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EXHIBIT WDCWA-210

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Attorney for Protestant California Department of Fish and Game

BEFORE THE STATE WATER RESOURCES CONTROL BOARD
OF THE STATE OF CALIFORNIA

| | |
|--|-------------------|
| In the Matter of Applications 30358A and) | PROTEST DISMISSAL |
| 30358B,) | AGREEMENT |
|) | |
| CITY OF DAVIS, CITY OF WOODLAND) | |
| and UNIVERSITY OF CALIFORINA,) | |
| DAVIS,) | |
|) | |
| Applicants,) | |
|) | |
| CALIFORNIA DEPARTMENT OF FISH) | |
| AND GAME, et al.,) | |
|) | |
| Protestants.) | |
| _____) | |

The City of Davis, the City of Woodland, and the University of California, Davis (the “Applicants”) and the California Department of Fish and Game (“CDFG”) agree as follows:

RECITALS

A. On April 19, 1994, the Yolo County Flood Control and Water Conservation District (the “Yolo District”) filed Application 30358 to appropriate water from the Sacramento River for use in Yolo County.

B. On November 28, 1994, CDFG filed a protest to Application 30358.

C. On November 6, 2001, the Yolo District assigned all of its right, title and interest in Application 30358 to the Applicants.

D. On September 25, 2005, the State Water Resources Control Board (the “SWRCB”) advised the Applicants that it had received notice from the Yolo District of this assignment, and that the SWRCB was splitting Application 30358 into Application 30358A of the City of Davis and the University of California, Davis, and Application 30358B of the City of Woodland.

E. The Applicants now are pursuing the development of one proposed project, which is known as the “Davis-Woodland Water Supply Project.” This proposed project is described in the April 2007 Draft Environmental Impact Report (the “Draft EIR”) and November 2007 Final Environmental Impact Report (the “Final EIR”) for the Davis-Woodland Water Supply Project. This project is referred to in this Agreement as the “Project.”

F. The Applicants and CDFG now wish to resolve CDFG’s protest to Application 30358 according to the terms of this agreement.

NOW, THEREFORE, in consideration of these recitals and the mutual promises stated herein, the Applicants and CDFG agree as follows:

1. All of the permit terms that are stated in the attached Appendix A will be included in any permit issued on Application 30358A or Application 30358B.

2. Any diversion facility for the Project will be equipped with a fish screen that will comply with CDFG's present fish screening criteria, a copy of which is attached to this agreement as Appendix E, with a maximum approach velocity of 0.33 feet per second. The Applicants will operate, maintain, repair and replace this fish screen (or portions of this fish screen) as necessary so that this fish screen will continue to comply with these fish screening criteria. The Applicants will not divert water pursuant to any permit issued on Application 30358A or Application 30358B during any time when this fish screen is not operational or does not comply with these fish screening criteria.

3. The Applicants will consult with CDFG and, as appropriate, obtain authorization pursuant to Fish and Game Code section 2080.1 or section 2081, subdivision (b) for any potential incidental take of any listed species that is protected under the California Endangered Species Act ("CESA") by the Project's diversions of water from the Sacramento River or related operations of the Project's Sacramento River diversion facilities. (No such authorization may be obtained for any "fully protected" species or specified birds. See Fish and Game Code sections 3505, 3511, 4700, 5050, 5515 and 5517.)

4. The Applicants will submit the notification or notifications that are required by California Fish and Game Code sections 1600-1616 for the construction of Project access

roads, the intake facility on the Sacramento River and conveyance structures from the point of diversion to the Sacramento River levee.

5. The Applicants will implement the Davis-Woodland Water Supply Project Positive Barrier Fish Screen Performance Evaluation and Monitoring Plan that is described in the attached Appendix C for the fish screen described in that plan, and they will operate, maintain, repair and replace this fish screen as necessary to address any problems that are identified through this monitoring program.

6. Consistent with the project description in the Draft EIR (see Draft EIR, pp. 2-5, 2-19 to 2-27 and Figs. 2-2 & 2-9), all conveyance pipelines for the Project will be buried and located within existing public rights-of-way to the maximum extent possible to minimize potential impacts to environmental resources including wetlands and associated habitats. The Applicants will use their best efforts to obtain the necessary permits and authorizations to construct these conveyance pipelines within the alignment of the Pipeline Alternative 1A or the Pipeline Alternative 2A that are described in the April 17, 2009 memorandum and map book prepared by ESA Land Management, and, if they can obtain these permits and authorizations, and if the total cost of constructing these pipelines in one of these alignments (including associated mitigation costs) does not exceed the total cost of constructing these pipelines in another alignment (including associated mitigation costs) by more than \$1,500,000, then they will construct these pipelines in one of these alignments. The \$1,500,000 amount in the preceding sentence will be adjusted in proportion to proportionate changes in the Engineering News Record Construction Cost Index between the date of execution of this agreement and the date of construction of these pipelines.

If the Applicants are not able to obtain all of these permits and authorizations, or if the total cost of constructing these pipelines in one of these alignments exceeds the total cost of constructing these pipelines in another alignment by more than the amount specified in the preceding paragraph, then the Applicants will meet with CDFG to try to reach agreement on another pipeline alignment. If the Applicants and CDFG cannot reach agreement on another pipeline alignment, then the Applicants may ask the SWRCB to hold a hearing and to issue an order regarding the appropriate pipeline alignment. Both the Applicants and CDFG may participate in this hearing, present any evidence and make any arguments that they believe are appropriate during the hearing, and pursue any available legal remedies regarding the SWRCB's order following the hearing.

Within the Applicants' service areas, pipelines to convey Project water will be installed in existing street rights-of-way to the maximum extent feasible.

7. The Applicants will implement the mitigation measures that are listed and described in the attached Appendix B. (The Applicants are referred to in Appendix B as the "Project Partners.")

8. The Applicants will consult with CDFG and, as appropriate, obtain authorization pursuant to Fish and Game Code section 2080.1 or section 2081, subdivision (b) for any potential incidental take of any listed species that is protected under the California Endangered Species Act ("CESA") by the construction or operations of the Project pipelines that will convey water from the Sacramento River to the Applicants' service areas, or by the Project water treatment plant. (No such authorization may be obtained for any "fully protected" species or specified birds. See Fish and Game Code sections 3505, 3511, 4700, 5050, 5515 and 5517.)

9. The Applicants will submit the notification or notifications that are required by Fish and Game Code sections 1600-1616 for the construction of Project pipelines that cross stream channels or otherwise are subject to these statutes.

10. The Applicants firmly intend, and commit in good faith, to enter into long-term transfer agreements (consistent with section 2.4 of the Draft EIR), and to seek approvals from the SWRCB and the Bureau of Reclamation for such agreements, for a base water-transfer supply at least 14,600 acre-feet per year, which will be used during times when diversions of water from the Sacramento River are not authorized by any permits issued on Application 30358A or Application 30358B. “Long-term transfer agreements” mean transfer agreements with terms the same as the terms of the Sacramento River settlement contracts that the water-rights holders described in section 2.4 of the Draft EIR and other water-rights holders have with the Bureau of Reclamation, and with rights of renewal like the rights of renewal in these contracts. These contracts have terms that expire in 2045, and they contain rights of renewal.

The Applicants also firmly intend, and commit in good faith, to enter into long-term transfer agreements (consistent with section 2.4 of the Draft EIR), and to seek approvals from the SWRCB and the Bureau of Reclamation for such agreements, for options to divert an additional water-transfer supply at least 4,900 acre-feet per year, which will be used during the years when additional water-transfer supplies are needed because diversions of water from the Sacramento River are not authorized by any permits issued on Application 30358A or Application 30358B.

If the Applicants seek approval from the SWRCB or the Bureau of Reclamation for more than one one-year temporary water transfer for part or all of the base supply or

the additional water-transfer supply described in the preceding two paragraphs, then the Applicants will meet and confer with CDFG regarding the Applicants' commitments under this section 10 of this agreement, and they will work in good faith with CDFG to develop a plan to take actions to promptly meet the commitments in this section 10.

The remaining water for the Project may be obtained through either long-term or temporary transfers, or will be made up from groundwater pumped directly by the Applicants.

