

AGREEMENT BETWEEN THE STATE OF CALIFORNIA DEPARTMENT OF FISH & GAME, DEPARTMENT OF WATER RESOURCES AND DEER CREEK IRRIGATION DISTRICT FOR CONSTRUCTION, OPERATION, MAINTENANCE AND MONITORING OF A FLOW ENHANCEMENT PROGRAM ON DEER CREEK IN TEHAMA COUNTY

THIS AGREEMENT, made this ____ day of _____, 2005, is between the State of California, acting by and through the Department of Fish and Game, hereinafter “DFG,” and the Department of Water Resources, hereinafter “DWR”, and the Deer Creek Irrigation District (hereinafter referred to as “DCID”).

RECITALS

A. DCID is a political subdivision of the State of California, duly organized and existing under Division 11 of the California Water Code and providing water service for the irrigation of lands and crops within the county of Tehama.

B. The Four Pumps Agreement refers to the 1986 Agreement between the Department of Water Resources and the Department of Fish and Game to offset fish losses associated with the enlargement of the Harvey o. Banks Delta Pumping Plant. DWR and DFG work with the Delta Four Pumps Fish Advisory Committee to implement the agreement through changes in operations management to directly offset fish losses, or through the funding of fish enhancement projects to mitigate losses.

C. Deer Creek provides many important surface water beneficial uses, including agriculture, recreation, wildlife habitat, freshwater habitat, and anadromous fish habitat, particularly the listed or threatened, spring-run, fall-run and late fall-run Chinook salmon, and steelhead trout. Due in part to naturally occurring low flows, agricultural diversions, channel morphology and excessive temperatures, the upstream migration of adults or downstream migration of juvenile salmon and steelhead may be impeded or blocked in the spring and fall of dry years.

D. DCID has adjudicated rights to divert Deer Creek surface water for irrigation.

E. Historically, DCID has cooperated with DFG by temporarily bypassing some of DCID's surface water to provide a short term pulse flow for fish transportation in Deer Creek.

F. The State and DCID recognize the need for a long-term solution to fish transportations issues in Deer Creek and have worked towards the phased development of a Deer Creek Flow Enhancement Program. The intent of the Deer Creek Flow Enhancement Program is to augment fish transportation flows in Deer Creek, maintain DCID's water rights, and achieve the groundwater protection requirements set forth by the Tehama County AB 3030 Groundwater Management Plan.

G. The Deer Creek Flow Enhancement Program will provide DCID with a supplemental agricultural water supply for the surface water that is bypassed through: groundwater wells, efficiency improvements to their distribution system and new water management techniques. The Deer Creek Flow Enhancement Program Agreement will provide DCID with supplemental water in the amount equal to that which DCID provides for fish transportation flow

H. It is recognized the timing at which enhanced fish transportation flow is needed is dependent on many variables and can change significantly based on annual climatic conditions, water temperature, agricultural diversions, channel morphology, etc. Although the existing Deer Creek data is insufficient to specifically predict the timing of salmon immigration and emigration, examination of Deer Creek hydrology, agricultural diversions, and fisheries information indicates that increasing the transportation flow during late spring (April, May and June) and early fall (October and November) may be beneficial to the Chinook Salmon and Steelhead fishery. In an effort to best accommodate the fish transportation and agricultural diversions requirements, operation of the Deer Creek Flow Enhancement Program will be tied to real-time fisheries monitoring and limited to the months of April, May, June, October and November. During these periods, flow related impediments to migration may be alleviated, in part, by DCID bypassing surface water that it would otherwise divert for irrigation purposes.

I. It is recognized that the amount of flow necessary to provide migration for adult salmon and steelhead in Deer Creek is largely unknown. The amount of flow necessary to

provide migration is dependent upon annual changes to channel morphology, hydrology and changes in surface water temperature. It is also recognized that, although insufficient data exist to specifically predict the amount of flow that is necessary to provide immigration and emigration of Chinook Salmon and Steelhead in Deer Creek, for the purposes of estimating the annual volume and timing of the Deer Creek Flow Enhancement Program operations, a preliminary estimate of an adequate flow for fish transportation in Deer Creek is necessary. Examination of the hydrology and geomorphology of similar east-side streams in the Northern Sacramento Valley indicates that a flow of 50 cfs, as measured below the Stanford Vina Diversion Dam, will serve as a preliminary fish transportation flow objective for the purposes of estimating the annual operations, maintenance, volume and timing of the Deer Creek Flow Enhancement Program.

J. It is recognized that, for initial cost planning and permitting estimates, the Deer Creek Flow Enhancement Program will be available to operate during the months of April, May, June, October and November, when the Deer Creek flow, as measured below the Stanford Vina Diversion Dam, is equal to or less than 50 cfs. Actual operations will be determined based on real-time fish monitoring, surface flow water measurement, agricultural water requirements, temperature monitoring and channel morphology, and thus will change from year to year, but will be within the projected range of initial planning and permitting estimates.

K. In order to effectively operate and adequately evaluate the potential benefits or impacts associated with the Deer Creek Flow Enhancement Program, the operations will incorporate adaptive management methods linked to a comprehensive monitoring program. It is anticipated that the annual monitoring program will include surface water monitoring, (both instream and in-district), temperature monitoring, identification of critical channel morphology impediments, groundwater monitoring, and fisheries monitoring. It is anticipated the annual monitoring programs will be required to operate, regardless of whether DCID water is bypassed or not, so as to provide baseline data needs for assessment of fish transportation, documentation of annual surface water diversions, and fulfillment of the requirements set forth by the Tehama County Groundwater Extraction and Off-Parcel Use Permit.

L. It is intended that the Deer Creek Flow Enhancement Program Agreement be implemented in two phases.

- (1) Phase one will fund installation of up to two additional new agricultural water supply wells and/or retrofitting and leasing of up to two existing agricultural wells, program-related management, fisheries monitoring, surface water monitoring, groundwater monitoring, operations, maintenance, and permitting. It is anticipated that DCID will develop an instantaneous well capacity of up to 10 cfs during phase one of the program. The 10 cfs of well capacity will be used as an instantaneous exchange of an equal amount of Deer Creek flow bypass, or if the volume of by-passed water provided by DCID exceeds the instantaneous well capacity i.e., short term pulse flow, the additional volume could be temporarily “banked” and pumped by project wells at a later date.
- (2) The second phase will provide DCID the opportunity to utilize additional water savings that may be realized through implementation of agricultural water use efficiency measures and water management. It is anticipated that phase two would be initiated in the spring of 2008, after completion of the work being funded under Section A of DCID’s 2004 Agricultural Water Use Efficiency Grant. Based on preliminary estimates described in the AgWUE Grant application, it is estimated that an additional 5 to 8 cfs of transportation flow may be made available from implementation of the improvement outlined under the DCID’s 2004 AgWUE Grant.
- (3) Upon completion of both phases, DCID would have the instantaneous capacity to provide approximately 15 to 18 cfs of instream transportation flow while meeting agricultural water demand requirements in the District. As noted above, the portion of this flow to be achieved through water use efficiency improvements would be subject to field monitoring and assessment. Once again, the amount of transportation flow volume provided by DCID, either through substitute groundwater pumping, water use efficiency improvements or better management practices, which is above the instantaneous capacity of the project wells, could be banked by DCID for use later in the year.

