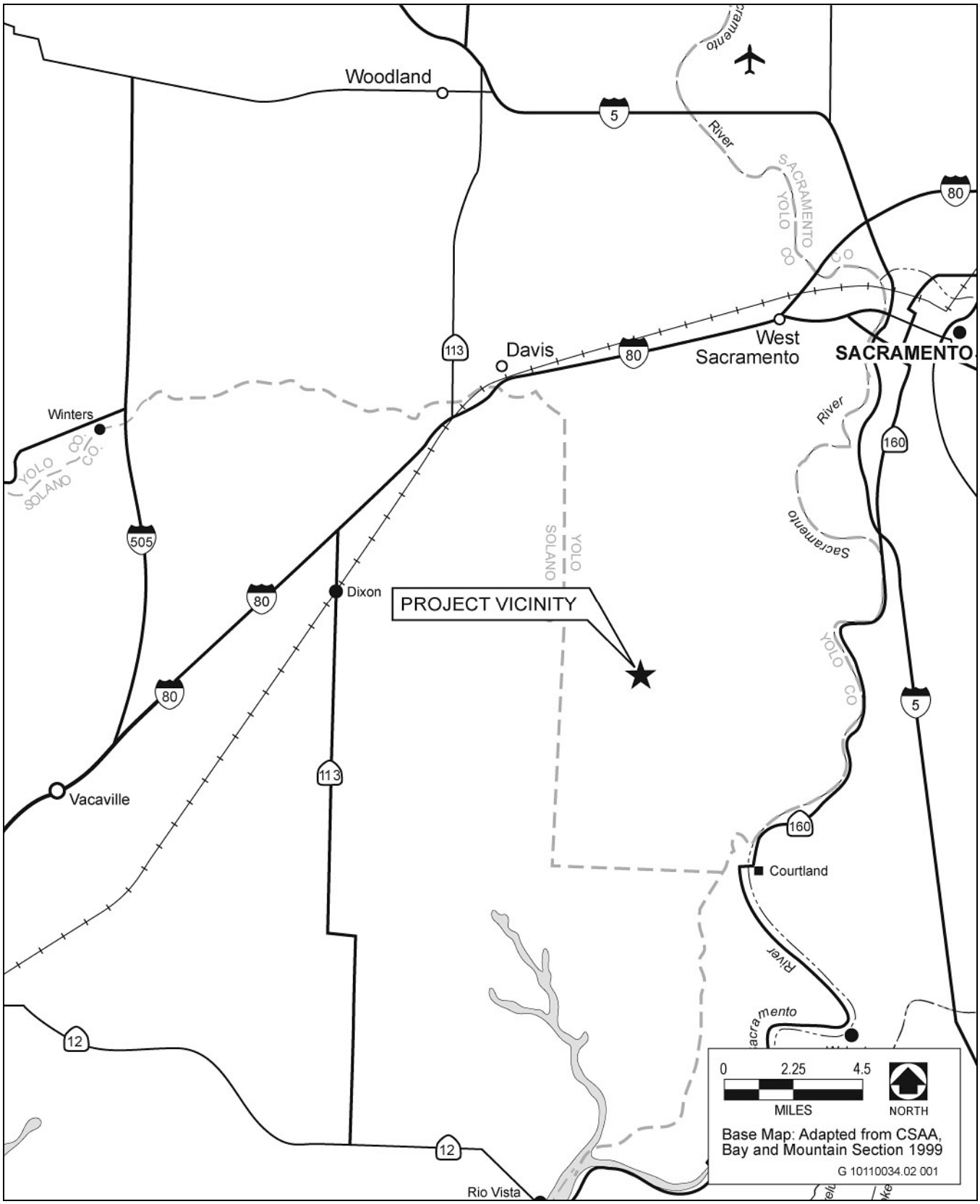
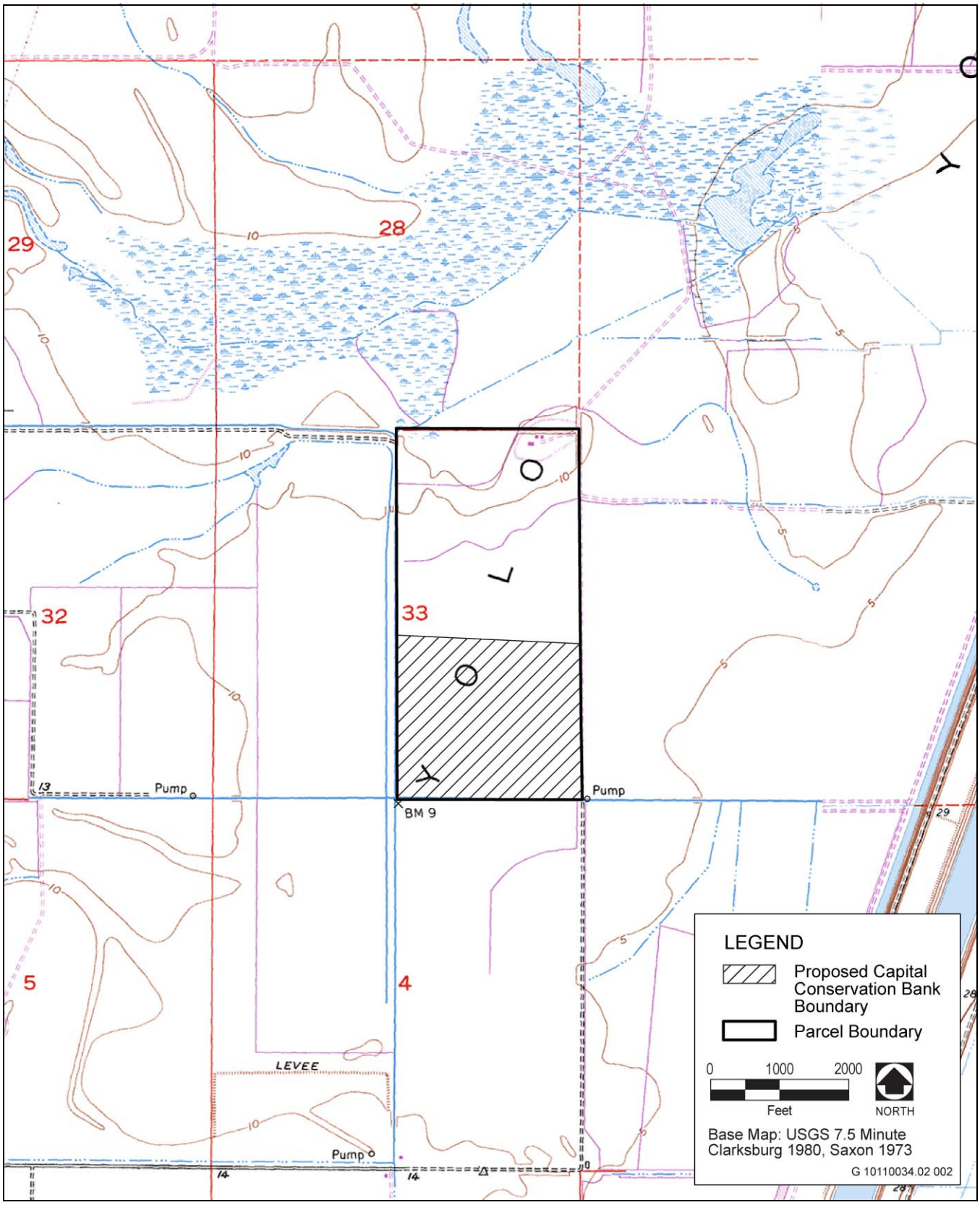


Source: Data adapted by AECOM 2010

Regional Project Vicinity **Exhibit 1**



Source: Data adapted by AECOM 2010

Proposed Bank Boundary **Exhibit 2**

STATE OF CALIFORNIA
THE RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD

RESOLUTION NO. 2014-10

FINDINGS AND DECISION AUTHORIZING ISSUANCE OF
ENCROACHMENT PERMIT NO. 18856
CAPITAL CONSERVATION AND MITIGATION BANK
PERENNIAL MARSH AND UPLAND HABITAT CREATION
FOR THE GIANT GARTER SNAKE
YOLO COUNTY

WHEREAS, Ronald D. and Clover A. Smith are proposing to construct a perennial marsh and upland habitat for giant garter snake bank totaling approximately 137-acres known as the Capital Conservation and Mitigation Bank (CCB); and

WHEREAS, the CCB will provide compensatory off-site mitigation for impacts to the Giant Garter Snake from future projects; and

WHEREAS, Ronald D. and Clover A. Smith, CCB owners, submitted Encroachment Permit Application No. 18856 to the Central Valley Flood Protection Board on March 12, 2013. The CCB project is located approximately 10.7 miles south of Interstate 80, and 6.5 miles west of Clarksburg within the Yolo Bypass in Yolo County; and

WHEREAS, America's Habitats will be the initial CCB Manager and will be responsible for maintaining the CCB per the Long-Term Maintenance Plan (LTMP) dated April 2014; and

WHEREAS, a non-wasting endowment fund will be established for conservation easement compliance monitoring and implementation of the CCB's LTMP in perpetuity; and

WHEREAS, Board staff completed a technical review of Permit Application No. 18856, and has determined that the proposed project conforms to all Title 23 standards; and

WHEREAS, the U.S. Army Corps of Engineers (USACE) issued a no-objection letter to the proposed project dated September 05, 2013, with conditions, that are incorporated into the permit as Exhibit A; and

WHEREAS, the Department of Water Resources' Flood Maintenance Office (FMO) has not formally commented on the proposed project due to concerns about mitigation bank projects such as the proposed CCB and their potential impacts on FMO's ability to effectively carry out its maintenance responsibilities as specified under California Water Code sections 8361 and 12878. Should the FMO choose to endorse the project with conditions, the conditions will be incorporated into the permit as Exhibit B; and

WHEREAS, Yolo County as lead agency under the California Environmental Quality Act, Public Resources Code sections 21000 *et seq*. ("CEQA") prepared an Initial Study, Mitigated Negative Declaration (IS/MND) (State Clearinghouse No.: 2013042067, April 2013) and Mitigation Monitoring and Reporting Plan (MMRP) on the Capital Conservation and Mitigation Bank Project (incorporated herein by reference and available at the Central Valley Flood Protection Board offices or Yolo County office); and

WHEREAS, Yolo County, as lead agency, certified the IS/MND, adopted mitigation measures and a MMRP (incorporated herein by reference and available at the Central Valley Flood Protection Board or at Yolo County), approved findings pursuant to CEQA and the CEQA Guidelines (incorporated herein by reference); and adopted Resolution 14-20 on March 11, 2014, and filed a Notice of Determination with the Yolo County Clerk on March 17, 2014 approving the Project; and

WHEREAS, the Central Valley Flood Protection Board has conducted an evidentiary hearing on Encroachment Permit Application No. 18856, and has reviewed the application and all supporting documentation, the Staff Report of its staff, the documents and correspondence in its file, and the environmental documents prepared by Yolo County;

NOW, THEREFORE, BE IT RESOLVED THAT,

Findings of Fact

1. The Central Valley Flood Protection Board hereby adopts as findings the facts set forth in the Staff Report.

2. The Board has reviewed all Attachments listed in the Staff Report.

CEQA Findings

3. The Central Valley Flood Protection Board, as a responsible agency, has independently reviewed the analysis in the IS/MND, MMRP, and the findings prepared by the lead agency, Yolo County, and has reached its own conclusions.

4. The Central Valley Flood Protection Board, after consideration of the IS/MND, MMRP, and Yolo County findings, adopts the project description, analysis and Findings which are relevant to activities authorized by issuance of Encroachment Permit No. 18856 for the Capital Conservation and Mitigation Bank Project.

5. **Custodian of Record**. The custodian of the CEQA record for the Board is its Executive Officer, Jay Punia, at the Central Valley Flood Protection Board Offices at 3310 El Camino Avenue, Room 151, Sacramento, California 95821.

Findings pursuant to Water Code section 8610.5

6. **Evidence Admitted into the Record**. The Board has considered all the evidence presented in this matter, including the original and updated applications and supporting documents, this Staff Report and attachments, and all other evidence presented by any individual or group, and all letters and other correspondence received by the Board and in the Board's files related to this matter.

7. **Best Available Science**. In making its findings, the Board has used the best available science relating to the issues presented by all parties.

8. **Effects on State Plan of Flood Control**. This project has no effects on facilities of the State Plan of Flood Control as the hydrologic and geotechnical impacts from the proposed project are localized and considered to be insignificant. Although the proposed project is located within the Yolo Bypass (approximately 2.5 miles east of the west levee and approximately one mile west of the Sacramento Deep Water Ship Channel Levee) it is compatible with the stated goals of the 2012 Central Valley Flood Protection Plan.

9. **Effects of Reasonable Projected Future Events.** The proposed project is located within the Yolo Bypass and habitat for the GGS is primarily perennial marsh. There will be minimal impacts to the proposed project from reasonable projected future events.

Other Findings/Conclusions regarding Issuance of the Permit

10. This resolution shall constitute the written decision of the Central Valley Flood Protection Board in the matter of Encroachment Permit Application No. 18856.

Approval of Encroachment Permit No. 18856

11. Based on the foregoing, the Central Valley Flood Protection Board hereby conditionally approves issuance of Encroachment Permit Application No. 18856 in substantially the form provided by the Board Staff as Attachment C of the Staff Report, subject to any necessary additional consideration of testimony by the Department of Water Resources, Division of Flood Management, Flood Maintenance Office, and.

12. The Central Valley Flood Protection Board directs the Executive Officer to take the necessary actions to prepare and execute the permit and all related documents and to prepare and file a Notice of Determination pursuant to CEQA for Encroachment Permit Application No. 18856.

PASSED AND ADOPTED by vote of the Board on _____, 2014.

_____

William H. Edgar
President

_____

Jane Dolan
Secretary

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STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18856 BD

This Permit is issued to:

Capital Conservation and Mitigation Bank
2665 Somey Loop Road
Rescue, California 95661

To create approximately 130-acres of perennial marsh and upland habitat inside of the Yolo Bypass. The 137-acre Capital Conservation Bank project includes water delivery channels, shallow wetlands, and raised areas suitable for the Giant Garter Snake. The project is located approximately 10.7-miles south of Interstate 80, 6.5-miles west of Clarksburg, and east of County Road 104 at the northern terminus of County Road 107 within the Yolo Bypass (Section 33, T7N, R3E, MDB&M, Sacramento Maintenance Yard, Yolo Bypass, Yolo County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection

Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18856 BD

THIRTEEN: A copy of this permit (No.18856) shall be included as an attachment to the Capital Interim Management Plan and the Capital Conservation Bank Long Term Management Plan.

FOURTEEN: All of the terms in the Capital Conservation Bank Long Term Management Plan dated April 2014 (LTMP) are incorporated into this permit. No changes may be made to the LTMP after the date of issuance of this permit, unless such changes are approved in writing by the Central Valley Flood Protection Board.

FIFTEEN: The permittee and/or subsequent Capital Conservation Bank Manager shall restore the project site to the initial as-constructed approved project conditions if the Central Valley Flood Protection Board, in its sole discretion, determines that the project negatively impacts flood conveyance and/or flood capacities in the Yolo Bypass.

SIXTEEN: The permittee and/or subsequent Capital Conservation Bank Manager will be responsible for securing any necessary permits, including those permits incidental to habitat manipulation and restoration work completed in the flood control project, and any biological surveying, monitoring, and reporting needed to satisfy those permits.

SEVENTEEN: In the event a required permit issued by another local, State or federal agency contains terms or conditions that conflict with any of the conditions in this Permit, the permittee and/or subsequent Capital Conservation Bank Manager must immediately take steps to resolve the conflict and agrees to incur all costs for compliance with local, state and federal permitting and resolution of any conflicts.

EIGHTEEN: The activities permitted by this Permit are and forever shall be subordinate to the flowage easements held by the Sacramento and San Joaquin Drainage District (i.e. The Central

Valley Flood Protection Board).

NINETEEN: If the Central Valley Flood Protection Board, in its sole discretion, determines at any time during the life of this permit that the LTMP is inadequate or that the permitee or its designee is not maintaining the project per the Capital Conservation Bank Long Term Management Plan, the Board shall be entitled to order maintenance of the project and access any and all funds in the endowment fund to pay for said maintenance. The Endowment Agreement must include a provision for Board access of funds.

TWENTY: All work approved by this permit shall be in accordance with the submitted drawings and specifications except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central Valley Flood Protection Board.

TWENTY-ONE: The permittee and/or subsequent Capital Conservation Bank Manager is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

TWENTY-TWO: The permittee and/or subsequent Capital Conservation Bank Manager shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

TWENTY-THREE: The Central Valley Flood Protection Board and Department of Water Resources shall not be held liable for any damage to the permitted encroachment(s) resulting from flood fight, operation, maintenance, inspection, or emergency repair of any of the facilities of the State Plan of Flood Control.

TWENTY-FOUR: No construction work of any kind shall be done during the flood season from November 1st to April 15th without prior approval of the Central Valley Flood Protection Board.

TWENTY-FIVE: The permittee shall be responsible for repair of any damages to the project levee and other flood control facilities due to construction, operation, or maintenance of the proposed project.

TWENTY-SIX: Upon receipt of a signed copy of the issued permit the permittee shall contact the Department of Water Resources by telephone, (916) 574-0609, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project.

TWENTY-SEVEN: No material stockpiles, temporary buildings, or equipment shall remain in the

floodway during the flood season from November 1st to April 15th.

TWENTY-EIGHT: The excess material, estimated to be 3,311-cubic yards, that will be spoiled in the northerly parcel shall be graded uniformly so that no holes or high spots remain.

TWENTY-NINE: Fill material shall be placed only within the areas indicated on the approved plans.

THIRTY: Submitted Grading Plans dated April 10, 2013 show that the proposed project will place approximately 1,500 cubic yards of rock inside the Yolo Bypass to control erosion in the water delivery channels and for the benefit of the Giant Garter Snake. An equivalent volume of material will be removed and discarded outside the Yolo Bypass and off all Project Works.

THIRTY-ONE: All debris generated by this project shall be disposed of outside the Yolo Bypass and off all Project Works.

THIRTY-TWO: The mitigation measures approved by the CEQA lead agency and the permittee are found in its Mitigation and Monitoring Reporting Program (MMRP) adopted by the CEQA lead agency. The permittee and/or subsequent Conservation Bank Manager shall implement all such mitigation measures.

THIRTY-THREE: The U.S. Army Corps of Engineers, the Department of Water Resources, and the Central Valley Flood Protection Board or their authorized representatives shall have access to the Capital Conservation Bank site at all times.

THIRTY-FOUR: The permittee or subsequent Capital Conservation Bank Manager shall not import any State or federally listed, threatened, or endangered species to the project site without prior written approval of the Central Valley Flood Protection Board.

THIRTY-FIVE: The permitted encroachment(s) shall not interfere with operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee and/or subsequent Conservation Bank Manager shall be required, at permittee's and/or subsequent Conservation Bank Manager's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee and/or subsequent Conservation Bank Manager does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's and/or subsequent Conservation Bank Manager's expense.

THIRTY-SIX: The permitte and/or subsequent Capital Conservation Bank Manager shall provide a copy of the Annual Report, defined in Section 4.8, Reporting Activities, of the Capital Conservation Bank Long Term Management Plan, to the Central Valley Flood Protection Board for review and comment.

THIRTY-SEVEN: The permittee and/or subsequent Capital Conservation Bank Manager shall submit any proposed material amendment to the Conservation Easement (CE), Conservation Bank Agreement (CBA), Interim Management Plan (IMP), Long Term Management Plan (LTMP), and Habitat Development Plan (HDP), including any "adaptive management" employed by the permittee, to the Central Valley Flood Protection Board for written approval prior to making any such

amendment.

THIRTY-EIGHT: The permittee and/or subsequent Conservation Bank Manager may be required, at permittee's and/or subsequent Conservation Bank Manager cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee and/or subsequent Conservation Bank Manager does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's and/or subsequent Conservation Bank Manager's expense.

THIRTY-NINE: If the project, or any portion thereof, is to be abandoned in the future, the permittee and/or subsequent Conservation Bank Manager shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's and/or subsequent Conservation Bank Manager's cost and expense.

FORTY: The permittee and/or subsequent Capital Conservation Bank Manager shall comply with all conditions set forth in the letter from the Department of the Army (U.S. Army Corps of Engineers, Sacramento District) dated September 5, 2013, which is attached to this permit as Exhibit A and is incorporated by reference.

FORTY-ONE: The permittee and/or subsequent Capital Conservation Bank Manager shall comply with all conditions set forth in the letter from the DWR Flood Maintenance Office dated April xx, 2014, which is attached to this permit as Exhibit B and is incorporated by reference.

FORTY-TWO: Upon completion of the project, the permittee shall submit as-constructed drawings to: Department of Water Resources, Flood Project Inspection Section, 3310 El Camino Avenue, Suite 256, Sacramento, California 95821.

DEPARTMENT OF THE ARMY
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

REPLY TO
ATTENTION OF

SEP 05 2013

Flood Protection and Navigation Section (18856)

Mr. Jay Punia, Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, CA 95821

Dear Mr. Punia:

We have reviewed a permit application by Ronald D. and Clover A. Smith – Capital Conservation Bank (application number 18856). This project includes creating 130 acres of perennial marsh and upland habitat inside of the Yolo Bypass by constructing water delivery channels, shallow wetlands, and raised areas suitable for the Giant Garter Snake. The project is located approximately 10.7 miles south of Interstate 80, 6.5 miles west of Clarksburg, and east of County Road 104 at the northern terminus of County Road 107 within the Yolo Bypass, at 38.404337°N 121.643257°W NAD83, Yolo County, California.

The Board shall ensure that the design flow of 490,000 cubic feet per second in the Yolo Bypass is not compromised by this proposed work. Based on the Board's determination that the flood risk reduction project is not compromised by the proposed work, the District Engineer has no objection to approval of this application by your Board from a flood control standpoint, subject to the following conditions:

a. That no excavation shall be performed within the floodway during the flood season of November 1 to April 15, unless otherwise approved in writing by your Board.

b. That in the event trees and brush are cleared, they shall be properly disposed of either by complete burning or complete removal outside the limits of the project right-of-way.

c. That no material shall be stockpiled within the floodway during the flood season November 1 to April 15, unless otherwise approved in writing by your Board.

d. That the proposed work shall not interfere with the integrity or hydraulic capacity of the flood risk reduction project; easement access; or maintenance, inspection, and flood fighting procedures.

A file (2010-00119) has been opened because a Section 10 and/or Section 404 permit may be required. Please advise the applicant to contact the U.S. Army Corps of

Engineers, Sacramento District, Regulatory Division, 1325 J Street, Room 1350, Sacramento, California 95814, telephone (916) 557-5250.

A copy of this letter is being furnished to Mr. Don Rasmussen, Chief Flood Project Integrity and Inspection Branch, 3310 El Camino Avenue, Suite LL30, Sacramento, CA, 95821.

Sincerely,

Rick L. Poeppelman, P.E.
Chief, Engineering Division

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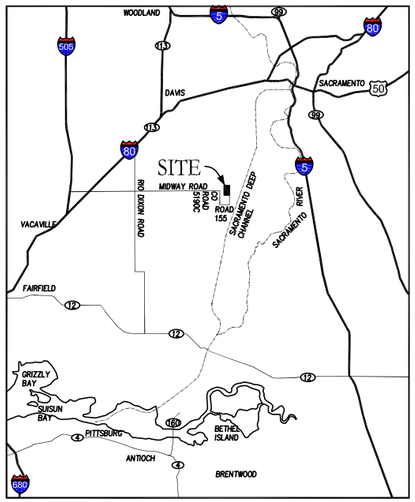
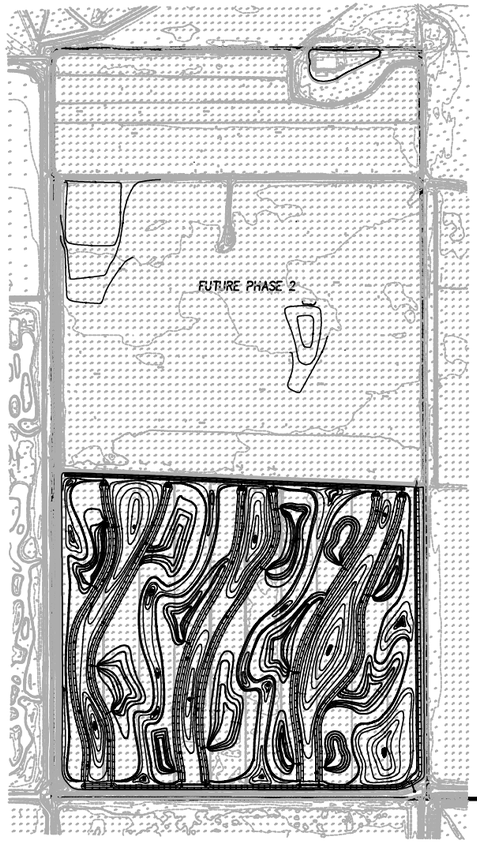
GRADING PLANS FOR
CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE
HABITAT-PHASE 1
YOLO COUNTY, CALIFORNIA



VICINITY MAP
NO SCALE



SCALE: 1"=500'
0'
500'

BENCHMARK

NGS DATA POINT DESIGNATED "ANDREW", PID #AE9864; FOUND SURVEY DISK STAMPED "ANDREW 1997", ELEVATION = 12.2 FEET, NAVD 88 DATUM

ABBREVIATIONS

CASP	CORRUGATED ALUMINIZED STEEL PIPE	LP	LOW POINT
CL	CLASS	P/L	PROPERTY LINE
C/L	CENTERLINE	PVC	POLYVINYL CHLORIDE PIPE
CMP	CORRUGATED METAL PIPE	RCP	REINFORCED CONCRETE PIPE
DIA	DIAMETER	S=	SLOPE EQUALS
DIP	DUCTILE IRON PIPE	SF	SQUARE FEET
EL	ELEVATION	TB	TOP OF BERM
FG	FINISHED GRADE	TYP	TYPICAL
FL	FLOWLINE	UNO	UNLESS NOTED OTHERWISE
HP	HIGH POINT		

LEGEND

FEATURE	EXISTING	PROPOSED
SCREW GATE		
STORM DRAIN MANHOLE		
STORM DRAIN (SIZE INDICATED)		24
DRAINAGE DITCH		
SIDE SLOPE		
DIRECTION OF SURFACE DRAINAGE FLOW		
FLOWLINE		
SILT/CONSTRUCTION FENCE		
SURVEY MONUMENT		
EXISTING GROUND SURFACE ELEVATION	8.5	
SURFACE CONTOUR		10
DETAIL NUMBER/SHEET NUMBER		1/3
GRADING LIMIT LINE		
PROPERTY LINE		
PIPE OUTFALL		
FLASHBOARD RISER		
UPLAND ROCK CLUSTER		
ROCK CLUSTER		
EXISTING EASEMENT		

CALL BEFORE YOU DIG
811
UNDERGROUND SERVICE ALERT
CA: 800-227-2600

SHEET INDEX

GEOTECHNICAL ENGINEER
MATRISCOPE LABORATORIES, INC.
601 BERCUT DRIVE
SACRAMENTO, CA 95611

GEOTECHNICAL REPORT TITLED
"GEOTECHNICAL INVESTIGATION REPORT FOR CAPITAL CONSERVATION BANK"
DATED: OCTOBER 31, 2011

TOTAL AREA-PHASE 1: 137.38 AC.

AREA OF DISTURBANCE: 135.7± AC.

WDID#: TBD

YOLO COUNTY
PLANNING AND PUBLIC WORKS
REVIEWED FOR CONFORMANCE WITH THE YOLO COUNTY IMPROVEMENT STANDARDS. THE UNDERSIGNED SHALL NOT BE LIABLE FOR ERRORS AND OMISSIONS ON THE PLANS.

_____ _____
COUNTY ENGINEER DATE

P.E._____ REGISTRATION EXPIRES___

OWNER: RONALD D. & CLOVER A. SMITH

ADDRESS: 2665 SORNEY LOOP ROAD
RESCUE, CA 95672
(530) 676-8867

TOTAL CUT = 262,574 (CUT)
TOTAL FILL = 265,886 (FILL)

BALANCE = 3,311 (NET FILL)

GENERAL NOTES

CONTRACTOR RESPONSIBILITIES: CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

UNAUTHORIZED CHANGES & USES: FRAYJI DESIGN GROUP, INC. WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

STAKING REQUESTS: FRAYJI DESIGN GROUP, INC. SHALL BE NOTIFIED AT LEAST 48 HOURS (2 WORKING DAYS) IN ADVANCE OF THE NEED FOR CONSTRUCTION STAKING TO BEGIN. CONTRACTOR SHALL SCHEDULE HIS EFFORTS TO ALLOW FOR THE TIME, AFTER THE FIELD CREW ARRIVES AT THE SITE, FOR STAKING NEEDS TO BE FULFILLED.

NO	REVISION	DATE	APPR'D

YOUR PROFESSIONAL ENGINEER ★ THE STATE OF CALIFORNIA ★ REGISTERED CIVIL
No. 67265
EXP. 06-30-15
TONY J. FRAYJI

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-3600 Phone
Roseville, CA 95661 (916) 782-3953 Fax
CIVIL ENGINEERING • PLANNING • SURVEYING

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1
YOLO COUNTY CALIFORNIA

COVER SHEET

SCALE:
AS SHOWN

PROJECT NO.
10650-01

SHEET
1 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C1-COVER.dwg, 04/25/13 08:59:49am, KStockwell COVER

PRELIMINARY - SUBJECT TO REVISION

I. YOLO COUNTY GENERAL NOTES

A UNLESS SHOWN OR SPECIFIED OTHERWISE, ALL CONSTRUCTION AND MATERIALS SHALL COMPLY WITH THE LATEST EDITION OF THE YOLO COUNTY IMPROVEMENT STANDARDS.

B THE CONTRACTOR SHALL NOT BEGIN ANY WORK SHOWN ON THESE PLANS UNTIL THE SIGNATURE OF APPROVAL OF THE COUNTY ENGINEER IS AFFIXED HEREON AND ALL APPLICABLE PERMITS HAVE BEEN OBTAINED.

C THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH COUNTY STAFF, OTHER AGENCY STAFF, CONTRACTOR, MATERIAL TESTING LAB, CONSULTANTS, AND OTHER APPROPRIATE PERSONNEL REPRESENTING THE DEVELOPER AT LEAST 2 WORKING DAYS IN ADVANCE OF ANY CONSTRUCTION ACTIVITIES.

D CONTRACTORS SHALL BE RESPONSIBLE FOR COORDINATING THEIR OPERATIONS WITH ALL REQUIRED MATERIALS TESTING SERVICES AS REQUIRED BY THE YOLO COUNTY IMPROVEMENT STANDARDS AND THE COUNTY INSPECTOR. EACH PHASE OF CONSTRUCTION SHALL BE TESTED AND APPROVED BY THE COUNTY INSPECTOR PRIOR TO PROCEEDING TO SUBSEQUENT PHASES.

E CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED IN THE DEVELOPMENT PRIOR TO BEGINNING OF WORK.

F UTILITIES TO BE INSTALLED UNDER EXISTING PAVEMENTS SHALL BE DIRECTIONALLY BORED.

G NO PAVEMENT WORK WILL OCCUR WITHIN THE ROAD RIGHT-OF-WAY PRIOR TO COMPLETION OF ANY NECESSARY UTILITY POLE REMOVAL AND UTILITY UNDERGROUNDING WORK WITHIN THAT RIGHT-OF-WAY

H CONTRACTOR SHALL NOTIFY "UNDERGROUND SERVICE ALERT" AT 811 AT LEAST TWO WORKING DAYS BEFORE STARTING ANY EXCAVATION ACTIVITIES.

I MATERIALS SUBMITTALS FOR MATERIAL INCORPORATED INTO THE WORK INCLUDING, BUT NOT LIMITED TO, AGGREGATE BASE, ASPHALT CONCRETE, AND CONCRETE MATERIALS SHALL BE SUBMITTED TO THE COUNTY AT LEAST 2 WEEKS PRIOR TO DELI VERY OF MATERIALS TO THE SITE.

J CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND/OR OTHER SURVEY MARKERS DURING CONSTRUCTION. ALL MONUMENTS OR MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED BY A LICENSED CALIFORNIA LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.

K PRIOR TO REQUESTING COUNTY ACCEPTANCE OF IMPROVEMENTS, THE CONTRACTOR SHALL SET STANDARD SURVEY MONUMENTS AT LOCATIONS REFERENCED BY ENGINEER. ALL SURVEY MONUMENTS SHALL BE PUNCHED AND SHALL BEAR THE LICENSE NUMBER OF THE SURVEYOR.

L CONTRACTOR SHALL NOTIFY THE APPROPRIATE SPECIAL DISTRICT, AFTER RECEIPT OF PERMITS AND PAYMENT OF REQUIRED FEES, PRIOR TO MAKING WATER OR SEWER TAPS.

M CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL CURRENTLY APPLICABLE SAFETY LAWS OF ALL JURISDICTIONAL BODIES. THE CONTRACTOR IS DIRECTED TO CONTACT THE CALIFORNIA STATE DEPARTMENT OF INDUSTRIAL RELATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BARRICADES, SAFETY DEVICES, AND CONTROL OF TRAFFIC WITHIN AND AROUND THE CONSTRUCTION AREA. FOR ALL TRENCH EXCAVATION 5 FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE CALIFORNIA STATE DIVISION OF INDUSTRIAL RELATIONS PRIOR TO BEGINNING ANY EXCAVATION.

N PUBLIC SAFETY AND TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE CALTRANS TRAFFIC MANUAL AND AS MAY BE DIRECTED BY THE COUNTY. ANY LANE CLOSURES (VEHICLE OR BICYCLE) SHALL BE APPROVED IN ADVANCE BY THE COUNTY. SAFE VEHICULAR, BICYCLE, AND PEDESTRIAN ACCESS SHALL BE PROVIDED AT ALL TIMES.

O THE CONTRACTOR SHALL MAINTAIN CONTINUOUS TEMPORARY TRAFFIC BARRICADES, WITH OPERABLE FLASHING DEVICES, SPACED AT INTERVALS OF NOT TO EXCEED 50 FEET WHENEVER THE WORK AREA IS ADJACENT TO AN EXISTING TRAFFIC LANE AND THERE IS A PAVEMENT CUT, TRENCH, OR DITCH WHICH IS OVER 2 INCHES IN DEPTH, OR IF THE TRAFFIC LANE USED BY VEHICLES IS NOT PAVED. IF THE CUT, TRENCH OR DITCH IS MORE THAN 10 FEET FROM A TRAFFIC LANE, THEN THE BARRICADE SPACING MAY BE GREATER, PROVIDED THAT IT DOES NOT EXCEED 200 FEET.

P CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES CONTRACTOR SHALL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONTRACTOR FURTHER AGREES TO INDEMNIFY AND HOLD THE COUNTY OF YOLO, ITS OFFICERS,, EMPLOYEES, AGENTS, AND VOLUNTEERS HARMLESS FROM ANY AND ALL LIABILITY , REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT.

Q IN THE EVENT THAT ANY STREET OR PORTION OF ANY STREET WILL BE CLOSED TO EMERGENCY TRAFFIC, THE CONTRACTOR SHALL NOTIFY YOLO COUNTY COMMUNICATIONS DISPATCH AT (530) 666-8920 PRIOR TO CLOSURE, AND IMMEDIATELY AFTER REOPENING SAID STREET.

R CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUCTING HIS OPERATION ENTIRELY OUTSIDE OF ANY FLOODPLAIN BOUNDARIES UNLESS OTHERWISE APPROVED. THE 100-YEAR FLOODPLAIN BOUNDARIES SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO CONSTRUCTION.

S CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUCTING HIS OPERATION ENTIRELY OUTSIDE OF ANY "NO GRADING" AREA. THESE AREAS SHALL BE CLEARLY DELINEATED IN THE FIELD PRIOR TO CONSTRUCTION.

T WHERE WORK IS BEING DONE IN AN OFF-SITE EASEMENT THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNER TWO WORKING DAYS PRIOR TO COMMENCING WORK WITHIN SAID EASEMENT. COPIES OF ALL SIGNED/APPROVED OFF-SITE EASEMENT AND/OR RIGHT-OF-ENTRY DOCUMENTS SHALL BE PROVIDED TO THE COUNTY.

U CONTRACTOR SHALL NOT DISPOSE OF CHLORINATED OR OTHER CHEMICALLY TREATED WATER INTO ANY DRAINAGE SYSTEM.

II. EARTHWORK NOTES:

A CONSTRUCTION SHALL STOP IF CULTURAL RESOURCES ARE SUSPECTED. IT IS POSSIBLE THAT PREVIOUS ACTIVITIES HAVE OBSCURED SURFACE EVIDENCE OF CULTURAL RESOURCES. IF SIGNS OF AN ARCHEOLOGICAL SITE, SUCH AS ANY UNUSUAL AMOUNTS OF STONE, BONE OR SHELL ARE INCURRED DURING GRADING OR OTHER CONSTRUCTION ACTIVITIES, WORK SHALL HE HALTED WITHIN 100 FEET OF THE FIND AND THE CONTRACTOR SHALL NOTIFY THE OWNER. A QUALIFIED ARCHEOLOGIST SHALL BE CONSULTED FOR AN ON-SITE EVALUATION. ADDITIONAL MITIGATION MAY BE REQUIRED BY THE ARCHEOLOGIST.

B ALL UNSUITABLE AND SURPLUS MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UNLESS SPECIFIED OTHERWISE BY THE OWNER.

C SUFFICIENT EQUIPMENT SHALL BE AVAILABLE TO PROVIDE DUST CONTROL AT ALL TIMES DURING CONSTRUCTION. A WATER TRUCK SHALL BE USED, WHEN REQUIRED, TO MAINTAIN ADEQUATE DUST CONTROL. AREAS SURROUNDING THE WORK SHALL BE KEPT CLEAN AND RETURNED TO ORIGINAL CONDITION UPON COMPLETION OF CONTRACT.

D CROSS LOT DRAINAGE IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE COUNTY ENGINEER.

E THE MAXIMUM EARTH SLOPES ALLOWED SHALL BE 2:1 (HORIZONTAL TO VERTICAL). ALL PROPOSED SLOPES THAT ARE 3:1 OR STEEPER SHALL BE SHOWN ON THE PLANS BY SOME TYPE OF SLOPE SYMBOL DELINEATION.

F GRADING AND COMPACTION SHALL BE IN CONFORMANCE WITH RECOMMENDATIONS LISTED IN THE GEOTECHNICAL REPORT PREPARED ON OCTOBER 31, 2011, TITLED "GEOTECHINICAL INVESTIGATION REPORT FOR CAPITAL CONSERVATION BANK," BY MATRISCOPE ENGINEERING, LABORATORIES, INC.

G CLEARING AND GRUBBING: IN ALL AREAS TO RECEIVE ENGINEERED FILL, EXISTING VEGETATION, ORGANIC TOPSOIL, AND ANY DEBRIS SHOULD BE STRIPPED AND DISPOSED OF OUTSIDE THE CONSTRUCTION LIMITS. STRIPPED TOPSOIL (LESS ANY DEBRIS) MAY BE STOCKPILED AND REUSED FOR AGRICULTURAL PURPOSES; HOWEVER, THIS MATERIAL SHOULD NOT BE INCORPORATED INTO ANY ENGINEERED FILL.

GENERAL NOTES - FRAYJI DESIGN GROUP, INC.

A THE CONTRACTOR SHALL REQUEST CONSTRUCTION STAKES FOR ANY PARTICULAR PHASE OF WORK AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTRACTOR SHALL REQUEST A FORM OR GRADE STAKE PRIOR TO PLACING OF IMPROVEMENTS. PRIOR TO ANY GRADING, THE COMPLETE LIMITS OF CONSTRUCTION SHALL BE STAKED IN THE FIELD AND APPROVED BY THE COUNTY, AND PRIOR TO ANY GRADING, CLEARING, OR TREE DISTURBANCE ALL CONSTRUCTION FENCING SHALL BE INSTALLED AND INSPECTED BY THE COUNTY.

B FRAYJI DESIGN GROUP, INC. ASSUMES NO RESPONSIBILITY FOR UNAUTHORIZED CHANGES TO THESE PLANS OR STAKING ERRORS IF STAKED BY OTHERS.

C PRIOR TO ANY CORRECTIVE ACTION BY THE CONTRACTOR WHICH IS NECESSARY DUE TO STAKING ERRORS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR RESTAKING AND VERIFICATION OF PREVIOUS STAKING. SHOULD ANY CORRECTIVE WORK BE DONE PRIOR TO NOTIFICATION, THE ENGINEER ASSUMES NO LIABILITY FOR THE COSTS INCURRED FOR THIS WORK.

D CONTOURS SHOWN ON THIS SET OF GRADING PLANS ARE COMPRISED FROM AN AERIAL SURVEY AND A FIELD SURVEY.

E IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ACTUAL LOCATION OF UNDERGROUND UTILITIES. THE TYPES, LOCATION, SIZES AND/OR DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE TRUE TYPES, EXTENT, SIZES, LOCATIONS AND DEPTHS. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL KNOWN UNDERGROUND UTILITIES, HOWEVER, THE ENGINEER CAN ASSUME NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF ITS DELINEATION OF SUCH UNDERGROUND UTILITIES NOR FOR THE EXISTENCE OF OTHER BURIED OBJECTS OR UTILITIES WHICH MAY BE ENCOUNTERED BUT WHICH ARE NOT SHOWN ON THESE DRAWINGS.

F ALL STORM DRAIN PIPE SHALL BE HDPE SMOOTH INTERIOR, UNLESS NOTED OTHERWISE.

STORM DRAIN NOTES

A THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE FACILITIES WITHIN THE CONSTRUCTION AREA UNTIL NEW DRAINAGE IMPROVEMENTS ARE IN PLACE AND FUNCTIONING

B EXISTING STORM DRAIN FACILITIES SHALL BE EXPOSED AND INVERT VERIFIED PRIOR TO PLACEMENT OF NEW PIPE

C BACKFILL MATERIALS: PIPE BACKFILL SHOULD CONSIST OF CLEAN NATIVE SOIL. REFER TO GEOTECHNICAL REPORT FOR FURTHER RECOMMENDATIONS.

D ALL TRENCH BACKFILL SHOULD BE PLACED AND COMPACTED IN ACCORDANCE WITH RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT FOR ENGINEERED FILL.

NO	REVISION	DATE	APPR

TONY I. FRAYJI — No. 67265 — REN. 06-30-13 — PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — CIVIL

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY I. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-3000 Phone
Roseville, CA 95661 (916) 782-3933 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

GENERAL NOTES

YOLO COUNTY — CALIFORNIA

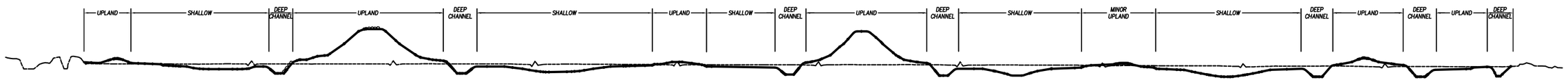
SCALE
AS SHOWN

PROJECT NO.
10650–01

SHEET
2 OF 20

PLOT NAME/DATE: E:\Drafting\10650\Plan Sets\Grading Phase 1\C2–GENERAL NOTES.dwg, 04/25/13 09:00:42am, KStockwell City&General Notes

PRELIMINARY - SUBJECT TO REVISION



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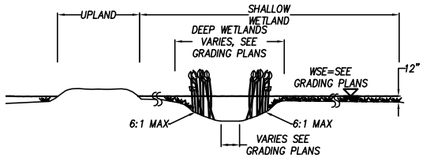
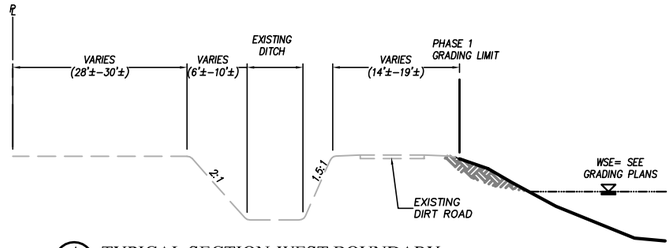


D/3 TYPICAL SECTION-DEEP WETLANDS
NOT TO SCALE



A/3 TYPICAL SECTION-WEST BOUNDARY
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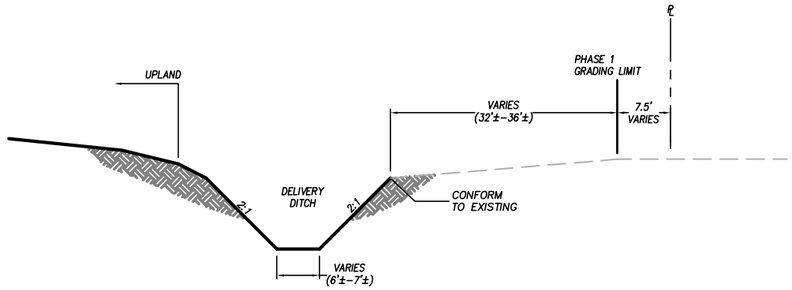
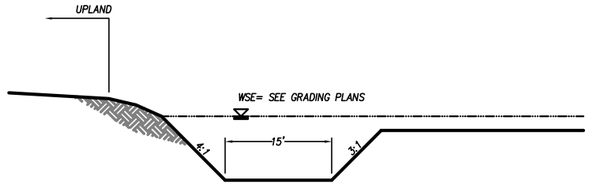
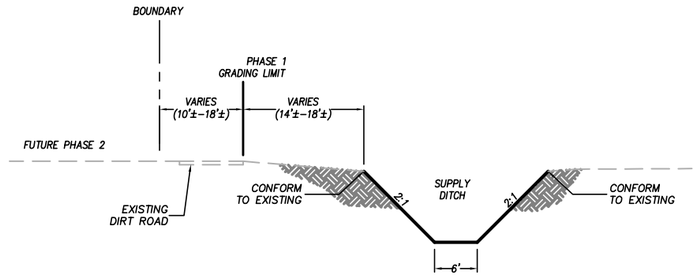


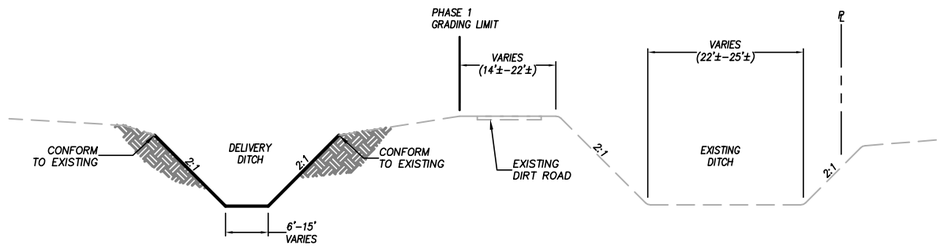
E/3 TYPICAL SECTION-EAST BOUNDARY
NOT TO SCALE



B/3 TYPICAL SECTION-DEEP CHANNEL
NOT TO SCALE



F/3 TYPICAL SECTION-NORTH BOUNDARY
NOT TO SCALE



C/3 TYPICAL SECTION-SOUTH BOUNDARY
NOT TO SCALE

NO.	REVISION	DATE	APPR

TONY J. FRAYJI — PROFESSIONAL ENGINEER — CIVIL — No. 67265 — REN. 06-30-15 — STATE OF CALIFORNIA

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 520 (916) 782-3600 Phone
Roseville, CA 95661 (916) 782-3953 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

SECTIONS

YOLO COUNTY — CALIFORNIA

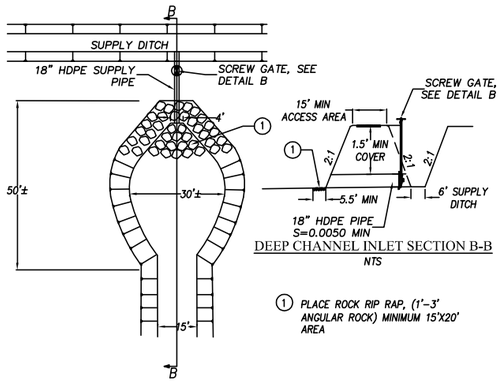
SCALE
AS SHOWN

PROJECT NO.
10650-01

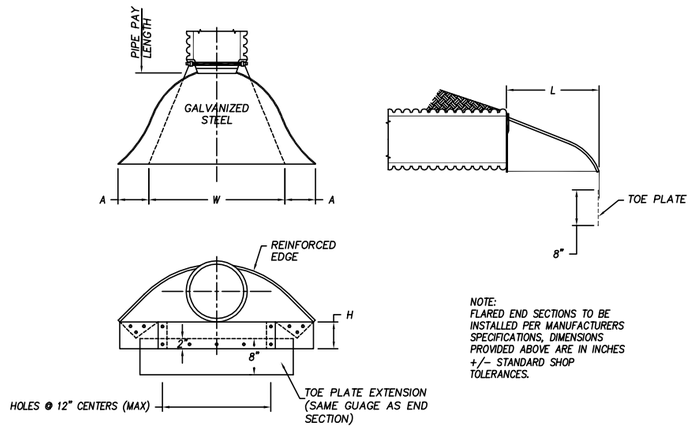
SHEET
3 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C3-Sections.dwg, 04/25/13 09:01:23am, KStockwell Sections

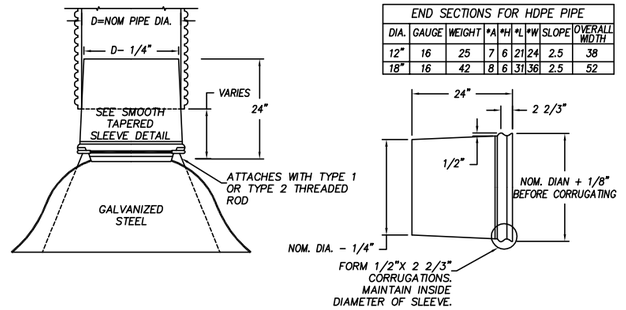
PRELIMINARY - SUBJECT TO REVISION



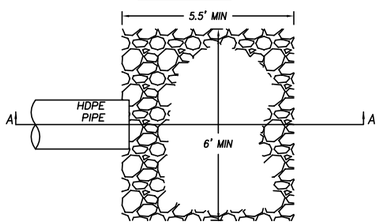
G/4 DEEP CHANNEL INLET
NOT TO SCALE



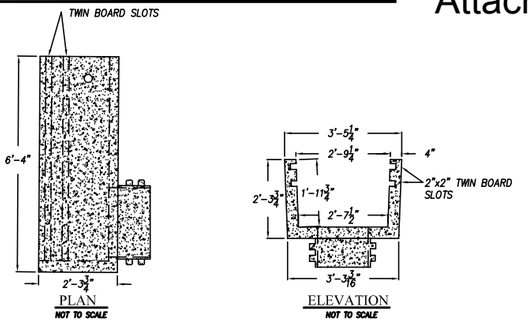
END SECTIONS FOR HDPE PIPE								
DIA.	GAUGE	WEIGHT	*A	*H	*L	*W	SLOPE	OVERALL WIDTH
12"	16	25	7	6	21	24	2.5	38
18"	16	42	8	6	31	36	2.5	52



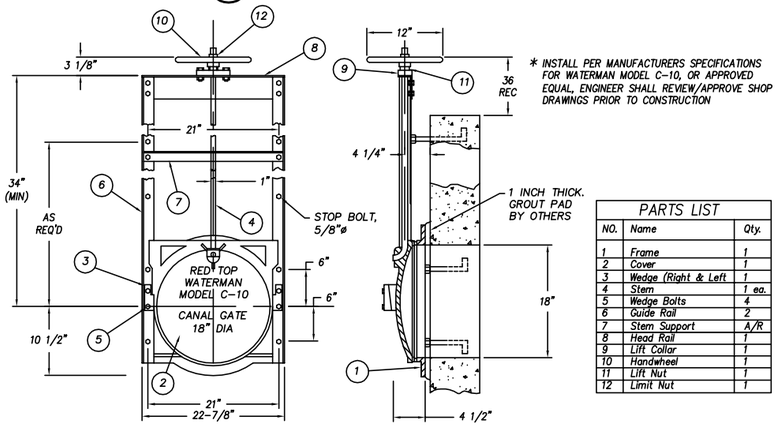
SECTION A-A



E/4 PIPE OUTFALL
NOT TO SCALE



A/4 FLASHBOARD RISER - (48" W x 72" H) AT OUTLETS
NOT TO SCALE

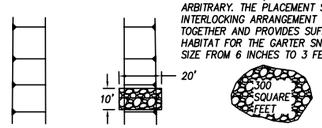


* INSTALL PER MANUFACTURERS SPECIFICATIONS FOR WATERMAN MODEL C-10, OR APPROVED EQUAL, ENGINEER SHALL REVIEW/APPROVE SHOP DRAWINGS PRIOR TO CONSTRUCTION

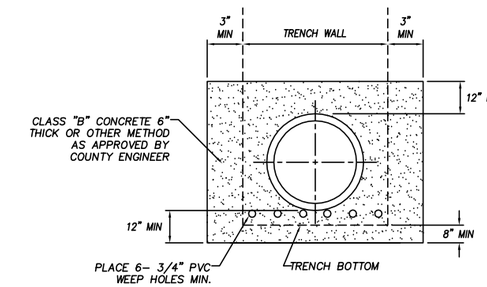
PARTS LIST		
NO.	Name	Qty.
1	Frame	1
2	Cover	1
3	Wedge (Right & Left	1
4	Stem	1 ea.
5	Wedge Bolts	4
6	Guide Rail	2
7	Stem Support	A/R
8	Head Rail	1
9	Lift Collar	1
10	Handwheel	1
11	Lift Nut	1
12	Limit Nut	1

B/4 SCREW GATE INLETS
NOT TO SCALE

NOTE:
ROCK PLACEMENT, AT LOCATIONS SHOWN ON PLANS, IS ARBITRARY. THE PLACEMENT SHOULD CREATE AN INTERLOCKING ARRANGEMENT THAT HOLDS ROCKS TOGETHER AND PROVIDES SUFFICIENT VOIDS TO CREATE A HABITAT FOR THE GARTER SNAKE. ROCKS SHALL VARY IN SIZE FROM 6 INCHES TO 3 FEET.