11. The Cities of Davis and Woodland currently are engaged in the Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) process with Yolo County. To the extent required by law, development in accordance with the Cities' adopted general plans will be mitigated through the regional HCP/NCCP that now is being developed, and development in accordance with the University of California, Davis's adopted long-range development plan will be mitigated through the Habitat Conservation Plan that the University is developing. No indirect impacts to agricultural lands associated with the proposed project have been identified.

12. The Applicants will comply with all applicable requirements in any applicable biological opinions that are issued under the federal Endangered Species Act (16 U.S.C., §§ 1531-1544) for terrestrial activities associated with Project pipelines or the Project water treatment plant footprint.

13. By executing this agreement, CDFG asks the SWRCB to include all of the permit terms that are stated in the attached Appendix A in any permit issued on Application 30358A or Application 30358B and to dismiss CDFG's protest to Application 30358.

14. Although water may be diverted by both the Applicants and Reclamation District 2035 ("RD 2035") at the same intake facility on the Sacramento River, the water pumped by the Applicants and the water pumped by RD 2035 will be pumped through separate pumps and pipes, with separate meters, and will not be commingled after pumping. Reclamation District 2035 will be responsible for reporting the amounts of its diversions of water from the Sacramento River, as required by the terms of the water-rights licenses and contracts that apply to its diversions. Applicants will encourage Reclamation District 2035 to report the instantaneous rate of diversion, the amounts of water diverted each day, and the cumulative quantity of water diverted by it from the Sacramento River.

15. Within six months after issuance of a water-right permit or permits on Application 30358, Applicants and CDFG will develop and complete a proposed scope of work for the Sacramento River Fisheries Study described in Appendix D. This study will begin within one year after initiation of Project diversions from the Sacramento River. Applicants will provide funding of up to a maximum of \$100,000 for this study.

Dated: October 30, 2009

CITY OF DAVIS

By 
William Emlen, City Manager


Dated: October 30, 2009

CITY OF WOODLAND

By 
Mark Deven, City Manager

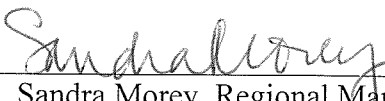
Dated: ~~October~~ ^{November} 4, 2009

UNIVERSITY OF CALIFORNIA, DAVIS

By 
Steven A. Drown, Campus Counsel

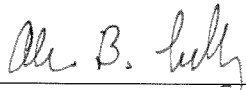
Dated: October 30, 2009

CALIFORNIA DEPARTMENT OF FISH AND GAME

By 
Sandra Morey, Regional Manager
North Central Region

Dated: ~~October~~ ^{November} 4, 2009

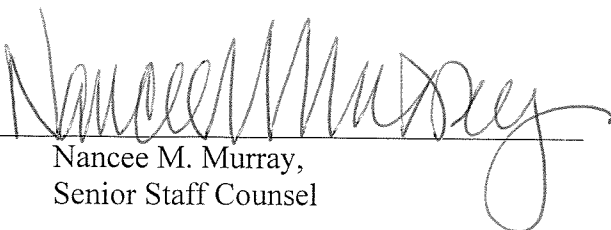
BARTKIEWICZ, KRONICK & SHANAHAN
A Professional Corporation

By 
Alan B. Lilly

Attorneys for the Applicants, City of Davis, City of Woodland, and University of California, Davis

Dated: October 30, 2009

CALIFORNIA DEPARTMENT OF FISH AND GAME

By 
Nancee M. Murray,
Senior Staff Counsel

APPENDIX A

Proposed Permit Terms

SWRCB Standard Permit Term 5A, modified for Davis-Woodland Project:

The total amount of water appropriated under permits issued on Applications 30358A and 30358B shall be limited to the quantity which can be beneficially used and shall not exceed 80.3 cubic feet per second (monthly average diversion rate) to be diverted from January 1 to December 31 of each year. Permittee may divert water under these permits at instantaneous rates of up to 100 cfs, for reasonable short-term variations, as necessary for the operations of permittee's water treatment plant, so long as the maximum average monthly diversion rate in the preceding sentence is not exceeded. The maximum total amount diverted under these permits shall not exceed 45,000 acre-feet per year.

(0000005A)

SWRCB Standard Permit Term R, modified for Davis-Woodland Project:

Permittee shall install and maintain devices satisfactory to the State Water Resources Control Board to measure the instantaneous rate of diversion, the amounts of water diverted each day, and the cumulative quantity of water diverted under this permit. Permittee shall make daily readings of these measuring devices and record these readings. Records of all such measurements shall be maintained by the Permittee, and made available to interested parties upon reasonable request. Permittee also shall, subject to any applicable Homeland Security restrictions, post such records on a publicly accessible website within 48 hours after the measurements are made. Copies of the records shall be submitted to the State Water Resources Control Board with the annual "Progress Report by Permittee" and Permittee shall submit copies of these records to the California Department of Fish and Game each year when these records are submitted to the State Water Resources Control Board.

Permittee shall allow the California Department of Fish and Game, or a designated representative, reasonable access to measuring devices for the purpose of verifying measurement readings.

Although water may be diverted by both Permittee and Reclamation District 2035 ("RD 2035") at the same intake facility on the Sacramento River, the water pumped by the Applicants and the water pumped by RD 2035 must be pumped through separate pumps and pipes, with separate meters, and may not be commingled after pumping.

(000000R)

Special permit term regarding fish screen:

No water shall be diverted under this permit except through a fish screen on the intake to the diversion structure, satisfactory to meet the physical and operational specifications of

the California Department of Fish and Game, United States Fish and Wildlife Service, and National Marine Fisheries Service to protect species of fish listed as endangered or threatened species under the California Endangered Species Act (Fish and Game Code sections 2050 to 2098) or the federal Endangered Species Act (16 U.S.C. sections 1531 to 1544) that are in effect on [insert date of Agreement]. Construction, operation, and maintenance costs of the required facility are the responsibility of the Permittee.

SWRCB Standard Permit Term 14:

This permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C. sections 1531 to 1544). If a “take” will result from any act authorized under this water right, the permittee shall obtain authorization for an incidental take prior to construction or operation of the project. Permittee shall be responsible for meeting all requirements of the applicable Endangered Species Act for the project authorized under this permit.

(0000014)

SWRCB Standard Permit Term 63:

No work shall commence and no water shall be diverted, stored or used under this permit until a copy of a stream or lake alteration agreement between the State Department of Fish and Game and the permittee is filed with the Division of Water Rights. Compliance with the terms and conditions of the agreement is the responsibility of the permittee. If a stream or lake agreement is not necessary for this permitted project, the permittee shall provide the Division of Water Rights a copy of a waiver signed by the State Department of Fish and Game.

(0000063)

APPENDIX B

(From Davis-Woodland Project EIR Mitigation Monitoring and Reporting Program, as modified by this Agreement)

Drainage and Floodplains

Impact 3.4-7: Removal and stockpiling of trench spoils during Project construction would release chemicals or spoils into the surrounding environment and affect surface water quality.

Measure 3.4-7a: Before construction begins, the Project Partners will consult with CDFG regarding the proposed upland sites where spoil material from trenching will be stockpiled. After making this consultation, the Project Partners will provide CDFG with a map of these proposed sites and the Project Partners' proposed conditions for using these sites. Within 60 days after receipt of this map and these proposed conditions, CDFG will respond to the Project Partners, advising them: (i) which sites are approved and what, if any, additional conditions must be followed when each such site is used; and (ii) which sites are not approved and what are the reasons for each such non-approval. If the Project Partners do not agree with CDFG's disapproval of any proposed site or with any of CDFG's additional conditions for use of any approved site, and if the Project Partners and CDFG cannot resolve these issues, then the Project Partners may ask the SWRCB to hold a hearing and issue an order regarding whether the Project Partners may use any of the sites that were disapproved by CDFG and regarding the conditions for the use of any site approved by CDFG or the SWRCB.