AGREEMENT

NOW, THEREFORE, the parties agree:

1.0. Well Design, Construction, Operations and Maintenance

1.1 As part of the 2005 Deer Creek Flow Enhancement Program Agreement, DWR through the Four Pumps Agreement will pay all reasonable costs (see Section 10, "Payment"), associated with the design, construction, retrofitting and leasing of new and existing production wells (hereinafter referred to as "project wells"), so the total capacity of project wells, including the previously constructed Pilot Well, is at least 10 cfs.

1.2 DWR will provide technical assistance for the design, construction, development and testing of the project wells. DCID will consult with DWR in determining the location of the project wells.

1.3 Through the Four Pumps Agreement, DWR will pay DCID to obtain access easements for installation and operation of project wells and related facilities. The Four Pumps will also pay for leases of wells. DWR shall review and approve all costs associated with obtaining easements and/or leases of project wells.

1.4 Through the Four Pumps Agreement, DWR will pay all costs associated with the project-related operation and maintenance of the project wells over the term of this agreement.

1.5 DCID will conduct manufacture recommended preventive maintenance; operate all project-related equipment in a safe manner, and keep accurate records of daily project well operations and annual flow volume. The records will be made available to DWR.

2.0 Ownership of Well.

2.1 DCID shall hold all right, title and interest to the project wells, well housing, electrical and other appurtenances associated with the well. DCID shall not transfer or sell ownership of the well. DCID will also be the Lessee for any existing well to be leased as part of this program.

3.0 Groundwater Monitoring.

DWR shall perform the groundwater monitoring, reporting and assist with permitting. DCID will purchase and issue all permits.

3.1 Through the Four Pumps Agreement, DWR will pay for the installation and operation of program-related groundwater monitoring equipment for the project wells and the surrounding dedicated monitoring wells. The monitoring equipment will include flow meters on project production wells, and continuous groundwater level recording instrumentation in project production wells, dedicated monitoring wells, and key third-party monitoring wells. Flow meters in the project production wells will have the capability to record instantaneous discharge rate and total volumetric production.

3.2 DCID will coordinate with DWR and Tehama County to implement a groundwater monitoring and management program following the guidelines outlined in Exhibit A of this Agreement. The guidelines will define a monitoring plan tied to the operating criteria for project production wells, and serve as partial fulfillment of the permit requirements associated with Tehama County Ordinance 1617.

3.3 Through the Four Pumps Agreement, DWR Northern District will be funded to provide annual groundwater monitoring and reporting associated with the Tehama County Groundwater Extraction and Off Parcel Use Permit in the first three years. After the first three years, and upon agreement of all parties, funding and obligation for groundwater monitoring, permitting and reporting may be transferred to DCID for the remainder of the term of this agreement.

4.0 Surface Water Monitoring.

4.1 Through the Four Pumps Agreement, DWR Northern District will be funded to operate and maintain the surface monitoring equipment for DCID's Deer Creek diversion. At a minimum, continuous monitoring of DCID's surface water diversion from Deer Creek will be operated and maintained, between April and November, using the existing parshall flume and datalogging equipment. DCID will measure and maintain surface water monitoring within the District's service area. It is anticipated that DCID's Water Use Efficiency Grant, hereinafter "WUE," will pay for start-up of DCID's surface water monitoring within the District.

4.2 DWR will continue to operate and maintain the surface water gauging station below the Stanford Vina Ranch Diversion Dam through existing program funding. Through the

Four Pumps Agreement, DWR Northern District will be funded to monitor flow in Deer Creek, above SVRIC Dam, during the first year few years of program operations to determine the losses or gains in Deer Creek flow between the USGS gauge and the SVRIC diversion dam.

4.3 If additional surface water monitoring is deemed to be necessary by DFG and DWR to implement the program, then it shall be paid for through the Four Pumps Agreement.

5.0 Fish Passage Management Assessment.

5.1 DFG will conduct a Fish Passage Management Assessment Program which will evaluate the productivity of any flow actions. These assessments will be used to adaptively manage the program and resolve four important questions related to the project: 1) When flow augmentation is necessary? 2) How much flow is necessary? 3) How to utilize the available flow? And, 4) What is the success of the project? Four Pumps will fund DFG to conduct the annual fish passage evaluation and reporting. Protocols for assessing and reporting the metrics necessary to determine the above questions have been developed by DFG and are included in Exhibit B of this Agreement.

5.2 DCID will coordinate with DFG to implement the Fish Passage Assessment Plan, as outlined in Exhibit B, to identifying volume and timing of flow necessary to pass fish upstream in Deer Creek. The results from these ongoing evaluations will be continually evaluated to develop appropriate protocols for long-term assessment of instream flow in Deer Creek.

6.0 Environmental Documentation.

6.1 DCID will be the lead agency for CEQA. DWR will provide DCID with information necessary to complete CEQA regarding the construction of the new wells. DFG will provide DCID with the information necessary to complete CEQA regarding biological resources, particularly the fishery resource. DWR and DFG staff time to assist in the preparation of the appropriate CEQA document will be funded through the Four Pumps Agreement.

6.2 DWR, through the Four Pumps Agreement, shall reimburse DCID the cost to complete an appropriate CEQA document. These costs shall not exceed \$8,000.

7.0 Program Operations.

7.1 During Phase one, in the months of April, May and June and after October 15, upon request of Fish and Game, DCID will bypass 10 cfs continuous diversion in conjunction with the use of project wells for fisheries transportation in lower Deer Creek. DCID may use the project wells to instantaneously replace the bypassed diversion at the time of the bypass, or any time within the calendar year.

7.2 During Phase two, after implementation of the agricultural water use improvements proposed under the 2004 AgWUE Grant application and upon the request of Fish and Game, DCID will provide additional continuous diversions, up to the documented amount of realized water savings from AgWUE improvements. The exact amount of additional bypass flow provided by DCID AgWUE improvements in Phase two is unknown, but is estimated between 6 and 8 cfs. DCID may use the project wells to instantaneous replace the bypassed diversion at the time of the bypass, or any time within the calendar year.

7.3 DFG may request that DCID bypass diversions greater than the instantaneous capacity realized through project wells and AgWUE improvements to provide a “pulse flow” of bypassed water. DCID, in its discretion, may bypass diverted flows greater than its instantaneous replacement capacity for reimbursement of the cost of pumping an equivalent amount of groundwater. Such agreements for a pulse flow may be made only upon mutual consent of DCID, DFG, and DWR.