C/4 ROCK PLACEMENT
NOT TO SCALE

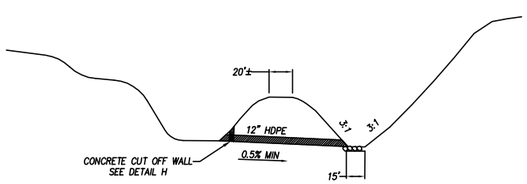


CUT-OFF WALL DETAIL

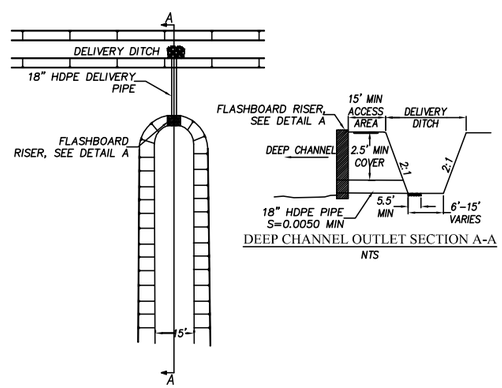
NOTES:

1. CUT-OFF WALL TO BE PLACED 3' MIN. AWAY FROM PIPE OPENING
2. CUT-OFF WALL TO BE INSTALLED PER DIRECTION OF SOILS CONSULTANT AND/OR COUNTY ENGINEER
3. OPTIONAL MATERIALS TO BE 2 SACK SAND CEMENT SLURRY OR BENTONITE CLAY.

H/4 CONCRETE CUT OFF WALL
NOT TO SCALE



F/4 DEEP WETLAND DRAIN
NOT TO SCALE



D/4 DEEP CHANNEL OUTLET
NOT TO SCALE

NO.	REVISION	DATE	APPR.

TONY J. FRAYJI — PROFESSIONAL ENGINEER — No. 67266 — REN. 06-30-15 — STATE OF CALIFORNIA

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-3000 Phone
Roseville, CA 95661 (916) 782-3953 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GANT GARTER SNAKE HABITAT-PHASE 1

DETAILS

YOLO COUNTY — CALIFORNIA

SCALE: AS SHOWN

PROJECT NO. 10650-01

SHEET 4 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C4-Details.dwg, 04/25/13 09:01:51am, KStockwell Details

PRELIMINARY - SUBJECT TO REVISION

Attachment D

SEE SHEET 10

INSTALL 48 LF OF 12" HDPE PIPE

WS=10.5

WS=10.0

WS=10.5

EXISTING CHANNEL

EXISTING CHANNEL

INSTALL 36 LF OF 18" HDPE PIPE

INSTALL 36 LF OF 18" HDPE PIPE

LIMIT OF GRADING

EXISTING CHANNEL

SEE SHEET 6

SCALE 1"=40'

KEY MAP
NTS

CONSTRUCTION NOTES

1. INSTALL FLASHBOARD RISER PER BRIGGS MANUFACTURING SPECIFICATIONS, OR APPROVED EQUAL, PER DETAIL A ON SHEET 4
2. ROCK PLACEMENT PER DETAIL C ON SHEET 4
3. INSTALL DEEP CHANNEL OUTLET PER DETAIL D ON SHEET 4
4. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
5. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4
6. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL.
7. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

NO	REVISION	DATE	APPR

TONY J. FRAYJI — No. 67266 — REN: 06-30-15 — CIVIL — STATE OF CALIFORNIA — PROFESSIONAL ENGINEER

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
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GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY — CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650-01

SHEET
5 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\GS-Grading Plan.dwg, 04/25/13 09:02:29am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

SEE SHEET 9

SEE SHEET 5

SEE SHEET 7

INSTALL 41 LF OF 12" HDPE PIPE

INSTALL 42 LF OF 12" HDPE PIPE

INSTALL 35 LF OF 18" HDPE PIPE

INSTALL 35 LF OF 18" HDPE PIPE

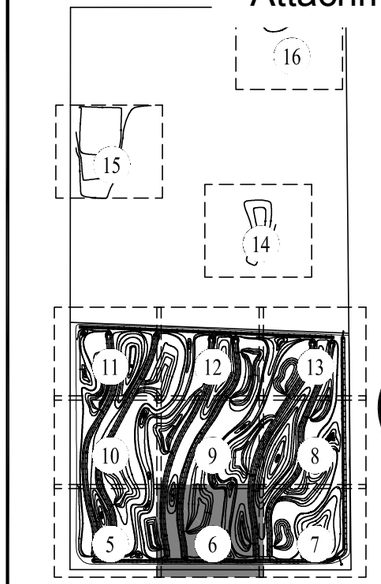
INSTALL 43 LF OF 12" HDPE PIPE

INSTALL 36 LF OF 18" HDPE PIPE

WS=9.5

LIMIT OF GRADING

EXISTING CHANNEL



KEY MAP
NTS

SCALE 1"=40'

CONSTRUCTION NOTES

1. INSTALL FLASHBOARD RISER PER BRIGGS MANUFACTURING SPECIFICATIONS, OR APPROVED EQUAL, PER DETAIL A ON SHEET 4
2. ROCK PLACEMENT PER DETAIL C ON SHEET 4
3. INSTALL DEEP CHANNEL OUTLET PER DETAIL D ON SHEET 4
4. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
5. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4
6. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL.
7. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
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CALL USA 1-800-227-2600

NO.	REVISION	DATE	APP'D

YOUR PROFESSIONAL ENGINEER ★ THROUGHOUT ALL OF YOUR PROJECTS ★ REGISTERED
TONY J. FRAYJI No. 67265 REN: 06-30-15 CIVIL STATE OF CALIFORNIA

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
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Roseville, CA 95661 (916) 782-3953 Fax
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GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650-01

SHEET
6 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\06-Grading Plan.dwg, 04/25/13 09:03:10am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

SEE SHEET 8

SEE SHEET 6

WS=9.0

INSTALL 43 LF OF 18" HDPE PIPE

INSTALL 36 LF OF 18" HDPE PIPE

INSTALL 74 LF OF 18" HDPE PIPE

EXISTING DIRT ROAD

EXISTING CHANNEL

LIMIT OF GRADING

B 3

D 3

E 3

C 3

KEY MAP
NTS

SCALE 1"=40'

CONSTRUCTION NOTES

1. INSTALL FLASHBOARD RISER PER BRIGGS MANUFACTURING SPECIFICATIONS, OR APPROVED EQUAL, PER DETAIL A ON SHEET 4
2. ROCK PLACEMENT PER DETAIL C ON SHEET 4
3. INSTALL DEEP CHANNEL OUTLET PER DETAIL D ON SHEET 4
4. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
5. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL
6. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4
7. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

REGISTERED PROFESSIONAL ENGINEER TONY J. FRAYJI No. 67266 REN. 06-30-15 CIVIL STATE OF CALIFORNIA

NO. REVISION DATE APPR.

FRAYJI DESIGN GROUP, INC.
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GIANT GARTER SNAKE HABITAT–PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650–01

SHEET
7 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C7-Grading Plan.dwg, 04/25/13 09:04:19am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

SEE SHEET 13

INSTALL 42 LF OF 12" HDPE PIPE

EXISTING PG&E EASEMENT (TO BE ABANDONED)

WS=9.0

EXISTING DIRT ROAD

LIMIT OF GRADING

SEE SHEET 9

SEE SHEET 7

CONSTRUCTION NOTES

1. ROCK PLACEMENT PER DETAIL C ON SHEET 4
2. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
3. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4
4. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL
5. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

KEY MAP
NTS

1" = 40' SCALE 1"=40'

NO.	REVISION	DATE	APPR

TONY J. FRAYJI — No. 67266 — REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA — EXP. 06-30-15

DESIGNED BY: F. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-5000 Phone
Roseville, CA 95661 (916) 782-5955 Fax
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GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT CARTER SNAKE HABITAT–PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY — CALIFORNIA

SCALE
1"= 40'

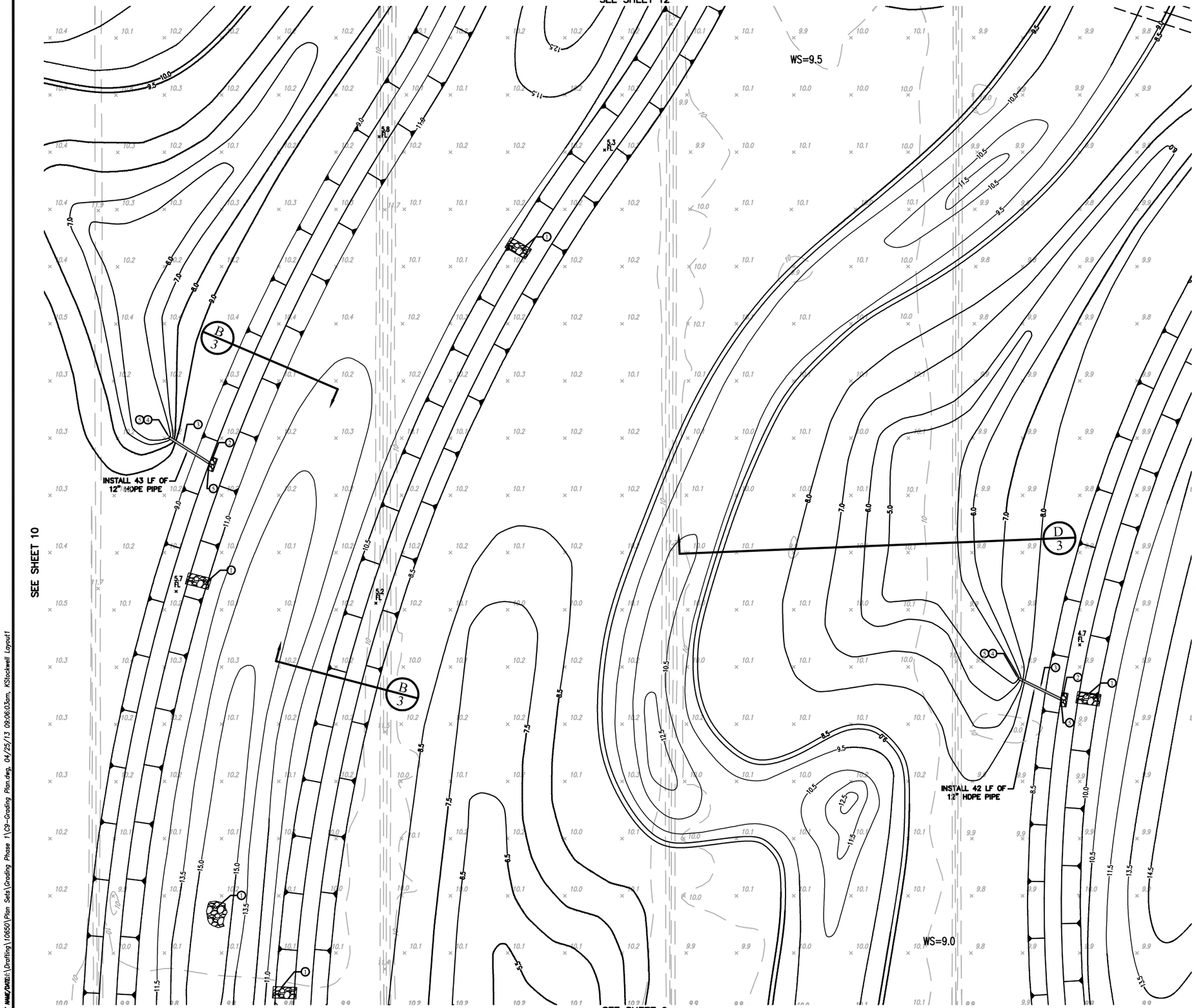
PROJECT NO.
10650–01

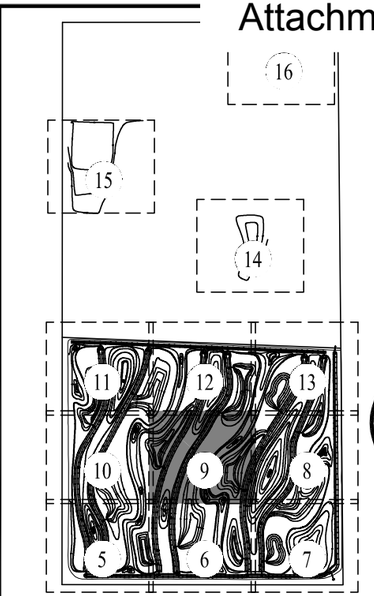
SHEET
8 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C8-Grading Plan.dwg, 04/25/13 09:05:09am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D





KEY MAP
NTS

CONSTRUCTION NOTES

1. ROCK PLACEMENT PER DETAIL C ON SHEET 4
2. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
3. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4
4. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL
5. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

NO. | REVISION | DATE

TONY J. FRAYJI — No. 67265 — REN. 12-31-13 — PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 520 (916) 782-3000 Phone
Roseville, CA 95661 (916) 782-3955 Fax
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GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY — CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650–01

SHEET
9 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\G9–Grading Plan.dwg, 04/25/13 09:06:03am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

SEE SHEET 11

EXISTING CHANNEL

EXISTING DIRT ROAD

LIMIT OF GRADING

INSTALL 41 LF OF 12" HDPE PIPE

SEE SHEET 9

SEE SHEET 5

CONSTRUCTION NOTES

1. ROCK PLACEMENT PER DETAIL C ON SHEET 4
2. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
3. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4
4. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL
5. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

KEY MAP
NTS

1" = 40' SCALE 1"=40'

NO	REVISION	DATE

YOUR PROFESSIONAL ENGINEER ★ THEODORE J. FRAYJI ★ REGISTERED IN STATE OF CALIFORNIA ★ CIVIL ★ NO. 67265 EXP. 12-31-13

DESIGNED BY: F. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2238 Douglas Blvd Suite 320 (916) 782-3600 Phone
Roseville, Ca 95661 (916) 782-3993 Fax
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GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650-01

SHEET
10 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C10-Grading Plan.dwg, 04/25/13 09:07:02am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

FUTURE PHASE 2

PHASE 1 BOUNDARY

INSTALL 38 LF OF 18" HDPE PIPE

7.2 FL

SCREW GATE 1

6.9 FL

INSTALL 33 LF OF 18" HDPE PIPE

SCREW GATE 1

WS=10.5

EXISTING CHANNEL

EXISTING CHANNEL

EXISTING DIRT ROAD

LIMIT OF GRADING

INSTALL 41 LF OF 12" HDPE PIPE

EXISTING PG&E EASEMENT (TO BE ABANDONED)

WS=10.5

SEE SHEET 12

SEE SHEET 10

SCALE 1"=40'

KEY MAP
NTS

CONSTRUCTION NOTES

1. INSTALL SCREW GATE, WATERMAN C-10, OR APPROVED EQUAL, PER DETAIL B ON SHEET 4
2. INSTALL DEEP CHANNEL INLET PER DETAIL G ON SHEET 4
3. ROCK PLACEMENT PER DETAIL C ON SHEET 4
4. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
5. INSTALL DEEP WETLAND DRAIN PER DETAIL F ON SHEET 4
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7. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

NO. | REVISION | DATE | APP'D

DESIGNED BY: F. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-9000 Phone
Roseville, CA 95661 (916) 782-9035 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY CALIFORNIA

SCALE 1"= 40'

PROJECT NO. 10650–01

SHEET 11 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C11-Grading Plan.dwg, 04/25/13 09:07:49am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

FUTURE PHASE 2

LIMIT OF GRADING

PHASE 1 BOUNDARY

EXISTING DIRT ROAD

SCREW GATE (1)

6.3 Ft

6.0 Ft

INSTALL 33 LF OF 18" HDPE PIPE

INSTALL 41 LF OF 12" HDPE PIPE

INSTALL 43 LF OF 12" HDPE PIPE

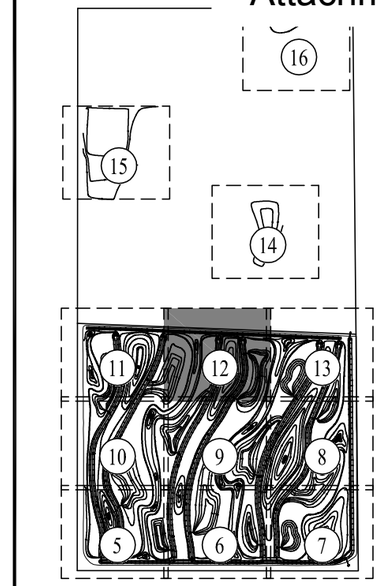
WS=10.0

EXISTING PG&E EASEMENT (TO BE ABANDONED)

SEE SHEET 11

SEE SHEET 13

SEE SHEET 9



KEY MAP
NTS

SCALE 1"=40'

CONSTRUCTION NOTES

1. INSTALL SCREEN GATES, WATERMAN C-10, OR APPROVED EQUAL, PER DETAIL B ON SHEET 4
2. INSTALL DEEP CHANNEL INLET PER DETAIL G ON SHEET 4
3. ROCK PLACEMENT PER DETAIL C ON SHEET 4
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7. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

NO	REVISION	DATE	APP'D

REGISTERED PROFESSIONAL ENGINEER
TONY J. FRAYJI
No. 67266
EXP: 06-30-15
CIVIL
STATE OF CALIFORNIA

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
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Roseville, CA 95661 (916) 782-3955 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650-01

SHEET
12 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C12-Grading Plan.dwg, 04/25/13 09:09:02am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

FUTURE PHASE 2

LIMIT OF GRADING

PHASE 1 BOUNDARY

STUBBED OUT PIPE FOR FUTURE CONNECTION WITH 4X4 POST

INSTALL 60 LF OF 18" HDPE PIPE

EXISTING DIRT ROAD

SCREW GATE (1)

FLASHBOARD RISER (5)

5.6 FL

INSTALL 33 LF OF 18" HDPE PIPE

SCREW GATE (1)

5.5 FL

5.3 FL

INSTALL 33 LF OF 18" HDPE PIPE

INSTALL 44 LF OF 12" HDPE PIPE

4.9 FL

4.9 FL

EXISTING PG&E EASEMENT (TO BE ABANDONED)

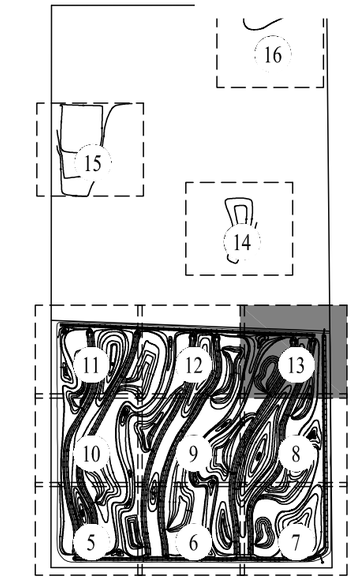
EXISTING PG&E EASEMENT (TO BE ABANDONED)

LIMIT OF GRADING

WS=9.0

SEE SHEET 12

SEE SHEET 8



KEY MAP
NTS

CONSTRUCTION NOTES

1. INSTALL SCREEN GATES, WATERMAN C-10, OR APPROVED EQUAL, PER DETAIL B ON SHEET 4
2. INSTALL DEEP CHANNEL INLET PER DETAIL G ON SHEET 4
3. ROCK PLACEMENT PER DETAIL C ON SHEET 4
4. INSTALL PIPE OUTFALL PER DETAIL E ON SHEET 4
5. INSTALL FLASHBOARD RISER PER BRIGGS MANUFACTURING SPECIFICATIONS, OR APPROVED EQUAL, PER DETAIL A ON SHEET 4
6. REFER TO DETAIL H ON SHEET 4 FOR CONCRETE CUT OFF WALL DETAIL
7. INSTALL FLARED END SECTION PER DETAIL E ON SHEET 4

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

1" SCALE 1"=40' 40'

NO.	REVISION	DATE	APPR

YOUR PROFESSIONAL ENGINEER ★ THE CHARTERED TYLIN OF STATE ★ REGISTERED I. FRAYJI No. 67265 REN: 06-30-15 CIVIL

DESIGNED BY: F. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-3000 Phone
Roseville, CA 95661 (916) 782-3955 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

GRADING PLAN-PHASE 1

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

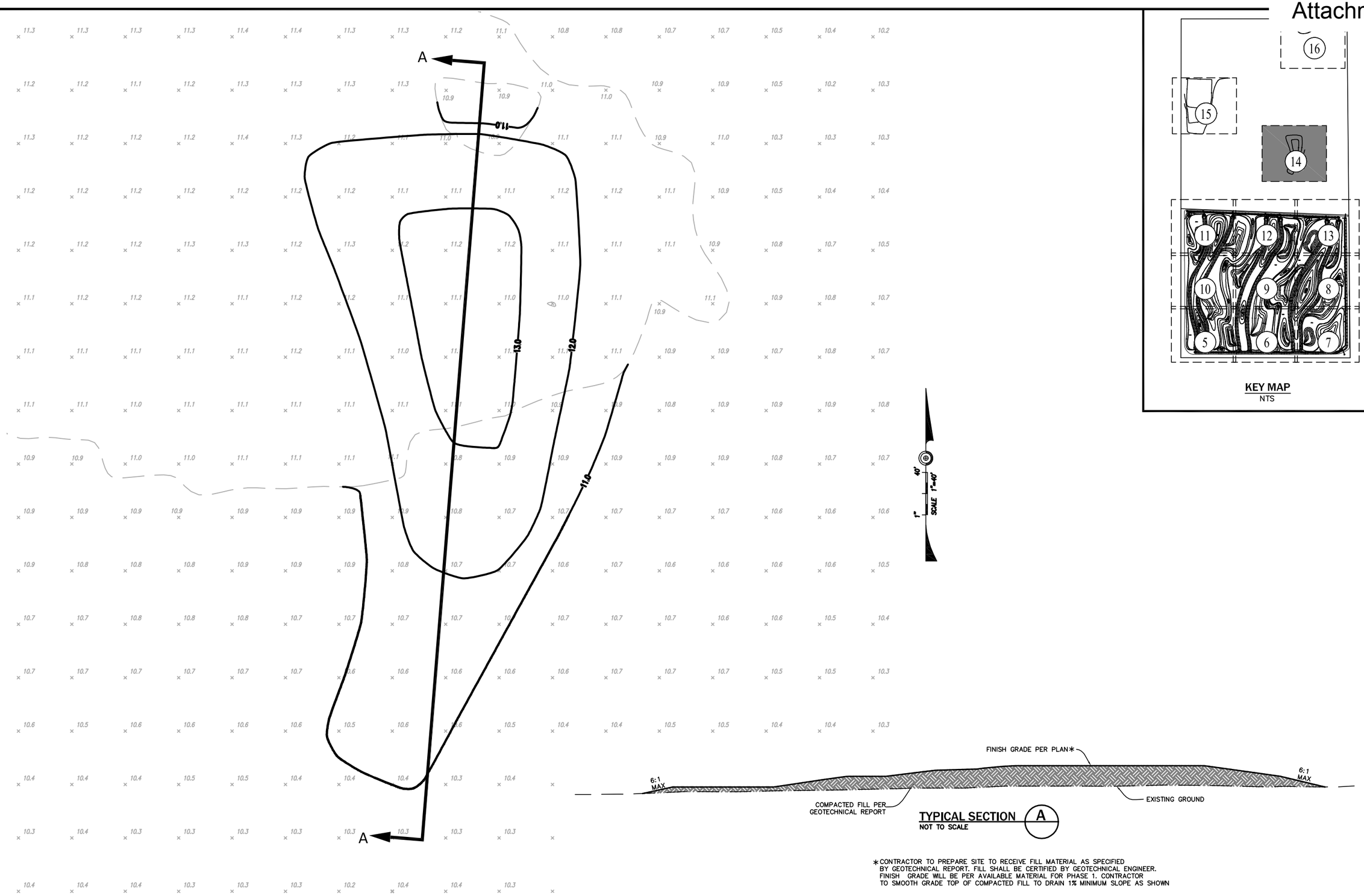
PROJECT NO.
10650-01

SHEET
13 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C13-Grading Plan.dwg, 04/25/13 09:09:53am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D



TYPICAL SECTION A
NOT TO SCALE

*CONTRACTOR TO PREPARE SITE TO RECEIVE FILL MATERIAL AS SPECIFIED BY GEOTECHNICAL REPORT. FILL SHALL BE CERTIFIED BY GEOTECHNICAL ENGINEER. FINISH GRADE WILL BE PER AVAILABLE MATERIAL FOR PHASE 1. CONTRACTOR TO SMOOTH GRADE TOP OF COMPACTED FILL TO DRAIN 1% MINIMUM SLOPE AS SHOWN

KEY MAP
NTS

WARNING
EXISTING UNDERGROUND UTILITIES
CALL USA 1-800-227-2600

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GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1
YOLO COUNTY

GRADING & EROSION CONTROL PLAN-PHASE 1 POTENTIAL SPOIL AREA

CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650-01

SHEET
14 OF 20

PLOT NAME/DATE:\\Drafting\10650\Plan Sets\Grading Phase 1\C14-Grading Plan-Spoil Pile.dwg, 04/25/13 09:10:52am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

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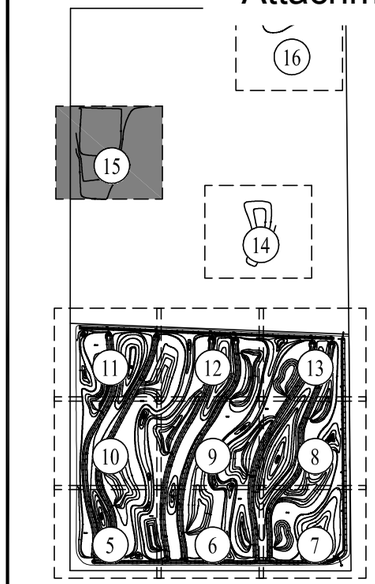
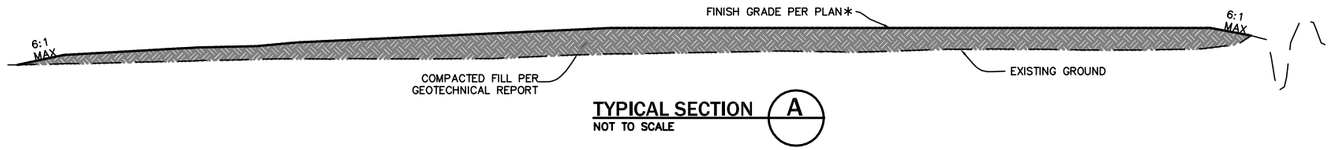


KEY MAP
NTS



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NO.	REVISION	DATE	APPR.

YOUR PROFESSIONAL ENGINEER ★ THROUGHOUT ALL OF CALIFORNIA ★ REGISTERED
T. I. FRAYJI
No. 67266
REN: 06-30-15
CIVIL

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY I. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
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Roseville, CA 95661 (916) 782-3955 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

GRADING PLAN
PHASE 1 POTENTIAL SPOIL AREA

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650-01

SHEET
15 OF 20

PLOT NAME/DATE:I:\Drafting\10650\Plan Sets\Grading Phase 1\C15-Grading Plan-Spoil Pile.dwg, 04/25/13 09:11:34am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

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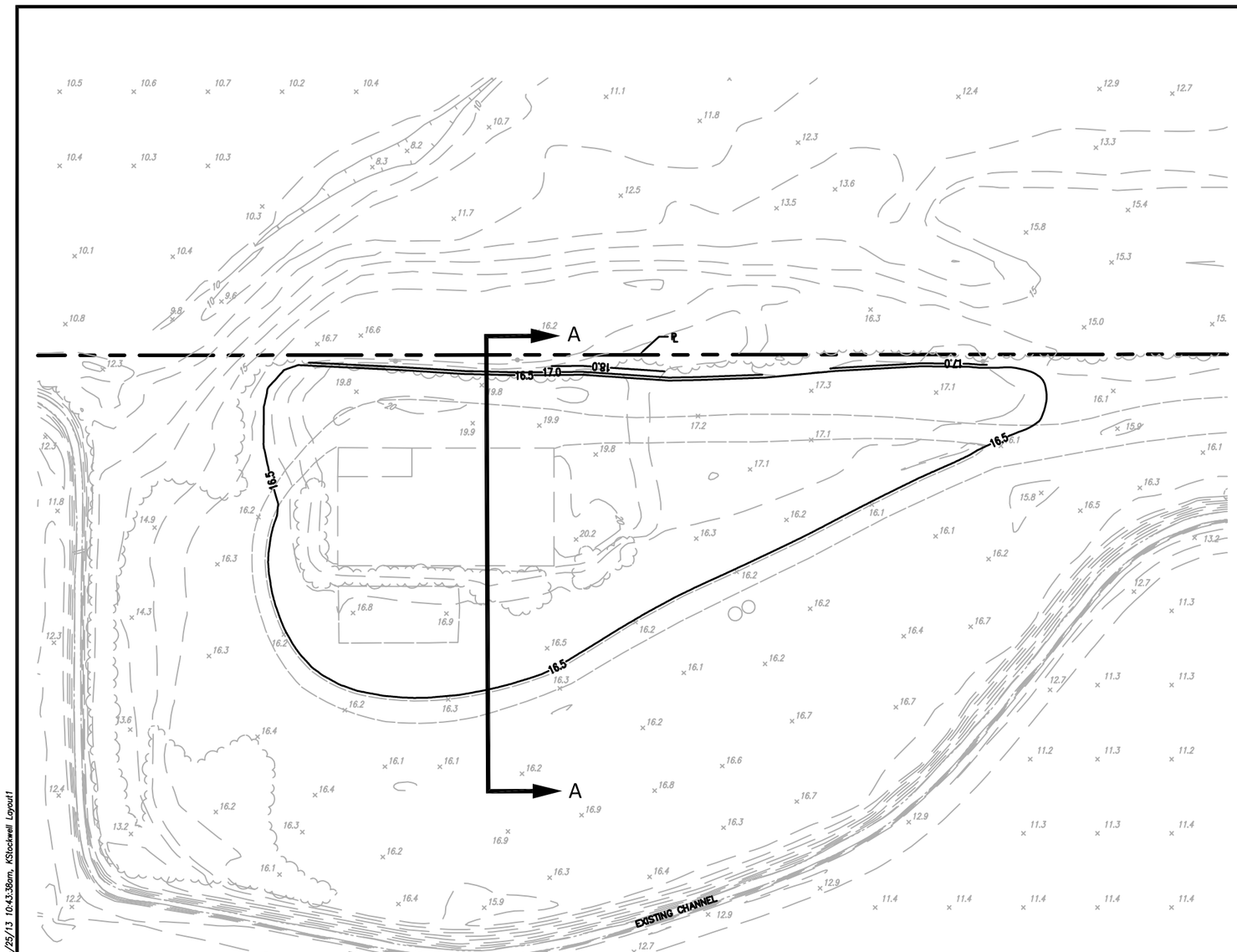

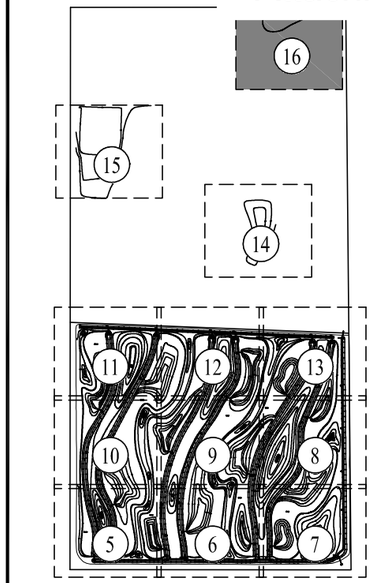

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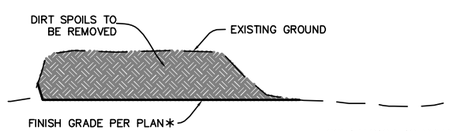

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NO.	REVISION	DATE	APPR

REGISTERED PROFESSIONAL ENGINEER ★ TONY J. FRAYJI ★ No. 67266 ★ REGISTERED IN STATE OF CALIFORNIA ★ CIVIL

DESIGNED BY: F. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 Roseville, CA 95661
(916) 782-3600 Phone (916) 782-3953 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

GRADING & EROSION CONTROL PLAN–PHASE 1 POTENTIAL SPOIL AREA

YOLO COUNTY CALIFORNIA

SCALE
1"= 40'

PROJECT NO.
10650–01

SHEET
16 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C16–Grading Plan–Spoil Pile.dwg, 04/25/13 10:43:38am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

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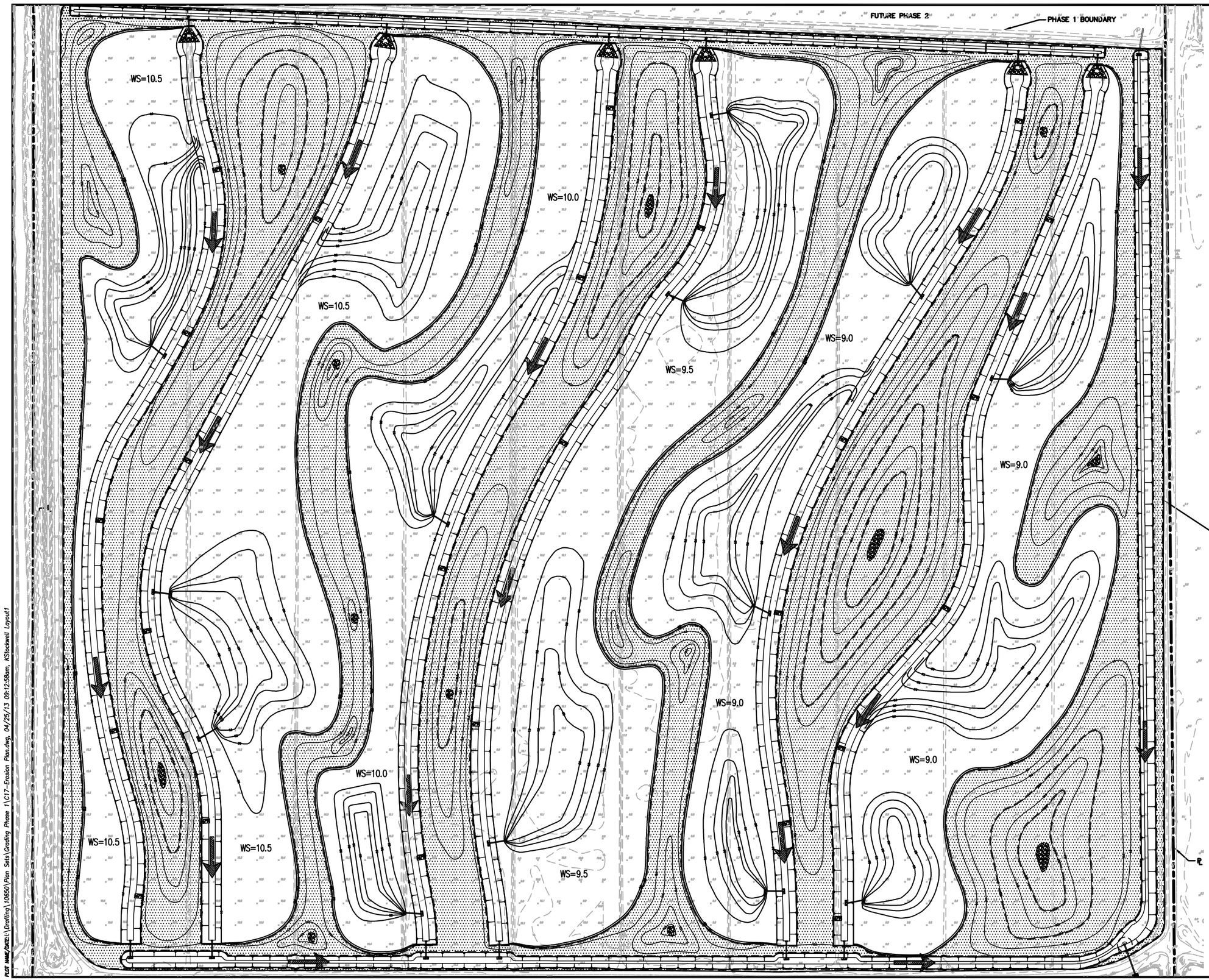

LEGEND

- HYDROSEED AND HYDROMULCH, SEE EROSION CONTROL NOTES FOR APPLICATION ON SHEET 20 (PLACE ABOVE WSE)
- GRAVEL BAGS, SEE SHEET 20 FOR INSTALLATION
- FLOW DIRECTION
- FIBER ROLL*, SEE SHEET 20 FOR INSTALLATION

*FIBER ROLL MAY NOT BE REQUIRED IF PLANT GROWTH HAS BEEN ESTABLISHED

1" = 100' SCALE 1"=100'

NO.	REVISION	DATE	APPR.

YOUR PROFESSIONAL ENGINEER ★ REGISTERED ★ TIMOTHY J. FRAYJI ★ No. 67265 ★ EXP. 06-30-15 ★ STATE OF CALIFORNIA ★ CIVIL

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2238 Douglas Blvd Suite 520 (916) 782-3600 Phone
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CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

PHASE 1-EROSION CONTROL PLAN

YOLO COUNTY CALIFORNIA

SCALE
1'= 100'

PROJECT NO.
10650–01

SHEET
17 OF 20

PLOT NAME/DATE:I:\Drafting\10650\Plan Sets\Grading Phase 1\C17–Erosion Plan.dwg, 04/25/13 09:12:58am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D

HYDROSEED AND HYDROMULCH. (SEE SHEET 20 FOR APPLICATION NOTES)

HYDROSEED AND HYDROMULCH. (SEE SHEET 20 FOR APPLICATION NOTES)

LEGEND

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1" SCALE 1"=100' 100'

NO	REVISION	DATE	APP

TONY J. FRAYJI PROFESSIONAL ENGINEER REGISTERED STATE OF CALIFORNIA NO. 67265 EXP. 12-31-13 CIVIL

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 520 (916) 782-3060 Phone
Roseville, Ca. 95661 (916) 782-3953 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

PHASE 1-EROSION CONTROL PLAN

YOLO COUNTY CALIFORNIA

SCALE
1'= 100'

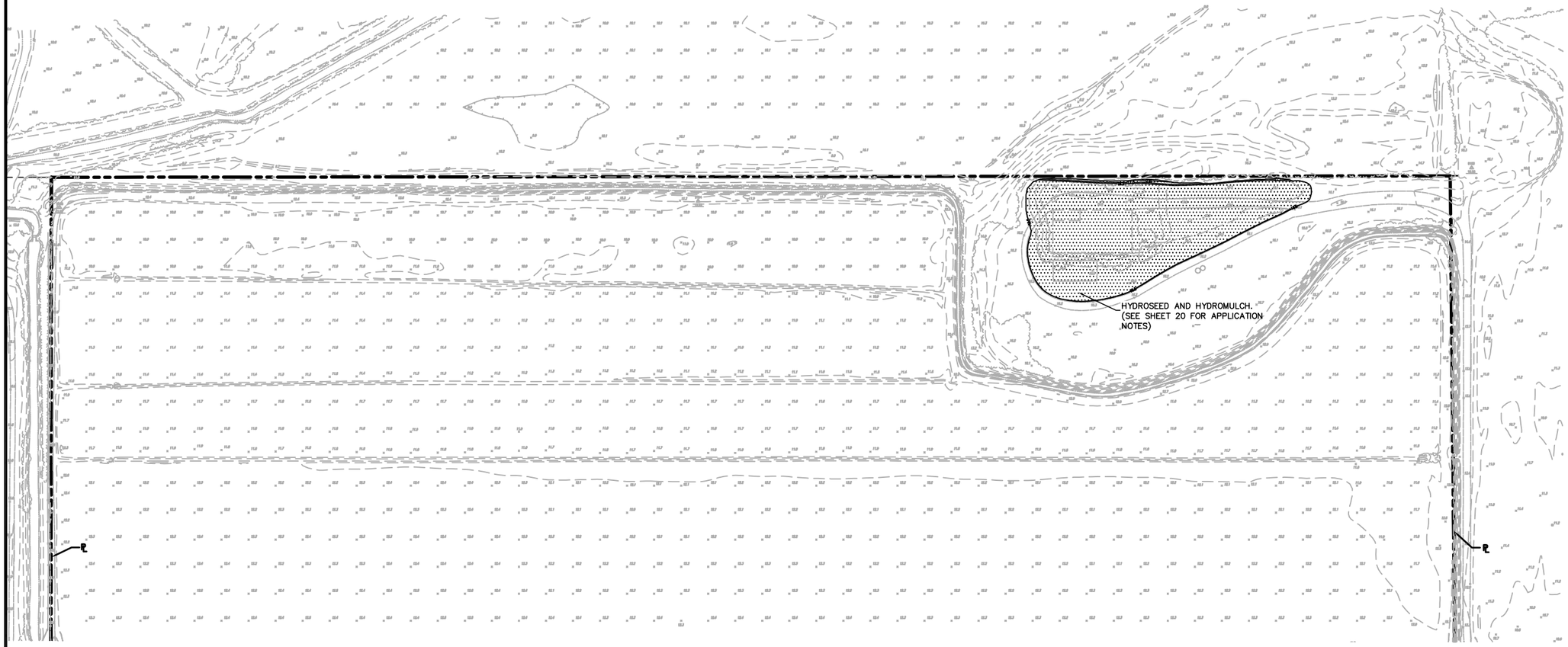
PROJECT NO.
10650–01

SHEET
18 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C18-Erosion Plan.dwg, 04/25/13 09:13:43am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

Attachment D



1" SCALE 1"=100' 100'

LEGEND

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- GRAVEL BAGS, SEE SHEET 20 FOR INSTALLATION
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- FIBER ROLL*, SEE SHEET 20 FOR INSTALLATION

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NO.	REVISION	DATE	APPR

TONY J. FRAYJI — No. 67266 — REG. 06-30-15 — CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

DESIGNED BY: E. SOUSA
DRAFTING BY: K. STOCKWELL
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DATE: APRIL 10, 2013

FRAYJI DESIGN GROUP, INC.
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CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT-PHASE 1

PHASE 1-EROSION CONTROL PLAN

CALIFORNIA
YOLO COUNTY

SCALE
1"= 100'

PROJECT NO.
10650-01

SHEET
19 OF 20

PLOT NAME/DATE: I:\Drafting\10650\Plan Sets\Grading Phase 1\C19-Erosion Plan.dwg, 04/25/13 10:42:58am, KStockwell Layout1

PRELIMINARY - SUBJECT TO REVISION

GENERAL CONSTRUCTION NOTES:

A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THIS PROJECT PREPARED BY FRAYJI DESIGN GROUP, INC. SHALL BE KEPT ONSITE AT ALL TIMES UNTIL CONSTRUCTION IS COMPLETE.

ALL EROSION CONTROL AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE CURRENT EDITION OF THE YOLO COUNTY IMPROVEMENT STANDARDS.

IDENTIFY ALL STORM DRAINS, DRAINAGE SWALES, AND CREEKS LOCATED NEAR THE CONSTRUCTION SITE AND MAKE SURE ALL SUBCONTRACTORS ARE AWARE OF THEIR LOCATIONS TO PREVENT POLLUTANTS FROM ENTERING THEM.

EROSION CONTROL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE INSTALLED AND MAINTAINED DURING THE WET SEASON (OCTOBER 1 THROUGH APRIL 30). SEDIMENT CONTROL BMP'S SHALL BE INSTALLED AND MAINTAINED YEAR ROUND.