Measure 3.4-7b: Any trench and tunnel spoils that are stockpiled at any upland site shall be tested before their replacement back into any excavated area or transportation to offsite disposal. Spoils containing high volumes of water shall be detained and allowed to settle at an upland site to reduce turbidity before the spoils are tested. If any such spoils are found to be contaminated by lubrication or hydraulic fluids, then such spoils will be collected and disposed of at a permitted waste disposal facility.

Agriculture

Impact 3.5-4: Construction of the proposed Project would involve changes in the existing environment that, due to its location or nature, would result in conversion of Farmland, to non-agricultural uses.

Measure 3.5-4a: The water conveyance pipeline and transmission pipelines shall be installed at a depth (to the top of the pipe) ranging from 4 to 7 feet below the ground surface. Installation at this depth should be sufficient to avoid conflict with expected agricultural production activities. Final depths shall be established in consultation with an agricultural specialist and landowners to ensure no conflict with future agricultural practices.

Measure 3.5-4b: The Project Partners will establish permanent Prime Farmland agricultural conservation easement at a ratio of 2:1 for the acreage of Prime Farmland that would be permanently displaced with Project development.

Biological Resources

Impact 3.6-1: The Project would interfere substantially with the movement of any native resident or wildlife species or with established native resident or migratory native wildlife corridors, or impede the use of wildlife nursery sites.

Measure 3.6-1: Implement Mitigation Measures for Impacts 3.6-4, 3.6-5, and 3.6-7.

Impact 3.6-2: The Project would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Measure 3.6-2: Prior to construction, Project Partners shall evaluate impacts to trees within the City of Davis city limits and submit the evaluation to the City for review. If deemed necessary, Project Partners shall apply for a permit and abide by any permit requirements for tree pruning or removal. In addition, sensitive habitats and wildlife shall be identified and protected for projects within the City of Davis, under the HAB 1.1 policy.

Impact 3.6-3: The Project would conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Measure 3.6-3: Project design, construction, and operation plans shall conform with, to the greatest extent possible, biological conservation goals fundamental to the ongoing Yolo County NCCP/HCP development process.

Impact 3.6-4: Construction of the intake facility would have a substantial adverse effect on channel margin and fish or other aquatic species, such as by increasing turbidity, degrading water quality or otherwise altering suitable aquatic habitat.

Measure 3.6-4a: Implementation of Mitigation Measure 3.4-1a (implementation of a Stormwater Pollution Prevention Plan (SWPPP) and erosion control measures), as well as Best Management Practices (BMPs) for construction activities, would reduce potential impacts to special-status fisheries species and habitat as well as bank-side habitat, resulting from sedimentation and turbidity. Specific measures aimed at protecting fisheries resources include:

- The Project Partners will prepare and implement a Stormwater Pollution Prevention Plan (SWPPP), acceptable to the Central Valley Regional Water Quality Control Board, for all Project construction activities.
- All instream construction activities will be conducted during the low-flow period of April 30 through October 15.

- Sediment curtains will be placed around the construction or maintenance zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.
- Silt fencing, including appropriate setbacks, where feasible, will be installed in all areas where construction occurs within 100 feet of known or potential steelhead habitat. Silt fencing will be installed adjacent to all aquatic habitat.
- Fresh concrete will be isolated from wetted channels for a period of 30 days after it is poured. If a 30-day curing period is not feasible, a concrete sealant approved for use in fisheries habitat may be applied to the surfaces of the concrete structure. If a sealant is used, the manufacturer's guidelines for drying times will be followed before reestablishing surface flows within the work area.
- Spoil sites (concrete wash areas) will be located so as to prevent drainage into the Sacramento River. If a spoil site drains towards the Sacramento River, then lined catch basins will be constructed to intercept sediment before it reaches the channel and removal of spoils will be conducted daily during routine maintenance of work sites. Spoil sites will be graded to reduce the potential for erosion.
- No disturbed surfaces will be left without erosion control measures (consistent with the SWPPP) in place during the wet season from October 15 through April 30. Erosion protection shall be provided on all cut and graded slopes and vegetative cover shall be established on each construction site as soon as possible after disturbance of the site.
- The Project Partners will, in consultation with CDFG, prepare and implement a Revegetation Program Plan that provides for the establishment and ongoing maintenance of native riparian species in all disturbed bank-side construction areas.

Measure 3.6-4b: Installation of the cofferdam for construction of the intake structure is expected to result in short-term increases in local suspended sediment concentrations that may affect the distribution and behavior of sensitive fish species and their habitat. To avoid and minimize these impacts, site preparation and installation of the sheet pile cofferdam will occur during the summer and fall. A pre-construction GGS survey shall be conducted at the intake site prior to any cofferdam staging activity. GGS survey shall be conducted by a qualified biologist in accordance with USFWS survey protocols, and findings shall be reported to CDFG and USFWS. As appropriate, follow-up inspections for presence of GGS individuals shall be conducted within 24 hours of initiating activity.

Measure 3.6-4c: In order to offset the permanent loss of 0.1 acres of channel margin habitat or shallow water habitat because of installation of the diversion/intake facility, off-site mitigation habitat shall be purchased in a ratio agreeable to CDFG and other agencies consulted. The Project Partners will work in consultation with CDFG, USFWS and the National Marine Fisheries Service to characterize functionally equivalent habitat for channel margin loss, and to identify the appropriate ratio of in-kind riparian corridor

habitat suitable for use by wildlife species known to reside within 2 river miles of the intake construction site.

Measure 3.6-4d: Installation of a cofferdam and dewatering may result in stranding and the loss of protected fish and other aquatic or terrestrial species. The Project Partners will ensure that a qualified fisheries biologist will design and conduct a fish rescue and relocation effort to collect fish from the area within the cofferdam involving the capture and return of those fish to suitable habitat within the Sacramento River. To ensure compliance, a fisheries biologist shall provide observation during initial dewatering activities within the cofferdam. The fish rescue plan will be provided for review and comment to NOAA Fisheries, USFWS, and CDFG prior to implementation.

The success of this dewatering measure will be the effective capture and removal of fish from the area to be dewatered with a minimum of capture and handling mortality for those fish returned to the Sacramento River. Implementation of the fish rescue and relocation program will avoid and minimize impacts to Chinook salmon, steelhead, other fish, and macroinvertebrate species, and thus reduce impacts to less than significant.

Impact 3.6-5: Construction of the Project intake structure would generate noise or vibrations that would adversely affect the behavior, movement, and local distribution of special-status fish.

Measure 3.6-5a: To the maximum extent reasonably feasible, installation of sheet piles and beams during construction of the cofferdam for the Project intake structure will be performed using a vibrating method. This method will be used so that vibratory sound waves that could cause potential adverse behavioral responses by salmonid species or by sensitive reptilian or avian species in the vicinity of the construction activity will be minimized.

Measure 3.6-5b: Prior to pile driving by any technique other than the vibrating method, the Project Partners will provide to CDFG a scientifically supported analysis to demonstrate that effects of the method will be limited to thresholds below that which could create sound pressure injury to juvenile salmonids in the vicinity.

Impact 3.6-7: The Project would have other substantial adverse effects, either directly or through habitat modifications, on any terrestrial species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG, USFWS, or NMFS.

Plant species – Alkali milk-vetch, brittlescale, San Joaquin spearscale (saltbrush), palmate-bracted bird's beak, Heckard's peppergrass, Ferris milk-vetch, heartscale, rose mallow, Sanford's arrowhead, and Brazilian watermeal:

Measure 3.6-7a: A pre-construction survey for rare plants of the selected diversion/intake site and conveyance pipeline route shall be conducted. The survey shall be conducted by a qualified botanist during the appropriate season for identification,

according to CNPS Botanical Survey Guidelines, included in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR. Data shall be compiled and reported to CDFG before initiating any construction.

Measure 3.6-7b: Identified populations of palmate-bracted bird's beak that would be directly affected by proposed Project construction will be completely avoided. Temporary preservation fencing shall be installed to protect individuals, and fencing shall provide a minimum 25-foot distance exclusion area. Indirect effects due to changes in hydrology or other ecological requirements for this species shall be evaluated and modifications to the Project design/construction shall be incorporated to minimize indirect effects to palmate-bracted bird's beak.