7.4 Project wells will become the property of DCID and will be available for use by DCID within the operating parameters of the Tehama County Permit and the groundwater monitoring and management guidelines in Exhibit A. DCID will pay to maintain and repair the project wells as needed, according to the manufactures recommended methods, during DCID’s use of the project wells outside the needs of this program agreement. If the wells are used to provide more water than is being bypassed or has been banked, then DCID shall pay the operational cost to pump such water. DCID will pay DWR based on a percentage of the well use for that year as it relates to O&M costs incurred by DWR for that year.

7.5 In the event that funding by DWR, through the Four Pumps Agreement, to operate the project wells in any given year is not available, DCID will have no obligation to the State under this agreement to bypass water.

8.0 Maintenance of Bypass Flow.

8.1 DCID is responsible for ensuring water is bypassed by the DCID Diversion Dam in an amount equal to the “bypass flows” which are contributed by DCID as part of this agreement.

8.2 DCID has requested of SVRIC and Cone-Kimball diversions to voluntarily cooperate in the bypass of water made available by DCID through this agreement.

8.3 If SVRIC and/or Cone-Kimball choose not to cooperate in allowing DCID’s bypassed water to flow past their diversion facilities, then DCID shall seek other methods of legally securing bypass flow.

8.4 DWR, through the Four Pumps Agreement, shall fund all costs and fees incurred by DCID to obtain the necessary approval to secure the bypass flow. The fees and costs for securing bypass flow are unknown, but will be funded by DWR up to \$50,000.

9.0 Payment

9.1 DWR, through the Four Pumps Agreement, will reimburse DCID on a monthly basis for expenses directly associated with DCID’s efforts to implement the Deer Creek Flow Enhancement Program.

9.2 Reimbursement through the Four Pumps Agreement to DFG for annual fishery passage evaluation shall not exceed \$37,000.

9.3 Reimbursement through the Four Pumps Agreement to DWR Northern District for annual groundwater monitoring and permitting under the Tehama County groundwater ordinance shall not exceed \$30,000.

9.4 Reimbursement through the Four Pumps Agreement, to DWR Northern District for annual surface water monitoring shall not exceed \$15,000.

9.5 Reimbursement through the Four Pumps Agreement, to DCID for installation of up to two new project production wells and the refurbishment of up to one existing well shall not exceed \$670,000.00. Well installation and/or refurbishment includes: well design, drilling contract management, well installation, well development and testing, pump and motor installation, power installation, outfall design, flow meter, groundwater level monitoring equipment, and well housing structure.

9.6 Reimbursement through the Four Pumps Agreement for annual operations and maintenance of program wells is based on estimates of the average annual bypass need provided in Exhibit C. The annual operations, maintenance and leasing of program wells shall not exceed \$36,000.

9.7 Reimbursement through the Four Pumps Agreement to DCID for expenses to administer the program shall be \$45,000 for the year's one and two, and \$30,000 per year for subsequent years.

9.8 Payment to DCID under section 10.1 will be paid by DWR, through the Four Pumps Agreement, upon approval of the State program manager. The State Program Manager is _____ of the DWR Northern District. DCID shall submit monthly invoices in triplicate, with reference to this contract's number, to the State Program Manager at the Department of Water Resources, Northern District, 2440 Main Street, Red Bluff, CA 96080.

10.0 Program Management

10.1 The parties shall establish a management committee of two (2) representatives from DCID, DFG, and DWR to discuss issues regarding program implementation, reporting, budgets, and finances, and to resolve problems.

11.0 Term of this Agreement

11.1 The term of this agreement is for ten years from April 1, 2006 until April 1, 2016.

12.0 Renewal

12.1 The parties at the end of the ten years will negotiate a renewal of the contract if the fish evaluation program shows benefits to the fishery of bypassed flows.

13.0 Effect of this Agreement on Other Matters

13.1 As a Precedent. Nothing in this Agreement, and nothing incorporated by reference into the terms of this Agreement, is intended or shall be construed as a precedent or other basis for any argument that the participants to this Agreement have waived or compromised their rights which may be available under state or federal law, except as to the matters addressed in this Agreement.

13.2 As an Admission. Nothing in this Agreement shall be construed as an admission by any Party that such Party has obligations relative to the protection of fishery or other resources and/or the maintenance of water quality standards in Deer Creek, the Delta, the Sacramento River, or its other tributaries. Similarly, nothing in this Agreement shall be construed or used in an effort to demonstrate that DCID has surplus water or water which is not being beneficially used by DCID.

13.3 Federal and State Agency Obligations. Nothing in this Agreement is intended to limit the authority of DWR, DFG, or any other agency of the State, to fulfill its responsibilities under federal or state law. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of the DWR, DFG, or any other agency of the State.

14.0 Representation by Counsel

This Agreement is entered into freely and voluntarily. The parties hereto acknowledge that they have been represented by counsel of their own choice, or that they have had the opportunity to consult with counsel of their own choosing, in the negotiations that preceded the execution of this Agreement and in connection with the preparation and execution of this Agreement. Each of the parties hereto executes this Agreement with full knowledge of its significance and with the express intent of affecting its legal consequences.

15.0 Entire Agreement

This Agreement constitutes the entire Agreement between the Parties pertaining to the settlement of disputes and obligations between them. This Agreement supersedes all prior and contemporaneous agreements and/or obligations concerning those obligations which are merged into this Agreement. Each party has made its own independent investigation of the matters settled, has been advised concerning the terms of this Agreement by counsel of its choice or has had an opportunity to be so advised, and is not relying upon any representation not specified herein.

16.0 Applicable Law

This Agreement shall be construed under and governed by the laws of the State of California and of the United States, without giving effect to any principles of conflicts of law if

such principles would operate to construe this Agreement under the laws of any other jurisdiction.

17.0 Construction of Agreement

This Agreement is the product of negotiation and preparation by and among each party hereto and its attorneys. Therefore, the parties acknowledge and agree that this Agreement shall not be deemed to have been prepared or drafted by any one party or another. Accordingly, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement.

18.0 Modification of Agreement

No supplement, modification, waiver or amendment with respect to this Agreement shall be binding unless executed in writing by the party against whom enforcement of such supplement, modification, waiver or amendment is sought.

19.0 Counterparts of Agreement

This Agreement may be signed in any number of counterparts by the parties hereto, each of which shall be deemed to be an original, and all of which together shall be deemed one and the same instrument. This Agreement, if executed in counterparts, shall be valid and binding on each party as if fully executed all on one copy.

20.0 Signatories' Authority

The signatories to this Agreement on behalf of all the parties hereto warrant and represent that they have authority to execute this Agreement and to bind the parties on whose behalf they execute this Agreement.

21.0 DWR 4100

The DWR 4100 standard clauses attached hereto as Exhibit C are included and made part of this agreement.