ALL BMP'S SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH SWPPP AND THE CONSTRUCTION GENERAL PERMIT.

ALL AREAS DISTURBED DURING CONSTRUCTION BY GRADING, TRENCHING, OR OTHER ACTIVITIES, SHALL BE PROTECTED FROM EROSION DURING THE WET SEASON (OCTOBER 1 THROUGH APRIL 30).

EROSION AND SEDIMENT CONTROL MEASURES FOR THE PROJECT SHALL BE IN SUBSTANTIAL COMPLIANCE AT ALL TIMES WITH THE SWPPP PREPARED FOR THE PROJECT IN ACCORDANCE WITH THE STATE OF CALIFORNIA GENERAL CONSTRUCTION PERMIT. THIS PERMIT REQUIRES THAT THE SWPPP IS TO BE AVAILABLE ON-SITE AT ALL TIMES FOR REVIEW BY STATE AND LOCAL INSPECTORS.

EFFECTIVE EROSION CONTROL BMP'S SHALL BE IN PLACE PRIOR TO ANY STORM EVENTS.

AVOID CONTAMINATING CLEAN RUNOFF FROM AREAS ADJACENT TO SITE BY USING BERMS AND/OR TEMPORARY OR PERMANENT DRAINAGE DITCHES TO DIVERT WATER FLOW AROUND THE SITE.

A STABILIZED CONSTRUCTION SITE ACCESS IS NOT REQUIRED FOR THIS PROJECT SINCE SURROUNDING STREETS AND ROADS ARE UNPAVED.

"NO PLASTIC, MONOFILAMENT, JUTE, OR SIMILAR EROSION CONTROL MATTING THAT COULD ENTANGLE GIANT GARTER SNAKES WILL BE USED. POSSIBLE SUBSTITUTES INCLUDE COCONUT COIR MATTING, TACKIFIED HYDROSEED COMPOUNDS, OR OTHER MATERIALS APPROVED BY THE USFWS AND DFG."

STRAW BALES SHALL BE STOCKPILED ON SITE AT A RATE OF 1.5 BALES PER PROJECT ACRE BY SEPTEMBER 25TH. STOCKPILED STRAW SHALL BE COVERED AND KEPT DRY. ALL SLOPES GREATER THAN 10:1 SHALL BE COVERED WITH BROADCAST STRAW AT A RATE OF 50 BALES PER ACRE (4000 POUNDS PER ACRE). IN ADDITION, STRAW SHALL BE PRESSED INTO PLACE WITH A SHEEP'S FOOT ROLLER OR OTHER APPROVED METHOD ON SLOPES EQUAL TO OR GREATER THAN 4:1.

THE CONTRACTOR SHALL INSURE THAT EACH CONSTRUCTION SITE IS ADEQUATELY PREPARED DURING CONSTRUCTION AND PRIOR TO THE ONSET OF ANY STORM EVENT. CONSTRUCTION ACTIVITIES SHALL HAVE SEDIMENT AND EROSION CONTROL MEASURES IN PLACE IN ACCORDANCE WITH THE SWPPP AND CONSTRUCTION GENERAL PERMIT.

THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL GOVERNMENT LAWS AND REGULATIONS RELATING TO THE DISCHARGE OF STORM WATER RUNOFF ASSOCIATED WITH CONSTRUCTION ACTIVITIES WHETHER OR NOT THE REQUIRED FACILITIES OR METHODS ARE STATED ON THESE PLANS.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PREVENT DISCHARGE OF SEDIMENT FROM THE SITE TO ANY WATERCOURSE, DRAINAGE SYSTEM, OR ONTO ADJACENT PROPERTIES AND TO PREVENT DAMAGE BY EROSION OR DEPOSITION OF SEDIMENT THAT MAY RESULT FROM CONSTRUCTION ACTIVITIES.

THE CONTRACTOR SHALL CONDUCT INSPECTIONS OF THE SITE IN ACCORDANCE WITH THE SWPPP AND CONSTRUCTION GENERAL PERMIT TO IDENTIFY AREAS CONTRIBUTING TO DISCHARGES OF STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY AND TO EVALUATE WHETHER EXISTING EROSION CONTROL PRACTICES ARE ADEQUATE TO REDUCE OR PREVENT POLLUTANT LOADING. THIS IS FURTHER DETAILED IN THE PROJECT SWPPP.

THE CONTRACTOR SHALL HAVE A QSP OR QSP TRAINED PERSONNEL, DURING ALL STORM EVENTS AND EVERY 24 HOURS DURING EXTENDED STORM EVENTS, TO ENSURE THAT THE MEASURES ARE FUNCTIONING PROPERLY, MONITOR ALL EROSION AND SEDIMENT CONTROL MEASURES. ALTERNATE MEASURES MUST BE INSTALLED OR IMPLEMENTED AS SOON AS POSSIBLE IF THE ORIGINAL MEASURES FAIL. AS DIRECTED PER THE PROJECT SWPPP, AND CONSTRUCTION GENERAL PERMIT.

EROSION CONTROL NOTES:

PROVIDE SOIL COVER FOR INACTIVE AREAS AND ALL FINISHED SLOPES, OPEN SPACE, UTILITY BACKFILL, AND CHANNELS/WETLANDS. (INACTIVE AREAS OF CONSTRUCTION ARE AREAS OF CONSTRUCTION ACTIVITY THAT HAVE BEEN DISTURBED AND ARE NOT SCHEDULED TO BE RE-DISTURBED FOR AT LEAST 14 DAYS).

COVER AND BERM LOOSE STOCKPILED CONSTRUCTION MATERIALS THAT ARE NOT ACTIVELY BEING USED (i.e. SOIL, SPOILS, ETC.)

SEDIMENT CONTROL NOTES:

SEDIMENT CONTROL BMP'S SHALL BE PLACED ALONG THE PROJECT PERIMETER WHERE DRAINAGE LEAVES THE PROJECT. SEDIMENT CONTROL BMP'S SHALL BE MAINTAINED YEAR ROUND UNTIL THE CONSTRUCTION IS COMPLETE OR THE DRAINAGE PATTERN HAS BEEN CHANGED AND NO LONGER LEAVES THE SITE.

SENSITIVE AREAS AND AREAS WHERE EXISTING VEGETATION IS BEING PRESERVED SHALL BE PROTECTED WITH CONSTRUCTION FENCING. SEDIMENTS CONTROL BMP'S SHALL BE INSTALLED WHERE ACTIVE CONSTRUCTION AREAS DRAIN INTO SENSITIVE OR PRESERVED VEGETATION AREAS.

INSTALL LINEAR SEDIMENT CONTROLS ALONG THE TOE OF THE SLOPE, FACE OF THE SLOPE, AND AT THE GRADE BREAKS OF EXPOSED SLOPES TO COMPLY WITH SHEET FLOW LENGTHS LISTED BELOW:

0-25%	(NOT TO EXCEED 20 FEET)
25-50%	(NOT TO EXCEED 15 FEET)
OVER 50%	(NOT TO EXCEED 10 FEET)

TIGHTLY WOVEN FIBER NETTING (MESH SIZE LESS THAN 0.25 INCH) OR SIMILAR MATERIAL WILL BE USED FOR EROSION CONTROL AND OTHER PURPOSES AT THE PROJECT SITE TO ENSURE THAT GIANT GARTER SNAKES ARE NOT TRAPPED OR BECOME ENTANGLED BY THE EROSION CONTROL MATERIAL. COCONUT COIR MATTING IS AN ACCEPTABLE EROSION CONTROL MATERIAL. NO PLASTIC MONOFILAMENT MATTING WILL BE USED FOR EROSION CONTROL. THE EDGE OF THE MATERIAL WILL BE BURIED IN THE GROUND TO PREVENT GIANT GARTER SNAKES FROM CRAWLING UNDERNEATH THE MATERIAL. EROSION CONTROL STRUCTURES WILL BE CONSTRUCTED SO RUNOFF WILL BE DIRECTED AWAY FROM SENSITIVE HABITATS, DIRECTING WATER FLOW INTO EXISTING DRAINAGES OR DISPERSE WATER ACROSS VEGETATED AREAS TO AVOID CONCENTRATING WATER.

WIND EROSION CONTROL NOTES:

WATER SHALL BE SUPPLIED AND APPLIED IN SUFFICIENT QUANTITY AND COVERAGE OF DISTURBED AREAS TO MINIMIZE DUST EMISSIONS. ALL VISIBLY DRY DISTURBED SOIL SURFACE AREAS OF OPERATION SHALL BE WATERED TO MINIMIZE DUST EMISSIONS.

HAUL VEHICLES EMPLOYED IN TRANSPORTING IMPORTED BORROW, SURPLUS EXCAVATED MATERIAL, SOIL OR SOIL AMENDMENTS INTO OR OUT OF THE PROPERTY SHALL BE COVERED.

ALL VEHICLES AND EQUIPMENT, INCLUDING EMPLOYEE VEHICLES AND EQUIPMENT AND MATERIALS DELIVERY VEHICLES, SHALL BE OPERATED AT SPEEDS THAT MINIMIZE DUST EMISSIONS.

SOIL STOCKPILES SHALL BE COVERED, WATERED OR OTHERWISE STABILIZED TO MINIMIZE DUST EMISSIONS.

NON-STORM WATER MANAGEMENT NOTES:

IMPLEMENT MEASURES TO CONTROL ALL NON-STORM WATER DISCHARGES DURING CONSTRUCTION, AND FROM DEWATERING ACTIVITIES ASSOCIATED WITH CONSTRUCTION. THESE CAN INCLUDE, BUT ARE NOT LIMITED TO; PROPERLY WASHING VEHICLES IN CONTAINED AREAS, DISCHARGES OF PROCESS WATER, SANITARY WASTES, PIPE TESTING WATER, AND MINIMIZING IRRIGATION RUN-OFF.

WASTE & MATERIALS NOTES:

USE OF TEMPORARY OR PORTABLE SANITARY AND SEPTIC WASTE SYSTEMS SHALL BE TREATED OR DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS. TEMPORARY OR PORTABLE TOILETS SHALL BE LOCATED A MINIMUM OF 25 FEET FROM DRAIN INLETS, WATERCOURSES AND TRAFFIC CIRCULATION. A LICENSED HAULER SHALL SERVICE AND DISPOSE OF SANITARY WASTE AT FREQUENCIES GREAT ENOUGH TO INSURE THE FACILITY DOES NOT OVERFLOW.

CLEAN UP AND PROPERLY DISPOSE OF ALL LEAKS, DRIPS, AND OTHER SPILLS IMMEDIATELY.

REFUEL VEHICLES AND HEAVY EQUIPMENT IN ONE DESIGNATED LOCATION OR OFF-SITE IF POSSIBLE.

WASH VEHICLES AT AN APPROPRIATE OFF-SITE FACILITY. IF EQUIPMENT MUST BE WASHED ON-SITE, DO NOT USE SOAPS, SOLVENTS, DEGRESERS, OR STEAM CLEANING EQUIPMENT, AND PREVENT WASH WASTER FROM ENTERING THE STORM DRAIN OR WATERCOURSE.

KEEP MATERIALS OUT OF THE RAIN. SCHEDULE CLEARING OR HEAVY EARTH MOVING ACTIVITIES FOR PERIODS OF DRY WEATHER. COVER EXPOSED PILES OF SOIL, CONSTRUCTION MATERIALS, AND WASTES WITH PLASTIC SHEETING OR TEMPORARY ROOFS. BEFORE IT RAINS, SWEEP AND REMOVE MATERIALS FROM SURFACES THAT DRAIN TO STORM DRAINS OR WATERCOURSES.

PLACE TRASH CANS AROUND THE SITE TO REDUCE LITTER. DISPOSE OF NON-HAZARDOUS CONSTRUCTION WASTES IN COVERED DUMPSTERS OR RECYCLING RECEPTACLES. RECYCLE LEFTOVER MATERIALS WHENEVER POSSIBLE. DISPOSE OF ALL WASTES PROPERLY. MATERIALS THAT CANNOT BE REUSED OR RECYCLED MUST BE TAKEN TO AN APPROPRIATE LANDFILL OR DISPOSED OF AS HAZARDOUS WASTE.

CONSTRUCTION SITE BMP'S:

MATERIALS

HYDROSEED AND HYDROMULCH

SEED MIX:

7 LB/ AC BLUE WILDRYE

5 LB/ AC SLENDER WHEATGRASS

12 LB/ AC MEADOW BARLEY

7 LB/ AC CREEPING WILDRYE

100% COCONUT COIR LOGS (WATTLES)

DEFINITION:
THE 100% COCONUT COIR LOGS ARE ROLLED AND BOUND INTO A TIGHT TUBULAR ROLL AND PLACED ON THE FACE OF SLOPES AT REGULAR INTERVALS TO INTERCEPT STORM WATER RUNOFF, REDUCE ITS VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW, AND PROVIDE SOME REMOVAL OF SEDIMENT FROM THE RUNOFF. IT SHALL BE WRAPPED IN BIODEGRADIBLE JUTE NETTING AND STITCHING.

APPLICABILITY:
FIBER ROLLS SHALL BE USED ALONG THE TOP, FACE, AND AT GRADE BREAKS OF EXPOSED AND ERODIBLE SLOPES AND USED AS CHECK DAMS WHEN PROPERLY INSTALLED.

LAY THE FIRST STRAW WATTLE SNUGLY IN THE TRENCH. NO DAYLIGHT SHOULD BE SEEN UNDER THE WATTLE. PACK SOIL FROM TRENCHING AGAINST THE WATTLE ON THE UPHILL SIDE. WHEN INSTALLING RUNNING LENGTHS OF STRAW WATTLES, YOU MUST BUTT THE SECOND WATTLE TIGHTLY AGAINST THE FIRST WATTLE. DO NOT OVERLAP THE ENDS ON TOP OF EACH OTHER. OVERLAPPING BEHIND EACH OTHER HAS BEEN DONE WITH SOME SUCCESS. STAKE THE STRAW WATTLES AT EACH END AND FOUR FOOT ON CENTER.

- 25 FOOT WATTLE USES 6 STAKES
- 20 FOOT WATTLE USES 5 STAKES
- 12 FOOT WATTLE USES 4 STAKES

STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE, LEAVING 2-3 INCHES OF THE STAKE PROTRUDING ABOVE THE WATTLE. A HEAVY SEDIMENT LOAD WILL TEND TO PICK THE WATTLE UP AND COULD PULL IT OFF THE STAKES IF THEY ARE DRIVEN DOWN TOO LOW. IT MAY BE NECESSARY TO MAKE A HOLE IN THE WATTLE WITH THE PICK END OF YOUR MADDOX IN ORDER TO GET THE STAKE THROUGH THE STRAW. WHEN STRAW WATTLES ARE USED FOR FLAT GROUND APPLICATIONS, DRIVE THE STAKES STRAIGHT DOWN; WHEN INSTALLING WATTLES ON SLOPES, DRIVE THE STAKES PERPENDICULAR TO THE SLOPE.

DRIVE THE FIRST END STAKE OF THE SECOND WATTLE AT AN ANGLE TOWARD THE FIRST WATTLE IN ORDER TO HELP ABUT THEM TIGHTLY TOGETHER. IF YOU HAVE DIFFICULTY DRIVING THE STAKE INTO EXTREMELY HARD OR ROCKY SLOPES, A PILOT BAR MAY BE NEEDED TO BEGIN THE STAKE HOLE.

STAKING:
IT'S RECOMMEND USING WOOD STAKES OR WILLOW CUTTINGS, RATHER THAN METAL PINS, TO SECURE THE STRAW WATTLES. WOOD STAKES WILL EVENTUALLY BIO-DEGRADE, AND WILLOW CUTTINGS WILL GROW AND PROVIDE EXTRA STABILIZATION. BE SURE TO USE A STAKE THAT IS LONG ENOUGH TO PROTRUDE SEVERAL INCHES ABOVE THE WATTLE: 18" IS A GOOD LENGTH FOR HARD, ROCKY SOIL. FOR SOFT, LOAMY SOIL USE A 24" STAKE FOR GREATER SECURITY. THE DIAMETER OF THE STAKE SHOULD BE APPROXIMATELY 1" FOR EASE OF DRIVING THROUGH THE WATTLE.

MAINTENANCE
A. REPAIR OR REPLACE SPLIT, TORN, UNRAVELING, OR SLUMPING FIBER ROLL.
B. INSPECT FIBER ROLLS WHEN RAIN IS FORECAST.
C. IN ACTIVE CONSTRUCTION AREAS WHERE FIBER ROLLS ARE REMOVED DURING THE WORKDAY, RETURN OR REPLACE THE FIBER ROLLS TO ITS PROPER PLACE AND STAKE THEM DOWN AT THE END OF EACH WORKDAY DURING THE WET SEASON.

GRAVEL BAG BERM

DEFINITION:
A GRAVEL BAG BERM CONSISTS OF A SINGLE ROW OF GRAVEL BAGS THAT ARE INSTALLED END TO END TO FORM A BARRIER ACROSS THE SLOPE TO INTERCEPT RUNOFF, REDUCE ITS FLOW VELOCITY, RELEASE THE RUNOFF AS SHEET FLOW AND PROVIDE SOME SEDIMENT REMOVAL. GRAVEL BAGS CAN BE USED WHERE FLOWS ARE MODERATELY CONCENTRATED, SUCH AS DITCHES, SWALES, AND STORM DRAIN INLETS TO DIVERT AND/OR DETAIN FLOWS.

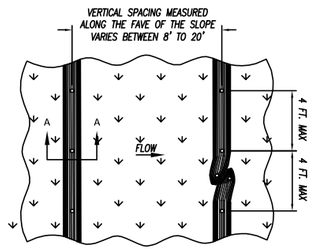
MATERIALS:
BAG MATERIAL: BAGS SHALL BE WOVEN POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE FABRIC, IN CONFORMANCE WITH THE REQUIREMENTS IN ASTM DESIGNATION D3786, AND ULTRAVIOLET STABILITY EXCEEDING 70% IN CONFORMANCE WITH THE REQUIREMENTS IN ASTM DESIGNATION D4355.

BAG SIZE: EACH GRAVEL-FILLED BAG SHALL HAVE A LENGTH OF 18 INCHES, WIDTH OF 12 INCHES, THICKNESS OF 3 INCHES, AND MASS OF APPROXIMATELY 33 POUNDS. BAG DIMENSIONS ARE NOMINAL, AND MAY VARY BASED ON LOCALLY AVAILABLE MATERIALS.

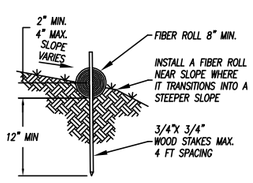
FILL MATERIAL: GRAVEL SHALL BE BETWEEN 0.4 AND 0.8 INCHES IN DIAMETER, AND SHALL BE CLEAN AND FREE FROM CLAY BALLS, ORGANIC MATTER, AND OTHER DELETERIOUS MATERIALS. THE OPENING IF GRAVEL-FILLED BAGS SHALL BE BETWEEN 28 AND 48 POUNDS IN MASS.

INSTALLATION:
WHEN USED FOR CONCENTRATED FLOWS:
1 STACK GRAVEL BAGS TO REQUIRED HEIGHT USING PYRAMID APPROACH.
2 UPPER ROWS OF GRAVEL BAGS SHALL OVERLAP JOINTS IN LOWER ROWS.

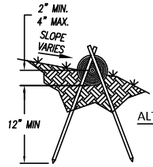
MAINTENANCE AND INSPECTION
1 INSPECT GRAVEL BAG BERMS BEFORE AND AFTER EACH RAINFALL EVENT, AND WEEKLY THROUGHOUT THE RAINY SEASON
2 RESHAPE AND REPLACE GRAVELS BAGS AS NEEDED
3 REPAIR WASHOUTS AND OTHER DAMAGES AS NEEDED
4 INSPECT GRAVEL BAG BERMS FOR SEDIMENT ACCUMULATIONS AND REMOVE SEDIMENTS WHEN ACCUMULATION REACHES ONE-THIRD OF THE BERM HEIGHT.
5 REMOVE GRAVEL BAG BERMS WHEN NO LONGER NEEDED. REMOVE SEDIMENT ACCUMULATIONS AND CLEAN, RE-GRADE, AND STABILIZE THE AREA.



TYPICAL FIBER ROLL INSTALLATION

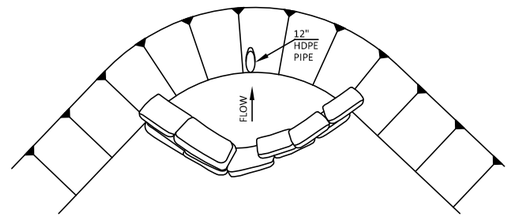


SECTION A - A



ALTERNATIVE STAKING DETAIL

NOTES:
1. *INSTALL FIBER ROLLS IN A ROW ALONG A LEVEL CONTOUR.*
2. *AT ENDS OF A ROW TURN THE LAST TWO FEET UP SLOPE SLIGHTLY.*
3. *FIBER ROLLS SHALL BE OVERLAPPED TIGHTLY AND STAKED AT THE JOINTS.*
4. *FIBER ROLLS WORK BEST IN CONJUNCTION WITH GOOD EROSION CONTROL BMPS.*
5. *INSPECT FIBER ROLLS WEEKLY, BEFORE AND AFTER A RAINFALL EVENT. REPAIR AND REPLACE AS NEEDED.*



TYPICAL PROTECTION FOR INLET WITH SINGLE FLOW DIRECTION

NOTES:

1 INTENDED FOR SHORT-TERM USE.
2 USE TO INHIBIT NON-STORM WATER FLOW.
3 ALLOW FOR PROPER MAINTENANCE AND CLEANUP
4 BAGS MUST BE REMOVED AFTER ADJACENT OPERATION IS COMPLETED
5 NOT APPLICABLE IN AREAS WITH HIGH SILTS AND CLAYS WITHOUT FIBER FABRIC

NO	REVISION	DATE	APP'D

PROFESSIONAL ENGINEER — TONY I. FRAYJI — No. 67266 — REN. 06-30-15 — STATE OF CALIFORNIA — CIVIL

DESIGNED BY: *F. SOUSA*
DRAFTING BY: *K. STOCKWELL*
UNDER THE SUPERVISION OF TONY J. FRAYJI
DATE: *APRIL 10, 2013*

FRAYJI DESIGN GROUP, INC.
2235 Douglas Blvd Suite 320 (916) 782-3000 Phone
Roseville, CA 95661 (916) 782-3955 Fax
CIVIL ENGINEERS • PLANNERS • SURVEYORS

GRADING PLANS FOR CAPITAL CONSERVATION BANK
GIANT GARTER SNAKE HABITAT–PHASE 1

EROSION CONTROL NOTES AND DETAILS

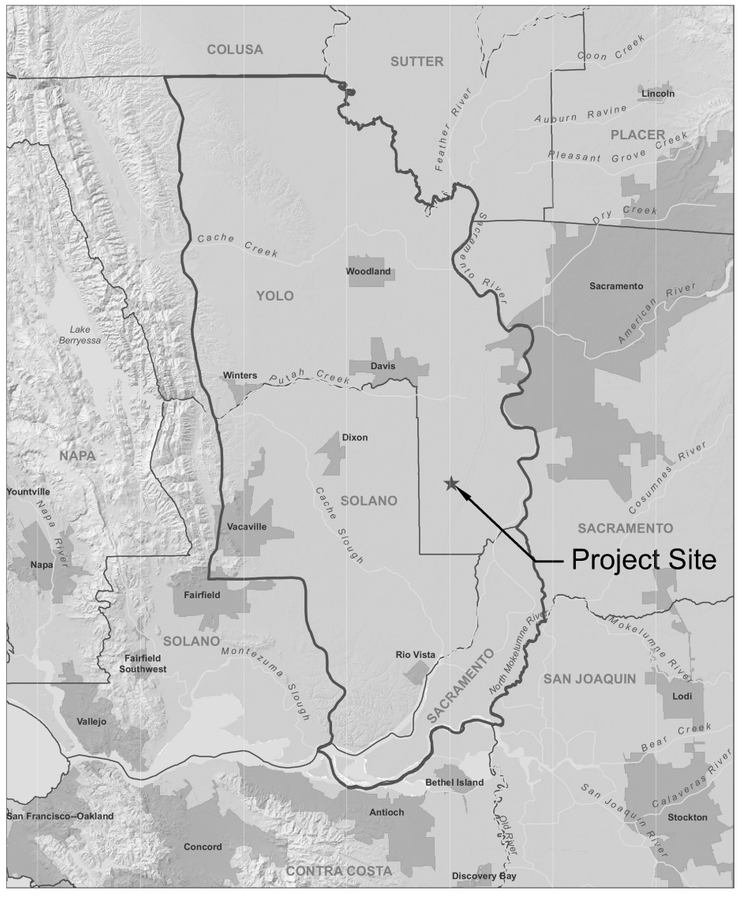
YOLO COUNTY — *CALIFORNIA*

SCALE
AS SHOWN

PROJECT NO.
10650–01

SHEET
20 OF 20

AMERICA'S HABITATS
CAPITAL CONSERVATION BANK - PHASE 1
Yolo, County, CA



VICINITY MAP

DIRECTIONS TO SITE:
From Sacramento: I-80 West. Exit Mace Blvd.
Turn South (left) onto Mace Blvd. Mace Blvd will turn into Co. Rd. 104.
Continue South to Co. Rd. 155 and turn east (left).
Continue on Co. Rd 155 until you must turn north (left).
The Project Site is located 1 mile north.

PREPARED FOR
America's Habitats
c/o Smith Development and Construction
7803 Madison Avenue Suite 700c
Citrus Heights, CA 95610

CONSULTANTS
Ecological Consultants / Landscape Architects
H.T. Harvey & Associates

Project Manager: Matt Wacker
1331 Garden Highway Suite 310
Sacramento, CA 95833
P: (916) 779-7353

Project Landscape Architect: Joe Howard, CRLA #4598
983 University Avenue Building D
Los Gatos, CA 95032
P: (408) 458-0224

DRAWING INDEX

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
www.harveyecology.com 530-753-3733

REVISIONS: DATE:

REGISTERED LANDSCAPE ARCHITECT JOSEPH M. HOWARD Exp. 12/31/14 CRLA 4598 STATE OF CALIFORNIA

PREPARED FOR:
America's Habitats
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and Construction
7803 Madison Ave
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Citrus Heights, CA 95610

AMERICA'S HABITATS
CAPITAL CONSERVATION
BANK - PHASE 1
Yolo County, California

COVER

Submittal: ISSUE FOR CONSTRUCTION
Scale: NOT TO SCALE
Date: 05 APRIL 2013
Drawn By: LD
Checked By: MW, JH, DS
File No.: 3261-01

SHEET L1.0
1 OF 7 SHEETS

GENERAL LEGEND

- WETLAND ZONE PLANTING
- TRANSITION ZONE PLANTING
- UPLAND SEEDING ZONE
- OPEN WATER - DEEP WETLAND
- OPEN WATER - DEEP CHANNEL
- DELIVERY DITCH
- EXISTING DITCH
- EXISTING ROAD
- LIMIT OF WORK
- EXISTING GATE
- SPEED LIMIT SIGN
- DETAIL CALLOUT (1 / L1.3)
- CROSS-SECTION CALLOUT (A / L1.3)

PLANTING AND SEEDING SCHEDULE

WETLAND ZONE

SYMBOL	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	ON CENTER SPACING	QUANTITY
	SCHOENOPLECTUS ACUTUS	TULE	1 FT x 1 FT SOD	5 *	46442
				TOTAL	46442

TRANSITION ZONE

SYMBOL	BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	ON CENTER SPACING	QUANTITY
	ELEOCHARIS MACROSTACHYA	CREEPING SPIKERUSH	PLUG	5	2153
	JUNCUS BALTICUS	BALTIC RUSH	PLUG	5	2153
	JUNCUS EFFUSUS	COMMON RUSH	PLUG	5	2153
	JUNCUS XIPHIOIDES	IRIS-LEAF RUSH	PLUG	5	2153
				TOTAL	8612

UPLAND ZONE SEEDING RATES

SYMBOL	BOTANICAL NAME	COMMON NAME	SEEDING RATE (LBS PURE LIVE SEED/ACRE)
	ELYMUS GLAUCUS	BLUE WILD RYE	7
	ELYMUS TRACHYCAULUS	SLENDER WHEATGRASS	5
	HORDEUM BRACHYANTHERUM SPP. BRACHYANTHERUM	MEADOW BARLEY	12
	LEYMUS TRITICOIDES	CREEPING WILD RYE	7
		TOTAL	31

* AS PLANTED IN GROUPS PER DETAIL 1 / L1.6

GENERAL NOTES

1. INSTALL WETLAND ZONE PLANTINGS PER DETAILS 1/L1.6 & 2/L1.6
2. INSTALL TRANSITION ZONE PLANTINGS PER DETAIL 3/L1.6
3. INSTALL SPEED LIMIT SIGNS PER 1/-

SEEDING NOTES

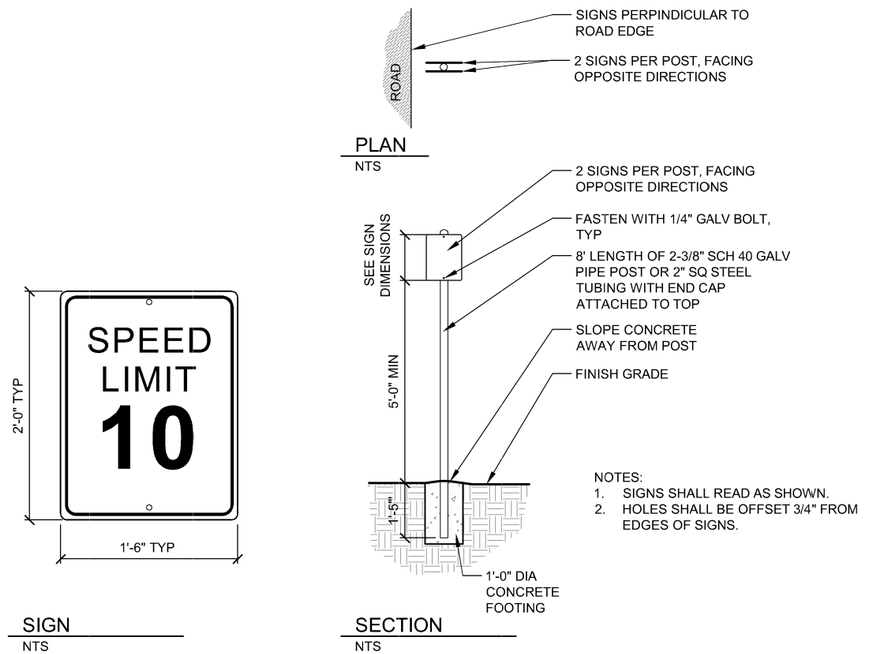
1. SEED BY RANGELAND DRILL SEEDING IN AREAS OF FLAT TO MODERATE SLOPES.
2. SEED BY BROADCAST SEED IN AREAS THAT ARE TOO STEEP TO ACCOMMODATE DRILL SEEDER
3. SEED SHALL BE APPLIED BETWEEN 15 AUGUST AND 15 OCTOBER, AND KEPT IN A COOL DRY, SHADED PLACE UNTIL UTILIZED.
4. CLEAR ALL AREAS TO BE SEEDED OF ANY SUBSTANTIAL DEBRIS AND ANY OTHER IMPEDIMENTS TO SEED-SOIL CONTACT.
5. APPLY THE SEED MIX EVENLY AND AT THE RATES SPECIFIED IN THE SEEDING SCHEDULE.
6. AFTER SEEDING, AVOID FOOT TRAFFIC OR STORAGE OF SUPPLIES IN SEEDED AREAS.

RANGELAND DRILL SEEDING:

1. SEED SHALL BE PLACED IN THE APPROPRIATE SEED BOXES, AND THE DRILL SHALL BE CALIBRATED ACCORDING TO THE MANUFACTURE'S SPECIFICATIONS TO ENSURE THAT THE SPECIFIED POUNDS OF PURE LIVE SEED PER ACRE ARE DELIVERED.
2. SEED SHALL BE PLANTED AT A DEPTH OF ¼-INCH BELOW THE SOIL SURFACE.
3. SPACE SEED ROWS NO GREATER THAN 8" APART.
4. COVER CHAINS, OR EQUIVALENT, SHALL BE DRAGGED BEHIND THE DRILL SEED TO PACK AND SMOOTH THE SOIL AROUND THE SEED.

BROADCAST SEEDING:

1. PRIOR TO APPLYING SEED, RAKE IN 2 DIRECTIONS ALL BROADCAST SEEDING AREAS WITH A METAL RAKE.
2. APPLY SEED.
3. HAND RAKE ALL SEED INTO THE SOIL IMMEDIATELY AFTER APPLICATION.



1 SIGN INSTALLATION

SIGN-INSTALLATION_16

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS
www.harveyecology.com 530-753-3733

REVISIONS: DATE:

REGISTERED LANDSCAPE ARCHITECT M. ROMANO JOSEPH Exp. 12/31/14 4598 STATE OF CALIFORNIA

PREPARED FOR:
America's Habitats
c/o Smith Development and Construction
7803 Madison Ave
Suite 700c
Citrus Heights, CA 95610

AMERICA'S HABITATS CAPITAL CONSERVATION BANK - PHASE 1
Yolo County, California

NOTES, LEGENDS, DETAIL, AND SCHEDULES

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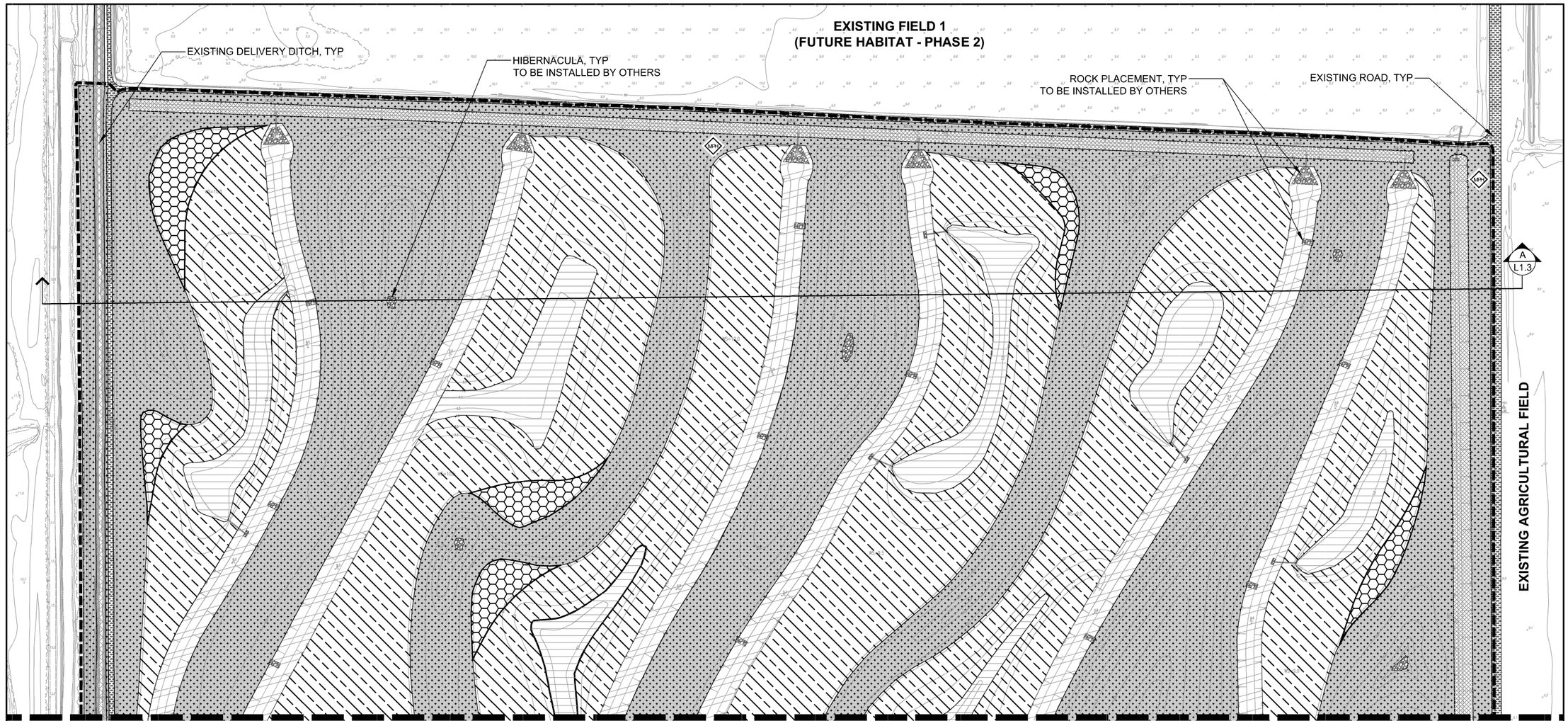
SHEET L1.1
2 OF 7 SHEETS

Attachment E



MATCHLINE - SEE SHEET L1.3

BASE PLAN INFORMATION, INCLUDING EXISTING TOPOGRAPHY AND PROPOSED CONTOURS, HAS BEEN PROVIDED BY FRAYJII DESIGN GROUP INC., JULY AND DECEMBER 2011.

NORTH

GRAPHIC SCALE

100 0 100 200 300

(IN FEET)

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AMERICA'S HABITATS
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BANK - PHASE 1
Yolo County, California

PLANTING PLAN (NORTH)

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SHEET L1.1
3 OF 7 SHEETS

Attachment E

MATCHLINE - SEE SHEET L1.2

B
L1.4

EXISTING AGRICULTURAL FIELD

EXISTING DELIVERY DITCH, TYP

HIBERNACULA, TYP
TO BE INSTALLED BY OTHERS

ROCK PLACEMENT, TYP
TO BE INSTALLED BY OTHERS

EXISTING GATE

EXISTING ROAD, TYP

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NORTH

GRAPHIC SCALE

100 0 100 200 300

(IN FEET)

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PLANTING PLAN (SOUTH)

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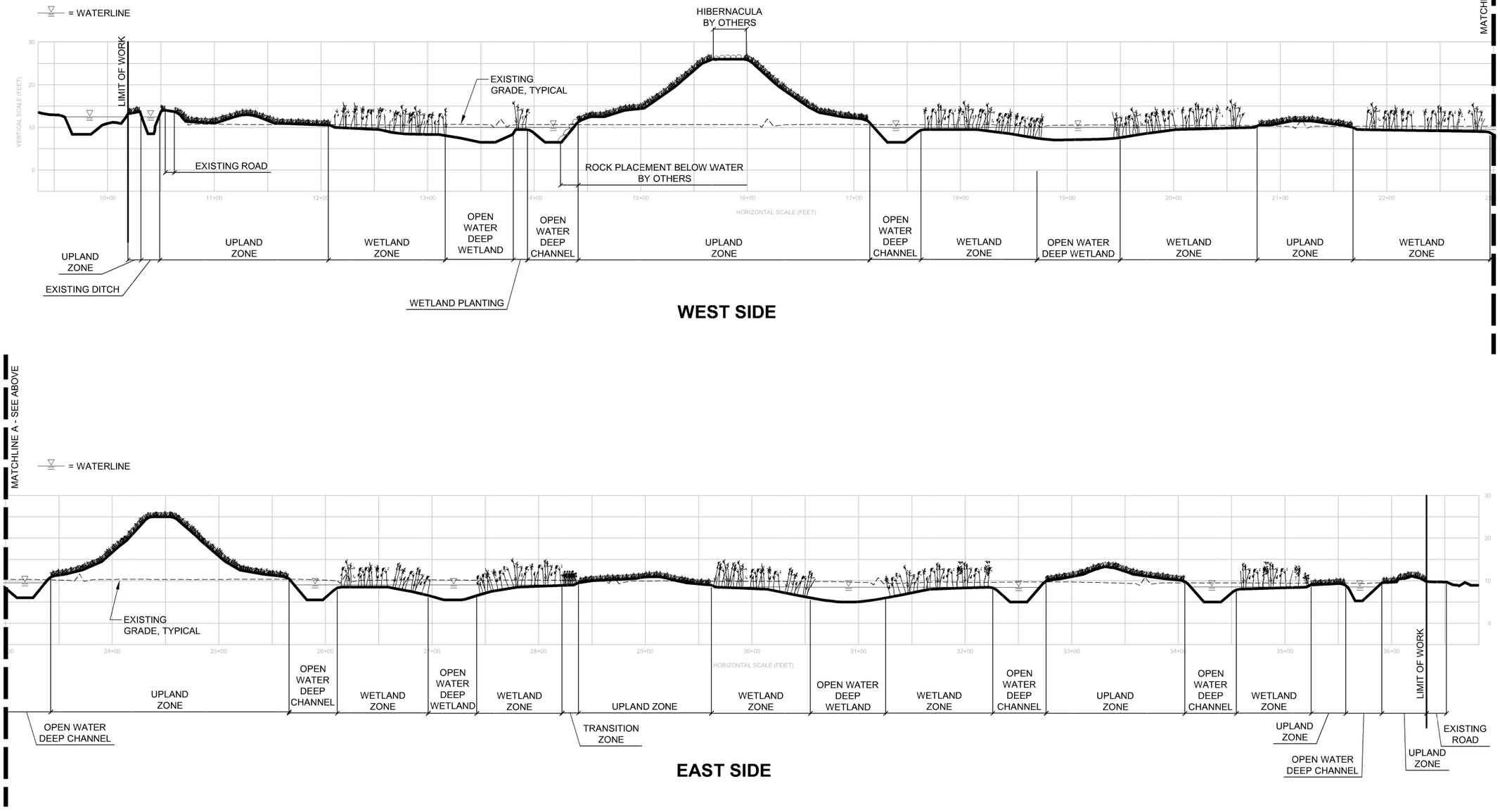
SHEET L1.3
4 OF 7 SHEETS

Attachment E



WEST SIDE

EAST SIDE

BASE CROSS-SECTION INFORMATION, INCLUDING EXISTING TOPOGRAPHY AND PROPOSED CONTOURS, HAS BEEN PROVIDED BY FRAYJI DESIGN GROUP INC., JULY/AUGUST/DECEMBER 2011.

TYPICAL CROSS-SECTION A

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PLANTING CROSS-SECTION A

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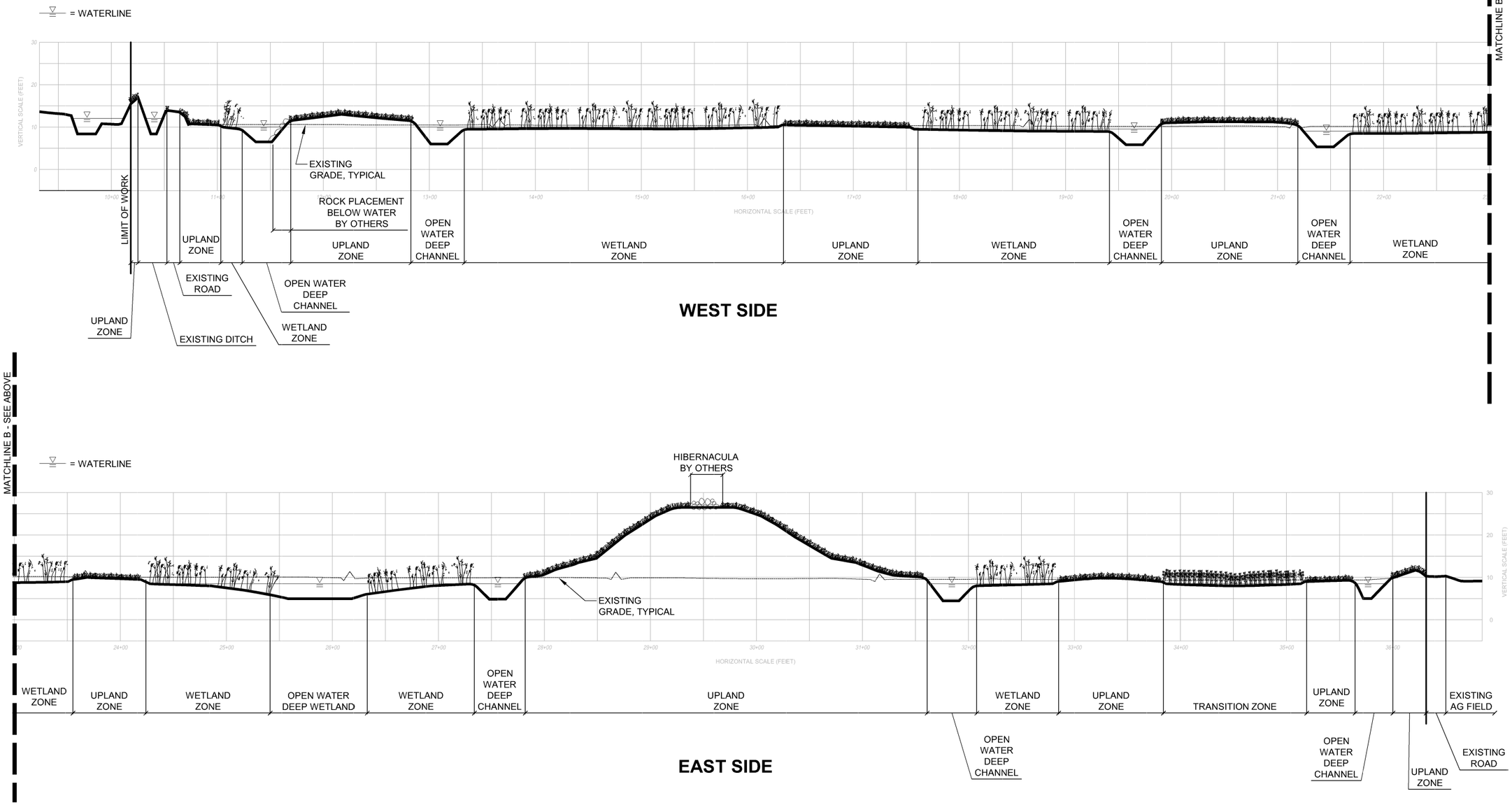
SHEET L1.4
5 OF 7 SHEETS

Attachment E



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TYPICAL CROSS-SECTION B

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PLANTING CROSS-SECTION B

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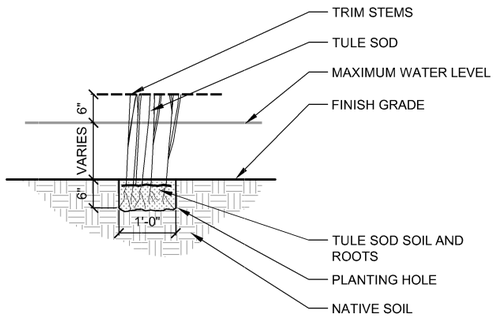
SHEET L1.5
6 OF 7 SHEETS



SECTION
NTS

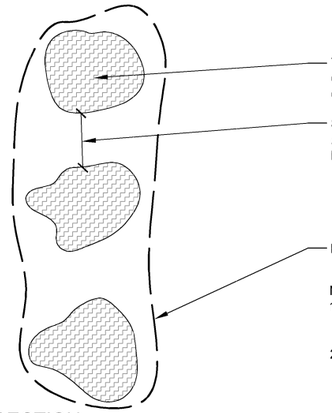
TULE SOD HARVEST

1. EXCAVATE 1 FT X 1 FT SOD SQUARES OF DENSE TULE BY USING A SPADE TO CUT 6" DEEP AROUND THE PERIMETER. SPACE HARVESTED SQUARES AT A MINIMUM 3-FT APART.
2. WET SOIL SUFFICIENTLY SO THAT SOIL STICKS TO ROOTS WHEN REMOVED.
3. REMOVE SOD BY THE ROOTBALL, USING CARE TO RETAIN SOIL AND ROOTS. ALWAYS HANDLE TULE SOD BY THE ROOTBALL, NOT BY THE STEMS.
4. DURING HANDLING AND TRANSPORT TO PLANTING SITE, PLACE SOD IN UNCOVERED CONTAINER AND SATURATE WITH WATER TO TOP OF SOIL.
5. INSTALL TULE SOD THE SAME DAY AS HARVEST.