Measure 3.6-7c: For individual Ferris's milk-vetch, alkali milk-vetch, heartscale, brittlescale, San Joaquin saltbush, Heckard's pepper-grass, rose-mallow, Sanford's arrowhead, Brazilian watermeal, or other special-status species without state or federal status that are detected within the proposed Project area during the pre-construction survey, the Project Partners shall identify and protect their locations with orange fencing, avoid specimens as feasible, and notify CDFG. Where these sensitive plants cannot be avoided by the Project, additional mitigation measures shall be implemented by the Project Partners in consultation with CDFG, prior to construction. These measures may include, but are not limited to the following (see also Mitigation Measure 3.6-8a):

- Minimizing impacts by restricting removal of plants to a few individuals of a relatively large population;
- Preparing a plan to relocate plants to suitable habitat outside the proposed Project area to a CDFG-approved site;
- Restoring or enhancing occupied habitat at an off-site location with appropriate ecological conditions to support the affected sensitive species.
- The pipelines shall be located entirely underground and the ground surface will be returned to pre-project grade and contours.
- Pipeline alignments shall be located according to paragraph 6 of this agreement.
- Project Partners shall consult with CDFG on constraints and opportunities for viable off-site habitat enhancement/creation for the species concerned and implement a plan for restoration and enhancement.
- The plan shall include a five-year monitoring and maintenance program to evaluate and support the establishment of the sensitive species, and shall include contingencies for additional recruitment, planting and monitoring, as necessary, if survivorship falls below 75%.
- Preserving occupied habitat for the species on-site or at another regional location.

Vernal Pool and Seasonal Wetland Species – *Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and western spadefoot:*

Measure 3.6-7d: With the implementation of Mitigation Measure 3.6-9a, prior to construction of the Project the selected diversion/intake pipeline corridor area shall be surveyed and assessed for the potential to support vernal pool and seasonal wetlands. All wetlands within 250 feet of the selected diversion/intake pipeline corridor shall be included in the assessment.

Measure 3.6-7e: All vernal pool and seasonal wetland habitats identified during the wetland delineation shall either be:

- (a) Surveyed for presence or absence of vernal pool crustaceans according to USFWS survey protocol (in the February 28, 1996 Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR), where those pools found to contain vernal pool crustaceans shall be mitigated by Mitigation Measures 3.6-7f, 3.6-7g, and 3.6-7h. All other pools shall be mitigated at a 1:1 compensation ratio.

Or,

- (b) Assumed to be occupied by vernal pool crustaceans and the following Mitigation Measures 3.6-7f, 3.6-7g, and 3.6-7h shall be implemented for all pools.

Measure 3.6-7f: All vernal pool and seasonal wetland habitats identified shall be avoided completely. The USFWS considers disturbance within 250 feet of all vernal pool wetlands to be an impact. Therefore, all wetlands shall be avoided by 250 feet and protected within that buffer. Protective measures may consist of temporary fencing such as silt fencing and plastic construction fencing. Also, Best Management Practices (BMPs) and Stormwater Pollution Prevention Plan (SWPPP) methods shall be implemented during construction to avoid indirect water quality impacts to wetlands. These pools shall be considered “avoided” and no further mitigation is necessary.

Measure 3.6-7g: If impacts to vernal pool and seasonal wetlands cannot be avoided but can be protected from direct fill or ground disturbance, then these wetlands shall be identified and protected using temporary fencing, which shall take the form of silt fencing and temporary plastic construction fencing placed no closer than 25 feet from the edge of the pool. The distance between the pool and protective fencing shall be maximized wherever possible. These pools will be considered as “indirectly affected” by project activities and shall be mitigated in accordance with the February 28, 1996 Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California (a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR). Some pools may be considered avoided if it can be shown that the proposed project activity would not adversely impact their surface and subsurface hydrology. This shall be considered on a case-by-case basis by a qualified biologist and hydrologist.

Measure 3.6-7h: For pools that will be directly impacted by project activities, the area of impact shall be calculated. For the purpose of this calculation, any portion of a pool that is directly impacted by project activities would result in the entire pool being identified as being permanently impacted. Impacted pools shall then be mitigated in accordance with the February 28, 1996 Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans within the Jurisdiction of the Sacramento Field Office, California (a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR).

Measure 3.6-7i: With the implementation of Mitigation Measure 3.6-9a, prior to construction of the Project the selected diversion/intake pipeline corridor area shall be surveyed and assessed for the potential to support vernal pool and seasonal wetlands which may support California tiger salamander and western spadefoot. The survey shall include the entire Project footprint and all areas within 1.24 miles of proposed project activities (where site access allows) for the presence of CTS using the protocol provided in the October 2003 Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR. Should California tiger salamander be detected in the area, all ground squirrel burrows and vernal pools shall be mapped within 1.24 miles of the proposed Project, and all vernal pools areas shall be calculated within this area.

Measure 3.6-7j: Vernal pools and burrows that can be protected from project activities shall be identified and protected from disturbance using temporary fencing. Temporary fencing shall take the form of silt fencing and temporary plastic construction fencing placed no closer than 25 feet from the edge of the habitat. The distance between the habitat and protective fencing shall be maximized wherever possible. Protective fencing around vernal pools identified as potential habitat for special-status amphibians shall be constructed in a way that allows California tiger salamander and western spadefoot to access these wetlands.

Measure 3.6-7k: For impacts to vernal pools and occupied California tiger salamander burrows, impacted vernal pools and burrow habitat quantified and shall be mitigated and compensated in accordance with Mitigation Measure 3.6-7h. Burrows that cannot be avoided shall be excavated by a USFWS-approved biologist prior to construction using hand tools. Excavated California tiger salamanders shall be relocated off the project site to a USFWS-approved site.

Valley elderberry longhorn beetle:

Measure 3.6-7l: Prior to construction of the Project, the selected diversion/intake pipeline corridor area shall be surveyed and assessed for the presence of elderberry shrubs. The survey shall be conducted according to USFWS's July 9, 1999 Conservation Guidelines for Valley Elderberry Longhorn Beetle, a copy of which is in Appendix C2 of

the Davis-Woodland Water Supply Project Draft EIR. The survey may be conducted concurrently with the rare plant surveys in Mitigation Measure 3.6-7a.

Measure 3.6-7m: Construction of the diversion/intake pipeline corridor shall avoid identified elderberry shrubs by a minimum of 100 feet. If complete avoidance is not feasible, then USFWS shall be consulted regarding impacts to valley elderberry longhorn beetle. Compensation for disturbance within 100 feet of shrubs will be implemented in a manner approved by USFWS and CDFG and may include transplanting elderberry shrubs into a conservation area for valley elderberry longhorn beetle. The conservation area must be at least 1,800 square feet and should be planted with 5 additional elderberry plants plus 5 native associated plants for every one transplanted/impacted elderberry shrub. Refer to USFWS's July 9, 1999 Conservation Guidelines for Valley Elderberry Longhorn Beetle, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR, for details.

Reptiles – Giant garter snake and western pond turtle:

Measure 3.6-7n: Prior to Project construction, the Project Partners shall survey the selected diversion/intake and pipeline siting option for giant garter snake habitat suitability within one year of anticipated construction. The survey area shall include up to 200 feet of upland habitat surrounding potential aquatic habitat for giant garter snake according to the USFWS November 13, 1997 programmatic biological opinion for giant garter snake (a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR). Habitat assessments shall follow CDFG guidelines Appendix D: Protocols for Pre-Project Surveys to Determine Presence or Absence for the Giant Garter Snake and to Evaluate Habitats, as cited in the USFWS Draft Recovery Plan for the Giant Garter Snake. These guidelines are included in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR.

Measure 3.6-7o: If suitable giant garter snake habitat is present, then the following mitigation measures will be implemented to avoid impacts to potential giant garter snake movement corridors. These mitigation measures are in accordance with the USFWS programmatic biological opinion for giant garter snake and pertain to Level 3 impacts, which are those where (a) there is a permanently loss of less than 3 acres of both aquatic and upland habitat for giant garter snake; (b) there is a permanent loss of less than 1 acre of aquatic habitat for giant garter snake; (c) there is a permanent loss of less than 218 linear feet of bank habitat; and (d) temporary disturbances are less than 20 acres and will occur over greater than 2 seasons.