22.0 Notice

Any notice required to be given by this Agreement shall be deemed to have been given by the notifying party when mailed, postage prepaid or delivered to the following:

John Edson, President
Deer Creek Irrigation District
Post Office Box 3
Vina, CA 96092

Dan McManus
Department of Water Resources
2440 Main Street
Red Bluff, CA 96080

DFG
Need Address and appropriate contact info

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

DATED: _____

John Edson, President
Deer Creek Irrigation District

DATED: _____

XXXXXXXXXXXX, Director
Department of Water Resources

DATED: _____

XXXXXXXXXXXX, Director
Department of Fish and Game

**GROUNDWATER MONITORING AND MANAGEMENT GUIDELINES
FOR THE AGREEMENT BETWEEN THE STATE OF CALIFORNIA DEPARTMENT
OF FISH & GAME, DEPARTMENT OF WATER RESOURCES AND
DEER CREEK IRRIGATION DISTRICT FOR CONSTRUCTION, OPERATION,
MAINTENANCE AND MONITORING OF A FLOW ENHANCEMENT PROGRAM ON
DEER CREEK IN TEHAMA COUNTY**

INTRODUCTION

The following Groundwater Monitoring and Management Guidelines are included as part of the attached Agreement between DWR, DFG and DCID to enhance fish transportation flows in Deer Creek through utilization of groundwater in-lieu of bypassed surface water. The following guidelines establish a clear set of criteria for program monitoring, reporting and management and are similar to the management objectives use successfully during DCID's 2003 pilot program and the 2004 test-pumping program.

The overall management goals of the Deer Creek Irrigation District are to maintain the groundwater surface elevation at a level that will assure an adequate and affordable irrigation water supply, and to assure a sustainable supply of good quality groundwater for agricultural and domestic use. In order to maintain this goal, it is recognized that the operational criteria presented in the Groundwater Monitoring and Management Objectives may need to be adjusted as additional operational data for the program are established.

PROGRAM COORDINATION and INSTITUTIONAL AUTHORITY

Deer Creek Irrigation District is signatory to the Tehama County AB 3030 Groundwater Management Plan. The Tehama County AB 3030 Groundwater management Plan is administered by the Tehama County Flood Control and Water Conservation District (TCFCWCD). The TCFCWCD has established a Technical Advisory Committee (AB 3030 TAC) that serves as an advisory body to the TCFCWCD Board. The TCFCWCD Board and the AB 3030 TAC hold monthly meetings to implement the AB 3030 plan, and to develop policy on local groundwater management issues.

Tehama County also administers several groundwater-related ordinances. Chapter 9.4, "Aquifer Protection", of the Tehama County Code incorporates County Ordinance No. 1617. Tehama County Ordinance No. 1617 requires a permit to extract groundwater for the purpose of using or selling the water for use on lands other than the parcel from which the extraction occurs. Permitting authority of this ordinance is through the Tehama County Board of Supervisors (BOS), but administration of the permitting process is through the Tehama County Health Agency, Environmental Health Division (EHD). The EHD also oversees permitting associated with drilling and installation of all new wells.

With respect to operation, monitoring and reporting of DCID's groundwater pumping associated with the Deer Creek Flow Enhancement Program, primary coordination and reporting will be through the Tehama County HED, via the Board of Supervisors. Secondary coordination at the county level will be through the AB 3030 TAC, via the TCFCWCD. At the local level, coordination will be through the DCID Board, the Deer Creek Watershed Conservancy, and through stakeholder meetings associated with ongoing program operations.

During operation of the Deer Creek Flow Enhancement Program, a Deer Creek Water Advisory Committee (WAC) will be established. The WAC will help oversee the development and compliance of the program, interface with the local, county and State representatives, and work towards a more compressive groundwater management plan for the Deer Creek watershed.

The Deer Creek WAC will invite representatives from each of the following entities to participate.

- Deer Creek Irrigation District,
- Tehama County AB 3030 TAC,
- Tehama County Health Agency, EHD
- Northern District Department of Water Resources,
- California Department of Fish and Game,
- UC Davis Agricultural Extension Farm Advisor,
- Deer Creek Watershed Conservancy,
- Stanford Vina Ranch Irrigation Company, and
- Private groundwater users outside DCID and SVRIC area, but within the lower Deer area.

A Deer Creek WAC was developed during the 2003 Pilot Program and proved valuable for providing program input and dispensing information to local, county and state groups. Under the current program, it is anticipated that the WAC will initially meet monthly between April and October to discuss program operations and monitoring results. As the program develops it is envisioned that meetings will be limited and program status/updates will be provided electronically. Official reporting and annual program review associating with the permitting process for the Deer Creek Flow Enhancement Program will be coordinated directly with the Tehama County Health Agency EHD.

GROUNDWATER LEVEL CRITERIA

One of the key criteria for program operations is maintaining a predetermined range of acceptable groundwater levels surrounding the program-related production wells. The acceptable range of groundwater level fluctuation during program operations was established based on historic groundwater level data, and the estimated worse-case decline in groundwater levels associated with previous test-production well pumping. The predetermined range of acceptable groundwater level fluctuation will be reviewed by the WAC and included as part of the Tehama County Groundwater Extraction Permit. Operation of the program production wells will proceed as long as there is compliance with the pre-agreed groundwater level criteria. The groundwater level monitoring location, timing, data reporting, acceptable range of fluctuation during program operations, and procedures for noncompliance determination, evaluation and program shutdown are presented below.

Groundwater Level Measurements

The Department of Water Resources will be responsible for monitoring groundwater levels during the Deer Creek Environmental Flow Enhancement Program. Groundwater monitoring will include a regional County-wide grid, a regional Deer Creek monitoring grid, and a local Key Well grid. Tehama County typically also measures summer groundwater levels in portions of the regional County-wide grid.

Regional County-Wide Groundwater Level Monitoring Network

DWR has maintained a groundwater level monitoring grid in Tehama County for over 50 years. Within this period, the annual size of the monitoring grid has fluctuated from as few as 3 wells in 1951, to about 125 wells in 2005. The County-wide groundwater level monitoring grid consists predominantly of domestic and irrigation wells, along with several dedicated multi-completion monitoring wells. The County-wide grid surrounds the Deer Creek Environmental Flow Enhancement Program on three sides and provides a good regional estimate of seasonal versus long-term groundwater level fluctuations.

Regional Deer Creek Groundwater Level Monitoring Network

A regional groundwater level monitoring network for the lower Deer Creek area was developed in 1998 and 1999, and utilized in the 2003 and 2004 pumping program at DCID. The monitoring grid consists of dedicated multi-completion monitoring wells, as well as, a combination of surrounding domestic and irrigation wells. The grid includes all of DCID and SVRIC, extending from the Sacramento River to the eastern portion of DCD, and from Thomes Creek to Singer Creek. The regional groundwater level monitoring grid, along with the larger Tehama County groundwater monitoring grid, will be used to help identify seasonal trends and long-term fluctuations in groundwater levels at a regional scale.