TULE SOD INSTALLATION

1. FLOOD WETLAND PLANTING AREA PRIOR TO PLANTING AND LET DRAIN UNTIL STANDING WATER IS GONE, BUT SOIL IS STILL MOIST AT LEAST TO A DEPTH THAT REACHES THE BOTTOM OF INSTALLED TULE SOD. MAINTAIN SOIL MOISTURE THROUGHOUT PLANTING.
2. DIG PLANTING HOLES THE SAME DIMENSIONS AS SOD AT THE SPACING PROVIDED IN THE PLANTING SCHEDULE.
3. INSTALL SOD AND TAMP SOIL FIRMLY INTO PLACE. ENSURE THAT THERE ARE NO GAPS IN BETWEEN THE SOIL AND ROOTS IN ORDER TO AVOID WATER HEAVE AND DESICCATION DUE TO AIR EXPOSURE.
4. TRIM STEMS OF TULE SOD TO 6" ABOVE THE MAXIMUM DESIGNED WATER LEVEL.
5. AFTER PLANTING, RAISE WATER LEVELS TO SATURATE THE SOIL OF THE INSTALLED SOD.
6. MONITOR AFTER PLANTING IS COMPLETE FOR SIGNS OF TRANSPLANT STRESS, WHICH MAY INDICATE THAT THE PLANTS HAVE TOO LITTLE OR TOO MUCH WATER. IF PLANTS APPEAR STRESSED, ADJUST WATER LEVELS AS REQUIRED. DO NOT INUNDATE STEMS COMPLETELY.

2 TULE SOD HARVEST AND INSTALLATION

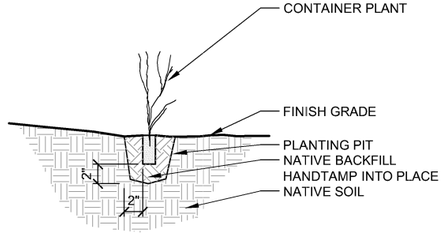


NOTES:
1. THIS DETAIL PRESENTS A SCHEMATIC DIAGRAM OF PLANT SPACING AND IS NOT INTENDED TO SHOW EXACT PLANTING LOCATIONS.
2. FOR TULE SOD HARVEST AND INSTALLATION, SEE 2/-

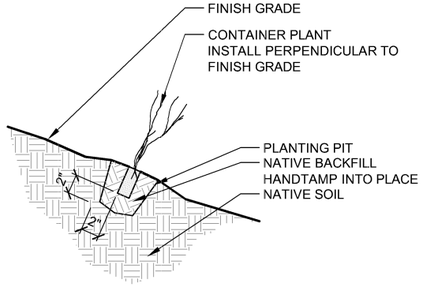
SECTION
NTS

1 WETLAND ZONE PLANTING LAYOUT

planting layout_24



SECTION
NTS



SECTION-ON A SLOPE
NTS

NOTES:
1. INSTALL AFTER 31 DECEMBER AND BEFORE 1 MARCH.
2. PLANTING HOLES SHALL BE EXCAVATED BY HAND.
3. REMOVE ALL ROCKS GREATER THAN 3 INCHES FROM PLANTING HOLE.
4. SCARIFY SIDES AND BOTTOM OF PLANTING HOLE.
5. PLANTING PIT SHALL BE LARGE ENOUGH TO PREVENT "J" ROOTING, WITH 2 INCHES MINIMUM CLEARANCE AT BOTTOM AND SIDES OF ROOT BALL.
6. IMMEDIATELY PRIOR TO INSTALLATION, THOROUGHLY MOISTEN CONTAINER PLANT.
7. GENTLY BREAK UP LOWER 1/3 OF ROOT BALL.
8. INSTALL PLANTS IMMEDIATELY AFTER REMOVAL FROM THE CONTAINER, AND MINIMIZE THE EXPOSURE OF THE ROOT BALL TO THE AIR WHILE PLACING THE ROOT BALL IN THE GROUND.
9. INSTALL PLANTS IN SUCH A MANNER THAT THE ROOTS ARE NOT RESTRICTED OR DISTORTED.
10. INSTALL PLANTS IN THE CENTER OF THE PLANTING HOLE AND SO THAT THEIR ROOT CROWNS ARE SLIGHTLY ABOVE GRADE (APPROXIMATELY 1/4-INCH) FOLLOWING PLANTING, SOIL SETTLEMENT, AND INITIAL IRRIGATION.
11. BACKFILL THE PLANTING HOLE AND LIGHTLY COMPACT TO REMOVE AIR SPACES BETWEEN ROOTS AND SOIL.
12. IRRIGATE EACH CONTAINER PLANT WITHIN 1 HOUR OF INSTALLATION WITH SUFFICIENT WATER TO SATURATE THE SOIL. THIS CAN BE DONE BY HAND.

3 TRANSITION ZONE PLANTING INSTALLATION

PLUG PLANTING_24

H. T. HARVEY & ASSOCIATES
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REVISIONS: DATE:

REGISTERED LANDSCAPE ARCHITECT M. ROMARDO 4598 Exp. 12/31/14 STATE OF CALIFORNIA

PREPARED FOR:
America's Habitats
c/o Smith Development
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7803 Madison Ave
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Citrus Heights, CA 95610

AMERICA'S HABITATS
CAPITAL CONSERVATION
BANK - PHASE 1
Yolo County, California

PLANTING DETAILS

Submittal: ISSUE FOR CONSTRUCTION
Scale: NOT TO SCALE
Date: 05 APRIL 2013
Drawn By: LD
Checked By: MW, JH, DS
File No.: 3261-01

SHEET L1.6
7 OF 7 SHEETS

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Attachment F

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

CAPITAL CONSERVATION BANK
INTERIM MANAGEMENT PLAN
BEI EXHIBIT D-4

Prepared by

H.T. HARVEY & ASSOCIATES

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Attn: Dustin R. Smith

January 2013

Project # 3261-01

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TABLES:

1 PURPOSE OF THE INTERIM MANAGEMENT PLAN

The Interim Management Plan (IMP) for the Capital Conservation Bank (CCB) identifies the short-term management, maintenance, monitoring, and reporting activities to be conducted from the time the CCB is established until the endowment, described in the Endowment Fund and Analysis Schedule (Exhibit D-2 in the BEI), has been fully funded for 1 year, and all performance standards described in the CCB Habitat Development Plan (HDP) (Exhibit C-1 in the BEI) have been met. The IMP builds from the CCB Long-Term Management Plan (LTMP) (Exhibit D-5 in the BEI); additional details regarding the activities described below are contained in that document.

The following entities are responsible for implementation of the IMP.

Conservation Bank Owner
Ronald D. and Clover A. Smith
2665 Sorney Loop Road
Rescue, CA 95672
Telephone: 530-676-8867
Fax: 530-676-8867
Email: cloverasmith@gmail.com

Conservation Bank Manager
America's Habitats
c/o Smith Development and Construction
7803 Madison Avenue #700C
Citrus Heights, CA 95610
Telephone: 916-966-7325
Email: d.smith@americashabitats.com

The Conservation Bank Manager will be responsible for completing all activities described in this IMP. All activities described in the IMP will be funded by the Conservation Bank Owner on an annual basis until the endowment, described in the Endowment Fund and Analysis Schedule (Exhibit D-2 in the BEI), has been fully funded for 1 year, and all performance standards described in the CCB Habitat Development Plan (HDP) (Exhibit C-1 in the BEI) have been met. Annual costs to implement this IMP are described in the Interim Management Security Analysis and Schedule (Exhibit D-1 in the BEI). The Interagency Review Team (IRT) is responsible for authorizing and overseeing the CCB. The IRT consists of the U.S. Fish and Wildlife Service (USFWS); the California Department of Fish and Wildlife (DFW) may also be part of the IRT in the event the DFW is added as a bank signatory at some point in the future.

2 MANAGEMENT AND MAINTENANCE ACTIVITIES

Long-term habitat management and maintenance tasks are described in detail within Section 4.3, Section 4.4, and Section 4.5 of the CCB LTMP. In general, tasks to be implemented during the long-term management period will be implemented during the interim management period as well, with the exception that some tasks, such as maintenance and replacement of water management infrastructure, are not expected to be required, and other tasks, such as initial management and fine tuning of water levels, are expected to be required more frequently. The methods, avoidance and minimization measures, notification requirements, and similar details described regarding the implementation of these management and maintenance tasks in the LTMP will also apply during the interim management period. Table 1 summarizes implementation of these tasks throughout the interim management period. DFW, USFWS, and U.S. Army Corps of Engineers (USACE) (collectively, Agency or Agencies) notification requirements for all management and maintenance activities shown in Table 1 are summarized in Table 3 of the CCB LTMP.

Table 1. Implementation of Management and Maintenance Tasks during Interim Management Period

Task	Summary of Task	Frequency and Intensity	Related PAR Line Item(s)
1.1 Manage Water Levels	Adaptively manage water levels to fine-tune management of water delivery system and maintain giant garter snake aquatic habitat values. Remove debris from gates and culverts to maintain water flow.	At least weekly during first year of operation and at least monthly in subsequent years between the months of May and September. At least semi-monthly between October and April.	Habitat Maintenance: Inspections: General Inspections Water Management:Water Control:Electricity – Pump Water Management:Water Control:Gate Maintenance
1.2 Repair and Replace Water Management Infrastructure	Repair or replace pipes, culverts, screw gates, weirs, risers, flashboards, etc.	Not expected to be required during interim management period but may be required to respond to unforeseen events (flood, vandalism, etc.).	Not applicable. Unforeseen needs funded through Performance Security.
1.3 Remove Sediment from Water Conveyance Canals	Remove sediment from water delivery canals to maintain conveyance capacity.	Not expected to be required during interim management period but may be required to respond to unforeseen events (flood, etc.).	Not applicable. Unforeseen needs funded through Performance Security.
1.4 Remove Sediment from Wetlands	Remove sediment from wetlands to maintain target water depths.	Not expected to be required during interim management period but may be required to adaptively respond to unforeseen events (flood, etc.).	Not applicable. Unforeseen needs funded through Performance Security.

Task	Summary of Task	Frequency and Intensity	Related PAR Line Item(s)
2.1 Thin Emergent Wetland Vegetation	Thin aquatic vegetation to maintain habitat values.	Not expected to be required during initial management period.	Not applicable.
2.3 Treat and Remove Woody Vegetation	Remove woody plants (willow, cottonwood, etc.).	Minimal effort expected during initial management period.	Habitat Maintenance:Exotic Plant Control:Spray/Hand Remove Habitat Maintenance:Exotic Plant Control:Herbicide Habitat Maintenance:Periodic Habitat Management:Adaptive Management Fund
2.4 Reduce Grassland Biomass	Mow or graze uplands to reduce biomass accumulation.	Not expected for first two years. Once annually thereafter, completed between July and September.	Habitat Maintenance:Periodic Habitat Management:Adaptive Management Fund
3.1 Prioritize and Treat Populations of Invasive Plants	Hand pulling, small hand tools, or herbicides as needed to prevent colonization and spread of invasive plants.	Assume 2 times annually during the late spring and summer months.	Habitat Maintenance:Exotic Plant Control:Spray/Hand Remove Habitat Maintenance:Exotic Plant Control:Herbicide Habitat Maintenance:Periodic Habitat Management:Adaptive Management Fund
3.2 Remove Muskrat Lodges and Beaver Dams	Removal as needed to maintain water delivery system.	Not expected to be required during initial management period.	Not applicable.
3.3 Control Muskrat and Beaver	Trap and remove problem animals.	Not expected to be required during initial management period.	Not applicable.

Task	Summary of Task	Frequency and Intensity	Related PAR Line Item(s)
3.4 Coordinate with Sacramento-Yolo Vector Control District	Coordination as needed for stocking of mosquito fish or other control measures.	Minimal effort expected during initial management period.	Site Construction/Maintenance:Project Management:Supervise/coordinate
4.1 Maintain Gates and Signage	Repair/replace the main, locked access gate and replace signs that are vandalized or damaged.	Not expected to be required during initial management period.	Not applicable.
4.2 Patrol Conservation Bank	Inspect bank to note trespass, vandalism, etc., collect and dispose of small amounts of trash.	At least weekly during first year of operation and at least monthly in subsequent years between the months of May and September. At least semi-monthly between October and April.	Habitat Maintenance: Inspections: General Inspections
4.3 Collect and Dispose of Trash and Refuse	Collect and dispose of larger amounts of trash and refuse.	Once annually between May and September.	General Maintenance:Sanitation Control:Collection and Disposal
4.4 Maintain Roads	Mow, grade, re-contour, and repair roads.	Not expected to be required during initial management period. Unforeseen needs funded through adaptive management fund.	Habitat Maintenance:Periodic Habitat Management:Adaptive Management Fund
4.5 Repair and Replace Speed Limit Signs	Replace signs that are vandalized or damaged.	Not expected to be required during initial management period.	Not applicable.

Task	Summary of Task	Frequency and Intensity	Related PAR Line Item(s)
5.1 Control and Manage Public Use	Coordinate and oversee requests for public access.	Minimal effort expected during initial management period.	Public Services:Public and Scientific Use:Coordination
5.2 Control and Manage Scientific Use	Coordinate and oversee requests for scientific use.	Minimal effort expected during initial management period.	Public Services:Public and Scientific Use:Coordination

3 MONITORING ACTIVITIES

As described in the CCB HDP, construction of the CCB will enhance or create approximately 75.57 ac of aquatic habitat, preserve 2.86 ac of aquatic habitat, create or enhance 54.35 ac of upland habitat, and preserve 4.87 ac of upland habitat, all of which will provide habitat for giant garter snakes. Regular quantitative monitoring will occur each year of the initial management period to document the progress of created and enhanced habitats toward established success criteria. Success criteria have been established for wetland habitats (CCB HDP, Table 2) and for giant garter snake occurrence (CCB HDP, Table 2). Other aspects of the CCB will be qualitatively monitored to assess the condition and trend of other biological resources and to assess the overall condition of the CCB, and photographs documenting general site and habitat conditions will be taken at regular intervals. Monitoring activities are described below and summarized in Table 1.

3.1 WETLANDS AND OTHER WATERS OF THE UNITED STATES

Vegetation percent cover within wetlands will be measured by placing 100 m transects (i.e. sampling units) starting at random locations and running in random directions within each wetland and adjacent water supply channel. The total distance of vegetation intercepting each transect will be measured and summed to yield a percent cover value for that sample unit. All vascular plant species observed along the transect and the species first intercepting the transect will be recorded at 1 m intervals to compute percent cover by species for that sample unit. The number of sample units within each wetland cell will be based on the variability of the site's vegetative cover and will be determined by evaluating the cumulative average cover value obtained over increasing numbers of sample units. The number of sample units used will be the point where additional samples do not substantially change the cumulative average cover value obtained. Analysis will include calculations of total plant cover, relative cover by wetland indicator species (plants rated as OBL, FACW, or FAC), and relative cover by native species.

All data will be recorded on field data sheets and transcribed into an electronic spreadsheet for analysis and reporting.

3.2 GIANT GARTER SNAKE MONITORING

A DFW and USFWS-approved biologist will monitor and document giant garter snake populations following project construction. Giant garter snake monitoring will include active visual surveys and passive aquatic trapping conducted at times and using methods most likely to result in capture of giant garter snake. Precise timing of the survey period will be determined by weather and seasonal conditions during the given year. Global positioning system (GPS) units will be used to determine the geocoordinates of capture locations. The vegetation type, approximate water depth, substrate type, time of day, and ambient temperature will be recorded. Data will also be collected from snakes upon capture. Weight, total length, snout to vent length, sex, scale counts on head and mid-body, and other physical features such as scars and tumors will be noted. Captured snakes will be implanted with passive induced transponder tags for permanent identification, allowing snakes to be identified using a scanner and facilitating independent study by separate investigators. All snakes will be immediately released at the point

Table 2. Implementation of Monitoring and Reporting Tasks during Initial Management Period

Task	Summary of Task	Frequency and Intensity	Related PAR Line Item(s)
Wetlands and Waters of the U.S. Monitoring	Monitoring to document progress of CCB toward defined habitat success criteria.	Annually between July and August.	Biotic Surveys:Plant Ecologist:Success Criteria Monitoring
Giant Garter Snake Monitoring	Monitoring to document progress of CCB toward defined species success criteria.	Annually between May and September.	Biotic Surveys:Wildlife Biologist:GGS Trapping
Photo-Documentation	Photo-documentation from fixed observation points to visually document condition and progress of CCB.	Annually between July and August. Aerial photographs taken in Year 1 and Year 5.	Biotic Surveys:Plant Ecologist:Success Criteria Monitoring Reporting:Aerial Photo:Digital Geo-referenced
General Inspections: Site Conditions	General inspections to document and adaptively adjust function of water management system; trespass and vandalism inspections; refuse collection	At least weekly during first year of operation and at least monthly in subsequent years between the months of May and September. At least semi-monthly between October and April.	Habitat Maintenance: Inspections: General Inspections

Task	Summary of Task	Frequency and Intensity	Related PAR Line Item(s)
General Inspections: Maintenance Needs	General inspections to document condition and function of upland areas, including presence of invasive plants and need for treatment; presence of woody species; need for re-planting of wetland vegetation to meet habitat success criteria.	Annually between May and September.	Biotic Surveys:Plant Ecologist:Success Criteria Monitoring Habitat Maintenance: Inspections: General Inspections
Annual Reporting	Annual IRT report describing results of all monitoring; progress toward defined habitat and species success criteria; management and maintenance activities; need for adaptive changes to management activities.	Annually by December 31.	Reporting:Agency Report:Annual Report

of capture after data have been collected, with the exception of potentially gravid snakes, which will be transported to the Sacramento Zoo for testing and immediately returned to the capture location and released following test completion.

A detailed study plan, describing trapping methods, approximate timing, and other relevant details will be prepared by the CCB Project Proponent and submitted to DFW and USFWS for approval prior to all giant garter snake surveys during the establishment phase for the CCB. The results of all surveys will be electronically tabulated and archived.

3.3 PHOTO-DOCUMENTATION

Photo-documentation of the site will be conducted from a number of fixed locations throughout the CCB. Photographs will also be taken to record any events that may have a significant effect on the success of restoration, such as flood, fire, trespass issues, or vandalism. The locations for photo-documentation will be selected when the record of habitat construction (i.e., biological as-built report) is developed for the site. These locations will be recorded on the record of habitat construction graphic. Additionally, aerial photos will be taken of the CCB in Year 1 and Year 5 of success criteria monitoring.

All photographs will be electronically archived.

3.4 GENERAL INSPECTIONS

General Inspections of the CCB during the interim management period will evaluate the following factors: erosion, condition and function of water delivery and management infrastructure, condition of canals and maintenance needs, wetland vegetation density and need for thinning, canal and wetland sedimentation, presence of woody vegetation, accumulation of grassland biomass, beaver and muskrat activity, signs of trespass and authorized use, trash accumulation, condition of signage, and condition of roads. Regular inspections of these factors are essential to maintaining the condition and function of the CCB.

Two types of general inspections will occur: regular weekly or monthly inspections and an annual inspection. During regular inspections all canals, gates, weirs and flash board risers, the main water pump, and other water delivery and management infrastructure will be inspected by the Conservation Bank Manager. The Conservation Bank Manager will also inspect the CCB for signs of trespass and vandalism, note the condition of signage, and review the overall integrity of the site. Between the months of May and September, regular inspections will occur weekly for the first year following bank construction and monthly in subsequent years. Regular inspections will occur semi-monthly between the months of October and April throughout the interim management period. Additional guidelines that will be followed for regular general inspections are described in Task 7.1 of the CCB LTMP.

Annual general inspections will focus on assessing periodic management needs and on the need for adaptive changes to the management of the CCB. Specific inspections that will occur include: the extent of sedimentation in canals and wetlands and need for removal, density of wetland vegetation and need for thinning, presence of young woody vegetation and need for removal, accumulation of grassland biomass and need for removal, presence of beaver and

muskrat including dams of lodges that should be removed, condition of roads and need for maintenance, and presence of large debris and refuse for collection and disposal. This inspection will be completed once annually between May and September for each year of the interim management period. Additional guidelines that will be followed for annual general inspections are described in Task 7.2 of the CCB LTMP. All observations from annual general inspections will be collected and organized on field data sheets, a copy of which is included as Appendix A of the CCB LTMP.

4 REPORTING

Following the completion of the first full growing season after construction, an annual report will be submitted to the IRT by December 31 of each year. The annual report will summarize the habitat monitoring and maintenance activities; results of all monitoring and inspections; the schedule for and progress toward achieving specific performance standards; and any deficiencies, recommendations, or remedial actions suggested by the Conservation Bank Manager. Annual reports also will document deposits to the Endowment Fund and credit sales or debits from the available credits established on the Bank. Following attainment of performance standards and full funding of the endowment principle for one year, the CCB LTMP will be implemented, and implementation of this IMP will cease. Reporting activities are summarized in Table 1.

5 REMEDIAL ACTIVITIES

If annual success criteria are not achieved for any portion of the CCB in any year, or if any of the final success criteria (Year 5) are not met, the Conservation Bank Manager will work with the IRT to prepare an analysis of the cause(s) of failure. If requested by the IRT, a remedial action plan will be prepared within 2 months of the initial request (see Section VIII (F) of the BEI for additional details and requirements). Implementation of remedial actions will depend on the nature of the work; thus, a schedule will be presented for IRT review and approval as part of the remedial action plan. As part of the BEI, a Performance Security Analysis and Schedule (Exhibit C-3 in the BEI) has been prepared and will be established by the Conservation Bank Owner to fund any required remedial activities.

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Attachment G

H.T. HARVEY & ASSOCIATES
Ecological Consultants

Capital Conservation Bank
Long-Term Management Plan
BEI Exhibit D-5

Project # 3261-01

Prepared for

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April 2014

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Section 1.0 Introduction

America's Habitats intends to implement a wetland restoration and enhancement project within a 137.65-acre (ac) portion of the Yolo Bypass in Yolo County to establish the Capital Conservation Bank (CCB). The CCB will be established to create and enhance habitat for the California and federally listed as threatened giant garter snake (*Thamnophis gigas*). The proposed project will be the first phase of a potential two-phase conservation bank. Phase 2, which will be located immediately north of Phase 1, may be implemented following the successful completion of Phase 1 based on the market demand for giant garter snake conservation credits.

If approved, the CCB will be the fourth active conservation bank approved by the U.S. Fish and Wildlife Service (USFWS) to sell giant garter snake conservation credits. Existing, active giant garter snake banks include Gilsizer Slough, Ridge Cut Slough, and Sutter Basin; however, none of these existing banks are authorized to sell credits within the service area proposed for the CCB. The primary giant garter snake conservation bank within the service area proposed for the CCB, the Pope Ranch Conservation Bank (located immediately west of the CCB), is closed and has sold all available conservation credits. Establishment of the CCB will increase the supply of conservation credits for projects affecting the giant garter snake or its habitat within the north Delta and adjacent areas.

This Long-Term Management Plan (LTMP) describes the CCB property, its habitats and associated species, and identifies long-term maintenance, management, monitoring, and reporting activities that will be implemented for the benefit of giant garter snakes and their habitat. Long-term monitoring and management activities will focus on acquiring knowledge for adaptive management decisions. These activities will be implemented in perpetuity, once the initial success criteria monitoring period following CCB construction is complete, as described in the CCB Habitat Development Plan (Exhibit C-1 in the BEI) and following completion of the Interim Management period as described in the CCB Interim Management Plan (Exhibit D-4 in the BEI).

1.1 Purpose of Establishment

The CCB will be established by the Bank Enabling Instrument (BEI) to compensate for unavoidable impacts to, and to conserve and protect, the federally and California listed as threatened giant garter snake and its habitat. The CCB will include 78.43 ac of covered aquatic habitat and 59.22 ac of covered upland habitat for this species. The BEI Signatory Agencies are the Sacramento Office of the USFWS and the Bay-Delta Office of the USFWS. The California Department of Fish and Wildlife (DFW) Bay-Delta Region is expected to be added as a bank signatory at a later date. The USFWS and DFW, if added as a bank signatory at some point in the future, comprise the Interagency Review Team (IRT). Terms used in this LTMP have the same meaning as defined in the BEI.

1.2 Purpose of this Long-term Management Plan

The purpose of this LTMP is to ensure that covered species and covered habitats are managed, monitored, and maintained in perpetuity for both habitat and flood control objectives. This LTMP establishes goals, objectives, and tasks toward this end. It is a binding and enforceable instrument, implemented by the conservation easement covering the CCB (Exhibit E-4 in the BEI) and required as a component of the BEI.

1.3 Conservation Values

For the purpose of this LTMP, Conservation Values are defined as those natural resource values that are present within the CCB at the time of establishment and that are intended to be preserved and enhanced in perpetuity through recordation of a conservation easement over the CCB and implementation of this LTMP. Conservation Values specifically include wetland and upland habitat for giant garter snakes.

It is noted that these Conservation Values are consistent with the proposed project's location with the Yolo Bypass, which is a component of the State Plan of Flood Control and provides important flood protection to communities in the lower Sacramento Valley. The CCB's Conservation Values have been developed in consideration of the need for the Yolo Bypass to convey design flows during flood events, and the CCB will be managed and maintained in perpetuity as described in this LTMP to maintain its Conservation Values and to have no adverse effects on the ability of the Yolo Bypass to convey design flood flows.

1.4 Personnel and Responsibilities

1.4.1 Conservation Bank Owner

The Conservation Bank Owner is Ron and Clover Smith. The duties of the Conservation Bank Owner, and subsequent owners upon transfer, include, but are not limited to the following:

- establishment and funding of a non-wasting endowment to fund conservation easement compliance monitoring and implementation of this LTMP;
- retaining a qualified Conservation Bank Manager to implement this LTMP;
- complying with the terms and conditions of all regulatory permits, authorizations, or approvals issued for construction and operation of the CCB;
- any other duties relating to the management and operation of the CCB as described in the BEI or as assigned by the IRT, and;
- Maintain vegetation to have no impact on hydraulic capacity of Yolo Bypass.

1.4.2 Conservation Bank Manager

The Conservation Bank Manager is America's Habitats. The Conservation Bank Manager, and subsequent managers upon transfer, will implement this LTMP, managing and monitoring the CCB in perpetuity to preserve its Conservation Values and flood control objectives in accordance with the CCB BEI and conservation easement. Specific responsibilities include, but are not limited to, the following:

- management and maintenance of canals, gates, pumps, flashboard risers, and similar water management infrastructure;
- management of wetland and upland vegetation to maintain habitat suitability for giant garter snake and maintenance of vegetation to have no impact on hydraulic capacity of Yolo Bypass;
- maintenance of culverts and signage;
- trash removal and trespass control;
- invasive plant management;
- conducting general inspections of the CCB;
- coordinating and overseeing all biological surveys of the CCB to be conducted by Qualified Personnel;
- maintenance of a log to include records of activities, correspondence, and determinations regarding the CCB;
- implementing corrective actions as necessary to maintain the habitat values of the CCB and maintain hydraulic conditions in Yolo Bypass;
- obtaining permits and any other required approvals or authorizations from the USACE, IRT, and any applicable local agencies needed for future corrective actions (e.g., grading or hydrologic alteration); and
- submitting annual reports to the IRT.

1.4.3 Qualified Personnel

The Conservation Bank Manager may retain Qualified Personnel, herein defined as professional fish and wildlife biologists, botanists, or other types of specialists to conduct specialized tasks on the CCB. Qualified Personnel will be familiar with California flora and fauna and will be experienced with the biology and ecology of giant garter snake and its aquatic and upland habitats. Specific duties of Qualified Personnel may include, but are not limited to, the following:

- monitoring wetland functions;
- evaluating the accumulation of dead vegetative matter (thatch) and recommending removal if needed;

- evaluating the presence of non-native (exotic) plant species and recommending appropriate management;
- conducting biological inspections and surveys and preparing reports required by this LTMP;
- evaluating site conditions and recommending remedial actions to the Conservation Bank Manager, if necessary;
- assisting in reviewing or planning remedial actions and habitat restoration activities for the CCB; and
- evaluating vegetation for hydraulic impacts to the Yolo Bypass.

Section 2.0 Property Description

2.1 Setting and Location

The 137.65 ac CCB project site is located south of Interstate 80 (I-80), east of County Road 104, and west of the Sacramento Deepwater Ship Channel in Yolo County, California at the northern terminus of County Road 107 within the Yolo Bypass (General Vicinity Map, BEI Exhibit A-1). The project site is found on the Saxon U.S. Geological Survey (USGS) 7.5-minute quadrangle map within Township 7 North, Range 3 East, Section 33 (portion of Yolo County Assessor's Parcel Number #033-190-10-1) (Map of Bank Property, BEI Exhibit A-2). It is accessible by vehicle from County Road 107, which runs along its eastern boundary. The Pope Ranch Conservation Bank, which is managed by Wildlands, Inc. as a giant garter snake and Swainson's hawk (Buteo swainsonii) conservation bank, is located immediately west of the CCB.

2.2 History and Land Use

The CCB project site has historically been used for agriculture since at least 1957 and likely since 1937 (AECOM and HTH 2011). In recent years, the CCB project site and the other lands in the vicinity that are owned by the Conservation Bank Owner have been farmed for rice and various other crops such as wheat, Sudan grass, rye grass, corn, and tomatoes (AECOM and HTH 2011). The CCB project site is currently fallowed and is zoned as Agriculture.

2.3 Hydrology and Topography

The CCB project site, in its current condition, has a slight topographic gradient north to south and from west to east, ranging in elevation from approximately 11 ft at the northwest corner to 9 ft at the southeast corner. Wetland hydrology on the project site is sustained by rainfall, groundwater, surface water diverted to the site through irrigation canals, and flood flows down the Yolo Bypass. On average, the project site receives approximately 15 in of rainfall, primarily between the months of November and April (AECOM and HTH 2011).Heavy clay soils found on the project site (see Section 2.3.4, below) contribute to localized areas of ponded water that may support wetland hydrology. Additionally, localized areas of wetland hydrology may be supported by shallow groundwater, which can be found at or immediately below the soil surface (i.e., within 12 in) during the rainy season.

During the summer, the hydrology of the project site is primarily influenced by a series of irrigation and drainage canals that run along its southern border (the Deep Canal) and western border. The Deep Canal receives water directly from the Yolo Bypass Toe Drain and is tidally influenced. A low-lift pump at the southwest corner of the site pumps water out of the Deep Canal into a high-line canal that flows north along the project site's western boundary. Water is diverted out of this canal into a series of smaller canals the supply irrigation water to the project site for rice cultivation throughout the summer.

Additionally, the project site lies within the Yolo Bypass, a flood facility located in Yolo and Solano Counties that conveys floodwaters from the Sacramento River away from the Sacramento Metropolitan area through a system of weirs into the Yolo Bypass, eventually draining into the Sacramento-San Joaquin River Delta via the Toe Drain at Prospect Slough. The Yolo Bypass was constructed to convey 500,000 cubic feet per second (cfs) of water to the north Delta and increase the Sacramento River capacity to 100,000 cfs from the City of Sacramento to the Sacramento River's junction with Cache Slough in the north Delta. The Fremont Weir diverts water from the Sacramento River into the northern end of the Yolo Bypass when the river stage exceeds 33.5 ft. The manually-operated Sacramento Weir, located immediately upriver from the city of West Sacramento, can be opened to divert additional water during high flow years. In addition to water from the Sacramento River, water enters the Bypass from several western drainages, primarily Knights Landing Ridge Cut, Cache Creek, Willow Slough, and Putah Creek. These drainages may contribute to localized inundation in the Yolo Bypass in years when the Sacramento River does not spill at the Fremont Weir.

Following project construction, the topography and hydrology of the CCB would be modified considerably, as summarized in Section 3.1 and as described in more detail within the CCB Habitat Development Plan, Exhibit C-1 in the BEI.

2.4 Soils

According to the Soil Survey of Yolo County (Andrews 1972), a single soil series, Capay clay, underlies the CCB project site. Capay clays are very deep, moderately well drained soils that formed in moderately fine and fine textured alluvium derived from mostly sandstone and shale. They are typically moderately acidic to moderately alkaline in the upper horizons becoming more alkaline in lower horizons (Andrews 1972). Clay content in the A horizon ranges from 40% to 55%.Permeability and surface runoff is slow and the available water holding capacity is 6.5 in to 8.0 in (Andrews 1972).

2.5 Existing Easements

A flowage easement over the CCB project site has been granted to the Sacramento San Joaquin Drainage District. There are no additional easements on the CCB site. A copy of the current title report for the CCB site is included as Exhibit E-1 in the BEI.

2.6 Adjacent Land Uses

The CCB project site is surrounded by wetlands and agricultural land, including several parcels enrolled in the Natural Resources Conservation Service Wetlands Reserve Program or parcels that have recorded conservation easements, active Williamson Act contracts, or other forms of legally-binding development restrictions. The Pope Ranch Conservation Bank is located immediately west of the CCB. Existing adjacent

land uses, including the location of conserved and protected parcels, are depicted in the Map of Existing Conserved Land in Bank Property Vicinity, Exhibit A-3 in the BEI.

Section 3.0 Habitat and Species Descriptions

Existing habitats within the CCB project site are limited to farmed freshwater emergent and seasonal wetlands as well as small ruderal areas along dirt roads (Figure 1). Irrigation ditches occur on the eastern and southern borders of the site. Frequent disturbances associated with agriculture (e.g., disking, herbicide/pesticide use) limit the quality and quantity of the ecological functions and services provided by these habitats; however, a number of bird species, fossorial mammals, reptiles, and amphibians have been observed or are expected to use the CCB site in its current condition. A full description of the current status of biological resources on the CCB project site is provided in Exhibit H of the BEI.

Section 3.1 below summarizes the bank development plan, including the acreages and types of habitats to be created or enhanced on the CCB project site. Federally or State of California listed as threatened or endangered species, plants considered to be rare, threatened or endangered by the California Native Plant Society (i.e., List 1 or List 2 species), California fully protected species, and California species of special concern (collectively, "special-status species") that could be found on the CCB following construction are also summarized.

3.1 Summary of Bank Development Plan

Construction of the CCB will create or enhance approximately 129.92 ac of perennial marsh and upland habitat for the giant garter snake. Approximately 7.73 ac of existing giant garter snake habitat will be preserved and enhanced. Existing agricultural land will be converted to a mixture of wetlands and uplands, some of which will be constructed to be above the design water surface elevation of the Yolo Bypass. Native wetland plants (e.g., tule [*Schoenoplectus acutus*]) will be planted within wetland habitats, and California-native perennial grasses will be planted in uplands. The proposed design includes a mosaic of aquatic and upland habitats to meet all the life history requirements of the giant garter snake. It includes shallow and deep wetlands for giant garter snake foraging and breeding with clusters of emergent vegetation to escape predators; deep channels for water delivery and production of small fish and other small vertebrates as a food source for adult giant garter snakes; wetland-upland transition zones to encourage invertebrate production as a food source for juvenile giant garter snakes; and, associated uplands for giant garter snake basking and winter brumation, including construction of hibernacula and backing sites using piles of rip-rap sized rock. In all, 58.27 ac of wetland habitat will be created or enhanced, 17.30 ac of relatively permanent waters will be created, 2.86 ac of existing relatively permanent waters will be preserved, 52.27 ac of upland habitat will be created, 2.08 ac of upland habitat will be enhanced, and 4.87 ac of existing uplands will be preserved.

Wetland hydrology for the CCB will be supported by natural (i.e., rainfall, shallow groundwater, and periodic flood flows down the Yolo Bypass) sources of wetland hydrology during the winter and early spring months, as described in Section 2.3, and by supplemental water delivered through a series of supply canals, similar to the existing agricultural operation on the project site (Figure 1). During the giant garter snake active period,

roughly May to October, the main water supply will be the Deep Canal, at the southern end of the CCB. Surface water in the Deep Canal, which is sustained via a direct connection to the Yolo Bypass Toe Drain and tidally influenced, will be pumped, using a low-lift hydraulic pump, approximately 10 to 15 ft into an existing high-line canal that separates the CCB from the Pope Ranch Conservation Bank. Water will flow, via gravity, north down the high-line canal and into a main supply canal running across the northern end of the CCB. Running east down the main supply canal, water will flow south into a series of channels, 4 to 5 ft in depth, each of them supplying a wetland cell ranging from 3 ft to 6 in deep that will be separated from adjacent wetlands by intervening upland habitat. Each wetland cell will contain a variable number of topographic depressions of differing sizes that will be approximately 2 ft deeper than the surrounding wetland. Outside the giant garter snake active period, roughly November through April, natural sources of wetland hydrology will be supplemented by water delivered from the Deep Canal, as described above, when needed to maintain wetland hydrology. The need for supplemental water between November and April will be evaluated on a year-to-year basis based on rainfall amounts, flood flows down the Yolo Bypass, and similar factors.

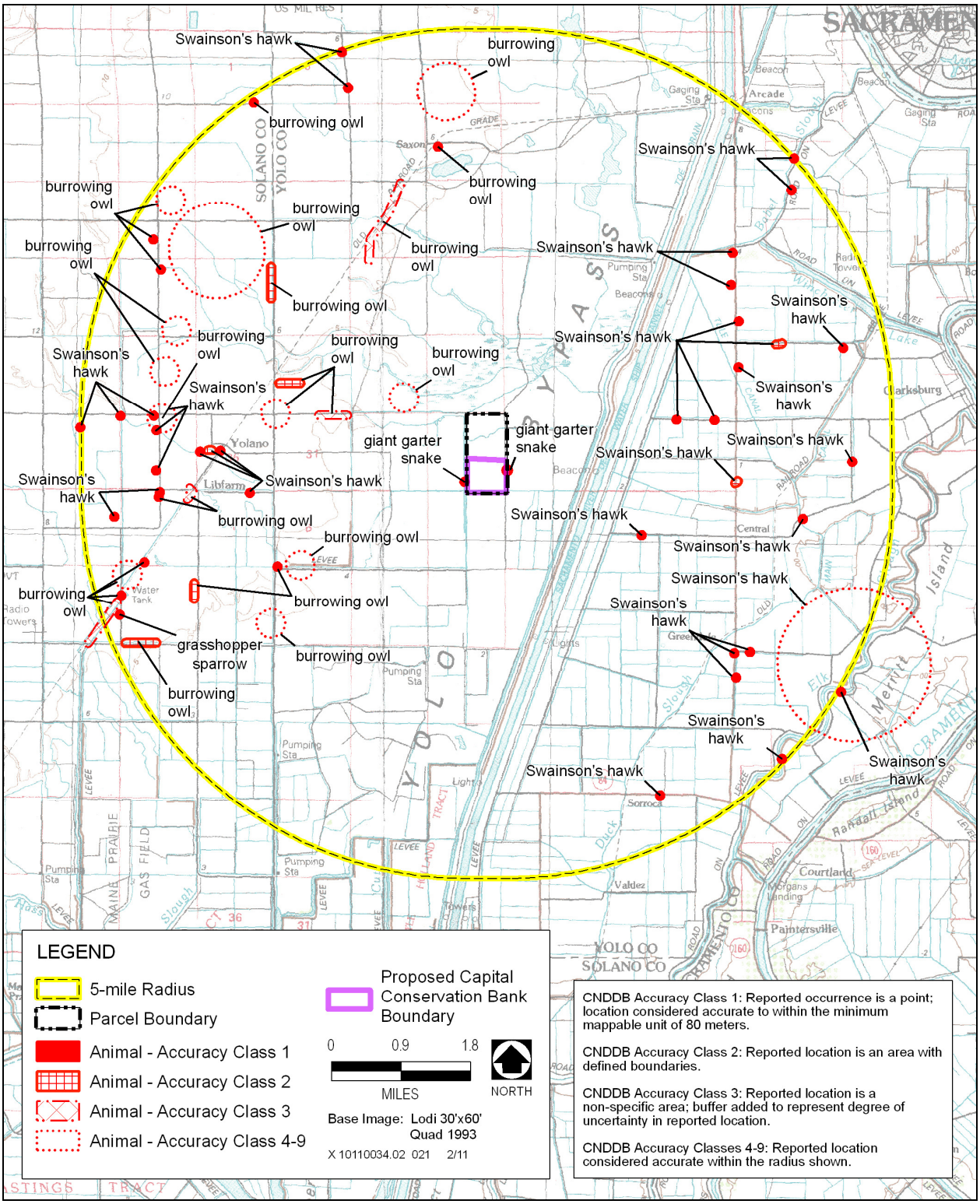
Vegetation communities will consist of wetlands and uplands, as summarized below.

3.1.1 Wetland Communities

Vegetation within wetlands will include tule and a variety of smaller, emergent macrophytes. Tule will be the primary plant within the deeper portions of wetlands (e.g., areas from 1 ft to 3 ft in depth). They will be planted along the margins of water supply channels, in scattered clumps throughout each wetland, and along the margins of the deeper topographic depressions to be excavated within each wetland cell. The shallower upland margins of each wetland cell (e.g., areas less than 1 ft deep) will be planted with clusters of low growing herbaceous species including Baltic rush (*Juncus balticus*), Santa Barbara sedge (*Carex barbarae*), Iris-leaf rush (*J. xiphioides*) and spike rush (*Eleocharis macrostachya*). Significant areas of open water will be maintained within wetland habitats for giant garter snake foraging and to maintain target hydraulic roughness values for flood water conveyance down the Yolo Bypass.

3.1.2 Upland Communities

Vegetation within uplands will include a variety of California-native grasses such as blue wild rye (*Elymus glaucus*), creeping wild rye (*Leymus triticoides*), meadow barley (*Hordeum brachyantherum*), and slender wheatgrass (*Elymus trachycaulus*). Large rip-rap sized rocks, boulders and other artificial refugia and hibernacula will be strategically placed and/or partially buried within uplands to provide refugia and basking sites for giant garter snakes until vegetation and natural burrows develop.



Source: Yolo County 2009, CNDDB January 2011. Prepared by AECOM 2011.

3.2 Endangered and Threatened Species

As described in Exhibit H of the BEI, previous biological surveys have documented the presence of giant garter snakes in the immediate vicinity of the CCB site. Construction of the CCB would primarily target habitat values for giant garter snakes, and long-term management actions would be implemented to maintain and enhance habitat values for this species.

Other federally or California listed as threatened and endangered species known from the surrounding region include Swainson's hawk (California threatened), which nest in adjacent parts of Yolo County and Sacramento County, outside the Yolo Bypass, and three species of anadromous fish that migrate through and rear on the Yolo Bypass during flood events: Sacramento River evolutionary significant unit (ESU) winter-run and Central Valley ESU spring-run Chinook salmon (*Oncorhynchus tshawytscha*) (federal and California endangered and federal and California threatened, respectively), Central Valley distinct population segment (DPS) steelhead (*O. mykiss*) (federal threatened), and the southern DPS of green sturgeon (*Acipenser medirostris*) (federal threatened). Swainson's hawk may occasionally use the CCB for foraging, given the proximity of known and potential nest sites, but suitable breeding habitat is not found on the site. Anadromous fish may migrate through the CCB or make otherwise make limited use of the site for brief periods when the Yolo Bypass is flooded. Long-term management actions implemented within the CCB to benefit giant garter snake make incidentally benefit these species as well (e.g., management of giant garter snake upland habitat may provide Swainson's hawk foraging habitat), but management of the CCB will not focus on these species.

The CCB project site contains suitable habitat for the giant garter snake based on presence of active rice agriculture and documented occurrences in close proximity to the site (Hansen 2009). Ten occurrences have been recorded within a 10-mile radius of the CCB site (Exhibit H of the BEI), 6 of which were within the same watershed as the CCB, and 4 were occurrences that are likely isolated from the CCB site by the Sacramento River. One of the records was less than 300 ft from the CCB site at the Pope Ranch Preserve. Visual surveys for giant garter snake were conducted on the CCB site on July 1, July 13, and September 11 in 2009, and 1 adult male giant garter snake was observed on July 1 at a ditch crossing along the alignment of Yolo County Road 107 (Exhibit H of the BEI). Additionally, giant garter snakes have been sighted on three separate locations during the summer of 2011. These sightings have all been confirmed by USFWS staff or by recognized species experts (D. Smith, pers. comm.).

3.2.1 Rare Species and Species of Special Concern

Both grasshopper sparrow (*Ammodramus savannarum*) (California species of special concern) and tri-colored blackbird (*Agelaius tricolor*) (California species of special concern) have been observed immediately north of the CCB. Several other rare wildlife species, DFG species of special concern, and DFG fully protected species have been observed in the region surrounding the CCB (Exhibit H of the BEI). A rare plant survey, conducted to DFG protocols, did not locate any rare, threatened, or endangered plant species on the CCB site. Following construction, the CCB could support a variety of rare species and species of special concern,

as described in Exhibit H of the BEI. In general, species potentially supported on the site following project construction could include species found within grasslands, such as burrowing owl (*Athene cunicularia*), and freshwater marshes, such as tri-colored blackbird and northern harrier (*Circus cyaneus*). Similar to Swainson's hawk, these species may incidentally benefit from long-term management actions implemented to maintain habitat suitability for giant garter snake, but they will not be the focus of management actions on the CCB.

Section 4.0 Management, Maintenance, Monitoring, and Reporting

4.1 Goals

The overall goal of long-term management and maintenance activities is to maintain the CCB's Conservation Values in perpetuity. Specific management goals include the following.

Goal 1: Maintain aquatic habitat values for giant garter snake, including a mosaic of open water and emergent marsh of varying depths to provide habitat for all giant garter snake life stages.

Goal 2: Maintain upland habitat values for giant garter snake, including open grassland, rock piles, small mammal burrows, and similar habitat elements to support giant garter snake movement, basking, and brumation.

Goal 3: Protect the CCB from the potentially adverse effects of wildfire, flood, and other unforeseen, episodic events and actively restore the CCB's Conservation Values, if needed, in response to these events.

Goal 4: Maintain vegetation to grow in a manner that does not impact flood flow capacity in Yolo Bypass.

Management, monitoring, and reporting objectives and implementation tasks to achieve these goals are described in detail below.

4.2 Avoidance and Minimization Measures

The following measures will be implemented for all habitat maintenance and management activities carried out within the CCB to avoid and minimize the potential for take of federally and California listed species.

4.2.1 Giant Garter Snake

To avoid and minimize take of giant garter snakes, the following measures, consistent with terms and conditions listed in the programmatic formal consultation for USACE permitted projects (USFWS 1997), will be implemented for all habitat maintenance and management activities within the CCB.

- Ground-disturbing activity within 200 feet of potential giant garter snake aquatic habitat will be conducted between May 1 and October 1.

- Dewatered habitat will be allowed to remain dry for 15 consecutive days after April 15 and prior to excavation or filling of the dewatered habitat.
- All construction personnel will participate in a USFWS and DFW-approved worker environmental awareness program that will address the life history of the giant garter snake; the importance of irrigation canals, marshes, wetlands, and seasonally flooded areas such as rice fields, to the giant garter snake; and, the terms and conditions of the USFWS biological opinion. Proof of training will be submitted to the Sacramento and Bay-Delta USFWS offices as well as the DFW Bay-Delta Regional office.
- The project site will be inspected by a qualified monitoring biologist approved by USFWS and DFW within 24 hours prior to the commencement of construction activities. A field report form documenting the monitoring effort will be provided to USFWS and DFW within 24 hours of start of construction activities. The monitoring biologist will be available thereafter for consultation if a snake is encountered during construction activities, and the biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or until it has been determined that the snake will not be harmed. Snakes encountered will be allowed to move away from the construction activities on their own. Capture or relocation of trapped or injured giant garter snakes will only be attempted by individuals with a current ESA Section 10(a)(l)(A) recovery permit. The monitoring biologist will immediately report any incidental take to USFWS and DFW by telephone and written letter addressed to the chief, USFWS Endangered Species Division, and DFW Regional Director, Bay-Delta Region, within 1 working day. The project site will also be re-inspected whenever a lapse in construction activity of 2 weeks or greater has occurred.
- Clearing of wetland vegetation within water supply channels will be confined to the smallest area necessary to excavate the canal banks and install field drains or culverts and replace native fill. Sediment excavation will be accomplished using equipment (i.e., a hydraulic excavator) from the top of the channel bank to minimize impacts to giant garter snake habitat.
- Clearing of vegetation within wetlands, if needed to maintain giant garter snake habitat values or target hydraulic roughness values for floodwater conveyance, will be confined to the smallest area necessary. Areas where wetland vegetation is removed will be restored to the original grade following vegetation removal, and all excavated vegetation and sediment will be removed from the site and disposed of or re-used consistent with all local, California, and federal laws and regulations.
- Heavy equipment moving to and from the project site will be restricted to established roadways.
- No plastic, monofilament, jute, or similar erosion control matting that could entangle giant garter snakes will be used. Possible substitutes include coconut coir matting, tackified hydroseed compounds, or other materials approved by the USFWS and DFW.

Additional measures that will be implemented to avoid and minimize take of giant garter snakes include the following.

- All vehicle traffic on access roads within the project site will observe a speed limit of 10 mph to minimize the potential for vehicles to run over giant garter snakes basking on access roads. The speed limit will be posted throughout the project site.
- Livestock used for vegetation management will be limited to sheep or goats. All wetlands and canals will be fenced with temporary electric fencing during any livestock grazing to prevent unintended trampling of canal banks, disturbance to wetlands, or grazing of wetland vegetation. Livestock grazing will be limited to May 1 through October 1.
- Vegetation will be mowed to a height of not less than 6 in to minimize the potential for giant garter snake injury. Mowing will be limited to May 1 to October 1.
- Excavated sediment will be removed from the project site and disposed of or re-used consistent with all local, California, and federal laws and regulations.