- Construction activity within giant garter snake habitat shall occur between May 1 and October 1, which is the active period for the snake. Between October 2 and April 30, the USFWS Sacramento Fish and Wildlife Office and CDFG, North Central Region, shall be consulted to determine if additional measures are necessary to minimize and avoid take. Such measures might include but are not limited to requiring a biological monitor on site during construction within giant garter snake habitat.

- Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.
- Construction personnel shall participate in a Service-approved worker environmental awareness program. Under this program, workers shall be informed about the presence of giant garter snakes and habitat associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of the Act. Prior to construction activities, a qualified biologist approved by the Service shall instruct all construction personnel about giant garter snake as directed in the USFWS programmatic biological opinion for giant garter snake. Proof of this instruction shall be submitted to the Sacramento Fish and Wildlife Office and CDFG, North Central Region.
- Pre-construction surveys for the giant garter snake shall be conducted by a USFWS-approved biologist within 24 hours prior to ground disturbance. Giant garter snake encounters and field reports shall be addressed per the USFWS programmatic biological opinion for giant garter snake.
- Clearing of wetland vegetation will be confined to the minimal area necessary to excavate toe of bank for riprap or fill placement. Excavation of channel for removal of accumulated sediments will be accomplished by using equipment located on and operated from top of bank, with the least interference practical for emergent vegetation.
- Movement of heavy equipment to and from the project site shall be restricted to established roadways to minimize habitat disturbance.
- Preserved giant garter snake habitat shall be designated as Environmentally Sensitive Areas and shall be flagged by a qualified biologist approved by CDFG and the Service and shall be avoided by all construction personnel.
- After completion of construction activities, any temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions. Restoration work may include replanting emergent vegetation as directed in the USFWS programmatic biological opinion for giant garter snake.
- Impacts to giant garter snake habitat shall be mitigated in accordance with USFWS mitigation compensation ratios, based on described levels of impact in the programmatic biological opinion. More than two season duration and temporary or permanent losses of habitat shall be compensated at 3:1 or the ratios described in Table 1 on page 7 of the USFWS November 13, 1997 programmatic biological opinion for giant garter snake, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR, and shall meet the criteria listed in the USFWS programmatic biological opinion for giant garter snake.
- All wetland and upland acres created and provided for the giant garter snake shall be protected in perpetuity by a Service-approved conservation easement or

similarly protective covenants in the deed and comply with provisions in the USFWS programmatic biological opinion for giant garter snake. Documentation of such land preservation shall be provided to CDFG.

- The Reporting Requirements shall be fulfilled in compliance with the USFWS programmatic biological opinion for giant garter snake and the reports shall be submitted to the USFWS and CDFG.

Measure 3.6-7p: The following measures shall be implemented to compensate for Level 3 impacts to giant garter snake:

- Replacement of affected giant garter snake habitat at a 3:1 ratio.
- All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres.
- If restoration of habitat is a component of the replacement habitat, one year of monitoring restored habitat with a photo documentation report due one year from implementation of the restoration with pre- and post-project area photos.
- Five years of monitoring replacement habitat with photo documentation report due each year.

Avian species – Swainson’s hawk:

Measure 3.6-7q: The Project Partners will conduct a pre-construction breeding-season survey (between March 1 and September 15) in the year when construction is scheduled to commence. The survey will be conducted by a qualified biologist, acceptable to CDFG, and according to the Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley, prepared by the Swainson’s Hawk Technical Advisory Committee, dated May 31, 2000, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR.

The survey area shall include all lands with a one quarter-mile radius around any Project construction activities scheduled to occur during that breeding season. If any nesting Swainson’s Hawks are detected, then the Project Partners shall implement the following:

1. Establish a buffer zone of one-quarter mile around the nest site, within which there will be no construction unless one of the following has occurred:
 - a) Based on ongoing monitoring of the nest site by a qualified biologist, and subsequent consultation with the CDFG, it is determined by the CDFG that work can occur within the buffer zone, along with the conditions under which such work may be carried out. Depending on conditions specific to each nest, it may be possible to allow

construction activities within the buffer zone without impacting breeding behavior. In these cases, the nest will be monitored by a qualified biologist acceptable to CDFG. The monitor will have all stop authority. If, in the professional opinion of the monitor, project activities are negatively affecting the nesting or breeding behavior of the birds, then the monitor shall stop all construction activity within the designated buffer zone, and construction activities within this designated buffer zone shall not resume until either the monitor has determined that the young have fledged and the nest is empty or as otherwise approved by CDFG; or,

- b) Monitoring has demonstrated, and the CDFG has concurred, that adults are no longer utilizing the nest area and/or birds of the year have fully fledged;

[The provisions of Measure 3.6-7r in the Davis-Woodland Water Supply Project Draft EIR have been incorporated into Measure 3.6-7q above.]

Measure 3.6-7s: To mitigate for permanent loss of Swainson's hawk foraging habitat associated with the construction of the WTP facility in all Options, compensation shall follow guidance in the May 2, 2002 Agreement Regarding Mitigation for Impacts to Swainson's Hawk Foraging Habitat in Yolo County entered into between CDFG and the Yolo County HCP/NCCP Joint Powers Agency (Habitat JPA), with the mitigation fee increase described in the January 26, 2004 staff report regarding this agreement. This agreement requires that:

- Urban development permittees shall pay an acreage-based mitigation fee in an amount, as determined by the Habitat JPA Board, sufficient to fund the acquisition, enhancement and long-term management of one (1) acre of Swainson's hawk foraging habitat for every one (1) acre of foraging habitat that is lost to urban development.
- A calculated fee of \$5,800.00 per acre is sufficient to fund the acquisition and preservation as of January 2004. This fee amount may be adjusted to reflect updated costs for acquisition of habitat.
- With written approval of and subject to conditions determined by CDFG, an urban development permittee may transfer fee simple title or a conservation easement over Swainson's hawk foraging habitat, along with appropriate enhancement and management funds, in lieu of paying the acreage-based mitigation fee.

Avian species – Western yellow-billed cuckoo, Cooper's hawk, white-tailed kite, yellow warbler, loggerhead shrike, northern harrier and short-eared owl:

Measure 3.6-7t: Implement Measures 3.6-7q and 3.6-7s for Swainson's hawk, and apply them to western yellow-billed cuckoo. Apply these measures, but modify survey area to include 500 feet around the construction activities, and modify buffer areas to include 500 feet around any Cooper's hawk, white-tailed kite, yellow warbler or loggerhead shrike nest.

Measure 3.6-7u: Implement Measures 3.6-7q and 3.6-7s for Swainson's hawk and apply them to northern harrier and short-eared owl, but modify survey area to include 500 feet around the construction activities; and modify buffer areas to include 500 feet around a nest.

Measure 3.6-7v: The Project Partners shall survey the entire route of the chosen siting diversion/intake pipeline corridor and WTP footprint for burrowing owls according to the October 17, 1995 CDFG Staff Report on Burrowing Owl Mitigation, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR, which includes survey guidelines for burrowing owl. The surveys must be conducted prior to Project construction and shall be conducted by a qualified biologist. Data shall be compiled and reported to CDFG before initiating any construction activities. The guidelines include the following:

- Conduct a winter survey (to be conducted between December 1 and January 31) and a survey during the breeding season (to be conducted April 15 to July 15).
- Conduct the survey beginning one hour before sunrise and two hours after, OR two hours before sunset and one hour after.
- The survey area shall include suitable habitat within a 500-foot radius around the Project construction zone.

Measure 3.6-7w: If occupied burrows are identified, the measures included in the October 17, 1995 CDFG Staff Report on Burrowing Owl Mitigation, a copy of which is in Appendix C2 of the Davis-Woodland Water Supply Project Draft EIR, will be implemented to minimize impacts to burrowing owl. These include but are not limited to the following measures:

- Owls shall not be disturbed from February 1 through August 31. Establish an avoidance buffer of 160 feet (September 1 through January 31) or 250 feet (February 1 through August 31) and monitor the nest burrow during construction activity. Any indication of impacts to the breeding pair as a result of construction shall be reported to CDFG whereby CDFG may have the authority to halt construction until the young have fledged from the nest.
- If impacts to owls cannot be avoided, then CDFG shall be consulted on minimization measures such as using passive relocation techniques during the non-breeding season (September 1 through January 31).