Local Key Well Groundwater Level Monitoring Network

Groundwater levels in key monitoring wells will be located adjacent to the program-related production wells and will be used to monitor compliance with the predetermined range of acceptable groundwater level fluctuation identified by the criteria below. Key monitoring wells will be selected by the WAC based on their construction, proximity to project wells, and their ability to represent groundwater levels in surrounding agricultural and domestic wells drawing from the upper Tuscan aquifer. Key groundwater monitoring wells were successfully utilized during the 2003 and 2004 pumping programs at DCID to help identify potential impacts to local water users from program-related pumping.

Frequency of Groundwater Level Measurements

Monitoring frequency will vary depending upon monitoring well location and type, and the program operations schedule.

During Periods of Non-Pumping : During non-program operations, the depth to groundwater will be measured in all wells within the County-wide and Deer Creek regional monitoring grids at a minimum frequency of three times per year, and according to the following schedule.

- Spring: (March or April)
- Summer: (July or August)
- Fall: (October)

In addition to the above monitoring, during periods of non-program operations, the selected key wells and the dedicated multi-completion monitoring wells within the Deer Creek regional network will be equipped with automated groundwater level recording equipment. The automated equipment will be set to measure groundwater levels at a minimum frequency of six times per day. The data from this equipment will be

downloaded a minimum of three times per year during non-pumping periods, according to the above schedule.

During Periods of Program-Related Pumping: During periods of program-related pumping, the depth to groundwater will be measured in the Deer Creek monitoring wells that are east of Highway 99, at a minimum frequency of once per month between April and October.

In addition to the above monitoring, during periods of program-related pumping, the selected key wells and multi-completion monitoring wells within the Deer Creek regional monitoring network will be equipped with automated groundwater level recording equipment. The automated equipment will be set to measure groundwater levels at a minimum frequency of twelve times per day. The data from this equipment will be downloaded once per month between April and October, and every three months from November through March.

Acceptable Range of Groundwater Level Fluctuation During Program-Related Pumping

The acceptable range of groundwater level fluctuation during program-related pumping will be determined for each key monitoring well. These ranges are based on static water level readings and were developed based on:

- review of the historic seasonal fluctuation of groundwater levels in domestic and agricultural wells surrounding the program-related production wells,
- the estimated program-related decline in groundwater levels in private wells surrounding the program production wells, and
- the ability of nearby third-party groundwater users to maintain an adequate and affordable supply of good quality groundwater for agricultural and domestic use.

In order to have adequate time to respond and make appropriate adjustments to program operations, the range limits are divided into a series of three warning stages. Each warning stage corresponds to a progressive increase in the decline in groundwater levels, and represents further movement towards noncompliance with the groundwater level criteria and eventual shutdown of program operations. Each warning stage also triggers a sequence of program management review and actions designed to alleviate any additional groundwater level decline.

Definition of Groundwater Level Warning Stages

The groundwater level warning stages are based on static water level readings. The groundwater level data will be plotted on a hydrograph along with warning stage levels as shown in Figure 1. The warning stages will be developed by the Deer Creek WAC and DCID, and are subject to approval by the Tehama County BOS through the permitting process under Tehama County Ordinance No. 1617. It is understood that adjustments to the warning stage criteria may be needed as data is collected during program operations. Procedures for adjustment to a warning stage will be similar to the initial development of the warning stage(s). Historic fluctuation in groundwater level in the Key wells will be used as a baseline for developing subsequent water stage levels.

Warning stages will be divided into three stages corresponding to three increasing levels of groundwater decline, with Stage 1 being the upper-most level and Stage 3 being the lowest level. The warning stages will be defined according to the following criteria.

- Stage 1 Warning will be declared when the static groundwater level in any of the Key Wells falls below the Stage 1 warning line.
- Stage 2 Warning will be declared when the static groundwater level in any of the Key Wells falls below the Stage 2 Warning line.
- Stage 3 Warning will be declared when the static groundwater level in any of the Key Wells falls below the Stage 3 Warning line.

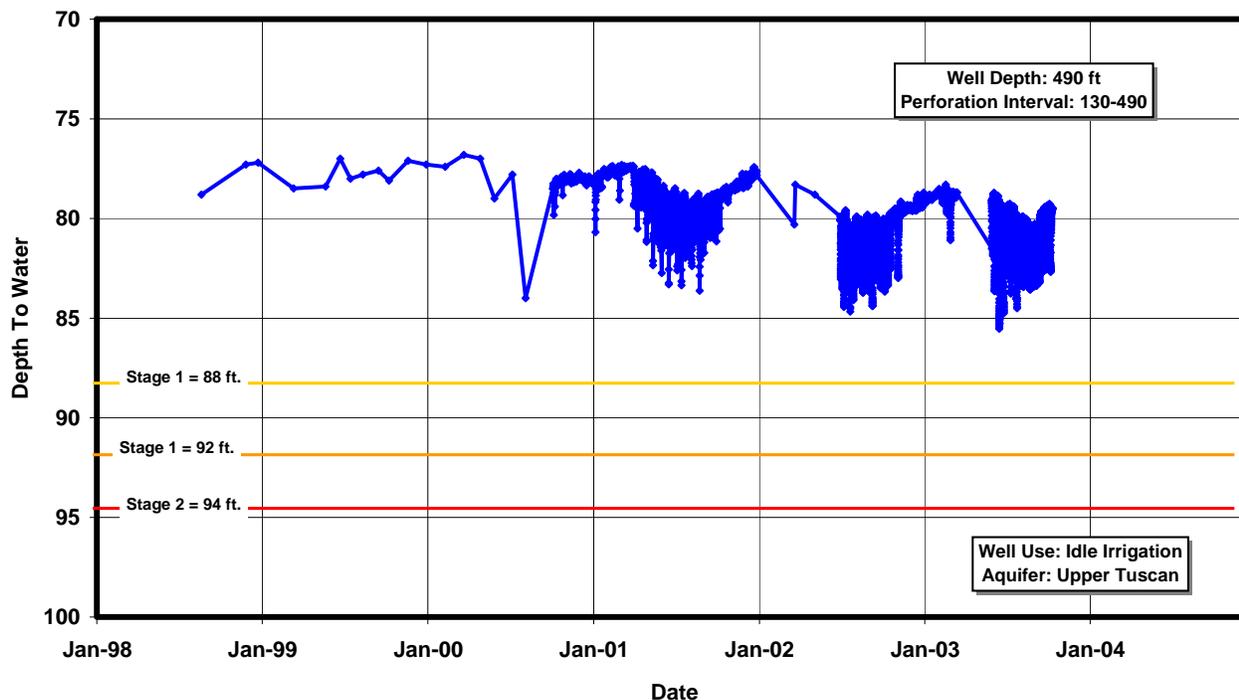


Figure 1. Example Key Well Hydrograph Showing Level Stages

Upon recommendation of the DCID Board and approval of the Tehama County BOS, a Stage 1 and Stage 2 Warning may be rescinded when the groundwater levels rise above the corresponding Stage 1 Warning Line in the non-compliant Key Well(s).