4.2.2 Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, Central Valley Steelhead, Southern Green Sturgeon.

To avoid and minimize take of Sacramento River winter-run ESU Chinook salmon, Central Valley ESU spring-run Chinook salmon, Central Valley DPS steelhead, and southern DPS green sturgeon during project construction, all construction activities will be conducted between May 1 and October 1, during periods when the project site is not inundated and these species are not present within the project site. To avoid take of Sacramento River winter-run ESU Chinook salmon, Central Valley ESU spring-run Chinook salmon, Central Valley DPS steelhead, and southern DPS green sturgeon during ongoing operation of the CCB, the following measures will be implemented during flood events within the Yolo Bypass.

- All water control structures (such as screw gates) will be opened prior to flood events.
- Flashboards will be removed from all flashboard risers, and any other structures that would impede natural water flow and drainage will be removed from canals and wetlands on the project site prior to flood events.
- The measures described above will continue to be implemented for at least 14 calendar days after the project site is no longer inundated from flood flows to allow fish to migrate out of wetlands and channels on the site back to the Toe Drain.

These measures will maintain hydrologic connectivity among the CCB's wetlands, water supply and drainage canals, and adjacent agricultural canals that flow to the Yolo Bypass Toe Drain to minimize fish stranding following flood events in the winter and spring when these species may be present within the project site.

4.3 Management Activities

Management of the CCB will focus on maintaining wetland and upland habitat suitability for giant garter snakes while concurrently maintaining the flood flow capacity of the Yolo Bypass. Wetlands will be managed to maintain appropriate water levels, areas of emergent vegetation, and areas of open water, including shallow to deep wetlands and channels. Uplands will be managed to reduce accumulation of vegetation (i.e., thatch); woody and invasive species will be treated and removed; and, pest and problem species, such as beaver (*Castor canadensis*) will be managed to prevent potentially adverse effects to the CCB and its habitats and species.

All management activities will be implemented within an adaptive management framework. Adaptive management is, simply put, the process of learning by doing. It is a management approach that allows management actions to proceed in the face of uncertainty and that describes monitoring and feedback mechanisms to permit the modification of selected management actions if ongoing monitoring indicates that a new approach is required to better meet resource management goals. Adaptive management includes those activities necessary to address climate change, fire, flood, or other natural events whose effects cannot be predicted. Due to the high degree of variability and uncertainty surrounding resource management actions within the CCB, the adoption of an adaptive management approach is essential to the maintenance and enhancement giant garter snakes and their habitat.

The Conservation Bank Manager will coordinate with the IRT and the California Department of Water Resources, Division of Flood Management before considering any adaptive management changes to the LTMP. All management activities described below are subject to the notification requirements described in Section 5, and these activities will be summarized by the Conservation Bank Manager in all annual reports to the IRT as described in Section 4.8. The expected frequency and timing of all management activities is summarized in Table 1.

4.3.1 Element 1: Water Management

Objective 1.1: Promote Aquatic Habitat Values for Giant Garter Snakes

As described in detail within the Habitat Development Plan (BEI Exhibit C-1) and summarized within Section 3.1, the CCB has been constructed to maximize aquatic habitat suitability for giant garter snake by facilitating active management of water levels throughout the site. Areas to be maintained as emergent wetland will have target inundation depths of less than 36 inches, and areas to be maintained as open water will have target inundation depths of 36 inches or greater. The design of the CCB permits de-watering of individual wetlands for maintenance without affecting the hydrology of other wetlands. There are four tasks that will be implemented to maintain suitable giant garter snake aquatic habitat values.

Task 1.1: **Manage Water Levels**

Water levels will be actively manipulated by the Conservation Bank Manager to maintain giant garter snake habitat suitability. Surface water will be pumped into a series of six supply canals that will inundate surrounding wetlands to target depths. Slowly flowing water will be maintained through water supply canals and wetlands (to the extent possible) at all times to discourage water stagnation and growth of nuisance aquatic vegetation. Water depths will be controlled through a series of screw gates and flashboard risers, similar to the existing agricultural operation. Depth staff gauges will be installed along each supply channel to determine the actual depth of water within each wetland.

It is anticipated that it will take a few years (i.e., the 5-year success criteria monitoring period described in the CCB HDP, BEI Exhibit C-1) following CCB construction to fine-tune the operation of the water control structures in combination with the delivery of water from supply canals to achieve target aquatic habitat values.

Following this period, water levels may need to be periodically adjusted and adaptively managed to better meet resource management goals. Specific examples of instances where the management of water levels may be required include:

- lowering of water levels to expose wetland edges during the spring to encourage germination of annual, upland grasses, followed by raising water levels during the summer to encourage vegetation decomposition and production of invertebrate prey for juvenile giant garter snakes;
- raising water levels during the spring and summer to discourage colonization by emergent aquatic vegetation and to maintain open water;
- temporarily draining wetlands during spring months to provide suitable germination conditions for tule and other emergent vegetation; and,
- temporarily draining wetlands and water supply canals for vegetation and sediment removal.

The Conservation Bank Manager will check all flashboard risers, screw gates, pumps, and water levels during General Inspections (Task 7.1); actively manipulate water levels as described above on a periodic basis; and, adaptively adjust water levels as needed to meet the management goals for the CCB.

Table 1. Frequency and Timing of Habitat Management and Maintenance Tasks

	Frequency			Timing											
Task	Monthly	Annually	Periodic1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.1 Manage Water Levels	X			X		X		X	X	X	X	X		X	
1.2 Repair and Replace Water Management Infrastructure			20 – 75					X	X	X	X	X			
1.3 Remove Sediment from Water Conveyance Canals[2]			5					X	X	X	X	X			
1.4 Remove Sediment from Wetlands[2]			5					X	X	X	X	X			
2.1 Thin Emergent Wetland Vegetation[2]			5					X	X	X	X	X			
2.3 Treat and Remove Woody Vegetation			5					X	X	X	X	X			
2.4 Reduce Grassland Biomass			2							X	X	X			
3.1 Prioritize and Treat Populations of Invasive Plants		X						X	X	X	X	X			
3.2 Remove Muskrat Lodges and Beaver Dams			5					X	X	X	X	X			
3.3 Control Muskrat and Beaver			5					X	X	X	X	X			
3.4 Coordinate with Sacramento-Yolo Vector Control District		X						X	X	X	X	X			
4.1 Maintain Gates and Signage			10 – 20					X	X	X	X	X			
4.2 Patrol Conservation Bank	X			X		X		X	X	X	X	X		X	
4.3 Collect and Dispose of Trash and Refuse	X	X		X		X		X	X	X	X	X		X	

Task	Frequency			Timing											
	Monthly	Annually	Periodic1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4.4 Maintain Roads			3					X	X	X	X	X			
4.5 Repair and Replace Speed Limit Signs			10					X	X	X	X	X			
5.1 Control and Manage Public Use		X[3]						X	X	X	X	X			
5.2 Control and Manage Scientific Use		X[3]						X	X	X	X	X			
6.1 Restore Uplands			X[3]					X	X	X	X	X			
6.2 Restore Wetlands and Canals/Channels			X[3]					X	X	X	X	X			
6.3 Restore Structures and Improvements			X[3]					X	X	X	X	X			

[1] Assumed occurrence interval for periodic tasks given in years or a range of years, where possible

[2] Tasks limited to not more than 25% of total habitat area on an annual basis

[3] Tasks assumed to occur sporadically; actual frequency of these tasks cannot be predicted or assumed.

Task 1.2: Repair and Replace Water Management Infrastructure

Management of water levels within the CCB will require a low-lift electric pump, as well as a back-up pump, culverts, screw gates, concrete weirs, rock outfalls, drainage pipes, flash board risers, and flash boards. These items will periodically require maintenance and replacement by the Conservation Bank Manager. Their condition and function will be inspected during General Inspections (Task 7.1); all items will be repaired when necessary; and, all items will be replaced on a periodic basis once they have become non-functional.

Task 1.3: Remove Sediment from Water Conveyance Canals

The ability of the water conveyance canals and water supply and drainage canals to efficiently move water into and out of surrounding wetlands may be adversely affected by a variety of factors. These factors, which can lead to sediment accretion on the bottoms and sides of the canals, include: soil sloughing from canal banks, sediments dropping out of slowly flowing water, and sediments remaining following flood flows down the Yolo Bypass. These sediments may need to be periodically removed by the Conservation Bank Manager, and canal banks may require re-construction to maintain adequate water flow into surrounding wetlands.

All sediment removal and canal re-construction will follow the avoidance and minimization measures described in Section 4.2.1. Sediment will be removed and banks re-constructed from the upland side of the canal using a long-reach hydraulic excavator wherever possible. Sediment removal activities will be limited to not more than 25% of the CCB's total canal length in a single year. Excavated sediment will be temporarily stockpiled in upland areas and removed from the CCB once work is completed. Removed sediment will be re-used on adjacent properties owned by the Conservation Bank Owner or disposed of at an off-site location consistent with all local, California, and federal laws and regulations. If sediment removal or bank re-construction must be conducted from the wetland side of the canal, disturbance will be confined to the smallest area required to complete the work.

Task 1.4: Remove Sediment from Wetlands

Similar to water conveyance canals, periodic sediment removal may be required within wetlands to maintain target inundation depths and open water habitats.

All sediment removal activities will follow the avoidance and minimization measures described in Section 4.2.1. The combined area of wetland sediment removal activities and emergent vegetation removal activities (see Task 2.2 below)

will be limited to 25% or less of the CCB's total wetland area in a single year. Excavated sediment will be temporarily stockpiled in upland areas and removed from the CCB once work is completed. Removed sediment will be re-used on adjacent properties owned by the Conservation Bank Owner or disposed of at an off-site location consistent with all local, California, and federal laws and regulations.

4.3.2 Element 2: Vegetation Management

Objective 2.1: Maintain a Diversity of Emergent, Aquatic Vegetation to Support Giant Garter Snakes

Giant garter snakes require a variety of wetland and aquatic habitat types ranging from shallow and deep wetlands for foraging and breeding with clusters of emergent vegetation to escape predators; deep open-water channels for water delivery, production of small fish and other small vertebrates as a food source for adult giant garter snakes, and movement; and, wetland-upland transition zones to encourage invertebrate production as a food source for juvenile giant garter snakes. Although the CCB has been designed to incorporate a variety of aquatic habitat types, from open water, to emergent wetland dominated by tule, to wetland-upland transition areas dominated by various species of sedges and rushes (Section 3.1), ongoing experience managing giant garter snake conservation banks and mitigation sites indicates that periodic thinning of emergent vegetation, cattail in particular, may be required to maintain open water habitats and wetland vegetation diversity beneficial to giant garter snakes. The two tasks below contribute to this objective.

Task 2.1: Thin Emergent Wetland Vegetation

The CCB will be initially graded to create areas of open water at least 36 inches deep. Although these areas of deeper water should naturally exclude emergent vegetation and maintain open water, periodic vegetation removal may be required in areas of shallower water less than 36 inches deep to maintain giant garter snake habitat values and to minimize hydraulic roughness for flood flows down the Yolo Bypass.

The Conservation Bank Manager may remove emergent vegetation by discing or similar methods. All aquatic vegetation removal activities will follow the avoidance and minimization measures described in Section 4.2.1. The combined area of wetland sediment removal activities (see Task 1.4 above), and emergent vegetation removal activities will be limited to 25% or less of the CCB's total wetland area in a single year. The Conservation Bank Manager will temporarily stockpile removed

vegetation in upland areas and disposed of removed vegetation at an off-site location consistent with all local, California, and federal laws and regulations.

Task 2.2: Manage Water Levels

The management of appropriate water levels will be required to exclude widespread colonization of the CCB by emergent wetland vegetation. This includes maintaining inundation of at least 1 in during the seed release period for emergent species, and cattail in particular (Sojda and Solberg 1993), and maintaining a depth of at least 3 ft within channels and deep wetlands to prevent spread of cattail by rhizomes. See Task 1.1 above for further description.

Objective 2.2: Prevent Establishment of Woody Vegetation

Woody vegetation such as willow (*Salix* spp.), cottonwood (*Populus fremontii*), and similar woody plants negatively affect giant garter snake habitat values by limiting giant garter snake movement, shading and limiting basking and thermoregulation sites, and have deleterious impacts on flood flow.

Task 2.3: Treat and Remove Woody Vegetation

The Conservation Bank Manager will remove woody vegetation wherever it is observed growing within the CCB. In general, the least environmentally damaging method of removal will be preferred and will include, in order of decreasing preference: hand removal; weed wrench; herbicide; chainsaw or similar coupled with herbicide treatment; and, mechanical excavation.

Woody species will be removed at the seedling or sapling stage [(less than 1-inch diameter at breast height (DBH)], to facilitate removal using techniques that are environmentally benign (relative to techniques needed to remove established trees) and that are less likely to be subject to regulatory agency permitting requirements. The entirety of the plant, including the root crown, should be removed to prevent subsequent re-sprouting. All woody plant material will be removed, collected, and disposed of by the Conservation Bank Manager consistent with all local, California, and federal laws and regulations.

Woody plant treatment involving herbicides will be implemented with the assistance of a California-licensed Pest Control Advisor, and may be subject to prior approval of the USFWS. All herbicides will be applied according to the directions on the herbicide label, and all herbicides used within the CCB will be registered for use near and over water. Herbicide use will be reported to the Yolo County Agricultural Commissioner and will follow all applicable California Department of Food and Agriculture and California Department of Pesticide

Regulation rules and regulations. Mechanical excavation of woody species will follow all giant garter snake avoidance and minimization measures described in Section 4.2.1.

Objective 2.3: Maintain Upland Habitat to Support Giant Garter Snake

Upland habitat requirements for giant garter snakes include open areas to facilitate movement and dispersal, small mammal burrows for brumation, and exposed areas, particularly areas with southern and eastern exposures for basking and thermoregulation. Management of vegetation with upland areas will be required to maintain these habitat values for the species.

Task 2.4: Reduce Grassland Biomass

Upland areas will be seeded with a mixture of California-native grasses as part of CCB construction. The Conservation Bank Manager will use a combination of mowing and livestock grazing to manage these areas. All grassland management activities will follow minimization and avoidance measures for giant garter snake described in Section 4.2.1.

Mowers will only be operated from July through September and blades will be placed not less than 6 in from the ground to provide sufficient cover and avoid injuring giant garter snakes. Mowing will be conducted in a linear pattern (i.e., rows), beginning distal to the bank edge and working across the upland area toward the opposite bank in an effort to "herd" or "corral" giant garter snakes in one direction towards the safety of either the steep, un-mowed bank slope or the water. Equipment will not be driven over artificial hibernacula and stands of native broadleaf plants and grasses will be avoided until after they have flowered and set seed to the maximum extent possible. Prior to mowing, the entire area to be mowed will be visually inspected for the presence of nesting birds such as northern harrier or waterfowl. If active nests are observed, the Conservation Bank Manager will consult with Qualified Personnel to determine the appropriate course of action.

If grazing is used to manage upland vegetation, only goats or sheep will be permitted. Portable electric fencing will be constructed by the grazing operator around areas to be grazed to control animal movement and to prevent animals from entering into canals and wetlands. Temporary water will be provided by the grazing operator along access roads, and livestock handling facilities (e.g., pens, loading chutes, ramps, etc.) will be located outside the boundary of the CCB on adjacent lands owned by the Conservation Bank Owner. Supplemental feeding of animals will not be permitted. Grazing will only occur during the giant garter

snakes' active period, and forage utilization targets will be set that result in an average residual vegetation height of approximately 6 to 10 inches following grazing.

Objective 2.4 Maintain Target Hydraulic Roughness Values

As part of the Central Valley Flood Protection Board floodway encroachment permit issued for construction and operation of the CCB (BEI Exhibit K-5), the total cover of emergent vegetation (e.g., tule and cattail) is limited to 50% of the CCB's wetland acreage to maintain adequate floodwater conveyance through the Yolo Bypass. The establishment of woody vegetation within the CCB would also have a negative effect on the site's ability to effectively convey flood flows. Tasks 2.1 and 2.3, above, would contribute this objective. There are no other tasks related to this objective.

4.3.3 Element 3: Pest and Problem Species Management

Objective 3.1: Prevent Infestations of Invasive Plant Species

Although uplands will be seeded with California-native grasses and wetlands will be managed to discourage colonization by invasive aquatic species (such water primrose [*Ludwigia peploides* and *L. hexapetala*], duckweed [*Lemna minor*], and water fern [*Azolla filiculoides*]), it is possible that these species and similar invasive species will become established within the CCB at some point. Due to the widespread distribution of these species and their abilities to colonize new habitat, it is unreasonable to require or to expect eradication of invasive plant species at the site. The required management of invasive plants will therefore be limited to the management of newly introduced invasive plants and to controlling the spread of existing invasive plant populations that pose a threat to the CCB's Conservation Values.

Task 3.1: Prioritize and Treat Populations of Invasive Plants

As described above, management of invasive plants within the CCB will focus on the eradication of newly introduced invasive species, before they become established, and on the control of invasive plant populations in the event that they become established on the CCB. Annual monitoring of the CCB by the Conservation Bank Manager (see Task 7.5) will document the presence of newly introduced invasive plant species and the trend of established populations and will form the basis for determining species and populations that should be prioritized for treatment. The Conservation Bank Manager and Qualified Personnel may also refer to the species found on the Cal-IPC website (www.cal-ipc.org) to assist them in determining if a plant is an invasive plant species of concern, and which species should be given priority for management. Other relevant sources of guidance on

invasive plant species and their management include: The California Department of Food and Agriculture (CDFA) list of "noxious weeds" that are subject to regulation or quarantine by county agricultural departments; the California Department of Food and Agriculture's Integrated Pest Control Branch; and, the University of California State Integrated Pest Management Program list of "Exotic and Invasive Pests and Diseases that Threaten California's Agricultural, Urban, or Natural Areas".

Hand removal or use of small hand powered or handheld equipment (such as a weed eater) is the preferred method of removing localized infestations of invasive plant species from the CCB. These methods are usually only cost effective and efficient when treating small populations of a few plants that can be removed by hand or are easily controlled by cutting or other mechanical means.

For species that cannot be effectively treated through hand removal or use of hand tools, the Conservation Bank Manager may use herbicides. The use of herbicides will be implemented with the assistance of a California-licensed Pest Control Advisor and may be subject to prior approval of the USFWS. All herbicides will be applied according to the directions on the herbicide label, and all herbicides used within the CCB will be registered for use near and over water. Herbicide use will be reported to the Yolo County Agricultural Commissioner and will follow all applicable California Department of Food and Agriculture and California Department of Pesticide Regulation rules and regulations.

Invasive plant infestations that cannot be effectively treated though hand removal, use of small hand tools, or the use of herbicides may require the use of alternative treatment methods such as prescribed burning or other methods. Alternative treatment methods will be developed in consultation with Qualified Personnel and subject to IRT approval.

Objective 3.2: Manage Populations of Beaver and Muskrat

Similar to invasive plants, certain species of animals, and beaver and muskrat (*Ondatra zibethicus*) in particular, may potentially threaten the Conservation Values of the CCB. Complete control or eradication of these species is not expected or required; however, they may need to be controlled or removed when their activities (i.e., construction of beaver dams or muskrat lodges or burrowing into canal sides) threaten the water control structures, canals, and other features related to the management of water and control of water levels within the CCB. Two tasks to accomplish this goal are described below.

Task 3.2: **Remove Muskrat Lodges and Beaver Dams**

The Conservation Bank Manager will remove muskrat lodges and beaver dams using excavators or similar equipment only when they impair the ability to manage water and control water levels within the CCB. All activities will follow the avoidance and minimization measures described in Section 4.2.1. The Conservation Bank Manager will temporarily stockpile removed materials from beaver dams and muskrat lodges in upland areas and disposed of removed vegetation at an off-site location consistent with all local, California, and federal laws and regulations.

Task 3.3: **Control Muskrat and Beaver**

Although regular control of muskrat and beaver is not anticipated to be required, occasional control may be necessary when the repeated activities of these animals threaten the Conservation Values of the CCB. All control efforts will be implemented in consultation with Qualified Personnel to determine the most effective method of control. If the Conservation Bank Manager and Qualified Personnel determine that removal is appropriate, the Conservation Bank Manager will work with DFG to secure the appropriate approvals.

Objective 3.3: **Minimize Mosquito Production**

Given public health concerns related to diseases carried and spread by mosquitoes, management actions to control mosquitoes will be implemented on the CCB. The CCB has been designed to incorporate a variety of features such as constant inputs of fresh water and the ability to strategically raise and lower water levels that should minimize the production of mosquitoes in wetlands on the site. Other actions, such as the use of mosquito fish (*Gambisua affinis*), may be needed to minimize mosquitoes and mosquito larvae.

Task 3.4: **Coordinate with Sacramento-Yolo Vector Control District**

The Conservation Bank Manager will coordinate with the Sacramento-Yolo Vector Control District on an overall program to minimize mosquito production from the CCB. This could potentially include stocking of mosquito fish within the CCB. Although mosquito fish are a non-native species, they are commonly used to control mosquitoes, and they provide a prey base for giant garter snakes. Chemical methods of mosquito control will not be permitted within the CCB. Other methods of mosquito control, including use of natural insecticides such as *Bacillus thuringiensis isreaelensis*, will be subject to prior IRT notification, as described in Section 5.

4.4 Maintenance Activities

Maintenance activities within the CCB emphasize regular patrolling and inspection of the site by the Conservation Bank Manager. Given the site's remote location and lack of development in the surrounding region, overall maintenance needs for the CCB are expected to be fairly minimal, relative to conservation banks and habitat preserves located in more urbanized or developed areas. However, the site will be regularly inspected and accumulated trash will be removed as needed. An access gate and appropriate signage will be installed, maintained, and replaced (the site will not be fenced due to its remote location and location with an area subject to periodic flooding), and roads on the CCB will be maintained as needed to facilitate vehicle access to the site. These activities are subject to the IRT notification requirements described in Section 5, and all activities will be summarized in annual reports to the IRT as described in Section 4.8. The expected frequency and timing of these activities are summarized in Table 1.

4.4.1 Element 1: Trespass and Refuse

Objective 4.1: **Prevent Unauthorized Use of the Capital Conservation Bank**

The CCB is located in a remote location, with little to no development in the surrounding region. Although unauthorized access to the site is unlikely to be a significant issue, unauthorized access and vandalism at the CCB could potentially affect the site's Conservation Values and should be prevented or minimized to the maximum extent possible. There are two tasks related to this objective.

Task 4.1: **Maintain Gates and Signage**

An existing metal gate is located along County Road 107 at the main entrance to the CCB. This gate will be locked and maintained and replaced as needed by the Conservation Bank Manager to prevent unauthorized vehicular access to the CCB. Additionally, metal signs noting the presence of wetlands and giant garter snake habitat will be posted at each corner of the site following CCB construction. The Conservation Bank Manager will replace and repair these signs as needed.

Task 4.2: **Patrol Conservation Bank**

The Conservation Bank Manager will patrol the CCB during General Inspections (Task 7.1). The Conservation Bank Manager will note any signs of trespass and vandalism during these inspections. Any vandalized signs or structures will be repaired, if needed, and reported to the Yolo County Sheriff.

Objective 4.2: **Prevent Accumulation of Trash and Refuse**

Similar to trespass, significant trash accumulation is not expected within the CCB due to its remote location and lack of development in the surrounding region; although, larger accumulations of trash or refuse may occur following periods of flood flows down the Yolo Bypass. The accumulation of trash could attract

potential predators on giant garter snakes (e.g., raccoon [*Procyon lotor*]), and trash and refuse would detract from the CCB's visual qualities.

Task 4.3: Collect and Dispose of Trash and Refuse

To the extent practical, trash and refuse will be collected by the Conservation Bank Manager during General Inspections (Task 7.1). Larger accumulations of trash or larger items will be collected on a less frequent basis, but at least yearly. All trash and refuse will be disposed of by the Conservation Bank Manager consistent with all local, California, and federal laws and regulations.

4.4.2 Element 2: Roads

Objective 4.3: Maintain Condition and Function of Roads

Properly constructed and maintained, all-weather roads are required to facilitate regular inspection, maintenance, management, and monitoring of the CCB by the Conservation Bank Manager. Maintenance may be particularly important following periods of flooding in the Yolo Bypass.

Task 4.4: Maintain Roads

The Conservation Bank Manager will maintain all roads on the CCB. Road surfaces will be mowed as needed to control vegetation growth and graded as needed to eliminate ruts, potholes, and similar defects. Adequate gravel, rock, or similar road base material will be added when needed to maintain road condition, and roads will be graded to ensure positive drainage (to the extent possible), to minimize the potential for erosion, and to ensure adequate vehicle clearance and safe driving conditions. All road maintenance activities will follow the avoidance and minimization measures in Section 4.2.1.

Objective 4.3: Maintain Speed Limits to Protect Giant Garter Snake

Giant garter snakes may use roads for basking and for movement between adjacent areas of aquatic habitat. Maintaining speed limits below 10 miles per hour will help to minimize the potential for giant garter snakes to be killed or injured on roads. Maintaining speed limits is also a required giant garter snake avoidance and minimization measure, as described in Section 4.2.1.

Task 4.5: Repair and Replace Speed Limit Signs

Signs noting a maximum speed limit of 10 miles per hour will be posted across roads on the CCB during initial bank construction. The Conservation Bank Manager will maintain and replace these signs.

4.5 Public Education and Outreach Activities

Although the primary purpose of the CCB is to protect and enhance the site's Conservation Values, limited public access for educational and outreach activities, managed and controlled by the Conservation Bank Manager, can increase public awareness and contribute to the conservation and management of these resources. Additionally, allowing limited and controlled access for scientific investigation and study can contribute to the conservation of giant garter snakes by increasing the scientific basis for the management of the species. Objectives and tasks related to the management of public access and education are described in more detail below. These activities are subject to the IRT notification requirements described in Section 5, and all activities will be summarized in annual reports to the IRT as described in Section 4.8.

4.5.1 Element 1: Public Education and Outreach

Objective 5.1: **Provide Opportunities for Public Education and Outreach**

Public access to the CCB can be used to educate school groups and other members of the public on the ecology and management of the giant garter snake and its habitats, thereby increasing public awareness of the species and building public support for conservation of the species and its habitats.

Task 5.1: **Control and Manage Public Use**

All public use will be subject to the prior approval of and overseen by the Conservation Bank Manager. Public use will be limited to passive wildlife observation, nature study, photography, and similar passive uses. Other recreational use of the CCB will be subject to prior IRT approval, consistent with the notification requirements in Section 5.

4.5.2 Element 2: Research and Scientific Study

Objective 5.2: **Provide Opportunities for Research and Scientific Study**

The CCB may be used as a research site by universities, government institutions, and similar organizations to study giant garter snake biology, ecology, and management. The results of these studies will be incorporated into the ongoing adaptive management of the CCB and may inform the conservation and management of the species throughout its range.

Task 5.2: **Control and Manage Scientific Use**

All scientific use will be subject to prior Conservation Bank Manager approval, prior approval by the IRT, and overseen by the Conservation Bank Manager. Additionally, all individuals wishing to handle giant garter snakes on the CCB will have the appropriate approvals from the USFWS and DFW, including a valid USFWS Section 10(a)(1)(A) recovery permit.

4.6 Restoration and Remediation Activities

Fires, floods, vandalism, and other unanticipated events may adversely affect the CCB and its habitats and potentially threaten maintenance of the CCB's Conservation Values and flood flow capacity goal. The Conservation Bank Manager may, from time to time, implement habitat restoration and remediation activities in response to these events. One management objective and related tasks are described below. These activities are subject to the IRT notification requirements described in Section 5, and all activities will be summarized in annual reports to the IRT as described in Section 4.8. Minor corrective measures not requiring notification or approval of the IRT or other applicable regulatory agency (e.g., USACE) will be carried out by the Conservation Bank Manager within sixty (60) days, unless site conditions warrant delay (e.g., if soil is saturated). All other corrective actions will take place when conditions are best suited for those actions to occur and following appropriate coordination with the IRT and other applicable regulatory agencies.

4.6.1 Element 1: Post Disturbance Restoration and Remediation

Objective 6.1: Restore and Maintain Conservation Values

The CCB's remote location and the presence of extensive agricultural land and wetlands surrounding the site should minimize the potential for vandalism, wildfire, and other unanticipated disturbances to the site that could threaten its Conservation Values. Despite the low probability of occurrence, appropriate post-disturbance restoration measures may be required in response to these events.

The CCB is also located in a major flood bypass; regular, and potentially prolonged, inundation of wetlands and lower-elevation upland areas is expected during years of above average rainfall in Northern California. Prolonged flood inundation and the high flow velocities associated with flood flows may cause erosion or other damage within uplands and may damage water control infrastructure, erode wetlands or canals, or deposit sediment, woody debris, and similar material across the site. Although the CCB has been designed to minimize the potential for significant, negative effects from flood flows (e.g., most channels are oriented parallel to the Yolo Bypass flow direction, uplands are shaped and oriented to permit free flow of water and minimize erosion) it is possible that disturbances associated with floods could threaten the CCB's Conservation Values. Following disturbances, appropriate restoration and remediation actions will be implemented.

Implementation of the two tasks described below would contribute to this objective.

Task 6.1: **Restore Uplands**

Restoration of upland areas due to disturbance resulting in bare ground will include seeding the area with native grass seed and implementing the proper erosion control measures until bare ground becomes re-vegetated. Restored upland areas are to be managed to avoid growth of brush and shrub that impede flow and trees greater than 2-inch DBH shall be removed The Conservation Bank Manager will use the same seed mix as originally specified in the CCB HDP (BEI Exhibit C-1, Table 8) as a guideline. This seed mix may be adaptively modified as needed to incorporate observations following initial bank construction (i.e., to emphasize those species that became well established within the CCB or to incorporate alternative species if the initial seed mix did not become well established within the CCB). Only erosion control measures consistent with the guidelines described in Section 4.2.1 will be permitted. The Conservation Bank Manager will consult with Qualified Personnel if needed to assist in the development of appropriate upland restoration and erosion control measures.

Task 6.2: **Restore Wetlands and Canals/Channels**

Restoration for fill/loss of waters of the United States should result in the removal of fill from the feature, potentially the minor re-grading and re-vegetation of the feature, and monitoring for at least 2 seasons to gauge the feature's recovery. The Conservation Bank Manager will implement all restoration activities with the assistance of Qualified Personnel (if required) and according to the original engineer's construction documents so that water flow and water elevations are restored to original conditions as closely as possible. The Conservation Bank Manager will contact USACE and IRT if fill/loss of wetlands or waters of the United States has occurred and submit for review and approval the proposed remediation/restoration activities (see Section 5).

Task 6.3: **Restore Structures and Improvements**

Structures and improvements will be re-built or re-installed by the Conservation Bank Manager according to the original engineer's construction documents. In the event that it is impossible or impractical to restore structures or improvements to their original condition, the Conservation Bank Manager will submit drawings for the proposed, re-designed structure or improvement to the IRT for review and prior approval. Any structure on improvement will require an encroachment permit issued by the Central Valley Flood Protection Board.

4.7 Monitoring Activities

Long-term management of the CCB will focus on regular monitoring to determine the stability of and ongoing trends for the CCB's Conservation Values and impacts to flood flow design capacity. Regular monitoring will assess the CCB's overall condition, status and trends of giant garter snake populations, invasion by non-native plant species, condition and function of water delivery and control structures, and other aspects that may warrant remedial management actions. While it is not anticipated that major management actions (e.g., wetland vegetation or sediment removal) will be needed on a more than periodic basis (e.g., every 5 to 10 years), regular monitoring will identify issues as they arise, and the appropriate management action will be identified at that time. All monitoring activities will be discussed and the results summarized in annual reports to the IRT, as described in Section 4.8. The frequency and timing of all monitoring activities is summarized in Table 2.

4.7.1 Element 1: General Inspections

Objective 7.1: **Qualitatively Monitor and Document CCB Status and Trends**

General Inspections of the CCB will evaluate the following factors: erosion, condition and function of water delivery and management infrastructure, condition of canals and maintenance needs, wetland and upland area vegetation density and need for thinning, canal and wetland sedimentation, presence of woody vegetation, accumulation of grassland biomass, beaver and muskrat activity, signs of trespass and authorized use, trash accumulation, condition of signage, and condition of roads. Regular inspections of these factors are essential to maintaining the condition and function of the CCB.

Task 7.1: **Conduct General Inspections**

All canals, gates, weirs and flash board risers, the main water pump, and other water delivery and management infrastructure will be inspected by the Conservation Bank Manager monthly from May through September and every other month the remainder of the year. During these inspections, the Conservation Bank Manager will also inspect the CCB for signs of trespass and unauthorized use, and any refuse observed during these visits will be collected and disposed.

The entirety of the CCB will inspected during each monitoring visit. If any problems are identified, the problem area(s) will be noted and appropriate steps will be immediately taken to restore target water levels within the CCB.

Task 7.2: **Assess Maintenance and Management Needs**

The Conservation Bank Manager will inspect the following at least once annually between May and September: the extent of sedimentation in canals and wetlands

and need for removal, density of wetland and upland area vegetation and need for thinning, presence of young woody vegetation and need for removal, accumulation of grassland biomass and need for removal, presence of beaver and muskrat including dams of lodges that should be removed, condition of roads and need for maintenance, and presence of large debris and refuse for collection and disposal.

The entirety of the CCB will inspected during each monitoring visit. An inspection sheet (Appendix A) will be utilized in order to evaluate the above criteria during each field visit. Previous inspection sheets should be reviewed before each visit in order to ensure that a possible or recurring problem area is adequately addressed. If any problems are identified, the problem area(s) will be noted on the inspection sheet and photographs of the problem area(s) will be taken to document the issue. More frequent inspections may be necessary for a limited time to closely track any problems as well as to ensure that resultant management actions are effective.

Table 2. Frequency and Timing of Habit Monitoring Tasks

Task	Frequency			Timing											
	Monthly	Annually	Periodic[1]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7.1 Conduct General Inspections	X			X		X		X	X	X	X	X		X	
7.2 Assess Maintenance and Management Needs		X						X	X	X	X	X			
7.3 Survey Giant Garter Snake Populations – Visual Surveys		X						X	X	X	X	X			
7.3 Survey Giant Garter Snake Populations – Trapping Study			10					X	X	X	X	X			
7.4 Survey General Biological Resources		X						X	X	X	X	X			
7.5 Survey Invasive Plant Species		X						X	X	X	X	X			

[1] Anticipated occurrence interval for periodic tasks given in years or a range of years

4.7.2 Element 2: Biological Inspections

Objective 7.2: **Document Giant Garter Snake Status and Trends**

The presence and population trends of giant garter snakes within the CCB will be periodically evaluated to determine the effectiveness of habitat management actions and, potentially, to adaptively adjust management actions in an effort to improve the status or trend of giant garter snake populations within the CCB.

Task 7.3: **Survey Giant Garter Snake Populations**

Giant garter snake population surveys will occur periodically. These will include visual surveys and trapping studies to provide an index of relative abundance. Visual surveys will be conducted during the annual walk-through survey (Task 7.4) by walking upland basking areas adjacent to the edge of wetland habitat. Observations recorded by Qualified Personnel will include the date, time, weather, and location of any observed giant garter snakes. Giant garter snake trapping will occur every 10 years in perpetuity and may employ a variety of different methods and study approaches to increase the probability of snake capture. Qualified Personnel will submit a study plan to the IRT for review and approval prior to initiating any trapping studies. The IRT will have 60 days to provide comment on the study plan. If comments from the IRT are not received within this time period, the study plan will be considered to be approved.

If a giant garter snake is captured, Qualified Personnel will record the date, time, weather, and location of the observation and the sex, length, mass, and various scale counts of the snake. Gravid or potentially gravid snakes may be transported to the Sacramento Zoo for further testing and will be immediately returned to the capture location at the conclusion of testing. Results of visual surveys and trapping efforts will be used to assess the effectiveness and success of the habitat enhancement and management activities and to identify adjustments that may need to be made to habitat management practices. Qualified Personnel wishing to handle or trap giant garter snakes will have a 10(a)(1)(A) permit and a scientific collecting permit.

Objective 7.3: **Document General Biological Resource Status and Trends**

The general condition of biological resources on the CCB, including the presence of special-status species, the presence of invasive plants and need for treatment, and similar biological resources, will be evaluated annually to determine the effectiveness of habitat management actions and, potentially, to adaptively adjust management actions in an effort to improve the status or trend of biological resources on the CCB.

Task 7.4: **Survey General Biological Resources**

At least one annual walk-through survey between the months of May and September will be conducted to qualitatively monitor the general condition of biological resources within the CCB. These surveys will target the following: general vegetation cover and composition, presence of special-status species, and occurrence of other wildlife.

The entirety of the CCB will inspected during each monitoring visit. An inspection sheet (Appendix B) will be utilized in order to evaluate the above criteria during each field visit. Photographs and geospatial data depicting biological resources will be collected as needed and archived to facilitate comparison among different surveys.

Task 7.5: **Survey Invasive Plant Species**

Each year's annual walk-through survey (Task 7.4) will include a qualitative assessment (e.g., visual estimate of cover) of potential or observed invasive plant species. Management actions to control invasive species will be evaluated and prioritized based on these surveys as described in Task 3.1.

The entirety of the CCB will inspected during each monitoring visit. An inspection sheet (Appendix B) will be utilized in order to evaluate the above criteria during each field visit. Photographs and geospatial data depicting invasive plant species will be collected as needed and archived to facilitate comparison among different surveys.

4.8 Reporting activities

4.8.1 Element 1: Annual Reporting

Objective 8.1: **Provide an annual report to the IRT and DWR**

The Conservation Bank Manager will provide an annual report to the IRT, California Department of Water Resources, Division of Flood Management (DFM) and Central Valley Flood Protection Board (CVFPB) describing all management, maintenance, and monitoring activities conducted within the CCB during the previous calendar year. The annual report will provide a record of all activities within the CCB, to facilitate comparison among years and to facilitate review and comment by the IRT and DWR (DFM and CVFPB).

Task 8.1: Prepare an Annual Report

The Conservation Bank Manager will prepare an annual report describing all management, maintenance, and monitoring activities as well as general site conditions within the CCB. The annual report will include a summary of monitoring and management activities undertaken during the previous year. The annual report will also make recommendations regarding: (1) any habitat enhancement measures deemed to be warranted; (2) any problems that need short- or long-term attention (e.g., weed removal or wetland vegetation or sediment removal); and, (3) any adaptive changes in the monitoring or management program that appear to be warranted based on monitoring results to date.

The annual report will be completed and circulated to the IRT, DFM, and CVFPB by December 31 of each year and will include, at minimum:

- a map of the CCB;
- photos documenting the status of the CCB;
- a description of actions for which IRT notification or approval was not needed, but were carried out during the year;
- observations from the General Inspection and all Biological Inspections;
- an accounting of all funds expended during the preceding year related to implementation of this LTMP;
- recommendations for altered (adaptive) management practices as needed; and,
- a description of proposed activities and maintenance or management actions to be implemented during the coming calendar year.

Section 5.0 Notification

5.1 Notification Requirements

In general, the intent of this LTMP is to describe most maintenance and management tasks in sufficient detail, particularly tasks that occur on a monthly or annual basis, so that IRT approval of this LTMP constitutes authorization for these tasks. However, it is recognized that prior IRT notification or a formal permit, approval, or authorization from the IRT or other applicable agencies will be required for some tasks. Prior IRT notification will also be required for the Conservation Bank Manager to implement management, maintenance, or monitoring tasks not described in this LTMP.

The Conservation Bank Manager will be responsible for providing appropriate IRT notification. Ideally, the Conservation Bank Manager will attempt to describe all management tasks for the coming 12 months in the annual report (see Task 8.1). If this is not possible, the Conservation Bank Manager will submit a separate letter to the IRT, DFM, and the CVFPB with a written description of the activity, including when the activity will take place and the methodology that will be used, as well as a map showing the areas that will be targeted. The Conservation Bank Manager will also submit a separate letter to the IRT, DFM and the CVFPB in the event that a new management, maintenance, or monitoring task, not described in this LTMP, is planned for implementation. These parties will have 30 days to contact the Conservation Bank Manager to discuss the activity. If the Conservation Bank Manager is not contacted within 30 days, the activity will be considered approved. Notification will be made by fax, email, registered mail, or overnight transmittal. The foregoing is not intended to imply that activities normally requiring a permit, approval, or other authorization from the IRT or CVFPB would be automatically approved within the specified 30-day period; such activities will be subject to applicable permitting or approval requirements and timelines prior to implementation by the Conservation Bank Manager.

In addition to activities requiring prior IRT notification, some of the activities mentioned in this LTMP have the potential to "impact" wetlands or waters of the United States. Under the USACE permitting program, an activity with the potential to result in the "loss of waters of the United States," may require a permit. The USACE has defined such activities in the Federal Register, Volume 67, No. 10 / Tuesday, January 15, 2002 / Notices, as follows:

> "Waters of the United States that include the filled area and other waters that are permanently adversely affected by flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent above-grade, at-grade, or below-grade fills that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is the threshold measurement of the impact to the existing waters for determining whether a project may qualify for a NWP; it is not a net threshold calculated after considering compensatory mitigation that may be used to offset losses of aquatic

> functions and values. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to preconstruction contours or elevations after construction, are not included in the acreage or linear foot measurements of loss of waters of the United States or loss of stream bed, for the purposes of determining compliance with the threshold limits of the NWPs."

If there is a question regarding the need for a USACE permit for tasks described in this LTMP or for future tasks not described in this LTMP, the Conservation Bank Manager will seek guidance from USACE.

Notification and permitting requirements for all management, maintenance, and monitoring tasks listed in Section 4, as well as activities not described in this LTMP, are summarized in Table 3.

5.2 Emergency Situations

Although the Conservation Bank Manager will provide prior IRT notification for certain tasks, and some tasks will require a permit from the USACE, IRT or other applicable regulatory agency, emergency situations may require immediate action where prior IRT notification or a USACE permit would be impractical or impossible. Should an emergency situation arise that requires immediate action, but would potentially require a formal permit, approval, or authorization from the IRT or USACE, the Conservation Bank Manager will notify the appropriate agency within twenty-four (24) hours regarding the situation and the actions taken. Follow-up notification will occur, in writing, within five (5) business days to describe the actions taken and need for further actions (if any). Applicable emergency notification stipulations are described below.

5.2.1 Wetlands and Other Waters of the United States

Should an emergency situation arise that requires an immediate action which could potentially result in direct or indirect impacts to USACE jurisdictional waters, the following exceptions apply (CFR Title 33, Chapter II, Part 325, Section 325.2 - Processing of Applications):

> "Emergency procedures - Division engineers are authorized to approve special processing procedures in emergency situations. An 'emergency' is a situation which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process the application under standard procedures."

5.2.2 Threatened and Endangered Species

Section 7 of the federal ESA regulations recognizes that an emergency (natural disaster or other calamity) may require expedited consultation (50 CFR §402.05). Expedited consultation procedures are described in Chapter 8 of the federal ESA Consultation Handbook (USFWS 1998). Specifically, Section 8.1 stipulates, in part:

"Where emergency actions are required that may affect listed species and/or critical habitats, a Federal agency may not have the time for the administrative work required by the consultation regulations under non-emergency conditions. Emergency consultations should be handled with as much understanding of the action agency's critical mission as possible while ensuring that anticipated actions will not violate sections 7(a)(2) or 7(d). Emergency consultation procedures allow action agencies to incorporate endangered species concerns into their actions during the response to an emergency. An emergency is a situation involving an act of God, disasters, casualties, national defense or security emergencies, etc., and includes response activities that must be taken to prevent imminent loss of human life or property. Under no circumstances should a Services representative obstruct an emergency response decision made by the action agency where human life is at stake."

Table 3. Notification Requirements

	USFWS			DFW			USACE
Task	No Notification	Notification	Permit	No Notification	Notification	Permit	Permit
1.1 Manage Water Levels	X			X			
1.2 Repair and Replace Water Management Infrastructure			X			X	X
1.3 Remove Sediment from Water Conveyance Canals			X			X	X
1.4 Remove Sediment from Wetlands			X			X	X
2.1 Thin Emergent Wetland Vegetation		X			X		
2.3 Treat and Remove Woody Vegetation[1]		X			X		
2.4 Reduce Grassland Biomass	X			X			
3.1 Prioritize and Treat Populations of Invasive Plants[1]	X		X	X		X	X
3.2 Remove Muskrat Lodges and Beaver Dams			X			X	X
3.3 Control Muskrat and Beaver	X				X		
3.4 Coordinate with Sacramento-Yolo Vector Control District	X			X			
4.1 Maintain Gates and Signage	X			X			
4.2 Patrol Conservation Bank	X			X			
4.3 Collect and Dispose of Trash and Refuse	X			X			
4.4 Mow and Grade Roads	X			X			
4.5 Repair and Replace Speed Limit Signs	X			X			
5.1 Control and Manage Public Use[2]	X			X			

	USFWS			DFW			USACE
Task	**No Notification**	**Notification**	**Permit**	**No Notification**	**Notification**	**Permit**	**Permit**
5.2 Control and Manage Scientific Use		X			X		
6.1 Restore Uplands		X			X		
6.2 Restore Wetlands and Canals/Channels[3]			X			X	X
6.3 Restore Structures and Improvements (5)			X			X	X
7.1 Conduct General Inspections	X			X			
7.2 Assess Maintenance and Management Needs	X			X			
7.3 Survey Giant Garter Snake Populations (Trapping)		X			X		
7.4 Survey General Biological Resources	X			X			
7.5 Survey Invasive Plant Species	X			X			
8.1 Prepare an Annual Report	X			X			
Tasks not Described in this LTMP[4]		X	X		X	X	X

[1] Woody vegetation removal within wetlands or other water features may require a permit

[2] Public use not described in the LTMP (i.e., use other than passive activities) requires prior IRT notification

[3] Activities not resulting in modification to canals or wetlands (i.e., dredging or filling), would not require prior IRT notification. Examples include planting of wetland vegetation.

[4] Tasks with the potential to result in the take of federally or California listed species or adverse effects to wetlands or other waters of the United States will require a permit or similar agency approval or authorization.

Section 6.0 Transfer, Replacement, Amendments, and Notices

6.1 Transfer

Any subsequent transfer of responsibilities under this LTMP to a different Conservation Bank Manager will be requested by the Conservation Bank Owner in writing to the IRT. Such request will require written approval by the IRT and will be incorporated into this LTMP by amendment. Notification will also be provided to the CVFPB and FMO. Any subsequent Conservation Bank Manager assumes the responsibilities described in this LTMP and as required in the conservation easement, unless otherwise amended in writing by the IRT.

6.2 Replacement

If the Conservation Bank Manager fails to implement the tasks described in this LTMP and is notified of such failure in writing by the IRT, the Conservation Bank Manager will have 90 days to remedy such failure. If failure is not resolved within 90 days, the Conservation Bank Manager may request a meeting with the IRT to address the failure. Such meeting shall occur within 30 days or a longer period if approved by the IRT. Based on the outcome of the meeting, or if no meeting is requested, the IRT may designate a replacement Conservation Bank Manager in writing by amendment of this LTMP. If a replacement Conservation Bank Manager is not designated, then a public or private land or resource management organization acceptable to and as directed by the IRT may enter onto the CCB to fulfill the purposes of this LTMP.

6.3 Amendments

The Conservation Bank Manager**,** Conservation Bank Owner**,** and the IRT may meet and discuss revisions to the LTMP in an effort to better meet management goals. Should this meeting occur, a representative from FMO and/or the CVFPB will also attend. Said meeting will occur at the request of any of the aforementioned parties. Any proposed changes to the LTMP will be discussed among all parties and approved by all parties prior to implementation. Formal amendments to the LTMP will be approved by the IRT in writing and implemented by the Conservation Bank Manager.

If the IRT determines, in writing, that implementation of the LTMP would jeopardize the continued existence of a California or federally listed species, either agency may require a formal amendment to this LTMP. Said amendment will be incorporated into the LTMP and implemented by the Conservation Bank Manager.