- A minimum of 6.5 acres of foraging habitat must be preserved for every occupied burrow potentially impacted (within 160 feet or 250 feet of the construction activity, depending on the season). Foraging habitat shall be preserved according to CDFG guidelines.

Avian species – Tricolored blackbird, white-faced ibis, western snowy plover, and bank swallow:

Measure 3.6-7x: Implement Measures 3.6-7q, 3.6-7r, and 3.6-7s for Swainson’s hawk and apply them to the above-listed species, but modify survey area to include 500 feet around the construction activities; and modify buffer areas to include 500 feet around nesting colonies/locations.

Impact 3.6-8: The Project would have other substantial adverse affects on riparian habitat or other sensitive natural communities identified in local or regional plans, policies, or regulations or by the CDFG or USFWS.

Measure 3.6-8a: Prior to construction, the Project Partners shall conduct an assessment within the proposed Project area to provide the basis of a vegetation mitigation plan. A vegetation mitigation plan will be developed in consultation with CDFG. The plan shall contain species expected to be found in the vicinity of Project sites. Details about the species and their past occurrence shall be included in the plan. The Project Partners shall comply with all terms and conditions of the plan, including additional mitigation provisions to be implemented. The Project Partners would follow performance standards in developing the plan. The requirements would consist of one or more of the following provisions:

- Establish an oak tree conservation easement in coordination with Yolo County to protect and preserve trees commensurate with the removal of large oaks as a result of project implementation
- Replace and maintain trees, for seven years, at a rate of 1 tree per 1-inch of tree diameter removed as measured at diameter breast height. Because this measure would only fulfill one-half of the required mitigation for the Project, one or more of the other provisions would need to be implemented to fulfill the remaining mitigation requirements.
- Contribute funds to a suitable oak woodland conservation fund, as established in accordance with § 1363 of the Fish and Game Code
- Consult with Yolo County and CDFG to determine and agree to implement other suitable measures consistent with the Yolo County Oak Woodland Conservation and Enhancement Plant 2007 and §21083.4(a) of the California Public Resources Code.

Measure 3.6-8b: For any drainage that would be crossed using trenchless construction techniques, the bore pits will be excavated at least 50 feet outside the edge of riparian vegetation to minimize impacts to waterways and adjacent areas.

Measure 3.6-8c: All new Project-related groundwater wells within water sellers' service areas shall be sited in areas that are not within 0.25 mile of wetlands and other sensitive biological resources that could be affected by groundwater drawdown.

Impact 3.6-9: The Project would have other substantial adverse effects on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, stream channel, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Measure 3.6-9a: Prior to construction, the Project Partners shall conduct and submit for approval a formal wetland delineation report for the proposed Project area for verification through the ACOE. The applicant shall obtain a Section 404 (Clean Water Act) permit for impacts to jurisdictional wetlands from the ACOE and/or a Section 401 permit from the RWQCB and shall comply with all conditions of permits received. In association with either or both permits, compensatory mitigation for impacts to jurisdictional wetlands may be required. ACOE mitigation guidelines emphasize on-site mitigation preference, but in the potential case that on-site mitigation is not available, the Project partners shall either purchase wetland mitigation credits from an ACOE -approved mitigation bank that services the area containing the proposed project or prepare a plan to implement mitigation at an off-site location.

Measure 3.6-9b: For open trench construction crossing minor wetland ditches (less than 15 feet in width), the following measures shall be implemented:

- Implement compliance measures, described in Section 3.7, Geology, Soils, and Seismicity for Impact 3.7-1, to reduce indirect impacts to wetlands and other waters during open trench construction;
- Conduct trenching and construction activities across drainages during low-flow or dry periods as feasible;
- If working in active channels, install cofferdam upstream and downstream of stream crossing to separate construction area from flowing waterway;
- Place sediment curtains upstream and downstream of the construction zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone;
- Locate spoil sites such that they do not drain directly into the drainages and/or seasonal wetlands;
- Store equipment and materials away from the drainages and wetland areas. No debris will be deposited within 250 feet of the drainages and wetland areas;
- Prepare and implement a revegetation plan to restore vegetation in all temporarily disturbed wetlands and other waters using native species seed mixes and container

plant material that are appropriate for existing hydrological conditions. All disturbed drainages will be restored to pre-construction conditions.

APPENDIX C

Davis-Woodland Water Supply Project

Positive Barrier Fish Screen Performance Evaluation and Monitoring Plan

As part of the Davis-Woodland Water Supply Project (the “Project”), a state-of-the-art positive barrier fish screen, designed to meet current CDFG and NMFS criteria, will be constructed and operated on the Sacramento River. To ensure that the fish screen is operating in compliance with the design criteria, specifically the maximum approach velocity of 0.33 ft/sec, an evaluation of hydraulic performance of the screen (uniformity and magnitude of screen approach velocities) will be conducted, and follow-up monitoring and maintenance will be conducted as necessary.

This performance evaluation and monitoring plan for the Project’s fish screen has been designed based on the Anadromous Fish Screen Program (AFSP) water velocity monitoring guidelines and the experience gained in field velocity monitoring conducted at other water diversions located on the Sacramento River (e.g., Glenn-Colusa Irrigation District diversion, Reclamation District 108 Wilkins Slough diversion, etc.).

EVALUATION OF FISH SCREEN’S HYDRAULIC PERFORMANCE

Anticipated Field Test Schedule and Diversion Rates During Hydraulic Performance Evaluation

Based on seasonal demand for water within the service area and the ability of the Davis-Woodland Water Supply Project to manage the diversions, it is anticipated that the hydraulic performance evaluation of the fish screen will be performed during the late spring or early summer. This performance evaluation will be scheduled for a period when the Project and Reclamation District 2035 (“RD 2035”) will operate their total diversion at this facility at 90 percent or more of the maximum design diversion rate of 400 cubic feet per second (“cfs”), that is, at total diversion rates greater than or equal to 360 cfs. If diversions at rates of 360 cfs or more cannot be maintained during the tests, then field velocity measuring will be discontinued and rescheduled for a time when diversions at these rates can be maintained. This performance evaluation will be conducted when the elevation of the Sacramento River water surface in the vicinity of the fish screen is 5.1 feet above mean sea level or higher, so that the fish screen panels will be entirely covered.

Based on results of the initial velocity measurements, baffles (or other hydraulic controls) may need to be adjusted to achieve uniformity of flows across the fish screen surface. Velocity measurements then will be repeated until the fish screen provides uniform velocities that are less than the 0.33 ft/sec approach velocity criterion while the total

diversions by the Project and RD 2035 together are 90 percent or more of the maximum design diversion rate of 400 cfs.

The field velocity monitoring for this performance evaluation is anticipated to occur over approximately a 3 to 5 day period, depending on the number of baffle adjustments that are required to meet hydraulic performance objectives. The final schedule for this performance evaluation will be established after the diversion facility is constructed and is fully operational.

Instrumentation

Approach velocities will be measured using three three-dimensional acoustic current (3D-ACM) velocity meters (Argonaut velocity meters or meters from other manufacturers that are approved by CDFG, NMFS, and USFWS). The 3D-ACM meters use the Doppler effect to measure variations in acoustical signal caused by moving water to calculate current speeds.

Measurement Locations

Water velocities are proposed to be measured at three depths (e.g., at depths of 2, 5, and 8 feet, if the screen panel is 10 feet high) across the surface of each screen panel in accordance with manufacturers' protocols. It is proposed that, during measurements, the velocity probes will be positioned at three horizontal locations (e.g., at 3, 7, and 11-foot intervals across the screen panel, if the screen panel is 14 feet wide). The final number and spacings of these measurements will be determined by the Applicants and RD 2035 in consultation with CDFG, NMFS and USFWS. The resulting array will represent nine sampling locations (three depths and three horizontal locations) across each screen panel. Velocity monitoring will occur at each of the nine sampling sites along each screen panel. Results of these velocity measurements will be used to adjust the positions of louver baffles or other similar hydraulic controls and for documenting hydraulic performance of the fish screen, based on both approach and sweeping velocity measurements.