Upon recommendation of the DCID Board and approval of the Tehama County BOS, the Stage 3 Warning may be rescinded when the groundwater levels rise above the Stage 2 Warning Line in the non-compliant Key Well(s). A Stage 3 Warning may also be temporarily downgraded to a Stage 2 Warning if, after review of all of the groundwater level data, the affected landowners, the DCID Board, and the Tehama County BOS unanimously agree to the temporary downgrade.

Evaluation for Compliance with Groundwater Level Criteria

Following each monitoring period, the DWR will evaluate the groundwater level data for determination of compliance with the groundwater level criteria as stated in the Groundwater Management Objectives.

Compliance Reporting and Groundwater Level Data

During periods of program-related pumping, the DWR will make groundwater level data available over the internet within 10 days of each monitoring period. The data will provide Key Well hydrograph data and indicate compliance or non-compliance with warning stage trigger levels.

If wells are found to be in noncompliance with the groundwater level criteria, a noncompliance report will be submitted by the DWR to the Deer Creek WAC, the DCID Board, and the Tehama County EHD within 7 days of the last monitoring period. The noncompliance report will include information as to the regional extent and magnitude of the noncompliance and the character of the compliance violation (Stage 1, 2 or 3 Warning Level).

Response Action for Noncompliance with Groundwater Level Criteria

A series of response actions for each warning level are listed below. The intent of the following list is to provide a minimum level of required response actions, thereby maintaining flexibility for further action, as needed and appropriate, to maintain the general program goals of sustaining the groundwater resource while minimizing third-party impacts. Therefore, the magnitude and extent of possible response actions shall not be limited to those identified below:

Stage 1 Warning - Stage 1 response actions shall include remeasuring groundwater levels and reassessing the appropriateness of the GMO groundwater level criteria with respect to the given circumstances. DWR shall collect and present all pertinent hydrological data to the Deer Creek WAC, the DCID Board, the Tehama County EHD, and the Tehama County AB 3030 TAC for review. The DCID and DWR shall investigate possible causes for the noncompliance, and develop recommend actions to resolve the Stage 1 noncompliance. These recommendations shall be made in a timely manner not to exceed 7 days after the reporting of the Stage 1 noncompliance. It shall be the intent of the review group to first make recommendations that focus on resolving the noncompliance through management actions and negotiations with all parties in the affected area. Additional action to help identify the cause for the noncompliance may include, but not be limited to, increasing the frequency of groundwater monitoring and re-assessing the existing appropriateness of the groundwater level criteria.

Stage 2 Warning - Stage 2 response actions shall include more extensive monitoring and evaluation of the GMO groundwater level criteria with respect to the given circumstances. DWR shall collect and present all pertinent hydrological data to the Deer Creek WAC, the DCID Board, the Tehama County EHD, and the Tehama County AB 3030 TAC for review. The DCID and DWR shall investigate possible causes for the noncompliance, and develop recommend actions to resolve the Stage 2 noncompliance. These recommendations shall be made in a timely manner not to exceed 7 days after the reporting of the Stage 2 noncompliance. Depending upon the circumstances surrounding the Stage 2 noncompliance, actions at this time could include shutting down the pilot program well if a Stage 3 noncompliance appears imminent. If the progression of groundwater levels towards a Stage 3 noncompliance appears slow or unlikely, other operational management methods may be implemented to avoid further decline of groundwater levels. The methods may include, but not be limited to, partial shutdown of the pilot well during periods of peak interference with surrounding pumping wells, reduction in the volume of daily groundwater extraction from the pilot well or voluntary water conservation measures. Implementation of Stage 2 management actions may require action by the Tehama County BOS.

Stage 3 Warning - Stage 3 management actions shall consist of terminating program-related groundwater pumping and collecting groundwater level recovery data in the surrounding monitoring wells. Groundwater level recovery data will be collected by the DWR and presented to the Deer Creek WAC, the DCID Board, the Tehama County EHD, and the Tehama County AB 3030 TAC for review. The DCID and DWR shall investigate the recovery from Stage 3 noncompliance levels, and develop recommend actions as to further program operation.

Supporting Data

When possible, groundwater level and groundwater quality data from surrounding Tehama County areas will be used to support evaluation of existing conditions in the DCID area.

GROUNDWATER QUALITY CRITERIA

Maintaining a minimum level of acceptable water quality from the pilot program pumping well is the second criteria for program operation. The water quality criteria will require that groundwater from the program-related production wells will be maintained above the Maximum Contaminant Level (MCL) established for agricultural use in the United States by the Food and Agriculture Organization of the United Nations. For some minerals and nutrients, no agricultural MCL's have been established. In these situations, water quality from the program-related production wells will be maintained at level that is equal to, or better than, the existing quality of surface water that is currently being diverted. The water quality standards for agriculture are listed in Table 1.

The range of acceptable groundwater quality will be reviewed by the Deer Creek WAC and supported by the DCID Board. Operation of the groundwater pumping program will proceed as long as there is compliance with the pre-agreed to groundwater quality criteria. The location and frequency of groundwater quality monitoring, the reporting of the data, and management action for noncompliance are presented below and is based on previous water quality monitoring conducted during the 2003 and 2004 pilot well programs which indicated that the quality of water from the lower Tuscan aquifer is of high quality.

Key Water Quality Monitoring Sites

Three key water quality monitoring sites will be selected at each of the program-related production well locations. The sites will be located as follows:

- Site 1: Sample and test surface water quality in the distribution system, above the point where groundwater from the pilot well discharges into the system.
- Site 2: Sample and test the groundwater quality as it discharges from the pilot well.
- Site 3: Sample and test the surface water quality in the distribution system below the point where groundwater from the pilot well discharges into the system.

Water Quality Sampling and Testing

The Department of Water Resources will be responsible for field collection and testing of surface and groundwater quality samples. Analytical testing will be conducted at a State of California approved laboratory and will include analysis for minerals, trace metals and nutrients. Minerals analysis will include testing for conductivity, pH, temperature, alkalinity, total dissolved solids, total hardness, boron, calcium, chloride, magnesium, potassium, sodium and sulfate. Trace metal analysis will include testing for aluminum, arsenic, barium, cadmium, chromium, copper, iron,

lead, manganese, mercury, nickel, selenium and zinc. Nutrient analysis will include testing for ammonia, dissolved orthophosphate, nitrite, nitrate, and total phosphorus.

Parameter	Aluminum	Arsenic	Boron	ASAR ²	Cadmium	Chloride	SC ³	TDS ⁴
Ag. MCL ¹ (mg/l)	5.0	0.1	0.7	< 3	0.01	106	0.7	450
Parameter	Manganese	Copper	Nickel	Iron	Selenium	Lead	Zinc	
Ag. MCL ¹ (mg/l)	0.2	0.2	0.2	0.3	0.02	5.0	2.0	
1. MCL = Agricultural Maximum Contaminant Level 2. ASAR = Adjusted Sodium Absorption Ratio 3. SC = Specific Capacity measured in micro-mhos/cm 4. TDS = Total Dissolved Solids								

Table 1. Agricultural Water Quality Standards Established by Food and Agriculture Organization of the United Nations.