6.4 Notices

Any notices regarding this LTMP shall be directed as follows:

Conservation Bank Owner
Ronald D. and Clover A. Smith
2665 Sorney Loop Road
Rescue, CA 95672
Telephone: 530-676-8867
Fax: 530-676-8867
Email: cloverasmith@gmail.com

Conservation Bank Manager
America's Habitats
Attn: Dustin R. Smith
c/o Smith Development and Construction
7803 Madison Ave Suite 700C
Citrus Heights, CA 95610
Telephone: 916-766-7325
Fax: 916-404-0332
Email: d.smith@americashabitats.com

U.S. Fish and Wildlife Service (IRT Member, BEI Signatory)
Sacramento Office
2800 Cottage Way
Room W-2605
Sacramento, CA 95825
Attn: Field Supervisor
Telephone: 916-414-6700
Fax: 916-414-6712/6713

U.S. Fish and Wildlife Service (IRT Member, BEI Signatory)
Bay-Delta Office
650 Capitol Mall, 8th Floor
Sacramento, CA 95814
Attn: Field Supervisor
Telephone: 916-930-5643

California Department of Fish and Wildlife (IRT Member, BEI Signatory)
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
Attn: Regional Manager
Telephone: 707-944-5517

California Department of Fish and Wildlife (IRT Member, BEI Signatory)
Habitat Conservation Branch
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
Attn: Branch Chief
Telephone: 916-653-4875
Fax: 916-653-2588

California Department of Water Resources
Division of Flood Management
3310 El Camino Avenue
Sacramento, CA95821
Attn: Flood Maintenance Office Chief
Telephone: 916-574-0315

Central Valley Flood Protection Board
Permitting and Enforcement Branch
3310 El Camino Ave. Room 151
Sacramento, California 95821

Section 7.0 Funding and Task Prioritization

7.1 Funding

BEI Exhibit D-2 describes the anticipated annual costs of long-term management for the CCB. These costs include estimates of time and funding needed to conduct general site visits, annual reporting, periodic giant garter snake monitoring, other biological monitoring, invasive plant treatment and other upland vegetation management, wetland and upland area vegetation management, periodic sediment removal, trash removal, and a prorated calculation of funding needed to fully replace the all elements of the water delivery infrastructure on a periodic basis, once these items reach the end of their functional lifespans. Using the PAR software developed by the Center for Natural Lands Management, the total annual funding required to complete these tasks is estimated to be $53,990 in 2011 dollars. Assuming a capitalization rate of 3.5%, the total endowment required to bear approximately $53,990 in annual interest earnings (in future year dollars) would be $1,542,577. The calculation of this endowment is described in detail within BEI Exhibit D-2. The relationship among numbered tasks described in this LTMP and specific PAR report line items detailed in Exhibit D-2 is shown in Table 4.

DFW, or another entity acceptable to DFW (Endowment Manager), will hold the endowment principal and interest monies as required by law in the Special Deposit Fund, or a subsequent state authorized trustee fund, which consists of monies that are paid into it in trust pursuant to law, and is appropriated to fulfill the purposes for which payments into it are made. These interest monies will fund the long-term management, enhancement, and monitoring activities on the CCB in a manner consistent with this LTMP.

The Conservation Bank Manager will consult with the Endowment Manager on a year to year basis to determine the amount of funding available for management and monitoring activities. Following annual management activities, the Conservation Bank Manager may invoice the Endowment Manager for management activities following the invoicing instructions provided by the Endowment Manager.

7.2 Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The Conservation Bank Manager and IRT will discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality and maintain hydraulic capacity in the Yolo Bypass; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the IRT and as authorized by the IRT in writing.

Table 4. Management, Maintenance, Monitoring, and Reporting Tasks and Related PAR Line Items

Task	Related PAR Line Item(s)
1.1 Manage Water Levels	Habitat Maintenance:Inspections:General Inspections
	Water Management:Water Control:Gate Maintenance
	Water Management:Water Control:Electricity - Pump
1.2 Repair and Replace Water Management Infrastructure	Water Management:Flashboard:Flashboard – Replace
	Water Management:Water Control:Culvert – Replace
	Water Management:Water Control:Screw Valve - Replace
	Water Management:Water Control:Weir – Replace
	Water Management:Water Delivery:Pipe - Replace
1.3 Remove Sediment from Water Conveyance Canals	Water Management:Channel Dredging:Daily Cost
	Site Construction/Maintenance:Permit, ACOE 404:Permit Preparation
1.4 Remove Sediment from Wetlands	Habitat Maintenance:Wetland Maintenance:Sediment & Veg Removal
2.1 Thin Emergent Wetland Vegetation	Habitat Maintenance:Wetland Maintenance:Sediment & Veg Removal
2.3 Treat and Remove Woody Vegetation	Habitat Maintenance:Exotic Plant Control:Spray/Hand Remove
	Habitat Maintenance:Exotic Plant Control:Herbicide
	Habitat Restoration:Periodic Habitat Restoration:Adaptive Management Fund
2.4 Reduce Grassland Biomass	Habitat Maintenance:Upland Management:Grazing or Mowing
3.1 Prioritize and Treat Populations of Invasive Plants	Habitat Maintenance:Exotic Plant Control:Spray/Hand Remove
	Habitat Maintenance:Exotic Plant Control:Herbicide
	Removal of woody vegetation
	Habitat Restoration:Periodic Habitat Restoration:Adaptive Management Fund
3.2 Remove Muskrat Lodges and Beaver Dams	Water Management:Channel Dredging:Daily Cost
3.3 Control Muskrat and Beaver	General Maintenance:Beaver & Muskrat:Trap & Remove
	Site Construction/Maintenance:Project Management:Supervise/coordinate
3.4 Coordinate with Sacramento-Yolo Vector Control District	Site Construction/Maintenance:Project Management:Supervise/coordinate

Task	Related PAR Line Item(s)
4.1 Maintain Gates and Signage	Public Services:Sign, Aluminum:Boundary Signs – Installed Site Construction/Maintenance:Gate:Rail Gate 12' – Installed Site Construction/Maintenance:Lock:Padlock
4.2 Patrol Conservation Bank	Habitat Maintenance:Inspections:General Inspections
4.3 Collect and Dispose of Trash and Refuse	Habitat Maintenance:Inspections:General Inspections General Maintenance:Sanitation Control:Collection and Disposal
4.4 Mow and Grade Roads	Site Construction/Maintenance:Road Construction & Maintenance:Annual Allowance
4.5 Repair and Replace Speed Limit Signs	Public Services:Sign:Speed Limit - Installed
5.1 Control and Manage Public Use	Public Services:Public & Scientific Use:Coordination
5.2 Control and Manage Scientific Use	Public Services:Public & Scientific Use:Coordination
6.1 Restore Uplands	Habitat Restoration:Periodic Habitat Restoration:Adaptive Management Fund
6.2 Restore Wetlands and Canals/Channels	Habitat Restoration:Periodic Habitat Restoration:Adaptive Management Fund
6.3 Restore Structures and Improvements	Habitat Restoration:Periodic Habitat Restoration:Adaptive Management Fund
7.1 Conduct General Inspections	Habitat Maintenance Inspections:General Inspections
7.2 Assess Maintenance and Management Needs	Biotic Surveys:General Biological Surveys:Annual Field Survey
7.3 Survey Giant Garter Snake Populations (Trapping)	Biotic Surveys:Wildlife Biologist:GGS Trapping
7.4 Survey General Biological Resources	Biotic Surveys:General Biological Surveys:Annual Field Survey
7.5 Survey Invasive Plant Species	Biotic Surveys:General Biological Surveys:Annual Field Survey
8.1 Prepare an Annual Report	Reporting:Agency Report:Annual Report Reporting:Aerial Photo:Digital Geo-referenced

Section 8.0 References

AECOM and HTH [H. T. Harvey & Associates]. 2011. Prospectus: Capital Conservation Bank. Prepared for Americas Habitats. Folsom, CA. Revised July 2011.

Andrews, W.F. 1972. Soil Survey of Yolo County, California. USDA, Soil Conservation Service. Davis, California.

Sojda, R. S. and K. L. Solberg. 1993. Management and control of cattails. U.S. Fish Wildlife Service Leaflet No. 13.4.13. 8pp.

USFWS. 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California. Sacramento, California.

Personal Communications

Dustin Smith. General Manager, America's Habitats. Phone Conversation with Matt Wacker of H. T. Harvey & Associates regarding occurrences of giant garter snake observed on and near the Capital Conservation Bank in summer 2011. August 2011.

CAPITAL CONSERVATION BANK
HABITAT DEVELOPMENT PLAN
BEI EXHIBIT C-1

Prepared by

H.T. HARVEY & ASSOCIATES

Dan Stephens, B.S., Principal-in-Charge
Debra Bishop, M.S., Senior Restoration Ecologist
Matt Wacker, M.S., Project Manager
Charles McClain, M.S., Restoration Ecologist

Prepared for

America's Habitats
c/o Smith Development and Construction
7803 Madison Avenue #700C
Citrus Heights, CA 95610

Attn: Dustin R. Smith

April 2013 Project # 3261-01

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SUMMARY

America's Habitats intends to implement a wetland restoration and enhancement project within a 137.65 acre (ac) portion of the Yolo Bypass in Yolo County to establish the Capital Conservation Bank (CCB). The CCB will be established to enhance habitat for the California and federally listed as threatened giant garter snake (*Thamnophis gigas*). The proposed project will be the first phase of a potentially two-phase conservation bank. Phase 2, which will be located immediately north of Phase 1, may be implemented following the successful completion of Phase 1, based on the market demand for giant garter snake conservation credits.

If approved, the CCB will be the fourth active conservation bank approved by the U.S. Fish and Wildlife Service (USFWS) to sell giant garter snake conservation credits. Existing, active giant garter snake banks include Gilsizer Slough, Ridge Cut Slough, and Sutter Basin; however, none of these existing banks are authorized to sell credits within the service area proposed for the CCB. The primary giant garter snake conservation bank within the service area proposed for the CCB, the Pope Ranch Conservation Bank (located immediately west of the CCB), is closed and has sold all available credits. Establishment of the CCB will increase the supply of conservation credits for projects affecting the giant garter snake or its habitat within the north Delta and adjacent areas.

This *Habitat Development Plan* (HDP) provides a detailed description of the proposed habitat construction activities for the CCB and includes habitat goals and criteria that will be used to evaluate the success of the project. It includes a description of site conditions, restoration methods, and detailed monitoring and maintenance schedule for activities to be performed during the habitat establishment phase.

This HDP is a component of a larger *Bank Enabling Instrument* (BEI) that is being developed to authorize establishment of the CCB by the Interagency Review Team (IRT). The IRT currently consists of the USFWS; the California Department of Fish and Wildlife (DFW) may be added to the IRT at some point in the future if DFW becomes a bank signatory.

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1.0 RESPONSIBLE PARTIES

The CCB Owner is:

Ronald D. and Clover A. Smith
2665 Sorney Loop Road
Rescue, California 95672
Phone: 530-676-8867

The CCB Owner is the landowner, in fee simple, of the CCB. It retains all rights and responsibilities associated with holding title to the CCB except for those rights or responsibilities reserved for other parties through deed restriction, contract, or other legally enforceable means.

The CCB Project Proponent is:

America's Habitats
c/o Smith Development and Construction
7803 Madison Avenue #700C
Citrus Heights, CA 95610
Contact: Dustin R. Smith
Phone: 916-966-7325 - Office

The CCB Project Proponent is responsible for implementing the Habitat Development Plan (HDP). The responsibilities of the CCB Project Proponent, or its designee, are set forth in more detail in Section 2.1.1.

The Plan Preparer is:

H. T. Harvey & Associates
1331 Garden Highway, Suite 310
Sacramento, California 95833
Contact: Matt Wacker, Senior Ecologist
Phone: 916-779-7353

H. T. Harvey & Associates is one of the leading ecological consulting firms in California with almost 40 years of on-the-ground project experience specializing in endangered and special-status species studies and consultations, ecological restoration design, permit applications and processing, wetland delineation, habitat mapping, and monitoring of wetlands.

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2.0 PROJECT REQUIRING MITIGATION

2.1 LOCATION

The 137.65 ac CCB project site is located south of Interstate 80 (I-80), east of County Road 104, and west of the Sacramento Deepwater Ship Channel in Yolo County, California at the northern terminus of County Road 107 within the Yolo Bypass (General Vicinity Map, BEI Exhibit A-1). The project site is found on the Saxon U.S. Geological Survey (USGS) 7.5-minute quadrangle map within Township 7 North, Range 3 East, Section 33 (portion of Yolo County Assessor's Parcel Number #033-190-10-1) (Map of Bank Property, BEI Exhibit A-2). It is accessible by vehicle from County Road 107, which runs along its eastern boundary. The Pope Ranch Conservation Bank, which is managed by Wildlands, Inc. as a giant garter snake (*Thamnophis gigas*) and Swainson's hawk (*Buteo swainsonii*) conservation bank, is located immediately west of the project site.

2.2 BRIEF SUMMARY OF OVERALL PROJECT

The CCB Project Proponent will convert approximately 129.92 ac of the 137.65 ac project site from fallow agricultural land to perennial marsh and upland habitat for the federally and California listed as threatened giant garter snake. The CCB will be reviewed and approved by the IRT to sell conservation credits. These credits will be subsequently sold by the CCB Project Proponent to assist third parties in mitigating adverse effects to giant garter snakes and their habitat as authorized by IRT member agencies. The existing agricultural field will be converted to a mixture of shallow to deep wetlands, water supply channels, and uplands, some of which will be constructed to be above the design water surface elevation of the Yolo Bypass. Native wetland plants (e.g., tule [*Schoenoplectus acutus*]) will be planted within wetland habitats, and upland areas will be planted with a mixture of California-native perennial grasses and forbs. A long-term management plan (LTMP) (Exhibit D-5 in the BEI) will be developed for the CCB, and habitat management activities specifically to benefit the giant garter snake will be implemented in perpetuity. The conservation bank will be permanently protected through a recorded conservation easement (Exhibit E-4 in the BEI), and a non-wasting, perpetual endowment (Exhibit D-2 in the BEI) will be funded to enable ongoing operations and maintenance of the conservation bank in perpetuity.

2.3 SITE CHARACTERISTICS

2.3.1 Jurisdictional Areas

AECOM conducted a delineation of waters of the United States, including wetlands, for the project site (AECOM 2010) (Figure 1). A total of 127.81 ac of palustrine, emergent, seasonal wetlands were delineated on the project site along with 2.86 ac of relatively permanent waters. Table 1 summarizes the type of jurisdictional wetlands and waters on the project site. Construction of the CCB will adversely affect all palustrine, emergent, seasonal wetlands found on the project site, and all existing relatively permanent waters will be preserved, as shown in Figure 2 and summarized in Table 1. The preliminary jurisdictional waters determination for the CCB, issued by the United States Army Corps of Engineers, is included at BEI Exhibit I.

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N:\Projects3200\3261-01\Reports\Surface Water Circulation Memo Dec 2011

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

Figure 1: Existing Habitats and Wetlands

Capital Conservation Bank (3261-01)
December 2011

N:\Projects3200\3261-01\Misc

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

Figure 2: Wetland Impacts and Proposed Habitats to be Created
Capital Conservation Bank(3261-01)
December 2011

Table 1. Summary of Existing Habitats, Impacts, and Enhanced Habitat

HABITAT TYPE	TOTAL EXISTING (AC)	NOT IMPACTED (AC)	TEMP. IMPACTS (AC)	PERM. IMPACTS (AC)	TOTAL IMPACTS (AC)	PROPOSED ENHANCED OR CREATED HABITAT (AC)
Palustrine, Emergent Seasonal Wetlands	127.81	0.00	75.54	52.27	127.81	58.27
Relatively Permanent Waters	2.86	2.86	0.00	0.00	0.00	17.30[1]
Total of Jurisdictional Waters	**130.67**	**2.86**	**75.54**	**52.27**	**127.81**	**75.57**
Upland	**6.98**	**6.95**	**0.00**	**0.03**	**0.03**	**54.35[2]**
Total Acres	**137.65**	**9.81**	**75.54**	**52.30**	**127.84**	**129.92**

1 Includes 17.27 ac converted from palustrine, emergent, seasonal wetlands and 0.03 ac converted from uplands

2 Includes 52.27 ac converted from palustrine, emergent, seasonal wetlands and 2.08 ac of existing uplands that would be enhanced with native grassland seeding

2.3.2 Aquatic Functions

Existing aquatic functions and values found on the project site are limited to those provided by agricultural lands and associated irrigation ditches. These include: groundwater recharge; primary and secondary ecosystem productivity (e.g., invertebrate production); limited aquatic habitat for fish, amphibians, and invertebrates; active-season habitat for giant garter snake; limited habitat for shorebirds; and, forage production for a variety of smaller granivorous birds and raptors that feed on these species. Disturbances associated with agriculture (e.g., disking, herbicide/pesticide use) limit the quality and quantity of these functions and values as does the overall lack of habitat structural diversity provided by rice. An aquatic functions and values assessment prepared for the project site is attached as Appendix A.

2.3.3 Hydrology and Topography

The project site has a slight topographic gradient north to south and from west to east, ranging in elevation from approximately 11 ft at the northwest corner to 9 ft at the southeast corner. Wetland hydrology on the project site is sustained by rainfall, groundwater, surface water diverted to the site through irrigation canals, and flood flows down the Yolo Bypass. On average, the project site receives approximately 15 in of rainfall, primarily between the months of November and April (AECOM and HTH 2011). Heavy clay soils found on the project site (see Section 2.3.4, below) result in localized areas of ponded rainwater that may support wetland hydrology. Additionally, localized areas of wetland hydrology may be supported by shallow groundwater, which can be found at or immediately below the soil surface (i.e., within 12 in) during the rainy season. During the summer, the hydrology of the project site is primarily influenced by a series of irrigation and drainage canals that run along its southern border (the

Deep Canal) and western border. The Deep Canal receives water directly from the Yolo Bypass Toe Drain and is tidally influenced. A low-lift pump at the southwest corner of the site pumps water out of the Deep Canal into a high-line canal that flows north along the project site's western boundary. Water is diverted out of this canal into a series of smaller canals the supply irrigation water to the project site for rice cultivation throughout the summer.

Additionally, the project site lies within the Yolo Bypass, a flood bypass located in Yolo and Solano Counties that conveys floodwaters from the Sacramento River away from the Sacramento Metropolitan Area through a system of weirs into the Yolo Bypass, eventually draining into the Sacramento-San Joaquin River Delta via the Toe Drain at Prospect Slough. The Yolo Bypass was constructed to convey 500,000 cubic feet per second (cfs) of water to the north Delta and to increase the Sacramento River capacity to 100,000 cfs from the City of Sacramento to the Sacramento River's junction with Cache Slough in the north Delta. The Fremont Weir diverts water from the Sacramento River into the northern end of the Yolo Bypass when the river stage exceeds 33.5 ft. The manually-operated Sacramento Weir, located immediately upriver from the city of West Sacramento, can divert additional water during high flow events. In addition to contributions from the Sacramento River, water enters the Bypass from several western drainages, primarily the Knights Landing Ridge Cut, Cache Creek, Willow Slough, and Putah Creek. These drainages may contribute to localized inundation in the Yolo Bypass in years when the Sacramento River does not spill at the Fremont Weir.

2.3.4 Soils

According to the Soil Survey of Yolo County (Andrews 1972), a single soil series, Capay clay, underlies the entire project site. Capay clays are very deep, moderately well drained soils that formed in moderately fine and fine textured alluvium derived from mostly sandstone and shale. They are typically moderately acidic to moderately alkaline in the upper horizons becoming more alkaline in lower horizons (Andrews 1972). Clay content in the A horizon ranges from 40% to 55%. Permeability and surface runoff is slow and the available water holding capacity is 6.5 in to 8.0 in (Andrews 1972).

2.3.5 Vegetation

Vegetation communities associated with relatively permanent waters, palustrine, emergent seasonal wetlands, and uplands are found within the project site (Figure 1).

Relatively permanent waters occur on the southern and western borders of the project site. Freshwater emergent vegetation that occurs within this habitat includes, but is not limited to: broad-leaf cattail (*Typha latifolia*) redroot flatsedge (*Cyperus erythrorhizos*).

The large area of palustrine, emergent, seasonal wetland that comprises the majority of the project site is mostly un-vegetated due to ongoing agricultural activities. However, small areas of wetland vegetation can form along topographic low points (i.e., along rice checks) where irrigation water and rainwater collect. Although these areas are disked and cultivated on an annual basis, weedy species such as hyssop loosestrife (*Lythrum hyssopifolia*), curly dock (*Rumex crispus*), and rough cocklebur (*Xanthium strumarium*) as well as narrow bands of broad-

leaf cattail and tule can be found in scattered locations within this vegetation community (AECOM and HTH 2011).

Uplands (i.e., canal edges and road sides) support a variety of weedy, ruderal species, including: johnsongrass (*Sorghum halepense*), black mustard (*Brassica nigra*), perennial pepperweed (*Lepidium latifolium*), soft chess (*Bromus hordeaceus*), common mallow (*Malva neglecta*), redstem filaree (*Erodium cicutarium*), and field bindweed (*Convolvulus arvensis*).

2.3.6 Threatened and Endangered Species

The project site provides potentially suitable habitat for special-status wildlife species (i.e., species with one or more of the following listing statuses: federal threatened or endangered, California threatened or endangered, California Native Plant Society List 1 or 2 species, California species of special concern, or California fully-protected species) that include giant garter snake, tri-colored blackbird (*Agelaius tricolor*) and several species of raptors. Giant garter snakes have been observed on the adjacent Pope Ranch Conservation Bank. Additionally, a giant garter snake was observed along County Road 107, immediately north of the project site in 2010, and giant garter snakes have been sighted on three separate locations during the summer of 2011. These sightings have all been confirmed by USFWS staff or by recognized species experts (D. Smith, pers. comm.). Tri-colored blackbirds have been observed along agricultural ditches to the north of the project site. This species may make limited foraging use of the project site, but the species is not expected to breed on the project site. Various species of raptors have also been observed flying over and foraging in the general vicinity of the project site. Similar to tri-colored blackbird, these species may forage on the project site, but they are not expected to breed here. Results of all previous wildlife surveys conducted on the project site are described in more detail in BEI Exhibit H.

When flooded, the project site may also support limited use by anadromous fish such as Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*O. mykiss*), and green sturgeon (*Acipenser medirostris*). However, given the small size of the project site relative to the larger Yolo Bypass, these species are not expected to significantly use the project site during migration through and rearing on (for juvenile salmonids) the Yolo Bypass floodplain.

No special-status plant species have been found on the project site (Exhibit H in the BEI), and, given the nature of ongoing agricultural activities on the project site, none would be expected to be found on the site.

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3.0 MITIGATION DESIGN

3.1 BASIS FOR DESIGN

The design for the CCB includes a mosaic of aquatic and upland habitats to meet all the life history requirements of the giant garter snake. It includes shallow and deep wetlands for giant garter snake foraging and breeding with clusters of emergent vegetation to escape predators; deep channels for water delivery and production of small fish and other small vertebrates as a food source for adult giant garter snakes; wetland-upland transition zones to encourage invertebrate production as a food source for juvenile giant garter snakes; and, associated uplands for giant garter snake basking and winter brumation. Descriptions of each of the proposed habitat types are below. Detailed grading plans and structure designs are provided in Appendix B, and landscape designs are provided in Appendix C.

3.2 PROPOSED MITIGATION SITE

The proposed mitigation site is the project as designed, the CCB. Existing physical and biological characteristics of the proposed mitigation site are identical to those described above in Section 2.3.

3.3 CREATED/ENHANCED HABITAT

3.3.1 Compensation Ratios

Construction of the CCB will affect existing jurisdictional waters and wetlands (Figure 2). Table 1 summarizes project impacts and proposed acreages of enhanced, preserved, and created wetlands, relatively permanent waters, and uplands. In all, 58.27 ac of wetland habitat will be enhanced, 17.30 ac of relatively permanent waters will be created, 2.86 ac of relatively permanent waters will be preserved, 52.27 ac of upland habitat will be created, 2.08 ac of upland habitat will be enhanced, and 4.87 ac of upland habitat will be preserved.

3.3.2 Long-Term Goals

The long-term project goals are to restore and maintain freshwater marsh and upland habitat for giant garter snakes. Freshwater marshes will include several meandering slough-like channels, open water, deep wetlands, and shallow wetland benches that will contain adequate water during the snake's active period to provide prey base and cover. The wetlands and transition zones will contain emergent, herbaceous wetland vegetation for escape cover and foraging habitat. In addition, upland habitat will provide basking and retreat sites with higher elevation uplands providing refuge from flood waters. Hibernacula will provide cover and retreat sites both within wetlands and uplands.

3.3.3 Aquatic Functions

Approximately 58.27 ac of perennial, emergent, wetland habitat and 17.30 ac of relatively permanent waters will be developed following habitat enhancement activities planned as part of CCB construction. The wetlands are designed to maximize the upland-aquatic and wetland-

aquatic habitat edges and provide giant garter snake habitat with variable water depth and duration of ponding, ranging from shallow, seasonal wetlands to perennial wetlands with associated deep channels. The wetlands and deep channels are designed to have variable bank slopes ranging from 1:1 to roughly 3:1 to provide topographic variation.

Relative to existing conditions on the project site, the aquatic functions and values of wetlands and other waters of the United States within the CCB will be significantly enhanced due to the relative lack of anthropogenic disturbances (e.g., plowing, disking, pesticide and herbicide use) and the implementation of the proposed HDP. Enhanced aquatic functions will include: groundwater recharge; primary and secondary ecosystem productivity (e.g., invertebrate production); aquatic habitat for fish, amphibians, and invertebrates; breeding, foraging, and other active-season habitat needs for adult and juvenile giant garter snake; habitat for waterfowl, shorebirds, and songbirds; and, nutrient cycling, sediment detention, pollutant filtering, and other water quality benefits (Appendix A). Furthermore, development/creation of perennial wetlands on the CCB will increase habitat connectivity to adjacent wetland habitat with similar aquatic functions and services.

3.3.4 Hydrology/Topography

Wetland hydrology for the CCB will be supported by natural (i.e., rainfall and periodic flood flows down the Yolo Bypass) sources of wetland hydrology during the winter and early spring months, as described in Section 2.3.3, and supplemental water delivered through a series of supply canals, similar to the existing agricultural operation on the project site (Figure 1).

During the giant garter snake active period, roughly May through October, the main water supply will be the Deep Canal, at the southern end of the CCB. Surface water in the Deep Canal, which is sustained via a direct connection to the Yolo Bypass Toe Drain and tidally influenced, will be pumped, using a low-lift hydraulic pump, approximately 10 to 15 ft into an existing high-line canal that separates the CCB from the Pope Ranch Conservation Bank. Water will flow, via gravity, north down the high-line canal and into a main supply canal running across the northern end of the CCB. Running east down the main supply canal, water will flow south into a series of channels, 4 to 5 ft in depth, each of them supplying a wetland cell ranging from 3 ft to 6 in deep that will be separated from adjacent wetlands by intervening upland habitat. Each wetland cell will contain a variable number of topographic depressions of differing sizes that will be approximately 2 ft deeper than the surrounding wetland. Appendix B shows the location of all wetlands, channels, and uplands on the CCB.

Outside the giant garter snake active period, roughly November through April, wetland hydrology may continue to be supported across the majority of the CCB by shallow seasonal groundwater, direct precipitation, or flood flows down the Yolo Bypass. Additionally, water may continue to be supplied to the CCB via pumped water from the Deep Canal, as described above.

3.3.5 Soils

Characteristics of the single soil series found within the CCB, Capay clay, are summarized above in Section 2.3.4. No amendment or modification of these soils is planned as part of CCB construction.

3.3.6 Vegetation

Vegetation at the CCB will consists of wetland and upland species in their respective habitats, as summarized below. Representative locations of these vegetation types are illustrated in Appendix C.

3.3.6.1. Wetland Habitat. Vegetation to be planted in wetland habitats within the CCB will include tule and a variety of smaller, emergent macrophytes. Tule will be the primary plant within the deeper portions of wetlands (e.g., areas from 1 ft to 3 ft in depth). They will be planted along the margins of the main wetland cell water supply channels, in scattered clumps throughout each wetland cell, and along the margins of the deeper topographic depressions to be excavated within each wetland cell. The shallower upland margins of each wetland cell (e.g., areas less than 1 ft deep) will be planted with low growing herbaceous species including Baltic rush (*Juncus balticus*), common rush (*Juncus effusus*), Iris-leaf rush (*J. xiphioides*) and creeping spike rush (*Eleocharis macrostachya*). Significant areas of open water will be maintained within wetland habitats for giant garter snake foraging and to maintain target hydraulic roughness values for flood water conveyance down the Yolo Bypass.

3.3.6.2. Upland Habitat. Vegetation to be planted within uplands include a variety of California-native grasses including blue wild rye (*Elymus glaucus*), creeping wild rye (*Leymus triticoides*), meadow barley (*Hordeum brachyantherum*), and slender wheatgrass (*Elymus trachycaulus*). Large rip-rap sized rocks and boulders will be strategically placed and/or partially buried to provide upland basking and refugia for giant garter snakes until natural burrows develop.

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4.0 SUCCESS CRITERIA AND MONITORING

4.1 SUCCESS CRITERIA

Monitoring to determine site performance and track progress towards success criteria will establish the extent to which the CCB is incrementally developing high-quality habitat values for giant garter snakes. The performance criteria are quantitative bench marks against which wetland habitat development progress and giant garter snake presence will be tracked. The attainment of specified success criteria will be used as one trigger for the phased release of conservation credits, as specified by the IRT in the BEI. The final habitat success criteria, with the exception of the jurisdictional delineation that will occur in Year 3, will be evaluated in the last year of the 5-year monitoring period. Giant garter snake monitoring will occur for a variable number of years following project construction until specified species occurrence performance criteria are met.

4.1.1 Wetlands and other Waters of the United States

The project will enhance approximately 58.27 ac of palustrine, emergent, seasonal wetland and create 17.30 ac of relatively permanent waters. Both habitats are intended to fall under the jurisdiction of the USACE. A formal delineation of the USACE jurisdictional area will be undertaken 3 years following site construction. These areas will be considered a success if the delineation demonstrates that the required acreage was created.

Percent cover will be used as the primary indicator of successful establishment of freshwater emergent wetland. The final goal (Year-5) for average percent cover is at least 80% relative cover of obligate (OBL), facultative wetland (FACW), and facultative (FAC) species and 50% total vegetation cover. Table 2 provides the performance and final success criteria for average percent cover of wetland indicator species during the 5 year monitoring period.

Table 2. Percent Cover Performance and Final Success Criteria for Wetland Vegetation

Monitoring Year	Total (Absolute) Percent Cover	Relative Percent Cover by Wetland (FAC or wetter) Species
1	20	70
2	25	75
3	30	80
4	40	80
5 (Final Success Criterion)	**50**	**80**

4.1.2 Giant Garter Snake

The project will enhance or create approximately 75.57 ac of aquatic habitat, preserve 2.86 ac of aquatic habitat, create or enhance 54.35ac of upland habitat, and preserve 4.87 ac of upland habitat, all of which will provide habitat for giant garter snakes. Performance and success criteria for giant garter snake presence were developed in conjunction with the USFWS as provided in Table 3. The attainment of these criteria will be tied to the release of specific

percentages of the total conservation credits potentially available within the CCB. Giant garter snake population monitoring will occur annually starting the first year following completion of project construction and continue as needed to document attainment of specific criteria. If at any time the final success criterion is met, annual population monitoring will cease and periodic monitoring associated with implementation of the LTMP for the CCB will start.

Table 3. Giant Garter Snake Performance and Final Success Criteria

Criterion	Criterion Description
Interim Criterion 1	Capture of at least 1 individual giant garter snake on the bank site
Interim Criterion 2	Capture of at least 2 individual giant garter snakes across at least 2 survey years (i.e., at least 1 snake per year for at least 2 years) on the bank site
Final Success Criterion	Capture of at least 2 individual giant garter snakes of more than 1 size-age class across at least 2 survey years (e.g., 1 adult in survey year 1 and 1 juvenile in survey year 2) or capture of at least 2 individual, gravid females across at least 2 survey years (i.e., at least 1 gravid female per year for at least 2 years) on the bank site or on parcels surrounding the bank site

4.2 MONITORING

4.2.1 Monitoring Methods

4.2.1.1. Wetlands and Other Waters of the United States. Vegetation percent cover will be measured by placing 100 m transects (i.e. sampling units) starting at random locations and running in random directions within each wetland and adjacent water supply channel. The total distance of vegetation intercepting each transect will be measured and summed to yield a percent cover value for that sample unit. All vascular plant species observed along the transect and the species first intercepting the transect will be recorded at 1 m intervals to compute percent cover by species for that sample unit. The number of transects (sample units) within each wetland cell will be based on the variability of the site's vegetative cover and will be determined by evaluating the cumulative average cover value obtained over increasing numbers of sample units. The number of sample units used will be the point where additional samples do not substantially change the cumulative average cover value obtained. Analysis will include calculations of total plant cover, relative cover by wetland indicator species (plants rated as OBL, FACW, or FAC), and relative cover by native species.

In addition to annual wetland vegetation monitoring, a wetland delineation, to USACE protocols, will be completed in Year 3 following project construction to verify successful creation of at least 75.57 ac of aquatic habitat.

All data will be recorded on field data sheets and transcribed into an electronic spreadsheet for analysis and reporting.

4.2.1.2. Giant Garter Snake Monitoring. A USFWS and DFW-approved biologist will monitor and document giant garter snake populations following project construction. Giant garter snake monitoring will include active visual surveys and passive aquatic trapping conducted at times and using methods most likely to result in capture of giant garter snake. Precise timing of the survey period will be determined by weather and seasonal conditions during the given year. Global positioning system (GPS) units will be used to determine the geocoordinates of capture locations. The vegetation type, approximate water depth, substrate type, time of day, and ambient temperature will be recorded. Data will also be collected from snakes upon capture. Weight, total length, snout to vent length, sex, scale counts on head and mid-body, and other physical features such as scars and tumors will be noted. Captured snakes will be implanted with passive induced transponder tags for permanent identification, allowing snakes to be identified using a scanner and facilitating independent study by separate investigators. All snakes will be immediately released at the point of capture after data have been collected, with the exception of potentially gravid snakes, which will be transported to the Sacramento Zoo for testing and immediately returned to the capture location and released following test completion.

A detailed study plan, describing trapping methods, approximate timing, and other relevant details will be prepared by the CCB Project Proponent and submitted to the USFWS and DFW for approval prior to all giant garter snake surveys during the establishment phase for the CCB. The results of all surveys will be electronically tabulated and archived.

4.2.1.3. Photo-documentation. Photo-documentation of the site will be conducted from a number of fixed locations throughout the CCB. Photographs will also be taken to record any events that may have a significant effect on the success of restoration, such as flood, fire, trespass issues, or vandalism. The locations for photo-documentation will be selected when the record of habitat construction (i.e., biological as-built report) is developed for the site. These locations will be recorded on the record of habitat construction graphic. Additionally, aerial photos will be taken of the CCB in Year 1 and Year 5 of success criteria monitoring.

All photographs will be electronically archived.

4.2.2 Monitoring Schedule

Monitoring will be conducted for at least 5 years or until all defined success criteria have been met for the CCB. Data should be collected at approximately the same time each year to standardize results but may be adjusted to account for seasonal variations in vegetation conditions, weather, precipitation, and temperature. The USACE jurisdictional area delineation will be conducted in the spring of Year 3 to take advantage of the best opportunities to examine the site's soils and hydrology. Tables 4 and 5 provide an overview of the monitoring schedule.

Table 4. Project Monitoring Timeline

Monitoring Element	Year 1	Year 2	Year 3	Year 4	Year 5
Wetland Vegetation Monitoring	X	X	X	X	X
Giant Garter Snake Monitoring[1]	X	X	X	X	X
Photo Documentation	X	X	X	X	X
Aerial Photographs	X				X
Wetland Delineation			X		
[1] Giant garter snake monitoring may extend beyond Year 5 if needed to document attainment of success criteria described in Table 3					

Table 5. Annual Monitoring Schedule

Monitoring Element	May	Jun	Jul	Aug	Sept	Oct
Wetland Vegetation Monitoring				X		
Giant Garter Snake Monitoring[1]						
Photo Documentation	X					X
Aerial Photographs				X		
Wetland Delineation	X					
[1] The timing of giant garter snake monitoring will be described in the annual study plan submitted for approval to UFWS and DFW						

5.0 IMPLEMENTATION PLAN

5.1 SITE PREPARATION

Site preparation primarily involves the grading of the site to elevations appropriate to support emergent wetland and upland habitats. Minimization and avoidance measures developed by the USFWS for construction projects within giant garter snake habitat will be implemented for all construction activities (USFWS 1997). All cut and fill will be balanced on the site (no import or export will occur from the project site). Temporary construction equipment staging and soil stockpiling will occur in designated upland areas approximately 0.5 mi north of the project site to avoid adverse effects to waters subject to the jurisdiction of the USACE. Standard storm water BMPs (e.g., installation of silt fencing, rice straw wattles) will be implemented if needed to avoid unintended indirect effects to adjacent irrigation canals, per the storm water pollution prevention plan that will be prepared and implemented for construction of the CCB.

5.1.1 Grading

Site grading will be done to the specifications shown on the final engineer's stamped drawings (draft drawings are included in Appendix B). Six meandering open-water channels will be created across the project area running north-south. The open-water channels will be bordered by wetlands and uplands. The open-water channels will be graded to a depth of approximately 4 to 5 ft below the existing grade. The main wetland cells will be graded to a depth of approximately 1 to 3 ft below existing grade. Seasonal wetlands, approximately 6 in deep, will be constructed to create transition areas between deeper, perennial wetlands and upland areas and to provide foraging habitat for juvenile garter snakes. Final grading of the upland topography will range from slightly above existing grade to up to 20 ft or more above existing grade (to provide elevations above the design water surface elevation of the Yolo Bypass). Banks of the open-water channels and upland areas will vary from steep to gradual (approximately 1:1 to 3:1) slopes. The typical types of equipment used during construction will include graders, bulldozers, excavators, and dump trucks. A staging area will be designated at an existing large, elevated upland mound located approximately 0.5 mi north of the CCB, with access via Yolo County Road 107.

5.1.2 Avoidance Measures

5.1.2.1. Giant Garter Snake. To avoid and minimize take of giant garter snakes, the following measures, consistent with terms and conditions listed in the programmatic formal consultation for USACE permitted projects (USFWS 1997), will be implemented for all habitat maintenance and management activities within the CCB.

- Ground-disturbing activity within 200 feet of potential giant garter snake aquatic habitat will be conducted between May 1 and October 1.
- Dewatered habitat will be allowed to remain dry for 15 consecutive days after April 15 and prior to excavation or filling of the dewatered habitat.

- All construction personnel will participate in a USFWS and DFW-approved worker environmental awareness program that will address the life history of the giant garter snake; the importance of irrigation canals, marshes, wetlands, and seasonally flooded areas such as rice fields, to the giant garter snake; and, the terms and conditions of the USFWS biological opinion and DFW Incidental Take Permit. Proof of training will be submitted to the Sacramento and Bay-Delta USFWS offices as well as the DFG Bay Delta Regional office.
- The project site will be inspected by a qualified monitoring biologist approved by USFWS and DFW within 24 hours prior to the commencement of construction activities. A field report form documenting the monitoring effort will be provided to USFWS and DFW within 24 hours of start of construction activities. The monitoring biologist will be available thereafter for consultation if a snake is encountered during construction activities, and the biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or until it has been determined that the snake will not be harmed. Snakes encountered will be allowed to move away from the construction activities on their own. Capture or relocation of trapped or injured giant garter snakes will only be attempted by individuals with a current ESA Section 10(a)(l)(A) recovery permit. The monitoring biologist will immediately report any incidental take to USFWS and DFW by telephone and written letter addressed to the chief, USFWS Endangered Species Division, and DFW Regional Director, Bay Delta Region, within 1 working day. The project site will also be re-inspected whenever a lapse in construction activity of 2 weeks or greater has occurred.
- Clearing of wetland vegetation within water supply channels will be confined to the smallest area necessary to excavate the canal banks and install field drains or culverts and replace native fill materials. Sediment excavation will be accomplished using equipment (i.e., a hydraulic excavator) from the top of the channel bank to minimize impacts to giant garter snake habitat.
- Clearing of vegetation within wetlands, if needed to maintain giant garter snake habitat values or target hydraulic roughness values for floodwater conveyance, will be confined to the smallest area necessary. Areas where wetland vegetation is removed will be restored to the original grade following vegetation removal, and all excavated vegetation and sediment will be removed from the site and disposed of or re-used consistent with all local, California, and federal laws and regulations.
- Heavy equipment moving to and from the project site will be restricted to established roadways.
- No plastic, monofilament, jute, or similar erosion control matting that could entangle giant garter snakes will be used. Possible substitutes include coconut coir matting, tackified hydroseed compounds, or other materials approved by the USFWS and DFW.

Additional measures that will be implemented to avoid and minimize take of giant garter snakes include the following.

- All vehicle traffic on access roads within the project site will observe a speed limit of 10 mph to minimize the potential for vehicles to run over giant garter snakes basking on access roads. The speed limit will be posted throughout the project site.

- Livestock used for vegetation management will be limited to sheep or goats. All wetlands and canals will be fenced with temporary electric fencing during any livestock grazing to prevent unintended trampling of canal banks, disturbance to wetlands, or grazing of wetland vegetation. Livestock grazing will be limited to May 1 through October 1.
- Vegetation will be mowed to a height of not less than 6 in to minimize the potential for giant garter snake injury. Mowing will be limited to May 1 to October 1.
- Excavated sediment will be removed from the project site and disposed of or re-used consistent with all local, California, and federal laws and regulations.

5.1.2.2 Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, Central Valley Steelhead, Southern Green Sturgeon. To avoid and minimize take of Sacramento River winter-run ecologically significant unit (ESU) Chinook salmon, Central Valley ESU spring-run Chinook salmon, Central Valley distinct population segment (DPS) steelhead, and southern DPS green sturgeon during project construction, all construction activities will be conducted between May 1 and October 1, during periods when the project site is not inundated and these species are not present within the project site. To avoid take of Sacramento River winter-run ESU Chinook salmon, Central Valley ESU spring-run Chinook salmon, Central Valley DPS steelhead, and southern DPS green sturgeon during ongoing operation of the CCB, the following measures will be implemented during flood events within the Yolo Bypass.

- All water control structures (such as screw gates) will be opened prior to flood events.
- Flashboards will be removed from all flashboard risers, and any other structures that would impede natural water flow and drainage will be removed from canals and wetlands on the project site prior to flood events.
- The measures described above will continue to be implemented for at least 14 calendar days after the project site is no longer inundated from flood flows to allow fish to migrate out of wetlands and channels on the site back to the Toe Drain.

These measures will maintain hydrologic connectivity among the CCB's wetlands, water supply and drainage canals, and adjacent agricultural canals that flow to the Yolo Bypass Toe Drain to minimize fish stranding following flood events in the winter and spring when these species may be present within the project site.

5.1.3 Soil Disposal

Native soil will be excavated from the project site to enhance existing wetland habitat. This excavated soil will be re-used on the site to create upland mounds for giant garter snake brumation. Excavated soils will be temporarily stored on an elevated upland mound, near an existing agricultural storage shed approximately 0.5 mi north of the proposed project site. Construction of the CCB is designed to balance cut and fill, with no need for excess soil disposal or soil import.

5.1.4 Soil Treatment

The native soils present at the CCB project site are adequate for wetland and upland habitat development; thus, soils will not be treated.

5.1.5 Pest Plant Removal

Because the CCB is within an agricultural area and is highly disturbed, it may be difficult to sustain entirely native populations of plants in the CCB without management. The CCB will be disked in the spring to reduce populations of nonnative plants before the beginning of construction; however, it is expected that the topsoil (i.e., uppermost 6 in of soil) will still contain a seed bank dominated by nonnative species. In the event that nonnative plants become established at the CCB following construction, a weed abatement program will be immediately implemented as described in the Interim Management Plan (IMP) (Exhibit D-4 in the BEI). More details regarding the weed abatement program and control of invasive weeds and undesirable vegetation are provided in this document.

5.1.6 Construction Monitor

A construction monitor familiar with this HDP will be onsite during grading and any other activities that include use of equipment or ground disturbance. The monitor will be experienced with the protected species known to potentially occur onsite. The monitor will check under and around equipment before it is moved after a period of inactivity and will visually clear each area to be disturbed immediately before work begins. If a protected or sensitive species is located during grading or other ground disturbing activities, construction activity will cease while the monitor determines an appropriate course of action. When practical, an animal will be allowed to move out of the construction area on its own. In some circumstances the monitor may elect to move the animal a short distance within the site and into appropriate habitat with adequate cover from predators. All other protective measures included in the project regulatory permits and agreements will be fully implemented.

5.2 PLANTING AND SEEDING

5.2.1 Planting Plan

Revegetation of the CCB will consist of native emergent wetland species transitioning to upland species using drill seeding, broadcast seeding, or plug planting. All planting will adhere to a set of detailed planting plans and specifications to be developed for CCB construction. A planting plan is attached as Appendix C.

Three planting zones have been established for the CCB: wetland, transition, and upland. Tables 6, 7, and 8 describe the species composition for each planting zone. The wetland planting zone includes all wetland areas with a target inundation depth equal to or exceeding 1 ft. These areas will be planted with tule plugs. Plugs will be placed in large, randomly-located clusters, several hundred square feet in size, on 5-ft centers.

Table 6. Planting Palette for the Wetland Zone

Common Name	Scientific Name	% Planting Palette	Container Size	Planting Method	Plant Spacing (feet)
Tule	*Schoenoplectus acutus*	100	1 ft by 1 ft tule sod plug	Individual	5

The transition planting zone includes areas of shallow inundation (less than 6 in) at the margins of wetland zones. The planting areas in the transition zone will be individually plug planted by hand in clusters of 100 to 200 plants on 5-ft centers (Table 7).

Table 7. Planting Palette for the Transition Zone

Common Name	Scientific Name	% Planting Palette	Container Size	Planting Method	Plant Spacing (feet)
Baltic rush	*Juncus balticus*	25	Plug	Individual	5
Common rush	*Juncus effusus*	25	Plug	Individual	5
Creeping spikerush	*Eleocharis macrostachya*	25	Plug	Individual	5
Iris-leaf rush	*Juncus xiphioides*	25	Plug	Individual	5

The upland planting zone includes all other areas within the CCB, with the exception of access roads. The upland planting zone will be seeded with a native grass seed mix. A rangeland drill seeder will be used for grass species in areas of flat to moderate slopes. A broadcast seeder will be used in areas that are too steep for a drill seeder (Table 8).

5.2.2 Nature and Source of Propagules

All tule plugs will be salvaged from an adjacent property owned by the CCB Owner and transplanted into the CCB site. All other plants and seeds will be contract grown or obtained from a qualified native plant nursery. All seeds and plants will originate from Yolo Bypass sources or, if not available, adjacent and ecologically-similar areas of the Sacramento Valley to ensure that plant materials appropriate to the CCB site are used in revegetation.

5.3 IRRIGATION

Irrigation is not anticipated to be required. All wetland plants will be inundated throughout the growing season to maintain giant garter snake aquatic habitat values, and upland plants will not require supplemental irrigation.

Table 8. Planting Palette for the Upland Zone

Common Name	Scientific Name	Planting Method	Seeding Rate (lbs pure live seed / ac)
Blue wildrye	*Elymus glaucus*	Drill seeding on uplands; broadcast seeding on slopes	7
Slender wheatgrass	*Elymus trachycaulus*	Drill seeding on uplands; broadcast seeding on slopes	5
Meadow barley	*Hordeum brachyantherum* ssp. *brachyantherum*	Drill seeding on uplands; broadcast seeding on slopes	12
Creeping wildrye	*Leymus triticoides*	Drill seeding on uplands; broadcast seeding on slopes	7
Total			31

5.4 IMPLEMENTATION SCHEDULE

Construction of the CCB will occur over a period of 4 to 5 months during summer and early fall of 2013, lasting approximately from mid -June or early July 2013 through early to late October 2013. Construction will be phased from the east to west across the CCB site. Excavation of water supply channels and adjacent wetlands will occur first, and excavated soils will be temporarily stored on an elevated upland mound, near an existing agricultural storage shed approximately 0.5 mi north of the proposed project site.

Once all supply channels and wetlands are excavated, adjacent uplands will be created by re-using stockpiled soils resulting from channel and wetland excavation. Final site construction will include: construction of poured concrete weirs, flash board risers, screw gates, and similar water control structures to facilitate ongoing water management within water supply canals and adjacent wetlands; installation of corrugated metal culverts to allow water movement between adjacent water supply canals and to facilitate water delivery onto the site and water drainage off the site; and, any required road improvements.

At the completion of construction, the water delivery system (supply canals, gates, weirs, flashboards and risers) will be tested to ensure functionality, verify target inundation depths of all wetland habitats, and to implement any corrective measures required to ensure proper function of the water delivery system and attainment of target wetland inundation depths. Once proper function of the water delivery system has been verified, approximately mid to late October, installation of wetland vegetation and upland seeding will be completed, and final placement of rip-rap sized rock along water supply channels and uplands to create temporary hibernacula for giant garter snakes will occur.