Each velocity probe will be mounted at a fixed location along a pipe that will be positioned and held at each designated monitoring location using a magnetic mounting system (or other applicable mounting system) for each individual screen panel. Information regarding the probe mounting systems used at the GCID and RD 108 Wilkins Slough intakes may be applicable for designing the approach velocity monitoring system at the Davis-Woodland intake. The velocity probes will be mounted a minimum of 10 feet upstream of the screen cleaning brush to minimize the influences of turbulence and potential velocity interferences and bias along the screen surface caused by structural components of the cleaning brush arm assembly. The mounting bracket will hold the velocity probe at a fixed orientation and distance relative to the surface plane of each individual screen panel. The velocity probes will be mounted to measure water velocities approximately three inches from the screen surface. The velocity probes will be installed each day by commercial divers or other suitable method using guides and jigs to orient the velocity probe in the proper position during installation. The velocity probes will be

moved parallel to the plane of each intake screen panel to make the measurements at each of the horizontal locations described above.

Velocity Measurements

The 3D-ACM velocity meters will record velocities in each of the three dimensions over a five-minute sampling interval at each measurement location. The velocity meters will be configured to collect data on 15-second vector averaged velocity measurements every 15 seconds (four readings per minute), or over another similar measurement period approved by CDFG, NMFS, and USFWS, over the minimum five-minute sampling period, yielding approximately 20 discrete water velocity measurements along each of the three measurement vectors at each sampling station. Based on results of these measurements, average approach velocities (water flow perpendicular to the screen panel) and average sweeping velocity (water velocity parallel to the screen panel) will be calculated.

Documentation

At completion of the hydraulic performance evaluation, a brief technical report will be prepared. This report will document the methods, the results of approach and sweeping velocity measurements, and conformance with the original intake screen design criteria. Average approach and sweeping velocity measurements will be presented in both tabular and graphic formats. Final velocity monitoring results, after baffle adjustments have been completed, with the Davis-Woodland Project diversion operating at 90 percent or more of maximum design capacity, will be documented in a technical report that then will be submitted to CDFG, NMFS, USFWS, SWRCB and other interested parties. Electronic copies of the original data files recorded by each velocity probe during the final testing phase, results of statistical analyses and calculations, and documentation on measured diversion rates during the tests will be provided to these agencies and interested parties for independent review and analysis as part of documentation of the study results.

LONG-TERM OPERATIONS AND MAINTENANCE

As part of long-term operations and maintenance of the intake facility and fish screen, the Applicants will take the following actions:

- Develop and implement a written protocol and a set of operations and maintenance standards for the intake and the fish screen. The protocol and standards will include periodic routine visual inspections of key screen components, inventories of spare and replacement parts, criteria for intake monitoring, alarms, operating overrides, procedures for annual screen panel removal, inspection, and repairs, operating criteria to maintain screen approach velocities within accepted criteria, debris removal, sediment removal from the intake, and other operating and maintenance functions. Standard datasheets and operating logs documenting intake operations and maintenance will be maintained.

- Routinely monitor and record water diversion flow rates and volumes, head pressure differentials across the screens, and results of visual screen and screen cleaner inspections and maintenance activities, document screen maintenance and repairs, monitor water depths and sediment accumulations within the intake forebay and in river adjacent to the screen, and make adjustments to screen operations
- Use results of head differential monitoring to assess the performance of the screen cleaner in removing debris from the screen surface. For example, if head losses increase, then this will be a sign that debris are accumulating on the screen and reducing screen porosity, while a sudden reduction in average head loss across the screen may indicate a loss of screen integrity (e.g., a hole or puncture in one of the screen panels). The remote monitoring will include alarms set to notify operators of conditions outside of the standard range of acceptable intake operations. Monitoring results will be used to manage intake inspections and maintenance.
- Provide access to state and federal resource and regulatory agencies to observe intake operations and, with prior coordination, to allow underwater inspection and observations of the fish screens
- Visually monitor operations and performance of the screen cleaning mechanism and adjust travel speed, cleaning frequency and brush tension as necessary to effectively remove debris from the screen surface
- Conduct routine screen cleaning, inspections, and maintenance in accordance with the operations plans and design requirements throughout the time that the intake is in operation
- Physically remove each screen panel from the intake structure at a frequency of not less than once per year for cleaning (with a high pressure spray wash) or conduct underwater surveys to inspect screen panel integrity, and repair as needed. Inspect screen seals (e.g., Teflon screen seals) and replace if worn or damaged to insure proper fit and sealing of each screen panel within the intake structure screen guides
- Periodically (several times during the year) remove and inspect the screen cleaning brush and replace as necessary to insure effective screen cleaning
- Periodically (e.g., annually) monitor sediment deposition in the river upstream and outside of the screen and within the screen, and, as authorized by regulatory agencies with permitting jurisdiction, remove sediment as needed to maintain hydraulic performance and uniformity of approach velocities to the fish screens

- No diversions will occur through a screen panel opening when the screen panel for that opening is missing or its integrity is damaged, or if the cleaner for that screen is not operating in accordance with standard procedures. Replacement panels or stoplogs will be used if screen panels are damaged or removed. Screen panel integrity will be determined by routine measurements of changes in head loss across the fish screens or through periodic inspections. If one or more screen panels are removed from the intake and temporarily replaced with blank panels, then the maximum intake diversion rate will be reduced to the ratio of the number of operable panels to the total number of panels, to maintain approach velocities at rates less than or equal to the specified criterion.

ADJUSTMENTS FOR LOW SACRAMENTO RIVER ELEVATIONS

When the surface-water elevation of the Sacramento River in the vicinity of the fish screen is less than 5.1 feet, total diversions by the Project and RD 2035 will be reduced as necessary so the maximum authorized approach velocity is not exceeded. During such times, the fish screen's performance will be monitored as necessary to ensure and confirm that the CDFG and NMFS fish-screen criteria in Appendix E are satisfied, and the Project will provide notice to CDFG, North Central Region, of the surface-water elevations, the total diversions and the actions that are being taken to monitor the approach velocities to make sure that they do not exceed the maximum authorized approach velocities.

APPENDIX D

Sacramento River Fisheries Study

Study Objectives

The Davis-Woodland Water Supply Project Partners will work with representatives of CDFG to develop and complete a proposed scope of work for a Sacramento River Fisheries Study no later than six months after issuance of a water-right permit or permits on Application 30358. This study will focus on the health of Sacramento River fisheries in the vicinity or downstream of the Project's Sacramento River diversion facility, and will use appropriate methods to collect useful scientific data. The scope of work, schedule and budget for the study will be developed into a work contract between the Davis-Woodland Water Supply Project Partners and either UC Davis (with CDFG as a collaborator) or CDFG. The study will begin within one year after initiation of Project diversions from the Sacramento River.

CDFG will have the flexibility to direct that study funds be used either for a study supervised by a UC Davis professor or for a fishery or environmental study that CDFG is involved in. Funds may be used for independent field research or dedicated as matching funds in a co-funded study. The study may involve laboratory and field measurements, other data collections and related analyses.

The general objective of the study will be to collect data and information about fish populations in, and the aquatic environment of, the Sacramento River in the vicinity or downstream of the Project's Sacramento River diversion facility that will help CDFG better understand and manage these fish populations in the future.

Work Products

The study results will be documented in a M.S. thesis or Ph.D. dissertation, depending on the level of study conducted, if the contract is with UC Davis, or in a manuscript for publication in peer-reviewed scientific literature, if the contract is with CDFG. Paper and electronic copies of the draft and final reports will be made available to CDFG and other interested parties. Brief annual reports summarizing results of the work completed to date will be prepared and made available to CDFG and other interested parties. A final resource data report or copy of the scientific manuscript shall be provided to CDFG.

Schedule

The study will begin within one year after initiation of Davis-Woodland Water Supply Project diversions from the Sacramento River, and then will be completed within two years after commencement of the study. Preparation of manuscripts and submittal of a thesis will be expected to occur during the third year. The funding for the project will be for a maximum of three years.