Frequency of Water Quality Monitoring

Based on the 2003 and 2004 data indicating that the quality of water from the lower Tuscan aquifer was of high quality, sampling for the future program will be collected once from the three above indicated sites, at each production well location, within 5 days of the start of the test-production well pumping and once within 5 days of the conclusion of the pumping. In addition, field measurements of electrical conductivity will be conducted monthly at similar locations. Following each monitoring period, the DWR will evaluate the surface and groundwater water quality data for compliance with the MCL's for agricultural use as listed in Table 1.

Compliance Reporting of Water Quality Data

During program operations, the DWR will provide the analytical results from the water quality testing over the Internet within 10 days of receiving the data from the lab, and within 7 days of the monthly field sampling date. In addition, status reports will be provided to the Deer Creek WAC, the Tehama County EHD, and the Tehama County AB 3030 TAC. Each report will provide a comparison of recently measured water quality data against the agricultural MCL's.

Response Action for Noncompliance with Water Quality Criteria

If water quality data is above the recommended agricultural standards presented in Table 1, DWR will submit the information to the DCID Board, the EHD and the Tehama County AB 3030 TAC along with recommend actions to improve water quality. The recommended corrective actions will vary depending upon which water quality parameters are exceeding the agricultural MCL. Corrective actions may include, but not be limited to, mixing of poor quality water with water of a higher quality, treatment of the poor quality water or termination of pumping from the pilot well.

ANNUAL REPORTING

An annual report will be prepared in the fall at the conclusion of the program-related groundwater pumping. The annual report will summarize the status of groundwater levels and water quality for the DCID project area over the past year, compliance or non-compliance with groundwater management objectives of the pilot water exchange program, evaluation of program operations, and recommendations for improvement.

DRAFT Exhibit B
Deer Creek Fish Passage Assessment Plan
For the
Deer Creek Environmental Flow Enhancement Program

California Department of Fish and Game
Version: November 23, 2005

The State and DCID recognize the need for a long-term solution to fish transportation issues in Deer Creek and are working towards a phased development of a Deer Creek Flow Enhancement Program. The intent of the Flow Enhancement Program is to augment fish transportation in Deer Creek by developing a supplemental water supply and implementing water use efficiency improvements. These measures are anticipated to provide between 15 and 18 cfs of flow for spring-run Chinook salmon (SRCS), fall-run Chinook salmon (FRCS) and Steelhead trout. DCID will be reimbursed with supplemental water in the amount equal to that bypassed for fish transportation flow. This Fish Passage Assessment will monitor fish passage conditions over a range of water year types to determine the timing and effectiveness of the Deer Creek Flow Enhancement Program operations.

Background

To date, no flow studies specific to the unique hydrology of Deer Creek have been completed to determine timing and duration of minimum and optimal bypass flows for adult salmon and steelhead migration. For the purposes of initially estimating the annual volume and timing of the Deer Creek Flow Enhancement Program, a preliminary estimate of 50 cfs has been chosen for fish transportation needs. To better refine transportation requirements of adult salmon, the fish flow objectives addressed in this plan are:

1. What is the sustained flow for unimpaired fish passage from the Sacramento River past Stanford Vina Ranch Irrigation Company (SVRIC) Dam?
2. In the absence of unimpaired sustained flows, will a pulse flow trigger fish movement?
3. In the absence of unimpaired sustained flow, will a combination of minimum sustained flow and riffle modification pass fish?
4. When and for how long are bypassed flows needed to move fish?

This fish passage assessment will focus on determining the appropriate habitat conditions to insure unimpaired migration. These habitat conditions will include salmon occurrence surveys, identification and measurement of critical riffles, identification and mapping of braided channels, and water temperature monitoring.

Measuring Fish Passage

The 4.9 mile section of Deer Creek between SVRIC dam and the confluence with the Sacramento River will be assessed using a combination of stream channel monitoring and salmon occurrence surveys. Spring surveys will be made April, May, and June and

will commence once post-diversion flows are ≤ 100 cfs. Fall surveys will start in mid-October once water temperatures can support spawning salmon and continue for a 2 week period.

Channel characteristics of riffles successfully passing fish will be compared with riffles causing fish stranding. A combination of ground and underwater observation techniques and fish ladder counts will be used to determine the occurrence of adult salmon and evidence of fish stranding. In the spring months riffles will be monitored starting at 100cfs and will continue until water temperatures create a thermal barrier, or adult salmon are no longer observed. Measurement of channel characteristics of critical riffles successfully passing salmon will be used to determine relationships between stream discharge, riffle depth characteristics, and fish occurrence.

Pulse Flows

Upon mutual consent of DCID, DFG and DWR, DFG may request that DCID bypass diversions greater than the instantaneous capacity (realized thru Project wills and WUE improvements) for a pulse flow rather than a continuous flow. If additional flows are needed, DCID may provide a pulse flow of up to approximately 30 cfs for a period of one or two days. Actual bypass flow will be based on DFG's recommendations utilizing concurrent assessment of surface water temperatures and critical riffle transportation flow need. Pulse flows are not recommended in the fall of the year due to the spawning potential downstream of SVRIC dam and possible salmon or redd stranding once sustained flows resume.

If adult salmon are observed between SVRIC dam and the confluence of Deer Creek, an enhanced one or two day pulse flow may be used to attract salmon upstream of SVRIC Dam if the following conditions occur:

- As maximum daily water temperatures reach 65°F to 70°F as measured at the DVD gage
- Critical riffles reach the minimum critical passage depths

Likewise, if juvenile salmon and steelhead are observed in lower reaches of Deer Creek in the end of June when bypassed flows may no longer be requested for adult fish passage, a pulse flow may be requested to trigger outmigration.

Lower Deer Creek is considered a migration corridor for immigrating SRCS and these fish are not utilizing this area for holding habitat or long-term resting pools. Consequently a pulse flow of up to 2 days should provide adequate time for fish to migrate past diversion dams. Studies in other rivers show that SRCS migrate upstream at rates between 6-18 miles/day early in the migration season and maximum rates of 31 miles/day later in the migration season. Applying these migration rate criteria to Deer Creek, (assuming unimpeded flows over critical riffles and no thermal inhibitors), yields passage rates of 4 to 19 hours to pass the lower dam and 6 to 29 hours to pass the upper dam. As shown in Table 1, a 1-2 day pulse flow (24-48 hours) should facilitate movement upstream of water diversions.

Table 1. Estimated migration rates for adult salmon in Deer Creek between the confluence and DCID upper dam.

Distance from confluence:		Travel Time	
		SVRIC Dam (4.9 miles)	DCID Dam (7.4 miles)
Early season rates	6.2 mi/day	19 hours	28.6 hours
	18.3 mi/day	6.5 hours	9.7 hours
Late season rate	31 mi/day	3.8 hours	5.7 hours

Before and after pulse flow events, visual observations (including ground surveys, underwater surveys and fish ladder counts) will be used to evaluate the effectiveness of pulses of water in triggering adult and juvenile fish movement, including evaluation of diurnal timing of pulse release and experimental ramp down rates.