6.0 MAINTENANCE DURING MONITORING PERIOD

Habitat management and maintenance activities will be implemented immediately following construction of the CCB and continue throughout the success criteria monitoring period to ensure that the intended habitats and species become successfully established within the CCB. Maintenance and management activities during this period are described in the IMP, BEI Exhibit D-4.

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7.0 PROPOSED MONITORING REPORTS

7.1 DUE DATES

Annual monitoring reports will be sent to the IRT by December 31 of each monitoring year.

7.2 BIOLOGICAL AS-BUILT REPORT

The Biological As-Built Report will describe all significant deviations from the conceptual design presented in this document (Appendix C). The report will be prepared by a qualified engineer or landscape architect (as required) and be provided to the IRT within 8 weeks following completion of project construction. The IRT will be notified in writing that construction and planting has been completed within 72 hours of concluding these activities.

7.3 ANNUAL REPORTS

Annual monitoring reports will include a brief description of the project, the methods used to collect and analyze the data, the results of the data analysis, a discussion of the results, issues and/or problems to be addressed, and conclusion regarding the present condition of the site. The report will also include a remedial action section, which will discuss any additional actions required to achieve the final success criteria. Representative photographs will be included. A draft report for IRT review and comment will be provided by December 31 of each year in which success criteria monitoring occurs, as described in Section 7.1 above.

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8.0 CONTINGENCY MEASURES

8.1 INITIATING PROCEDURES

If annual success criteria are not achieved for any portion of the CCB in any year, or if any of the final success criteria (Year 5) are not met, the Project Proponent will work with the IRT to prepare an analysis of the cause(s) of failure. If requested by the IRT, a remedial action plan will be prepared within 2 months of the initial request. Implementation of remedial actions will depend on the nature of the work; thus, a schedule will be presented for IRT review and approval as part of the remedial action plan.

8.2 CONTINGENCY FUNDING MECHANISM

As part of the conservation bank approval process, performance bonds will be posted by the CCB Project Proponent to ensure that sufficient funding exists to successfully complete all construction and monitoring described in this HDP (Exhibit C-2 in the BEI) as well as any remedial actions that may be needed, should success criteria not be met (Exhibit C-3 in the BEI).

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9.0 COMPLETION OF MITIGATION RESPONSIBILITIES

9.1 NOTIFICATION OF COMPLETION

Monitoring will be conducted for a period of at least 5 years following CCB construction and until all success criteria described in this HDP have been met. At the end of the monitoring period, a final monitoring report will be prepared to document that the CCB has met specified final success criteria. If the CCB has met the success criteria, a letter will be sent to the IRT within 8 weeks of achieving the success criteria acknowledging the CCB's conditions and requesting agency concurrence. The project will be considered a success and should be approved by the IRT when the site-specific objectives are met.

If the site has not met its final success and performance criteria, monitoring will continue until the criteria have been successfully met. If it appears, for whatever reason, that final success criteria are unattainable within a reasonable timeframe, the CCB Project Proponent or IRT may request a reduction in the CCB mitigation credit values to match the degree to which the CCB has achieved its defined success criteria at that point in time.

9.2 CONFIRMATION

Monitoring will cease when the CCB has met all defined success criteria or when the IRT agrees that the site is expected to meet those goals with little chance of failure. Upon notification of completion, the IRT may concur based on written documentation or, at its discretion, may request a site visit to observe the completed project. Following completion of mitigation responsibilities, the CCB will be managed in perpetuity as summarized in Section 10 and as described in detail within the LTMP (Exhibit D-5 in the BEI).

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10.0 LONG-TERM MANAGEMENT

10.1 PROPERTY OWNERSHIP

The CCB Owner will continue to own the CCB in fee following bank establishment. The CCB Project Proponent will be responsible for the ongoing maintenance and stewardship of the bank site. A conservation easement, in format approved by the USFWS and DFW, will be recorded on the bank site in favor of DFW or a DFW-approved conservation organization or local government (as defined by Section 65965 of the California Government Code) (Exhibit E-4 in the BEI). The Wildlife Heritage Foundation, a DFW-approved conservation organization, has tentatively indicated that it would be willing to hold the conservation easement for the CCB. The entirety of the CCB site will be included in the conservation easement. The conservation easement holder will monitor the terms of the conservation easement in perpetuity. Annual monitoring reports will be provided by the conservation easement holder and the bank owner as requested by all agencies.

10.2 MANAGEMENT PLAN

10.2.1 Resource Manager

The CCB Project Proponent, or its designee, is responsible for CCB management and maintenance as outlined in the LTMP (Exhibit D-5 in the BEI).

10.2.2 Management Approach

The LTMP identifies management actions that will be implemented for the benefit of giant garter snakes and its habitat. Methods to manage upland and wetland vegetation will include: goat or sheep grazing and mowing; hand removal of invasive plants; herbicide application; and mechanical removal of invasive plants and woody plants using a hydraulic excavator or similar equipment.

Invasive aquatic and upland weeds will be treated and removed to the extent feasible and as needed to maintain the CCB's conservation values. Upland vegetation will be managed to encourage a diversity of vegetation heights to provide sufficient cover for giant garter snakes. Accumulated sediments will be periodically removed from wetlands and channels as needed to maintain channel conveyance and giant garter snake aquatic habitat values. Other vegetation management activities, such as thinning of tule and cattail may also occur on a periodic basis as needed to maintain target hydraulic roughness values and suitable habitat for giant garter snakes.

If livestock grazing is included as a potential tool to manage vegetation on the site, infrastructure elements to support livestock grazing (i.e., electrical fencing to exclude grazing from sensitive areas, solar pumps and troughs) will be constructed as needed, and all grazing activities will be designed to minimize impacts to giant garter snakes (e.g., burrow trampling). All grazing facilities will be sited to avoid conflicts with sensitive resources. All-weather roads will be constructed as needed to facilitate access for long-term management activities, including inspection, maintenance and monitoring activities. Routine maintenance activities included in the LTMP will include visual inspection of all infrastructure (e.g., canals, water control

structures, culverts, signs, roads); inspection for trespass, dumping, vandalism, and similar activities; maintenance of water control features and canals; and, vegetation management and invasive plant control. Biological monitoring such as giant garter snake population monitoring, vegetation and invasive plant surveys, and general wildlife surveys are included in the LTMP pursuant to agency requirements.

10.3 SITE PROTECTION

A non-wasting perpetual management endowment will be developed using the Property Analysis Record software, or similar software, to determine the endowment amount required to fund the stewardship and maintenance of the CCB in perpetuity (Exhibit D-2 in the BEI). The endowment will be incrementally funded by the CCB Project Proponent coincident with the release of credits during the bank establishment period with the goal of fully funding the endowment by the end of the initial establishment and maintenance period. The endowment will be invested with a third-party (potentially either DFW or the National Fish and Wildlife Foundation), consistent with DFW policy on conservation bank endowments.

11.0 REFERENCES

AECOM. 2010. Preliminary delineation of wetlands and other waters of the United States, Capital Conservation Bank. Prepared for Americas Habitats. Folsom, CA.

AECOM and HTH [H. T. Harvey & Associates]. 2011. Prospectus: Capital Conservation Bank. Prepared for Americas Habitats. Folsom, CA. Revised July 2011.

Andrews, W.F. 1972. Soil Survey of Yolo County, California. USDA, Soil Conservation Service. Davis, CA.

USFWS [U. S. Fish & Wildlife Service]. 1997. Programmatic Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California Survey Protocols and Other Guidelines. Appendix C – Standard Avoidance and Minimization Measures during Construction Activities in Giant Garter Snake (*Thamnophis gigas*) Habitat. Sacramento, CA.

Personal Communications

Dustin Smith. General Manager, America's Habitats. Phone Conversation with Matt Wacker of H. T. Harvey & Associates regarding occurrences of giant garter snake observed on and near the Capital Conservation Bank in summer 2011. August 2011.

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APPENDIX A

AQUATIC FUNCTIONS AND SERVICES ASSESSMENT

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MEMORANDUM

PROJECT# 3161

April 8, 2013

TO: Ms. Jinnah Benn
United States Army Corps of Engineers
Sacramento Regulatory Branch

FROM: Matt Wacker, Senior Restoration Ecologist
H. T. Harvey & Associates

SUBJECT: Wetlands Functions and Values Assessment
Proposed Capital Mitigation and Conservation Bank
Corps File No. SPK-2010-00119

H.T. Harvey & Associates (HTH) has prepared a preliminary wetlands functions and values assessment of the proposed Capital Conservation and Mitigation Bank (CCB) for America's Habitats. A wetland delineation report has been previously prepared for the site (AECOM 2010), and the U.S. Army Corps of Engineers (USACE) issued a preliminary jurisdictional determination (PJD) based on this report. In the PJD, the USACE asserted jurisdiction over the majority of the proposed CCB, totaling 126.03 acres. Rice is currently cultivated within this portion of the proposed CCB.

Construction of the proposed CCB would result in the creation of 78.25 acres of wetlands of a variety of depths ranging from open water channels to perennial emergent wetlands to seasonal emergent wetlands. A mitigation and conservation bank prospectus (AECOM 2011), describing construction and operation of the bank, has been prepared and submitted to the California Mitigation Bank Interagency Review Team (IRT) for review and comment. During their review of the prospectus, the USACE expressed reservations regarding the permitting and operation of the bank. Specifically, the USACE was not certain that it could grant wetland mitigation credits for the proposed CCB because perennial inundation of the constructed wetlands within the bank will likely be sustained through manipulated water (i.e., water pumped from a main supply canal and delivered to wetlands on the site through a series of supply channels and flow control gates) if groundwater is not encountered.

Additionally, given that 126.03 acres of USACE-jurisdictional waters would be affected by construction of the proposed CCB, the USACE was not certain that construction of the bank, which would create 78.25 acres of potentially jurisdictional wetlands and other waters, would fully

mitigate for the conversion of 126.03 wetland acres or if there would be surplus mitigation credits remaining to be sold once the project had fully mitigated for its construction-related wetland impacts.

To assist with its evaluation of the proposed CCB and its permitting of CCB construction activities, the USACE requested that a wetland functions and values assessment be completed. Specifically, the USACE requested that, as an initial step, HTH complete a functions and values assessment using the methodology described in federal Highway Methodology Workbook Supplement (USACE 1999). Using information from past fieldwork at the site and materials from the CCB prospectus, HTH prepared one evaluation reflecting existing conditions at the site and a second evaluation for hypothetical conditions that are expected to be found on the site following construction and establishment of the proposed bank. These evaluations are shown in Figure 1 for existing conditions and Figure 2 for future conditions. A description of the numeric codes shown in Figure 1 and Figure 2 is provided in Attachment A. Additionally, contrasts between existing conditions and proposed future conditions are described in more detail within Table 1.

Please contact us at your earliest convenience to discuss this functions and services assessment. We anticipate that some modifications may be required following USACE review, and we understand that a more detailed functions and services assessment may be required to provide justification for the granting of wetland mitigation credits from the USACE for the proposed CCB.

REFERENCES

AECOM. 2010. Preliminary Delineation of Waters of the United States Capital Conservation Bank. Prepared for America's Habitats. Folsom, CA. Dated May 2010.

AECOM. 2011. Prospectus Capital Conservation Bank. Prepared for America's Habitats. Folsom, CA. Dated February 2011.

USACE. 1999. The Highway Methodology Workbook Supplement Wetland Functions and Values: A Descriptive Approach. U.S. Army Corps of Engineers New England District. Concord. MA. Available: http://www.nae.usace.army.mil/reg/Pubs/hwsplmnt.pdf. Last accessed: April 14, 2011.

cc: Mr. Dustin Smith (America's Habitats)
Dr. Kathleen Dadey (USACE Sacramento District)

Attachments: Attachment A (Function and Value Rationale Code Descriptions)

Figure 1. Wetlands Functions and Values Assessment Capital Conservation and Mitigation Bank – Existing Conditions

Wetland Function-Value Evaluation Form

Total area of wetland 126.03 Human made? Yes Is wetland part of a wildlife corridor? Yes or a "habitat island"?

Adjacent land use Conservation bank, managed wetlands, agriculture Distance to nearest roadway or other development > 1 mi

Dominant wetland systems present Palustrine, emergent Contiguous undeveloped buffer zone present Yes

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Midway

How many tributaries contribute to the wetland? Numerous Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. IRW4

Latitude 38.404319 Longitude -121.642814

Prepared by: MJW Date 4/12/11

Wetland Impact: Type Fill Area 126.03

Evaluation based on: Office X Field X

Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	X		5, 7, 15, 17		Groundwater recharge through rainfall infiltration and summer irrigation water infiltration
Floodflow Alteration		X	5, 6, 7, 9, 10, 12, 13		Limited potential for flood flow alteration
Fish and Shellfish Habitat		X	7, 10, 16		Limited to no fish habitat except for common species such as catfish and mosquitofish
Sediment/Toxicant Retention		X	1, 2, 3, 4, 6, 10		Limited potential; pesticides applied for ag use
Nutrient Removal		X	3, 4, 6, 7, 14		Limited potential; fertilizers applied for ag use
Production Export		X	1, 2, 3, 4		Limited by rice cultivation
Sediment/Shoreline Stabilization		X	3, 4, 9, 10		Limited by lack of winter vegetation and lack of topographic complexity
Wildlife Habitat	X		3, 4, 6, 7, 8, 13, 17, 19, 21, 24		GGS present; high seasonal bird use by common species; limited by rice cultivation
Recreation		X			Not applicable
Educational/Scientific Value		X	1		Not applicable
Uniqueness/Heritage		X			Not applicable
Visual Quality/Aesthetics		X	5, 10, 11, 12		Limited aesthetic values
ES Endangered Species Habitat	X		1		Giant garter snake documented adjacent to site
Other	X			X	Rice production is primary wetland function; ag use limits other functions and values

Notes:

*Refer to backup list of numbered considerations.

Figure 2. Wetlands Functions and Values Assessment Capital Conservation and Mitigation Bank – Future Conditions

Wetland Function-Value Evaluation Form

Total area of wetland 78.25 Human made? Yes Is wetland part of a wildlife corridor? Yes or a "habitat island"?

Adjacent land use Conservation bank, managed wetlands, agriculture Distance to nearest roadway or other development > 1 mi

Dominant wetland systems present Palustrine, emergent Contiguous undeveloped buffer zone present Yes

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Midway

How many tributaries contribute to the wetland? Numerous Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. CCB Phase 1

Latitude 38.404319 Longitude -121.642814

Prepared by: MJW Date 4/12/11

Wetland Impact:
Type N/A Area N/A

Evaluation based on:
Office Yes Field

Corps manual wetland delineation completed? Y N X

Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	X		5, 7, 15, 17		Potential recharge through excavated wetlands, greater volume of water stored on-site
Floodflow Alteration	X		5, 6, 7, 8, 9, 10, 12, 13, 14, 18		Minor attenuation of flood flows
Fish and Shellfish Habitat	X		7, 9, 10, 14, 16, 17		Habitat for common species, could provide limited habitat for Delta smelt, salmonids
Sediment/Toxicant Retention	X		1, 2, 3, 4, 5, 6, 7,10, 12,14,15,16		Interspersed perennial vegetation (tule) provides opportunities for retention
Nutrient Removal	X		3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14		Interspersed perennial vegetation (tule) provides opportunities for removal
Production Export	X		1, 2, 4, 5, 6, 7, 9, 11, 13		Nutrient export possible from periodic flood flows through tule marsh
Sediment/Shoreline Stabilization	X		2, 3, 4, 9, 10, 13, 15		Tule marsh would attenuate wave action during flood events
Wildlife Habitat	X		3,4,6,7,8 9,10,11,12,13,16,17,18	X	Habitat created specifically for GGS; interspersion of wetland, upland and open water
Recreation	X		3, 5, 6, 12		Potential for seasonal hunting use; limited public access subject to agency authorization
Educational/Scientific Value	X		1, 2, 3, 4, 5, 6, 9, 13, 14, 16	X	Potential for significant educational use and research; better knowledge of regional GGS
Uniqueness/Heritage	X		3, 4, 5, 6, 8, 12, 13, 16, 19		Provides freshwater marsh and GGS habitat benefits in southern Yolo Bypass
Visual Quality/Aesthetics	X		1, 2, 5, 7, 8, 10, 11, 12		Tule marsh provides aesthetic values, wildlife viewing opportunities
ES Endangered Species Habitat	X		1	X	Tule marsh managed specifically for giant garter snake
Other	X		19, 21, 22, 23	X	Additional wildlife benefits; benefits to adjacent Pope Ranch GGS population

Notes:

* Refer to backup list of numbered considerations.

Table 1. Comparison of Wetland Functions and Values for Existing Conditions and Proposed Future Conditions at the Capital Conservation Bank Site

Wetland Function or Value	Existing Conditions	Proposed Future Conditions	Comments
Wetland Acreage	126.03	78.25	Future acreage subject to delineation and USACE verification
Wetland Type	Seasonal palustrine emergent (farmed)	Perennial palustrine emergent (managed)	Unmanaged seasonal palustrine emergent wetlands possible under future conditions due solely to rainfall and flood flows down Yolo Bypass, but total acreage of this habitat type is uncertain and subject to management of the site to sustain perennial palustrine emergent marsh for giant garter snake (*Thamnophis gigas*)
Groundwater Recharge/Discharge	Recharge likely through infiltration of rainfall and flood flows as well as summer irrigation	Similar to existing functions and values with potential for slight enhancement due to presence of excavated wetlands and channels under future conditions	Presence of excavated wetlands and channels under future conditions would retain a larger volume of water that could potentially infiltrate resulting in local groundwater recharge
Fish Habitat	Limited habitat in supply canals for species such as catfish (*Ictalurus punctatus* and *I. catus*) and mosquitofish (*Gambusia affinis*)	Similar to existing functions and values with potential for slight enhancement	Constructed wetlands under future conditions may provide periodic rearing habitat for juvenile Chinook salmon (*Oncorhynchus tshawytscha*) and spawning habitat for Delta smelt (*Hypomesus transpacificus*) and Sacramento splittail (*Pogonichthys macrolepidotus*) during periods when Yolo Bypass is inundated
Sediment/Toxicant Retention	Limited potential due to lack of vegetation during late fall, winter, and spring months; agricultural activities in summer months a source of sediment and toxicants	Improved functions and values due to presence of dense tule patches and increased topographic complexity as well as cessation of agricultural activities	Patches of dense tule should increase sediment and toxicant retention; topographic complexity associated with varying wetland depths interspersed with uplands should similarly result in local decreases in water velocity during flood flows and increased opportunities for sediment retention

Table 1. Comparison of Wetland Functions and Values for Existing Conditions and Proposed Future Conditions at the Capital Conservation Bank Site

Wetland Function or Value	Existing Conditions	Proposed Future Conditions	Comments
Nutrient Removal	Limited potential due to lack of vegetation during late fall, winter and spring months; agricultural activities in summer months a source of nutrients	Improved functions and values due to presence of dense tule patches and increased topographic complexity as well as cessation of agricultural activities	Patches of dense tule should increase nutrient removal; topographic complexity associated with varying wetland depths interspersed with uplands should similarly result in local decreases in water velocity during flood flows and increased opportunities for nutrient removal
Production Export	Limited potential due to agricultural activities and harvesting of crops	Improved functions and values due to creation of tule marsh	In addition to tule marsh, a variety of other wetland types ranging from open water channels to shallow seasonal wetlands will be present under future conditions; primary productivity should be much greater and the potential for this to be exported offsite during flood events should be increased with less management of the site (i.e., tilling and vegetation harvesting)
Sediment/Shoreline Stabilization	Limited due to lack of vegetation during periods of flood flows	Improved functions and values due to creation of tule marsh	Presence of tule clumps under future conditions should result in local reductions of wave action and erosion during flood flows in the Yolo Bypass
Wildlife Habitat	Moderate quality wildlife habitat from rice in summer months	High quality wildlife habitat functions and values provided due to presence of upland native grassland habitat, greater wetland habitat diversity, lack of ongoing disturbance	Future conditions include tule marsh managed explicitly for giant garter snake; should benefit Pope Ranch population due to presence of elevated brumation habitat; lack of ongoing disturbance and increased habitat diversity, including addition of upland habitat managed as native perennial grassland, should benefit a wider variety of species

Table 1. Comparison of Wetland Functions and Values for Existing Conditions and Proposed Future Conditions at the Capital Conservation Bank Site

Wetland Function or Value	Existing Conditions	Proposed Future Conditions	Comments
Recreation	Limited to no value	Similar to existing functions and values with potential for slight enhancement, subject to regulatory agency approval	
Educational/Scientific Value	Limited to no value	Opportunity for study of regional giant garter snake populations and habitat restoration relationships	Creation of tule marsh (i.e., giant garter snake habitat) under future conditions should provide opportunities to study regional snake populations and demographics as well as the relationship between snakes and restored marsh habitats
Uniqueness/Heritage	Limited to no value	Marginally improved functions and values	The acreage of tule marsh habitats has declined in the Central Valley; creation of this habitat helps offset some of this habitat loss and adds to the uniqueness of the site
Visual Quality/Aesthetics	Limited to no value	Greater habitat diversity likely provides moderate increases in aesthetic values	This is not a significant value given the site's location in the Yolo Bypass, but aesthetic values should be improved through greater diversity of natural habitats under future conditions
Endangered Species Habitat	Likely provides active season habitat for giant garter snake	Enhanced due to presence of brumation habitat	Future conditions should improve habitat values for giant garter snake by providing enhanced active season habitat and brumation habitat; habitat for other species such as Swainson's hawk (*Buteo swainsonii*) may be marginally enhanced as well

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cbec eco engineering

Hydraulics | Hydrology | Geomorphology | Design

MEMORANDUM

Date:	June 6, 2011
To:	Dustin Smith (America's Habitats)
From:	Chris Campbell and Ali Abrishamchi
Project:	10-1016 – Capital Conservation Bank
Subject:	Flood Conveyance Modeling – Phase 1 and Phase 2

1 INTRODUCTION

The proposed Capital Conservation Bank (CBB), located within the Yolo Bypass (YB), is a planned two-phase project to develop the entire 320-acre parcel, with Phase 1 occurring in the southern 135 acres (see Figure 1). The CBB is intended to provide conservation benefits for giant garter snake (GGS) both locally and regionally. These benefits will be met by creating wetland habitat as well as upland habitat with artificial hibernacula. The upland habitats will be constructed to varying elevations, with the highest elevations at 24.5 feet NGVD29, which are 2.0 feet above the Yolo Bypass design water surface elevation (WSE).

To understand the potential flood conveyance impacts of these proposed habitats, especially the uplands which daylight above the design water surface, flood conveyance modeling of the Yolo Bypass was undertaken for both phases of the CBB. The following describes the modeling methods, assumptions, and findings.

2 DESCRIPTION OF SCENARIOS

In addition to modeling existing conditions (see Figure 2), both phases of the CBB were modeled (see Figure 3) to assess the potential flood conveyance impacts of the CBB on Yolo Bypass water surface elevations. Phase 1 consists of the southern 135 acres of the 320-acre parcel and will be built first. Phase 2 consists of the northern 185 acres, and while there are no formal plans to develop this portion of the project at this time, it was modeled to understand the potential cumulative impacts of the project as a whole. Also, as a subset of each scenario, the proposed uplands were modeled as grazed and ungrazed (see Table 1).

3 FLOOD MODEL SETUP

The Yolo Bypass RMA2 model, developed by the USACE (2007a) for use in permitting and planning within the Yolo Bypass, was used as a basis for assessing the potential flood conveyance impacts of the CBB. The following describes the model domain, topography, boundary conditions, and how the RMA2 model was adapted for this project.

3.1 TRUNCATED MODEL DOMAIN

For computational reasons identified in the Yolo Bypass RMA2 model documentation (USACE, 2007b), the Yolo Bypass RMA2 model was truncated to the extents shown by Figure 4. The northern model boundary was 5.8 miles north of the project site at County Road 35. The southern model boundary was truncated 0.5 miles north of the northernmost Stair Step or 4.0 miles south of the project site. Refinements to the model mesh, which had a nominal size of 500 feet by 500 feet, included refining the mesh within the project footprint to ±30-foot cells (see Figure 5) to adequately characterize the wetlands and upland habitats.

3.2 TOPOGRAPHY

The source hydrographic data in the Yolo Bypass RMA2 model was based on data collected in 1997 to support the Sacramento and San Joaquin River Basins Comprehensive Study. The data was collected to produce 2 foot contours with a vertical accuracy of 1 foot and registered to NGVD29. To supplement this existing hydrographic data, photogrammetric data collected on May 25, 2010 for the project site (see Figure 2) was converted from NAVD88 to NGVD29 (using an adjustment of -2.49 feet) and incorporated into the model domain.

Figure 3 shows the topographic conditions for Phase 1 and Phase 2.

3.3 BOUNDARY CONDITIONS

3.3.1 Hydraulic Roughness

The hydraulic roughness coefficients in Table 1, as adopted from the Yolo Bypass RMA2 model, were used to characterize predominate land uses in the Yolo Bypass and at the project site, namely water conveyance features, agriculture, and wildlife habitat. Water conveyance features include irrigation and drainage canals, tidal waterways, and flooded islands. Agricultural land uses include rice, other crops, and irrigated pasture. Wildlife habitat typically consists of wild grasslands, seasonal and permanent wetlands and riparian areas. The roughness coefficients were initially based on engineering judgment and later verified by the USACE during calibration simulations to the 1997 flood event.

Current land uses at the project site are dominated by rice production in the northern (Field 12) and southern (Field 2) fields with the center field (Field 1) currently fallow. For the purposes of modeling, Figure 6 shows that the project site material types for existing and project conditions. The wetlands

were treated as a mix between fields and reeds since tules will be managed as patches (much like the Yolo Bypass Wildlife Area). The uplands were treated both as grazed fields or ungrazed grasslands to evaluate the need for vegetation management.

Table 1. Hydraulic roughness coefficients

Current RMA2 Roughness Coefficients		Project Specific Roughness Coefficients	
Material Type	**Manning's n value**	**Material Type**	**Manning's n value**
Agriculture Fields	0.030	Roads	0.030
Wild Grassland	0.045	Deep Channels	0.025
Open Water	0.025	Potholes	0.030
Maintained Levee Slope	0.050	Wetlands	0.040
Bridges	0.070	Uplands	0.045
Reeds and Rushes	0.050	Uplands Grazed	0.030
Mixed Grassland/Riparian	0.070		
Riparian Woodland	0.120		
Restricted Height Levees	0.100		

3.3.2 Flow and Stage

For the truncated model domain, and as derived from the RMA2 model, inflows at the northern model boundary were 490000 cfs and water levels at the southern boundary 19.5 feet NGVD29.

3.3.3 Convergence Criteria

As taken for USACE (2007a), the following criteria were used to converge upon model solutions:

> *When the maximum change in computed water surface between iterations at any node in the model geometry is less than the convergence criterion, the simulation either proceeds to the next boundary condition revision or stops. The convergence criteria value of 0.0025 ft used assures that the accuracy of impact assessments featuring the comparison of computed water surface data sets is better than +/- 0.005 ft. This allows water surface contours generated from such a comparison to be viewed with confidence at an interval of 0.01 ft.*

4 RESULTS

A total of five (5) models were setup and run to assess the potential flood conveyance impacts of the CCB project on Yolo Bypass water levels and velocities. These included 1) existing conditions, 2a) Phase 1 grazed, 2b) Phase 1 ungrazed, 3a) Phase 2 grazed, and 3b) Phase 2 ungrazed. The ungrazed versus grazed options considered the potential benefits of vegetation management on the uplands only.

Figure 7 shows the bounding rectangle within the model domain within which there were changes in water surface elevations (WSE) and velocities. Figures 8 to 11 show the relative change in WSE for Phase 1 and Phase 2. Figures 12 to 15 show the relative change in velocity for Phase 1 and Phase 2. To determine if any scenario resulted in a flood conveyance impact, especially along a project levee, level of significance thresholds were set to 0.05 feet for increases in WSE and 0.5 feet for increases in velocity. The WSE threshold accounts for some degree of model uncertainty given that model input data (i.e., topography) have vertical accuracies far greater than 0.05 feet (i.e., an order of magnitude greater).

Based on CBB model results, potential flood conveyance impacts within the Yolo Bypass are limited to the following:

1. Figure8 shows that Phase 1 with vegetation management in the uplands increases WSEs up to 0.02 feet just outside the project boundary, which are isolated to the immediate area just upstream of the upland mounds.
2. Figure 9 shows that Phase 1 without vegetation management in the uplands increases WSEs up to 0.01 feet along the eastern levee.
3. Figure 10 shows that Phase 2 with vegetation management in the uplands results in similar increases in WSEs up to 0.01 feet on the upstream side of the Phase 1 upland mounds (see Figure 8); however, there are small decreases of 0.01 feet in WSEs upstream of the northern property boundary.
4. Figure 11 shows that Phase 2 without vegetation management in the uplands results in similar increases in WSEs up to 0.01 feet along the eastern levee.
5. Figures 12 to 15 demonstrate that small changes in velocity are isolated to the project area and immediate vicinity. The largest decreases of 1 fps are located on the leeward side of the upland mounds with the largest increases up to 1 fps localized to the upland mounds as the flood waters flow around the mounds. Figure 16 shows that maximum velocities flowing around the face of the upland mounds are approximately 3.5 fps, which is within the permissible velocity range for native grasses (Fischenich, 2001).

5 SUMMARY AND RECOMMENDATIONS

Based on the results presented in Figures 8 to 16, increases in WSE and velocities, both within the adjoining properties and along the eastern levee, are below the stated thresholds of significance. Most notably, increases in WSE up to 0.01 feet along the eastern levee under the ungrazed scenario for both Phase 1 and Phase 2 are reduced to localized increases up to 0.02 feet along the property boundary. Similarly, the adjoining properties only see small changes in velocity well within ±0.5 fps for both Phase 1 and Phase 2 under both the grazed and ungrazed scenarios. These results demonstrate that vegetation management of the uplands can be used to effectively eliminate potential freeboard encroachment along the eastern levee and keep small changes in localized to the project vicinity. Therefore, based on the flood conveyance results documented in this report, both Phase 1 and Phase 2 of the CBB as currently designed are recommended for approval assuming vegetation management is included as a strategy to reduce hydraulic roughness in the uplands to the levels assumed in these analyses.

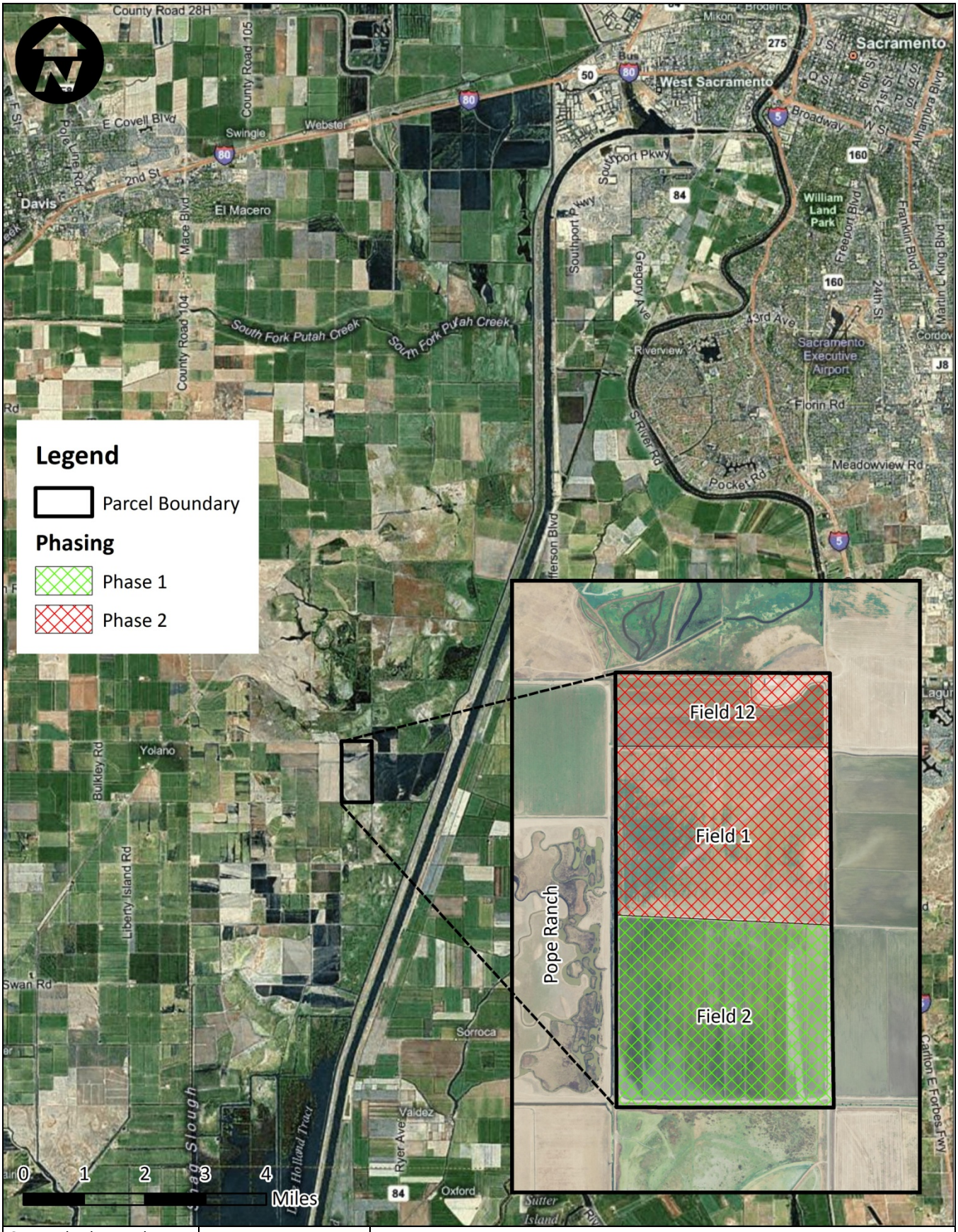
6 REFERENCES

Fischenich, C. 2001. Stability Thresholds for Stream Restoration Materials, EMRRP Technical Notes Collection (ERDC TNEMRRP-SR-29). US Army Engineer Research and Development Center, Vicksburg, MS.

USACE. 2007a. Engineering Documentation Report: Yolo Bypass 2-D Hydraulic Model Development and Calibration. US Army Corps of Engineers, Sacramento District.

USACE. 2007b. Yolo Bypass RMA2 Model User Guide. US Army Corps of Engineers, Sacramento District.

7 LIST OF FIGURES



Source: background courtesy of Bing Maps	cbec eco engineering	*Capital Conservation Bank* **CBB location map**		
		Project No. 10-1016	Created By: CRC	**Figure 1**

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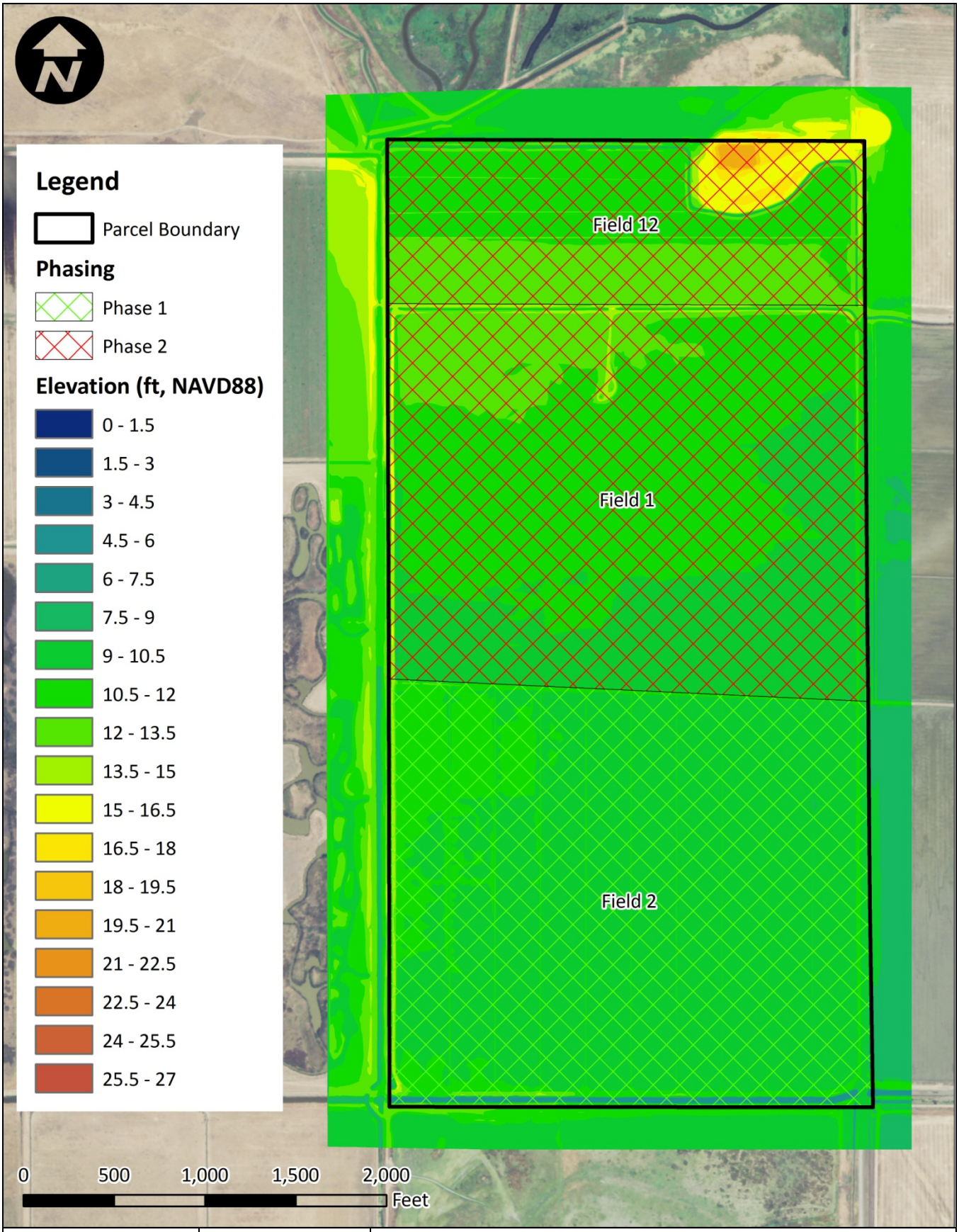
5/28/2011



Source: background courtesy of NAIP (2009)	cbec eco engineering	*Capital Conservation Bank* **CBB existing topography**		
		Project No. 10-1016	Created By: CRC	**Figure 2**

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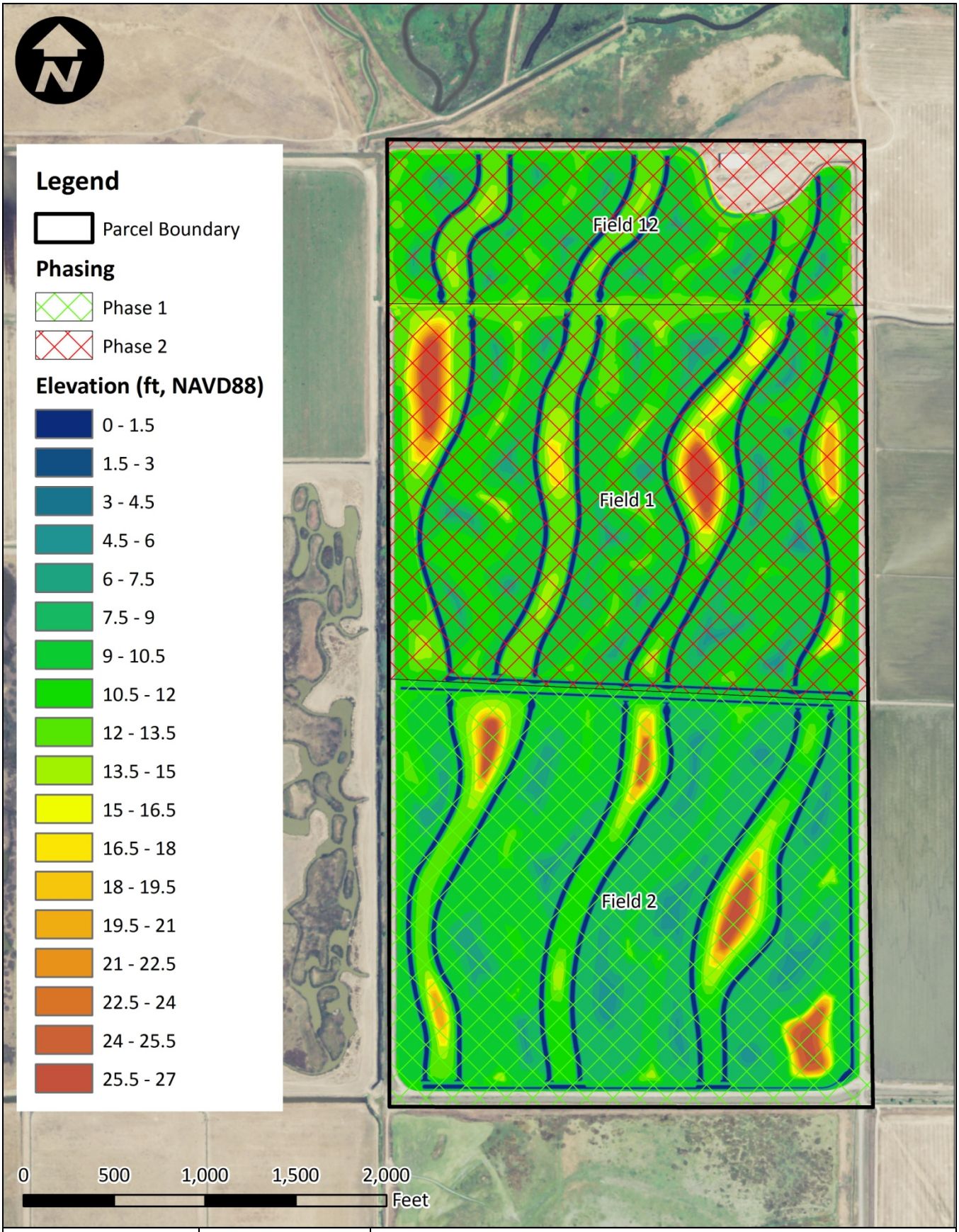
5/28/2011



Source: background courtesy of NAIP (2009)	cbec eco engineering	*Capital Conservation Bank* **CBB project topography**		
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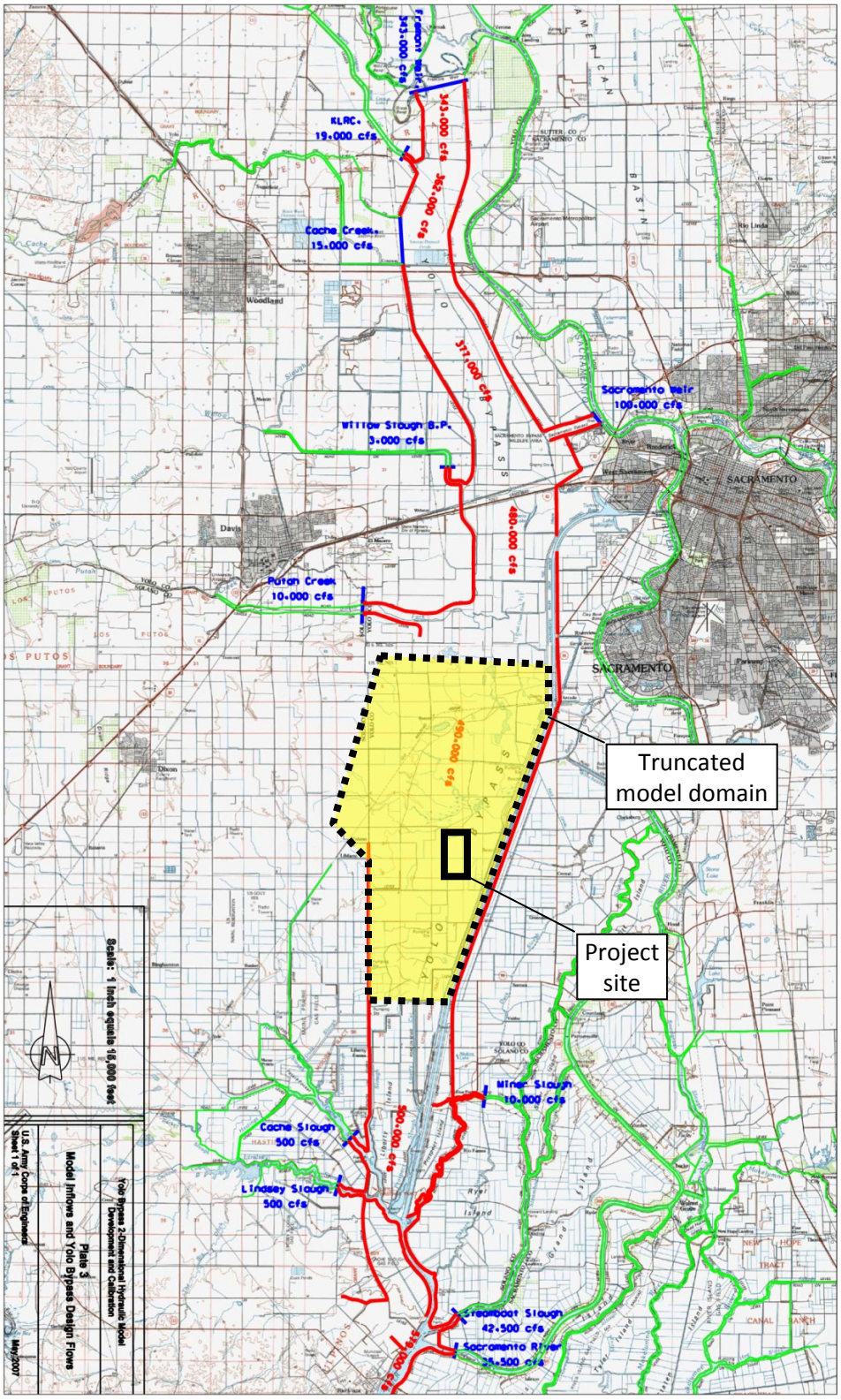
5/28/2011



Source: background from USACE (2007a)	cbec eco engineering	*Capital Conservation Bank* **Truncated model domain**		
		Project No. 10-1016	Created By: CRC	**Figure 4**

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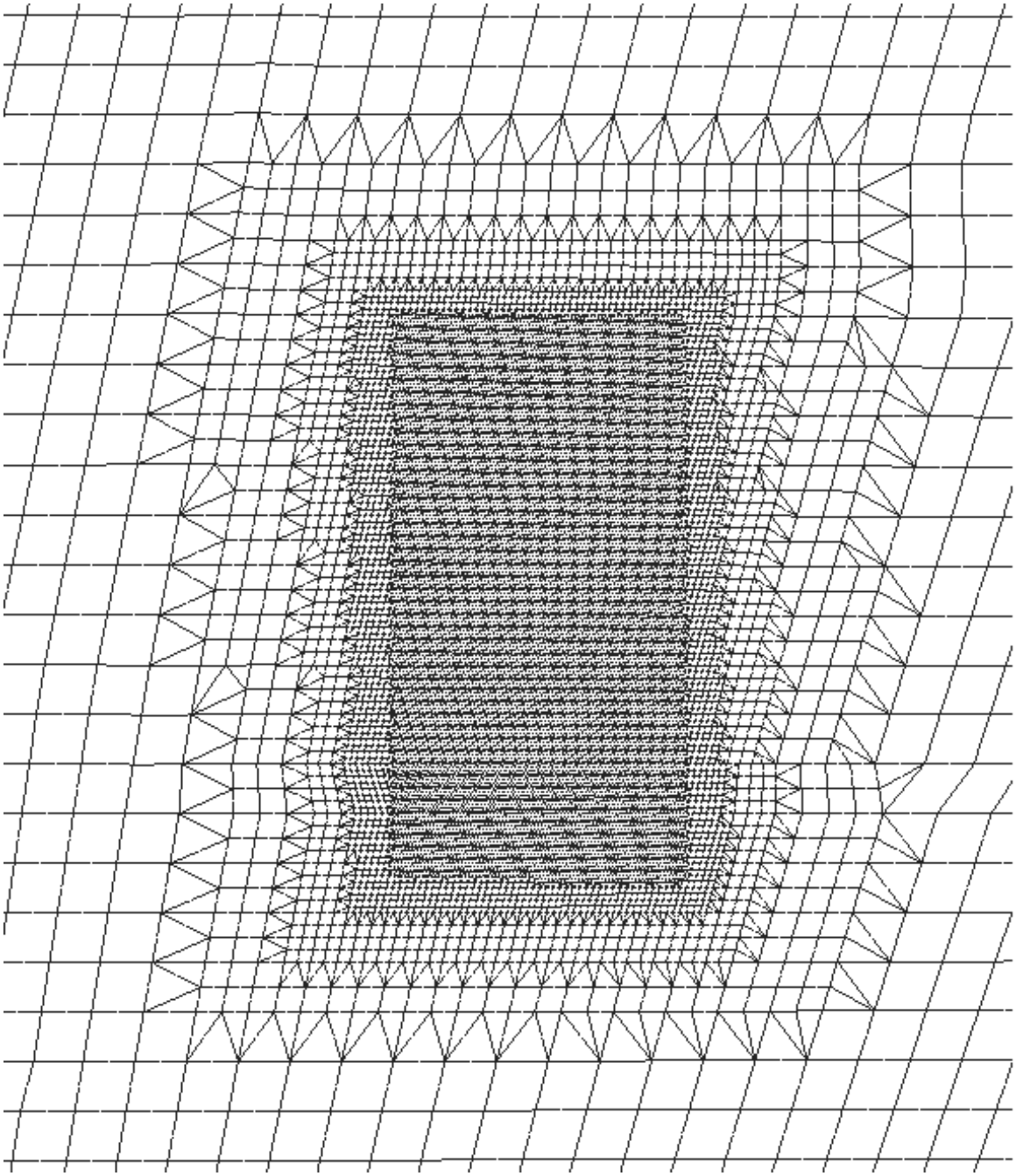
6/2/2011