Funding

Funding for the study will include a graduate-student stipend of \$25,000 per year over a three-year period, for a maximum total of \$75,000. Funding of an additional \$25,000 will be available for equipment, laboratory space, travel, and other study-related expenses. The maximum total funding from the Davis-Woodland Water Supply Project Partners for this study will be \$100,000.

APPENDIX E

DEPARTMENT OF FISH AND GAME

Fisheries Engineering Projects and Information

[Team Overview](#) | [Fish Screening Policy](#) | [Projects Overview](#) | [Resources Overview](#)

FISH SCREENING CRITERIA

STRUCTURE PLACEMENT

A. Streams And Rivers (flowing water): The screen face shall be parallel to the flow and adjacent bankline (water's edge), with the screen face at or streamward of a line defined by the annual low-flow water's edge.

The upstream and downstream transitions to the screen structure shall be designed and constructed to match the bankline, minimizing eddies upstream of, in front of, and downstream of, the screen.

Where feasible, this on-stream fish screen structure placement is preferred by the California Department of Fish and Game.

B. In Canals (flowing water): The screen structure shall be located as close to the river source as practical, in an effort to minimize the approach channel length and the fish return bypass length. This in canal fish screen location shall only be used where an "on-stream" screen design is not feasible. This situation is most common at existing diversion dams with headgate structures. The current National Marine Fisheries Service - Southwest Region criteria for these types of installations shall be used.

C. Small Pumped Diversions: Small pumped diversions (less than 40 cubic-feet per second) which are screened using manufactured, self-contained screens shall conform to the National Marine Fisheries Service - Southwest Region criteria Attachment A.

D. Non-Flowing Waters (tidal areas, lakes and reservoirs): The preferred location for the diversion intake structure shall be offshore, in deep water, to minimize fish contact with the diversion. Other configurations will be considered as exceptions to the screening criteria as described in Section 5.F. below.

APPROACH VELOCITY (Local velocity component perpendicular to the screen face)

A. Flow Uniformity: The design of the screen shall distribute the approach velocity uniformly across the face of the screen. Provisions shall be made in the design of the screen to allow for adjustment of flow patterns. The intent is to ensure uniform flow distribution through the entire face of the screen as it is constructed and operated.

B. Self-Cleaning Screens: The design approach velocity shall not exceed:

1. Streams and Rivers (flowing waters) - Either:

a. 0.33 feet per second, where exposure to the fish screen shall not exceed fifteen minutes, or

b. 0.40 feet per second, for small (less than 40 cubic-feet per second) pumped diversions using manufactured, self-contained screens.

2. In Canals (flowing waters) - 0.40 feet per second, with a bypass entrance located every one-minute of travel time along the screen face.

3. Non-Flowing Waters (tidal areas, lakes and reservoirs) - The specific screen approach velocity shall be determined for each installation, based on the species and life stage of fish being protected. Velocities which exceed those described above will require a variance to these criteria (see Section 5.F. below).

(Note: At this time, the U.S. Fish and Wildlife Service has selected a 0.2 feet per second approach velocity for use in waters where the Delta smelt is found. Thus, fish screens in the Sacramento-San Joaquin Estuary should use

this criterion for design purposes.)

C. Screens Which Are Not Self-Cleaning: The screens shall be designed with an approach velocity one-fourth that outlined in Section B above. The screen shall be cleaned before the approach velocity exceeds the criteria described in Section B.

Frequency Of Cleaning: Fish screens shall be cleaned as frequently as necessary to prevent flow impedance and violation of the approach velocity criteria. A cleaning cycle once every 5 minutes is deemed to meet this standard.

Screen Area Calculation: The required wetted screen area (square feet), excluding the area affected by structural components, is calculated by dividing the maximum diverted flow (cubic-feet per second) by the allowable approach velocity (feet per second). Example:

$1.0 \text{ cubic-feet per second} / 0.33 \text{ feet per second} = 3.0 \text{ square feet}$

Unless otherwise specifically agreed to, this calculation shall be done at the minimum stream stage.

SWEEPING VELOCITY (Velocity component parallel to screen face)

A. In Streams And Rivers: The sweeping velocity should be at least two times the allowable approach velocity.

B. In Canals: The sweeping velocity shall exceed the allowable approach velocity. Experience has shown that sweeping velocities of 2.0 feet per second (or greater) are preferable.

C. Design Considerations: Screen faces shall be designed flush with any adjacent screen bay piers or walls, to allow an unimpeded flow of water parallel to the screen face.

SCREEN OPENINGS

A. Porosity: The screen surface shall have a minimum open area of 27 percent. We recommend the maximum possible open area consistent with the availability of appropriate material, and structural design considerations.

The use of open areas less than 40 percent shall include consideration of increasing the screen surface area, to reduce slot velocities, assisting in both fish protection and screen cleaning.

B. Round Openings: Round openings in the screening shall not exceed 3.96mm (5/32in). In waters where steelhead rainbow trout fry are present, this dimension shall not exceed 2.38mm (3/32in).

C. Square Openings: Square openings in screening shall not exceed 3.96mm (5/32in) measured diagonally. In waters where steelhead rainbow trout fry are present, this dimension shall not exceed 2.38mm (3/32in) measured diagonally.

D. Slotted Openings: Slotted openings shall not exceed 2.38mm (3/32in) in width. In waters where steelhead rainbow trout fry are present, this dimension shall not exceed 1.75mm (0.0689in).

SCREEN CONSTRUCTION

A. Material Selection: Screens may be constructed of any rigid material, perforated, woven, or slotted that provides water passage while physically excluding fish. The largest possible screen open area which is consistent with other project requirements should be used. Reducing the screen slot velocity is desirable both to protect fish and to ease cleaning requirements. Care should be taken to avoid the use of materials with sharp edges or projections which could harm fish.

B. Corrosion and Fouling Protection: Stainless steel or other corrosion-resistant material is the screen material recommended to reduce clogging due to corrosion. The use of both active and passive corrosion protection systems should be considered.

Consideration should be given to anti-fouling material choices, to reduce biological fouling problems. Care should be taken not to use materials deemed deleterious to fish and other wildlife.

C. Project Review and Approval: Plans and design calculations, which show that all the applicable screening criteria have been met, shall be provided to the Department before written approval can be granted by the appropriate Regional Manager.

The approval shall be documented in writing to the project sponsor, with copies to both the Deputy Director, Habitat Conservation Division and the Deputy Director, Wildlife and Inland Fisheries Division. Such approval may include a requirement for post-construction evaluation, monitoring and reporting.

D. Assurances: All fish screens constructed after the effective date of these criteria shall be designed and constructed to satisfy the current criteria. Owners of existing screens, approved by the Department prior to the effective date of these criteria, shall not be required to upgrade their facilities to satisfy the current criteria unless:

1. The controlling screen components deteriorate and require replacement (i.e., change the opening size or opening orientation when the screen panels or rotary drum screen coverings need replacing),
2. Relocation, modification or reconstruction (i.e., a change of screen alignment or an increase in the intake size to satisfy diversion requirements) of the intake facilities, or
3. The owner proposes to increase the rate of diversion which would result in violation of the criteria without additional modifications.

E. Supplemental Criteria: Supplemental criteria may be issued by the Department for a project, to accommodate new fish screening technology or to address species-specific or site-specific circumstances.

F. Variances: Written variances to these criteria may be granted with the approval of the appropriate Regional Manager and concurrence from both the Deputy Director, Habitat Conservation Division and the Deputy Director, Wildlife and Inland Fisheries Division. At a minimum, the rationale for the variance must be described and justified in the request.

Evaluation and monitoring may be required as a condition of any variance, to ensure that the requested variance does not result in a reduced level of protection for the aquatic resources.

It is the responsibility of the project sponsor to obtain the most current version of the appropriate fish screen criteria. Project sponsors should contact the Department of Fish and Game, the National Marine Fisheries Service (for projects in marine and anadromous waters) and the U.S. Fish and Wildlife Service (for projects in anadromous and fresh waters) for guidance.

Copies of the current criteria are available from the Department of Fish and Game through the appropriate Regional office, which should be the first point of contact for any fish screening project.