Riffle Modification

In some instances, a riffle or braided channel may require more flow for unimpaired passage than is available to be bypassed. If fish surveys find evidence of adult salmon stranding caused by a barrier condition and extra flows are not available for a pulse flow event, the potential of mechanically modifying a riffle to afford fish passage will be evaluated. All proposed modifications will be discussed with affected landowners. Although it is not the intent of this program to annually modify riffles as a substitute for providing adequate passage flows for salmon, it is recognized that concurrent with changing channel conditions, bypass needs for unimpeded passage may also change. A program that occasionally modifies a critical passage area will assist with providing salmon access into Deer Creek in situations when extra bypass flow is not available.

Water Temperature Standards

Since adult Chinook salmon are less tolerant of thermal stress than juvenile salmon, temperature tolerance criteria for adult Chinook will be used for setting temperature standard for all life-stages of salmonids in lower Deer Creek. These temperature standards will be used in determining the effects of flow reduction and flow augmentation, the duration of fish migration, the cessation of bypass flows in early summer and the beginning of bypass flows in the fall.

In order to determine upper optimal temperature ranges and maximum temperature tolerance levels for immigrating SRCS, a literature review was made of temperature studies on Chinook salmon. The following table represents a generalized temperature tolerance regime for adult Chinook salmon.

Table 2. Adult Chinook salmon immigration temperature tolerances.

Tolerance Levels	Maximum daily average of 7 days
Upper optimal temperature range	57.7°F to 62.2°F
Acute (short-term) exposure	68°F to 69.8°F (single daily maximum)
Upper migration limit	70°F
Resuming migration	66°
Lethal	≥ 72°F
Upper limit for spawning FRCS	57.5°F

For the purposes of establishing temperature tolerance criteria for immigrating Deer Creek SRCS, the following **maximum daily water temperatures** will be used:

- Prolonged exposure to 70°F or greater will be considered lethal
- Salmon will presume to migrate up to 70°F. At 70°F will salmon presumably halt migration and resume movement when temperatures cool to 66°F.
- Water temperature will be taken pre-diversion at the USGS, DCV stream gage and post-diversion at he DVD gage

A weekly rolling average of maximum daily water temperatures in conjunction with monitoring for salmon occurrence will be used to predict when SRCS migration has ceased in early summer and when FRCS will begin migration in the fall. Using a combination of established USGS temperature gages and portable temperature monitors, when the 7-day arithmetic average of the daily maximum temperature values exceeds 70°F, it will be assumed that SRCS migration has ceased for the season. When this criteria has been reached DFG will notify DCID and DWR. Conversely, bypass flows will be requested for FRCS when the 7-day average of the daily maximum water temperature declines below 57.5°F. A fall flow release will be arranged by mutual consent of DCID, CDFG, and DWR. Once fall flows commence, they must be maintained for the duration of salmon spawning and egg incubation.

Time Line

The following chart shows the anticipated timeline for data collection and assessment for this program.

Activity	Years 1 - 10					
	Apr	May	Jun		Oct	Nov
Water temperature monitoring	√	√	√		√	
Channel and riffle assessment	√	√	√		√	
Salmonid occurrence surveys	√	√	√		√	
Develop long-term monitoring plan	Jan-Mar of 3 rd year					

Years 1-3 will be used to define riffle depth criteria, recommended channel profiles and minimum instream flows. Field monitoring efforts in years 4-10 will be reduced by approximately 50% and will concentrate on implementing the fish passage criteria determined from the programs initial 3 years.

Budget

Four-Pumps will contract with Pacific States Marine Fisheries Commission (PSMFC) to hire Fishery Technicians. These Technicians will be selected and trained by DFG. DFG will provide an Associate Fishery Biologist as project lead. DFG will be responsible project management and coordination between landowners and DCID.

For field assessment during years 1-3, DFG will employ 2 Technicians for a total of 3 months in April, May, June and a 2 week period in October and November. In years 4-10, Technicians will be used a total of 1.5 months during the same time periods. Table 3 shows the annual cost and total budget for these 10 years of monitoring. DFG will supply an in-kind funding match to this program by providing an Associate Biologist for project management and reporting, transportation costs to Deer Creek, and stream survey equipment. Table 4 shows the total DFG funding match for the 10 years of the program.

Table 3. 10-year budget for Fish Passage Assessment component of Deer Creek Flow Enhancement Program.

PSMFC Labor	Start Up	Year 2	Year 3	Years 4-10
1. Labor/Benefits (2 PSMFC technicians)	\$27,000	\$27,000	\$27,000	\$15,000 annually
2. Supplies/Reporting/PSMFC Project Management	\$10,000	\$8,000	\$8,000	\$5,000 annually
subtotal	\$37,000	\$35,000	\$35,000	\$20,000 annually
Project Total				\$247,000

Table 4. DFG in-kind match for Deer Creek Fish Passage Assessment

DFG Labor	Years 1-3	Years 4-10
1. DFG Project Management	\$25,000	\$12,500 annually
2. Field supplies and Transportation	\$6,000	\$3,000 annually
subtotal	\$31,000 annually	\$15,500 annually
Project Total		\$201,500

Reporting

A fish assessment template for anadromous fish instream flow needs in lower Deer Creek will be prepared after the initial three years of the program. This template will include:

- a. Recommendations for minimum in-stream flows needed for unimpaired passage of adult salmon between the Sacramento River and SVRIC Dam.
- b. Recommendations on the seasonal duration of bypass flow periods based on maximum daily water temperatures and fish occurrence surveys.

- c. Minimum riffle depth criterion and recommended channel profiles to pass fish at recommended minimum flows.
- d. Criteria for critical riffle modification.
- e. Criteria for the timing, frequency and duration of pulse flows.
- f. Anticipate frequency of this program based on assessment results and historical hydrographs.
- g. Sampling protocol and revised projected budget for years 4-10 of the Deer Creek Fish Passage Assessment Plan.

Stream Access Permission

DFG has not obtained permission for land access between SVRIC dam and Deer Creeks confluence for the purposes of this Assessment Plan. Likewise, permission has not been obtained for potential riffle modification activities. If access permission cannot be obtained at the onset of this program, objectives may not be completed as outlined.

Other fish monitoring in the Watershed

Additional monitoring by DFG in Deer Creek which may be used to measure the effectiveness of supplemental flows include annual SRCS and FRCS population counts and juvenile salmon outmigrant monitoring. Adult SRCS and FRCS population numbers will be used in this assessment to compare annual escapement levels with unimpaired passage flows. (Although, using salmon escapement numbers to justify program effectiveness cannot be verified with the proposed sampling methodologies.) These monitoring activities are funded thru existing DFG contracts.

The rotary screw trap monitoring will be used in this assessment to predict the occurrence of juvenile Chinook and Steelhead trout in lower Deer Creek during the months of May, June and late October.