Notes:		*Capital Conservation Bank* **Refined model mesh**		
		Project No. 10-1016	Created By: CRC	**Figure 5**

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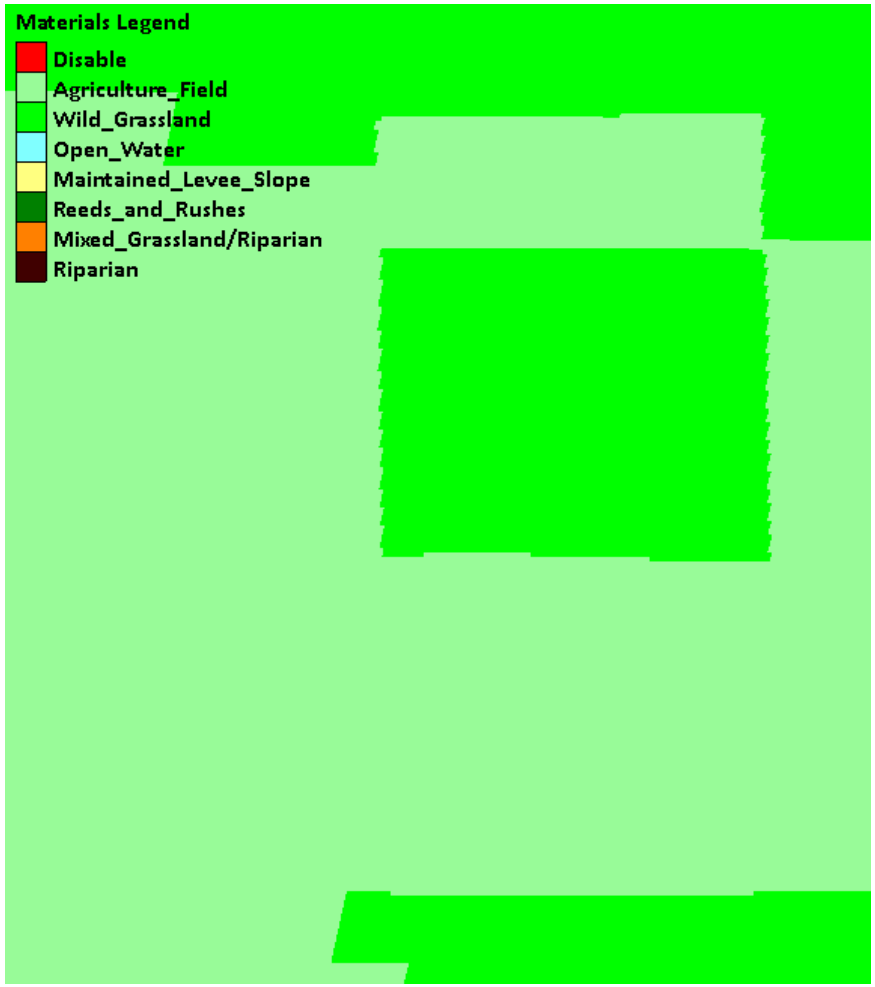
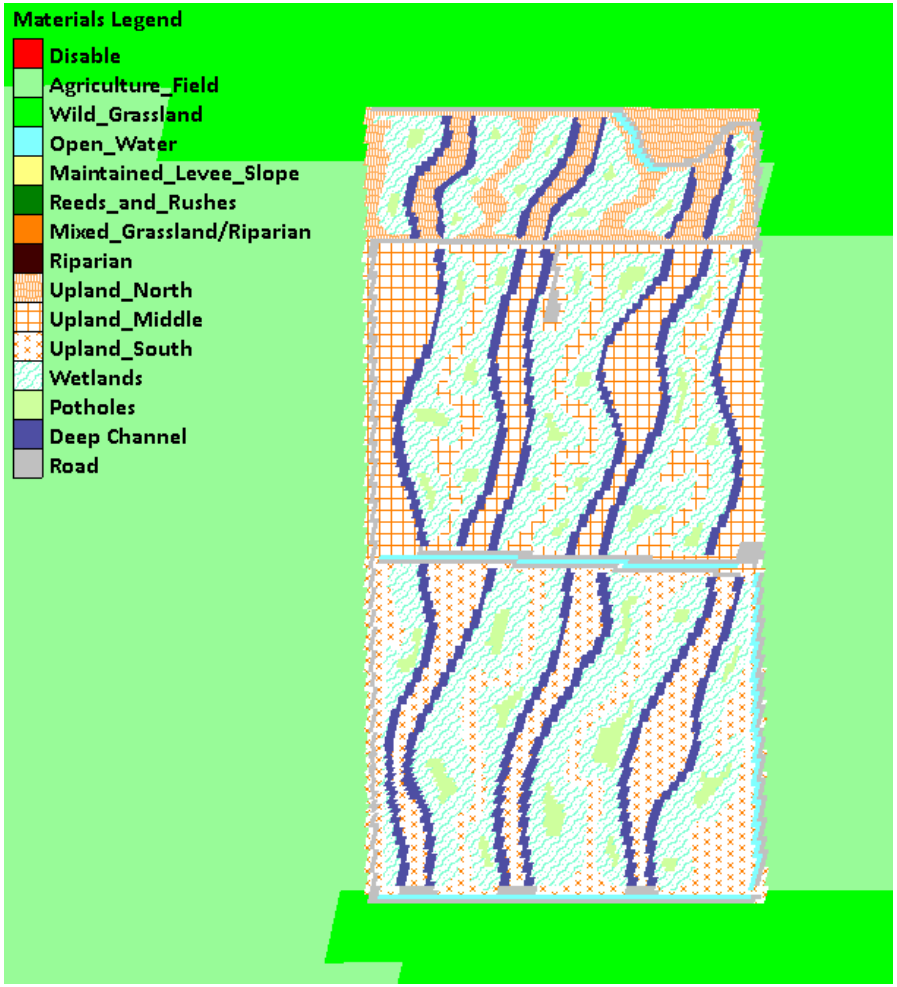
6/2/2011





Notes: Manning n-values for material types for existing conditions (left) and Phase 2 (right) are shown by Table 1

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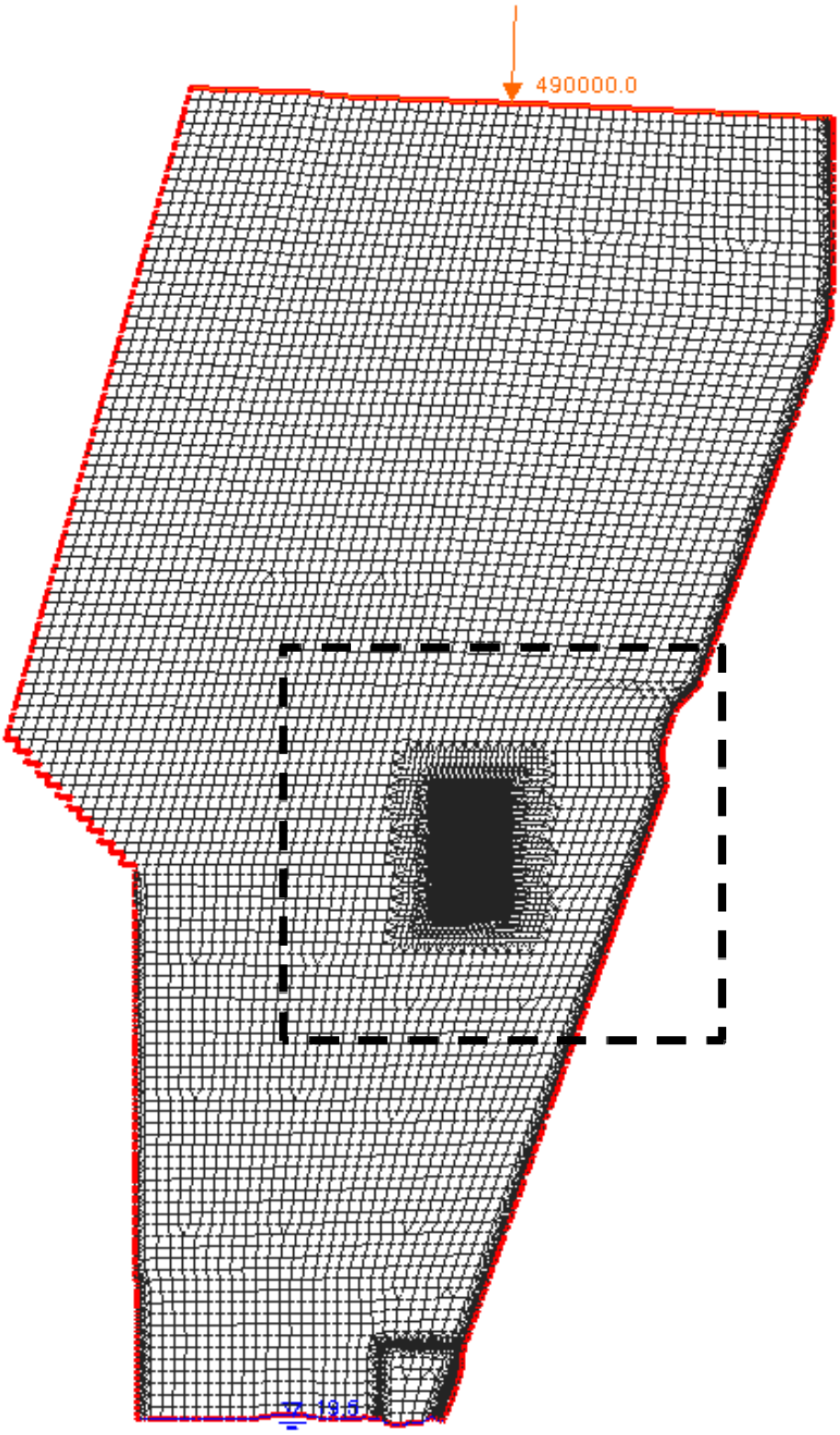
Roughness types

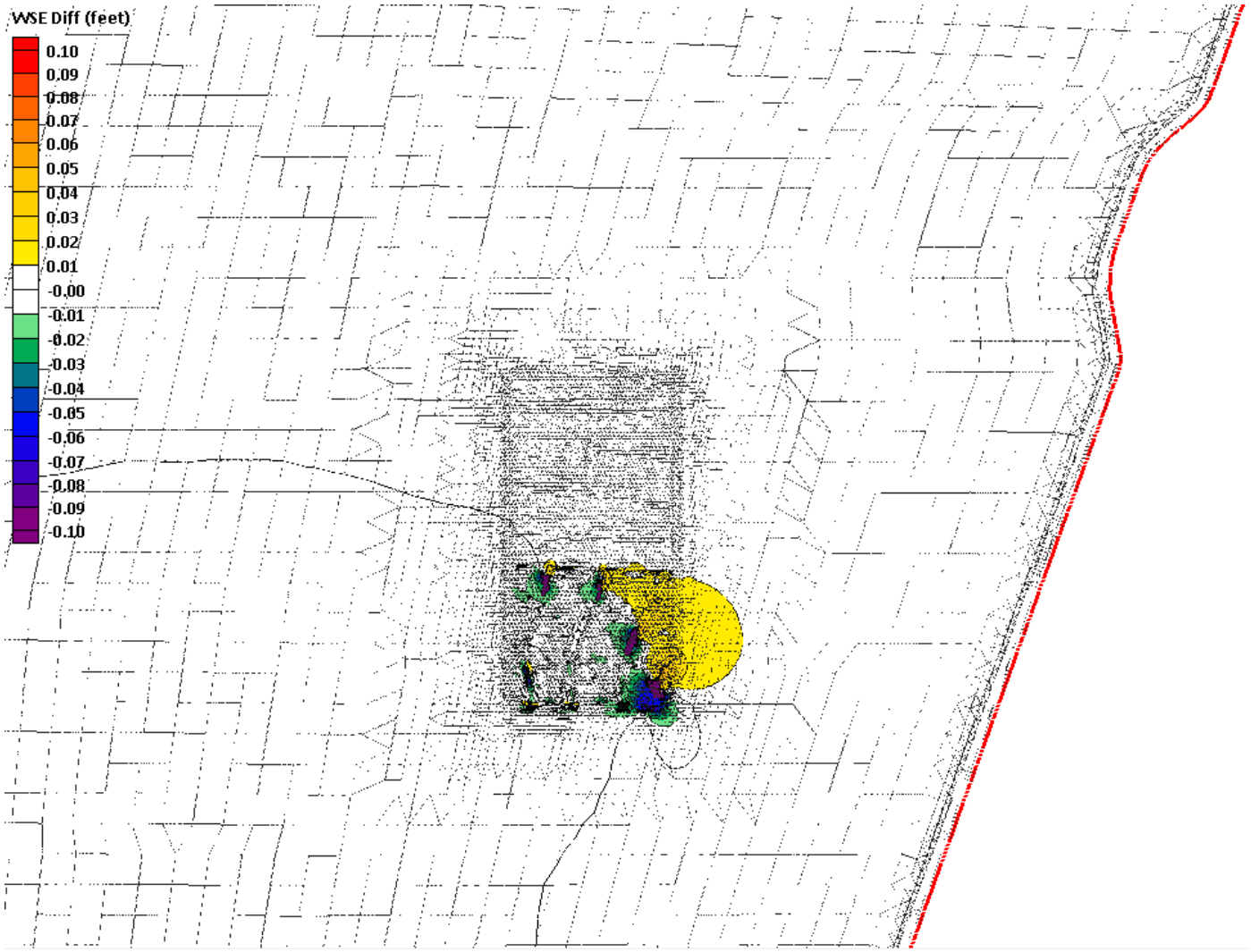
Project No. 10-1016	Created By: CRC	**Figure 6**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig6_Roughness_Types.docx
6/3/2011



Notes:		*Capital Conservation Bank* **Domain of hydraulic impact**		
		Project No. 10-1016	Created By: CRC	**Figure 7**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig7_Impact_Domain.docx
6/2/2011



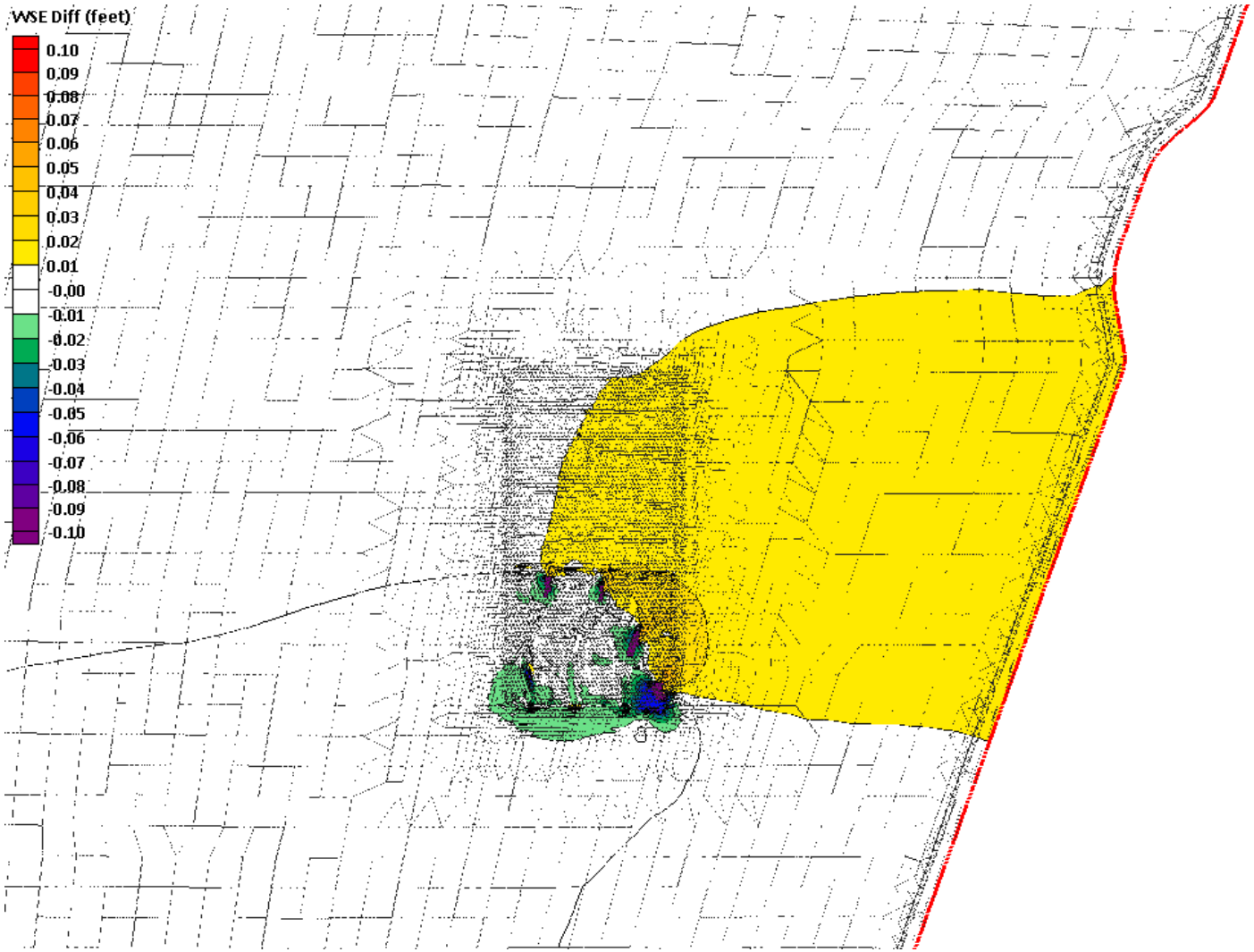
Notes:

Capital Conservation Bank

Phase 1 grazed WSE change

Project No. 10-1016	Created By: CRC	**Figure 8**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig8_WSE_Ph1graze.docx
6/3/2011



Notes:

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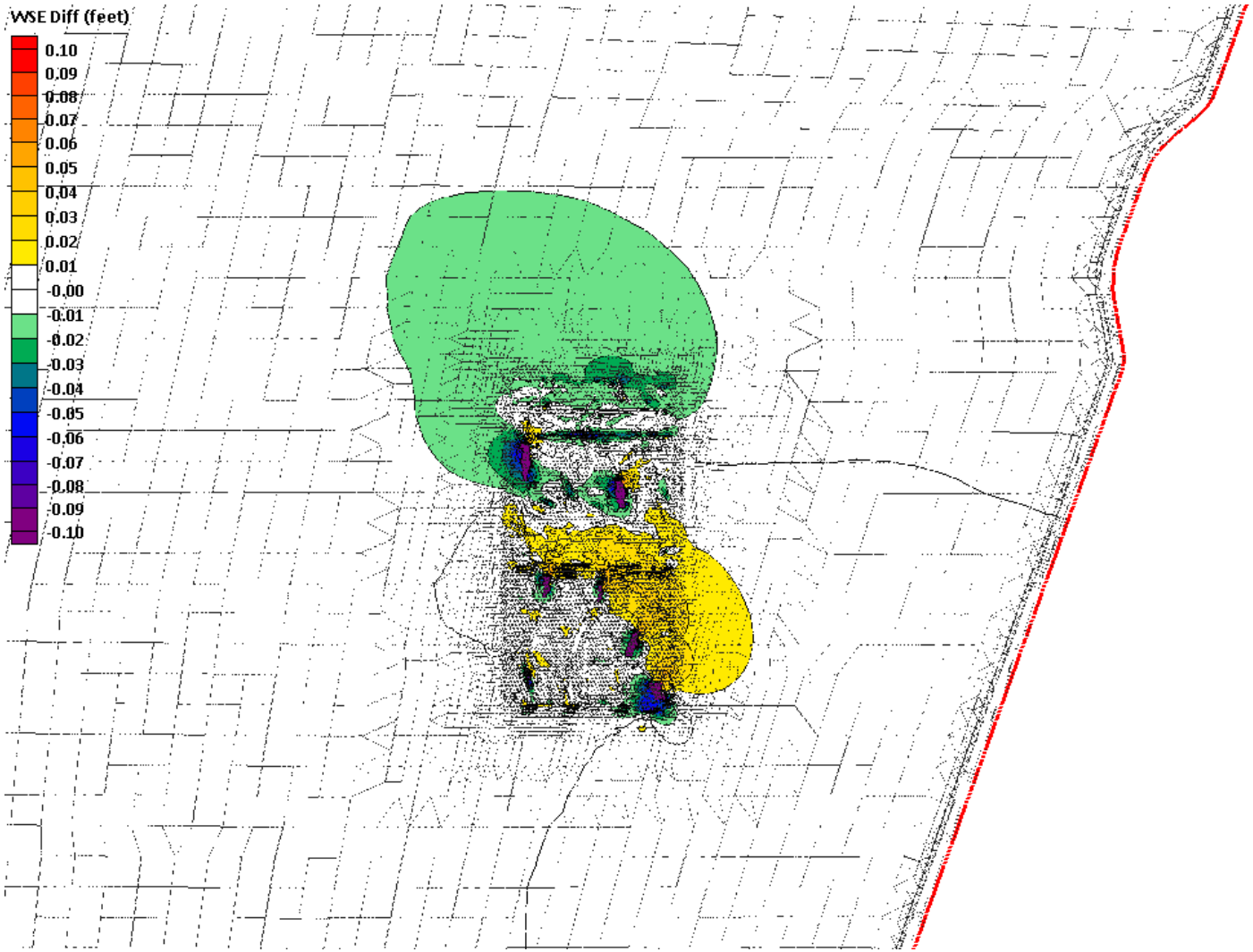
Capital Conservation Bank

Phase 1 ungrazed WSE change

Project No. 10-1016	Created By: CRC	**Figure 9**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig9_WSE_Ph1nograze.docx
6/2/2011



Notes:

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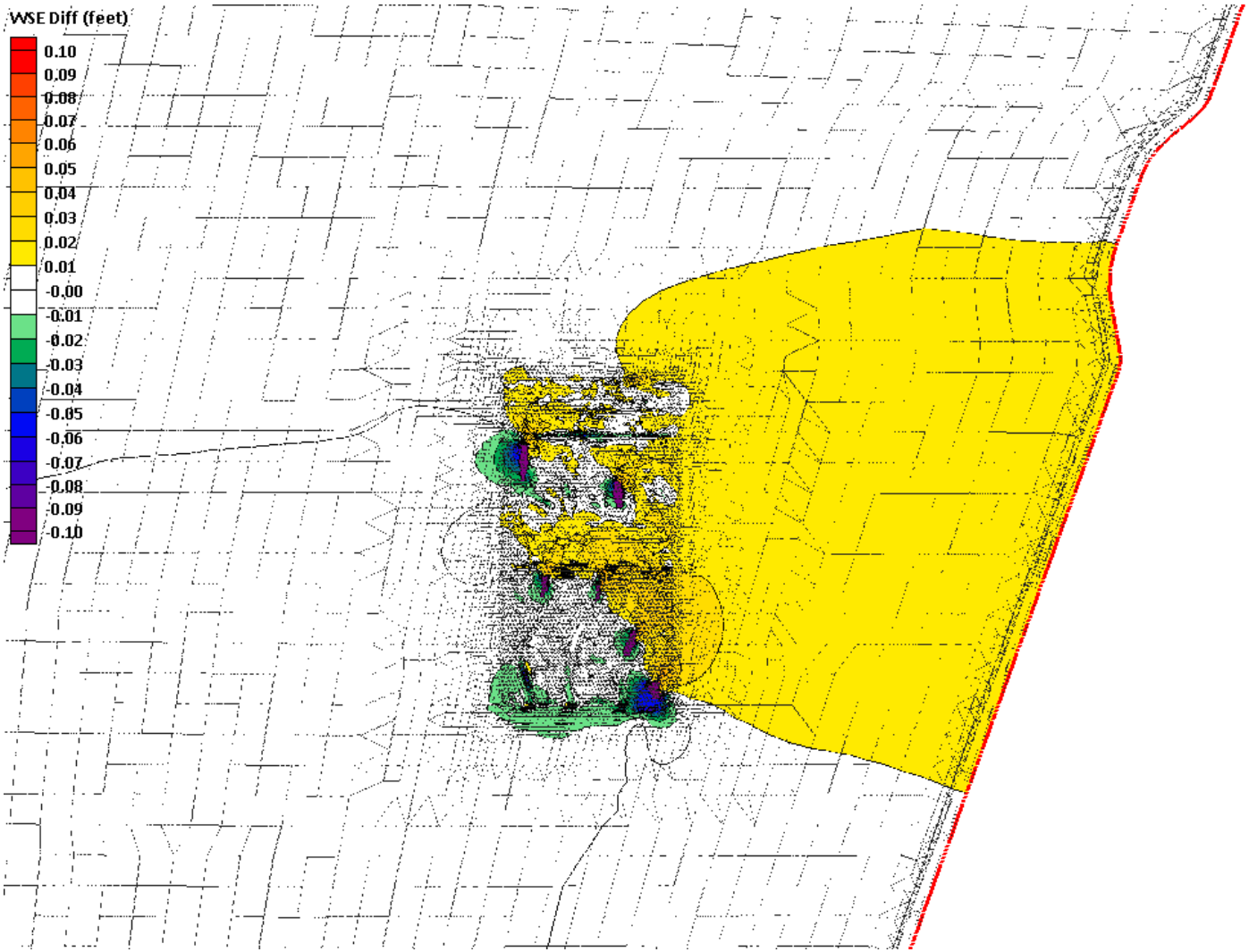
Phase 2 grazed WSE change

Project No. 10-1016	Created By: CRC	**Figure 10**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig10_WSE_Ph2graze.docx
6/2/2011



Notes:

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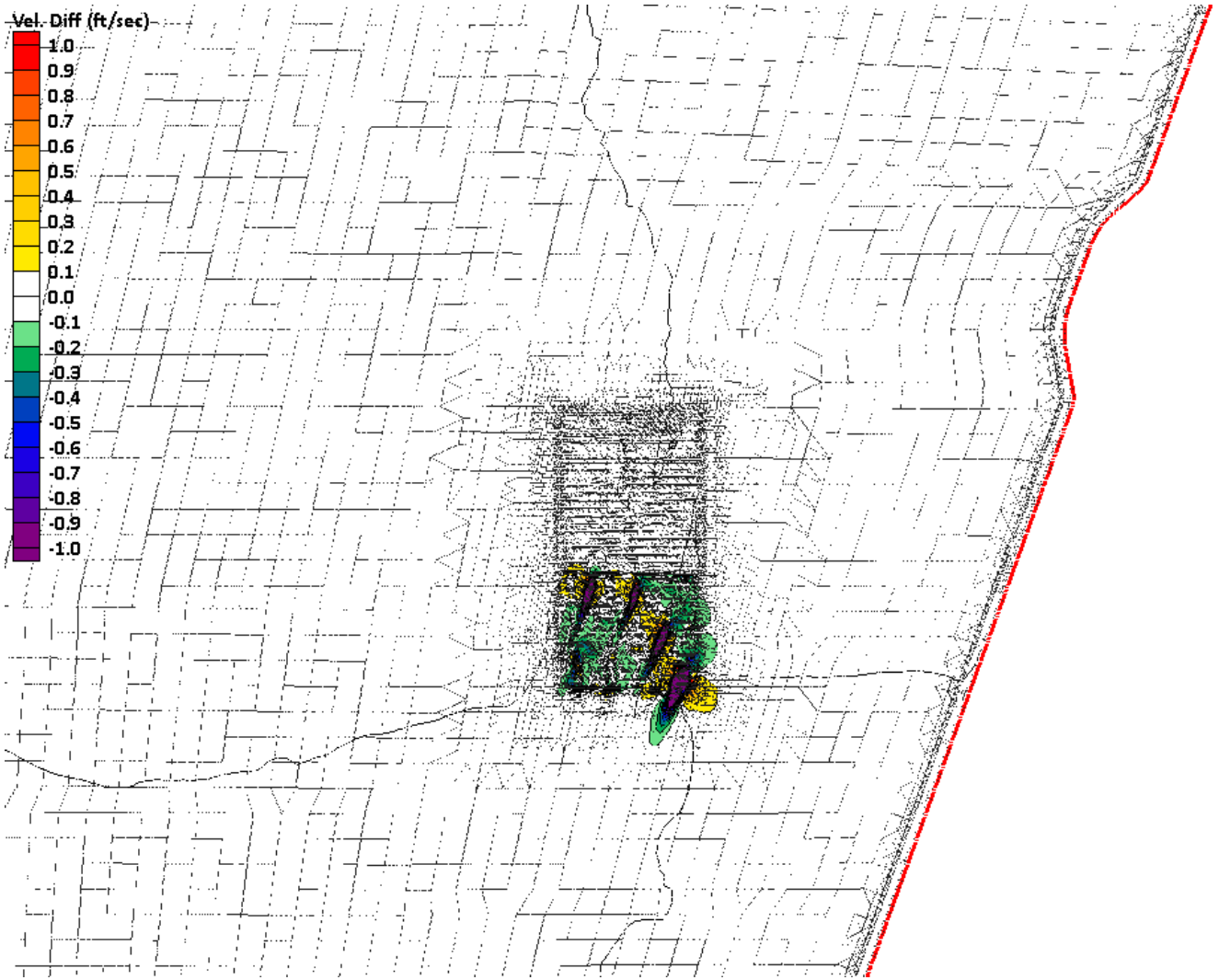
Capital Conservation Bank

Phase 2 ungrazed WSE change

Project No. 10-1016	Created By: CRC	**Figure 11**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig11_WSE_Ph2nograze.docx
6/2/2011



Notes:

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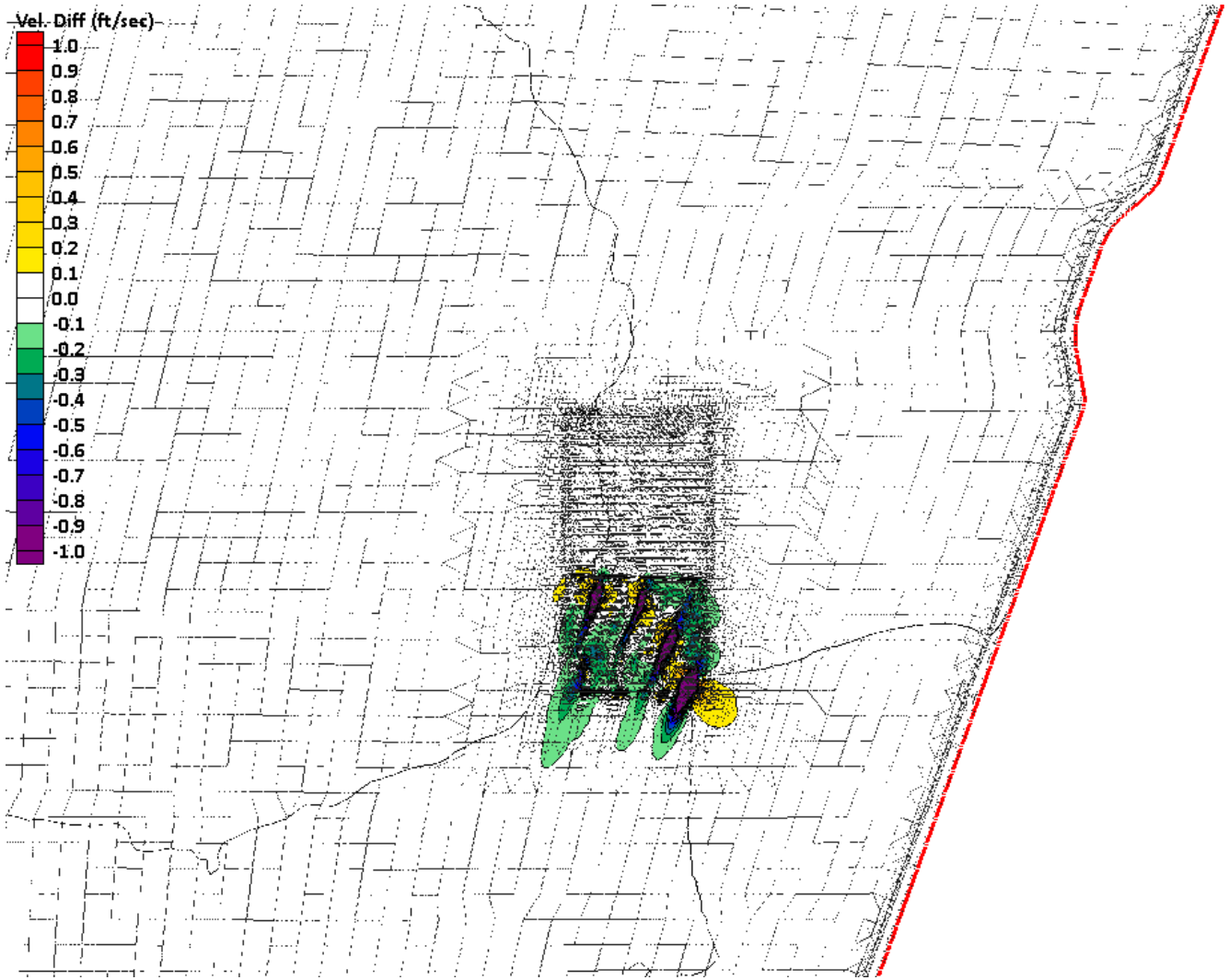
Capital Conservation Bank

Phase 1 grazed velocity change

Project No. 10-1016	Created By: CRC	**Figure 12**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig12_Vel_Ph1graze.docx
6/2/2011



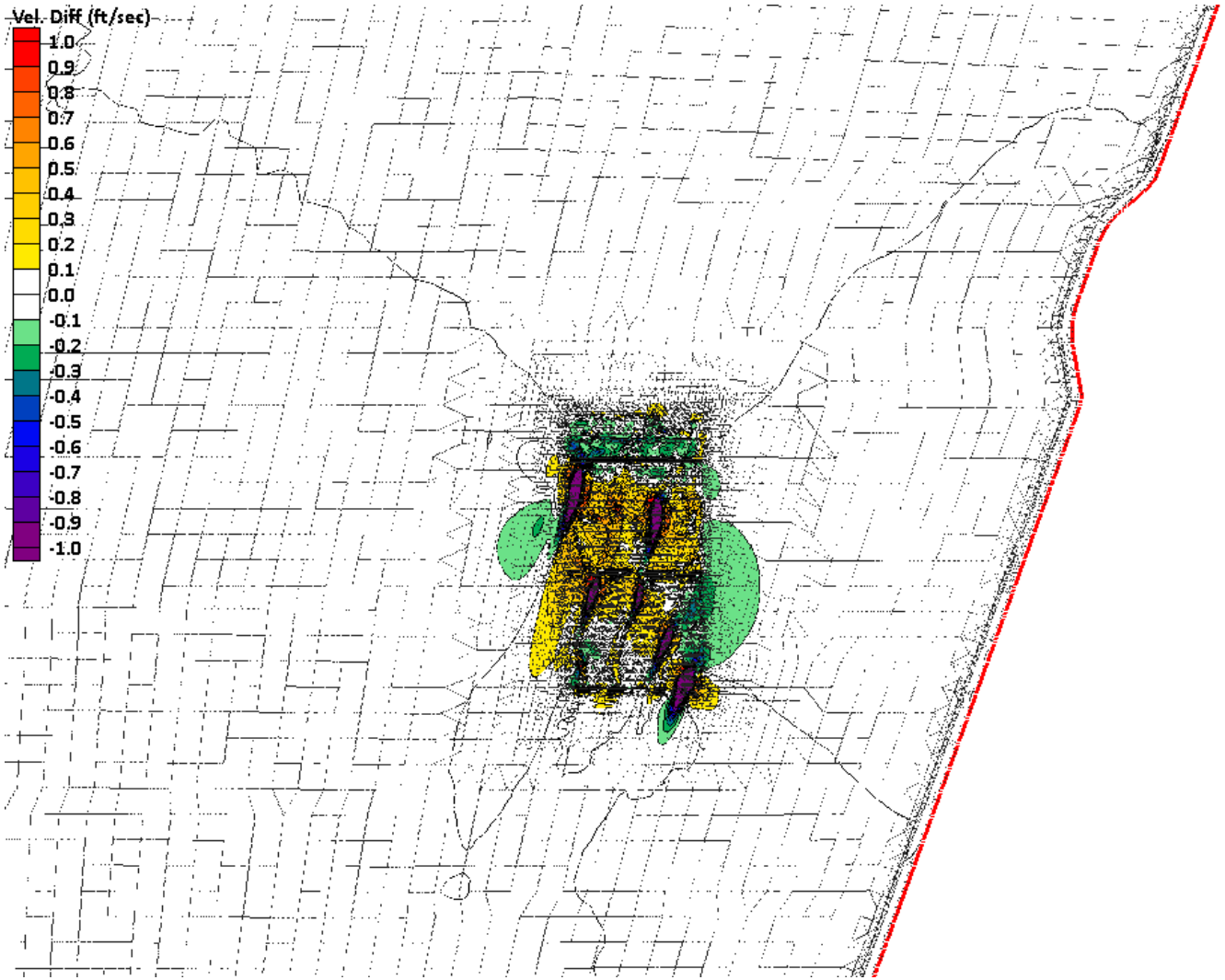
Notes:

Capital Conservation Bank

Phase 1 ungrazed velocity change

Project No. 10-1016	Created By: CRC	**Figure 13**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig13_Vel_Ph1nograze.docx
6/2/2011



Notes:

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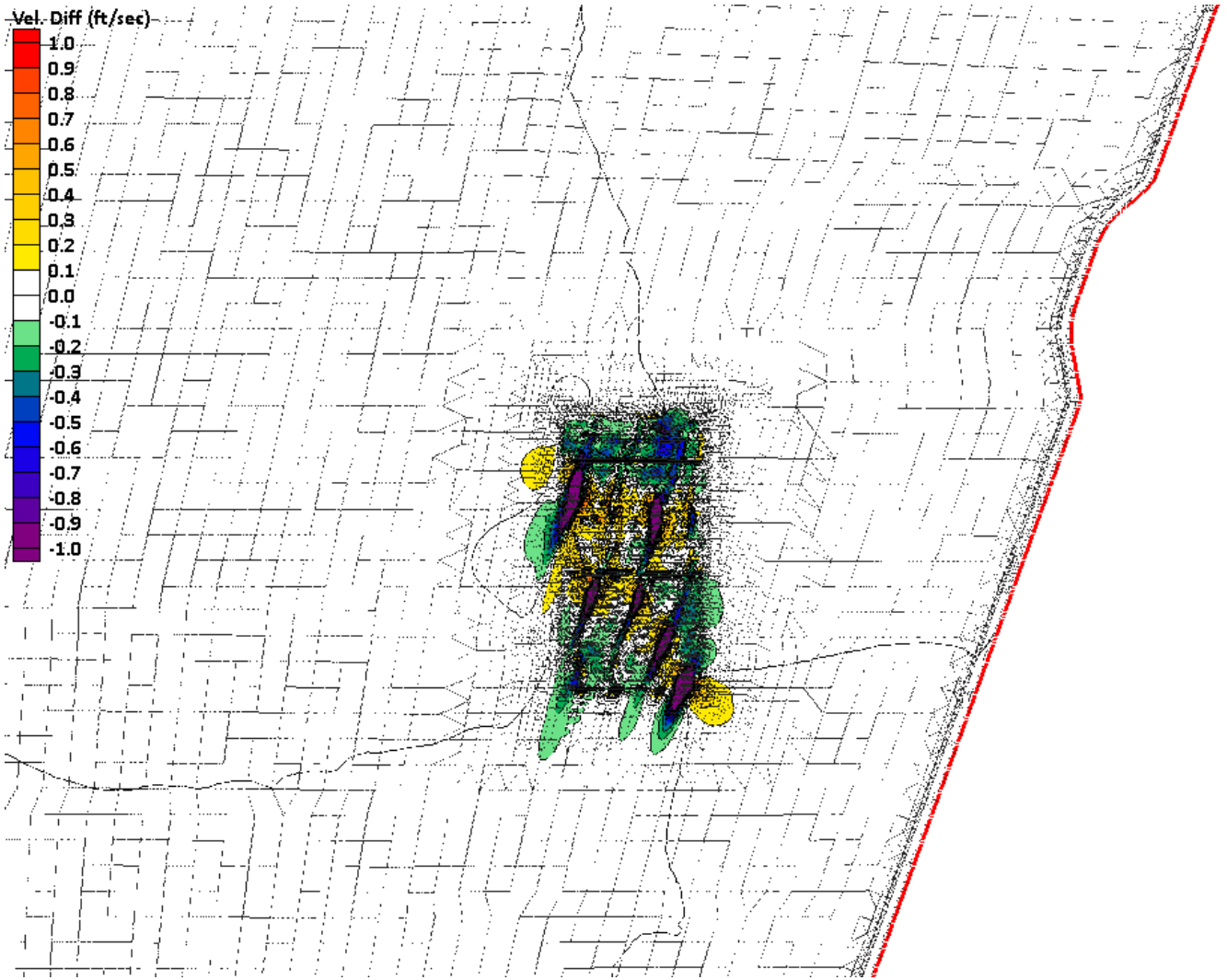
Capital Conservation Bank

Phase 2 grazed velocity change

Project No. 10-1016	Created By: CRC	**Figure 14**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig14_Vel_Ph2graze.docx
6/2/2011



Notes:

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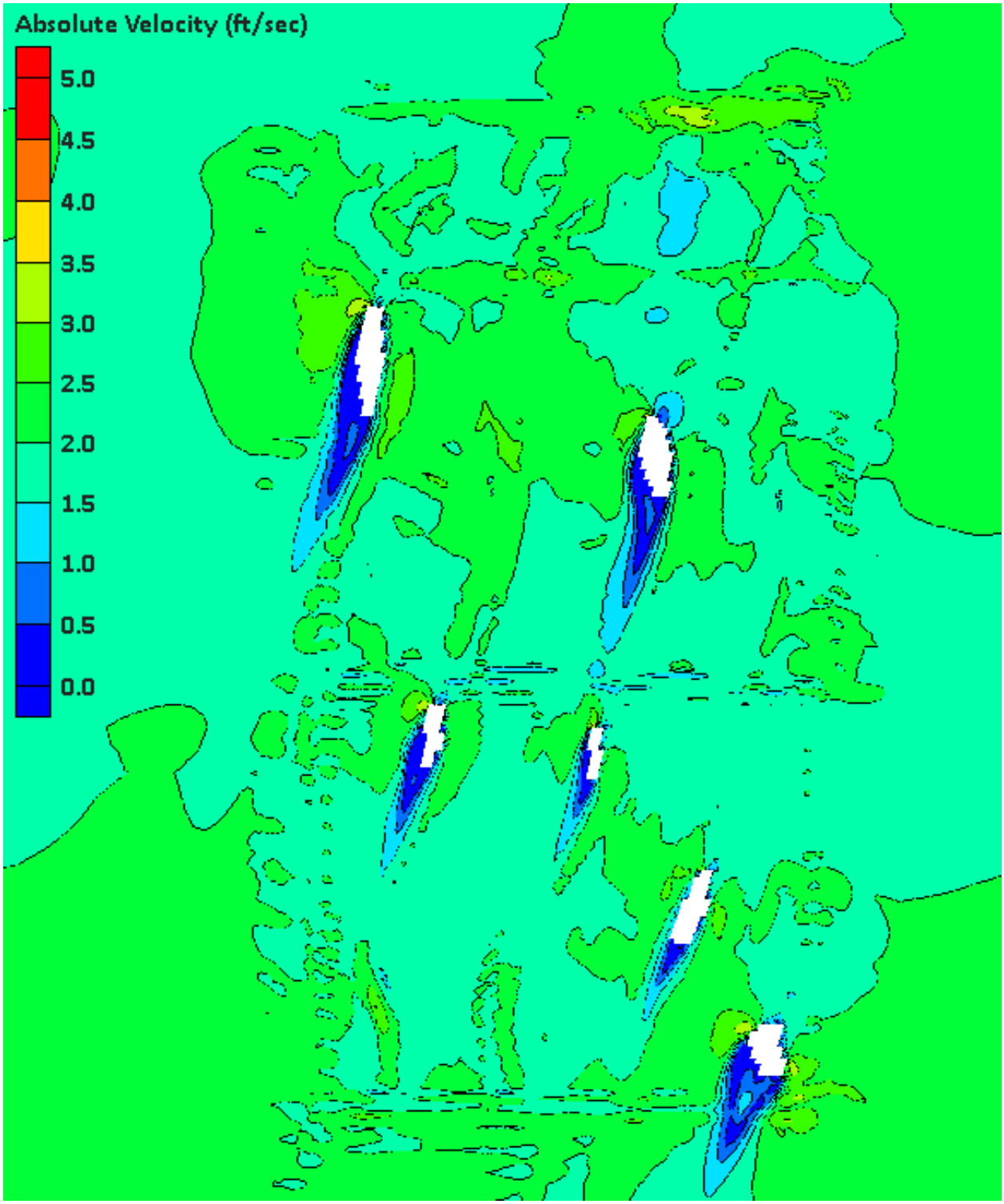
Capital Conservation Bank

Phase 2 ungrazed velocity change

Project No. 10-1016	Created By: CRC	**Figure 15**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig15_Vel_Ph2nograze.docx
6/2/2011



Notes:	cbec eco engineering	*Capital Conservation Bank* **Phase 2 grazed absolute velocity**		
		Project No. 10-1016	Created By: CRC	**Figure 16**

R:\Projects\10-1016_Capital_GGS\Reporting\Figures\Fig16_Phase2_Abs_Velocity.docx
6/3/2011

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Table B-1. Sacramento River Watershed Channel Capacity Status (contd.)

River Reach[1]	River Miles[2]		Design Flows from Senate Document No. 23	Design Capacity from O&M Manual (cfs)	Design Flow from 1957 Revised Profile Drawings (cfs) (Basis of State Operations)	Difference between 1957 Profile Flow and O&M Capacity (yes/no)	Estimated Current Channel Conveyance Capacity (cfs)	Channel Capacity Status	Data Source for Estimated Current Capacity	Comments
	From	To								
Yolo Bypass										
Fremont Weir to Knights Landing Ridge Cut	57.2	54.2	343,000	343,000	343,000	No	290,000	Potential inadequacy; additional evaluation required	MBK modeling for Natomas 408 Impact Analysis	None
Knights Landing Ridge Cut to Cache Creek	54.2	51.8	362,000	362,000	362,000	No	276,000	Potential inadequacy; additional evaluation required	MBK modeling for Natomas 408 Impact Analysis	None
Cache Creek to Sacramento Bypass	51.8	45.3	377,000	377,000	377,000	No	201,000	Potential inadequacy; additional evaluation required	MBK modeling for Natomas 408 Impact Analysis	None
Sacramento Bypass to Putah Creek	45.3	39.5	480,000	480,000	480,000	No	334,000	Potential inadequacy; additional evaluation required	MBK modeling for Natomas 408 Impact Analysis	None
Putah Creek to RM 29	39.5	29.0	490,000	490,000	490,000	No	322,000	Potential inadequacy; additional evaluation required	MBK modeling for Natomas 408 Impact Analysis	None
RM 29 to Miner Slough	29.0	18.5	500,000	490,000	500,000	Yes	No data	No data	N/A	The Comprehensive Study UNET model does not provide reliable results in this reach. Additional model development will be required.
Miner Slough to Sacramento River	18.5	14.1	500,000	490,000	500,000	Yes	N/A	Backwater controlled; additional evaluation required	MBK modeling for Natomas 408 Impact Analysis	Backwater control – flows vary accordingly.