Revised 2013 Inadvertent Overrun Payback Plan

August 5, 2013

Purpose

Bureau of Reclamation's *Colorado River Accounting and Water Use Report – Arizona, California, and Nevada – Calendar Year 2011*[1] documents that Imperial Irrigation District (IID) incurred an inadvertent overrun in calendar year 2011, for which payback in the amount of 82,662 acre-feet is required. This inadvertent overrun was caused by increased irrigation demand due to record demand for agricultural commodities and by subnormal precipitation.

In accordance with the Inadvertent Overrun and Payback Policy (IOPP), IID is required to submit this payback plan to describe how IID will meet its calendar year 2013 payback obligation of 62,000 ac-ft. IID intends to use Intentionally Created Surplus (ICS), IOPP Supplementation Measures, and IOPP Conservation Measures in 2012 as early payback and in 2013 as scheduled payback. Each source of payback water and its scheduled use is described below.

Intentionally Created Surplus

Reclamation's 2011 Decree Accounting Report indicates that IID's 2011 ICS end-of-year balance was 5,842 ac-ft. IID hereby requests that these 5,842 ac-ft of Extraordinary Conservation ICS be deducted in 2012 and applied as early payback toward its 2011 overrun. Upon approval of this payback plan, IID will revise its 2012 water order to include this ICS deduction.

IOPP Supplementation Measures

Per the *Agreement for Storage of Groundwater by and between Coachella Valley Water District and Imperial Irrigation District*[2] executed October 10, 2003, IID delivered 525 ac-ft of Colorado River water to Coachella Valley Water District (CVWD) in 2010 for groundwater storage. "Delivery Loss" and "Storage Loss" are incurred per the agreement and IID estimates that 445 ac-ft of stored water will be available in IID's "Storage Account" on January 1, 2013. The agreement indicates that "Return of Stored Water" may be requested by IID and requires that CVWD reduce its consumptive use of Colorado River water in a volume equal to that requested by IID within certain provisions. Thus an equal volume of water is made available to IID by exchange at Imperial Dam. IID intends to forbear delivery of these 445 ac-ft in 2013 as an IOPP Supplementation Measure to be applied toward its payback obligation.

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[1] Hereafter referred to as *2011 Decree Accounting Report.* http://www.usbr.gov/lc/region/g4000/4200Rpts/DecreeRpt/2011/2011.pdf

[2] http://www.iid.com/Modules/ShowDocument.aspx?documentid=871

IID may request that CVWD return the stored groundwater in 2012 if such an arrangement is deemed beneficial to both parties. In such case, IID would forebear delivery of 451 ac-ft as an early payback of its scheduled 2013 payback obligation. IID will provide updates to Reclamation including letters exchanged with CVWD detailing the exact dates and volumes of supplementation as final documents become available.

IOPP Conservation Measures

IID plans to implement the following types of IOPP conservation measures:

- Delivery System Improvements
- Main Canal Seepage Interception
- Fallowing Program
- On-Farm Conservation in the following categories:
  - Irrigation Scheduling and Event Management
  - Pressurized Irrigation
  - Tailwater Reuse
  - Surface Irrigation Optimization

IID's primary objective in implementing the measures listed above is to satisfy its conservation, transfer, and mitigation obligations under the 2003 Quantification Settlement Agreement and Related Agreements (QSA), although implementation schedules and conservation targets have been accelerated to meet IOPP obligations. Water conserved through these measures will first be applied to meet QSA obligations. Remaining volumes will be applied to IOPP obligations and then, in the unlikely event that excess conservation occurs, to ICS storage where approved.

Main Canal Seepage Interception and Fallowing Programs are identified as conservation measures in IID's *2013 Plan for the Creation of Extraordinary Conservation Intentionally Created Surplus*. IID acknowledges that Extraordinary Conservation ICS cannot be created during a calendar year when IID incurs an overrun. Thus should IID incur an overrun in 2013, any volume conserved through Main Canal Seepage Interception and Fallowing Programs in excess of the volumes required for transfer and payback would first be applied to eliminate the 2013 overrun before being considered for storage as ICS.

Conservation Measure Descriptions, Estimated Volumes, and Proposed Verification

Accounting for the consumptive use reduction associated with the following IOPP Conservation Measures is performed relative to IID's diversion at Imperial Dam using the loss factors previously agreed upon by IID and Reclamation. Station 60 accuracy is assumed comparable to All-American Canal accuracy at Pilot Knob. Uncertainty of annual volume for the All-American Canal at Pilot Knob has been demonstrated to have 2.0% accuracy with 95% confidence.[3] The volume estimates given below for the various conservation measures are estimated at-site yields and do not include conveyance loss corrections.

[3] Clemmens, A. and Wahlin, B. (2006). "Accuracy of Annual Volume from Current-Meter-Based Stage Discharges." *J. Hydrol. Eng.*, 11(5), 489–501.

Delivery System Improvements

In 2013, IID will begin implementing its System Conservation Program (SCP) consisting of delivery system improvements designed to conserve water through targeted spill reductions and improvements to water delivery operations. Components of the SCP include automated headings of main canals and laterals, continuous measurement and monitoring of lateral spill sites and customer delivery gates, and eventually construction of inline lateral reservoirs. Water level and flow information will be provided to operations personnel in near-real-time to facilitate quicker responses to system fluctuations. These projects will require significant upgrades to IID's current SCADA system, development of custom decision-support software, and deployment of technology aids such as portable computers for zanjeros.

The SCP is expected to yield up to 8,000 ac-ft of conserved water in 2013. Depending on the performance of other planned conservation measures, some or all of this water may be needed to help meet transfer requirements of the QSA. Thus, up to 8,000 ac-ft may be available for overrun payback. IID will provide updates to Reclamation as conservation measure performance projections are refined in 2013.

IID will make available site locations and specific conservation yields as they become available. Reclamation may randomly select five percent of the sites for on-site verification, whereupon IID will provide baseline data and estimated conservation volumes. The implementation schedule for this project is such that the customary spring verification visit may not be feasible – Reclamation should plan to perform a minimum of one verification inspection in fall 2013.

Main Canal Seepage Interception System

IID's Main Canal Seepage Interception System is the first efficiency conservation program to be implemented to meet IID's water transfer obligations under the QSA and other related agreements. This project consists of the installation and operation of pump stations, collection sumps, and appurtenant structures in open drains that run parallel to certain reaches of main canals located in areas of highly permeable soils. These open drains were constructed along main canals decades ago to intercept and carry seepage to the Salton Sea to relieve adjacent agricultural lands of high water tables associated with canal seepage. The Main Canal Seepage Interception System is estimated to have the capacity to collect 30,000-40,000 ac-ft of water from existing interceptor drains and pump seepage back into the main canals to supply downstream water users and reduce IID's delivery at Imperial Dam. In total, 22 pumping stations were constructed at the lower ends of interceptor drains and are operated to maintain drain water levels within six inches of historical levels to prevent interference with normal drainage and induction of additional seepage from the main canals. The locations of the 22 pump stations are shown in Figure 1.

Each pump station is equipped with an electromagnetic flow meter and a programmable logic controller with data logging and telemetry capabilities. Data is transmitted via radio to IID's servers for daily quality control, summary, and archival.

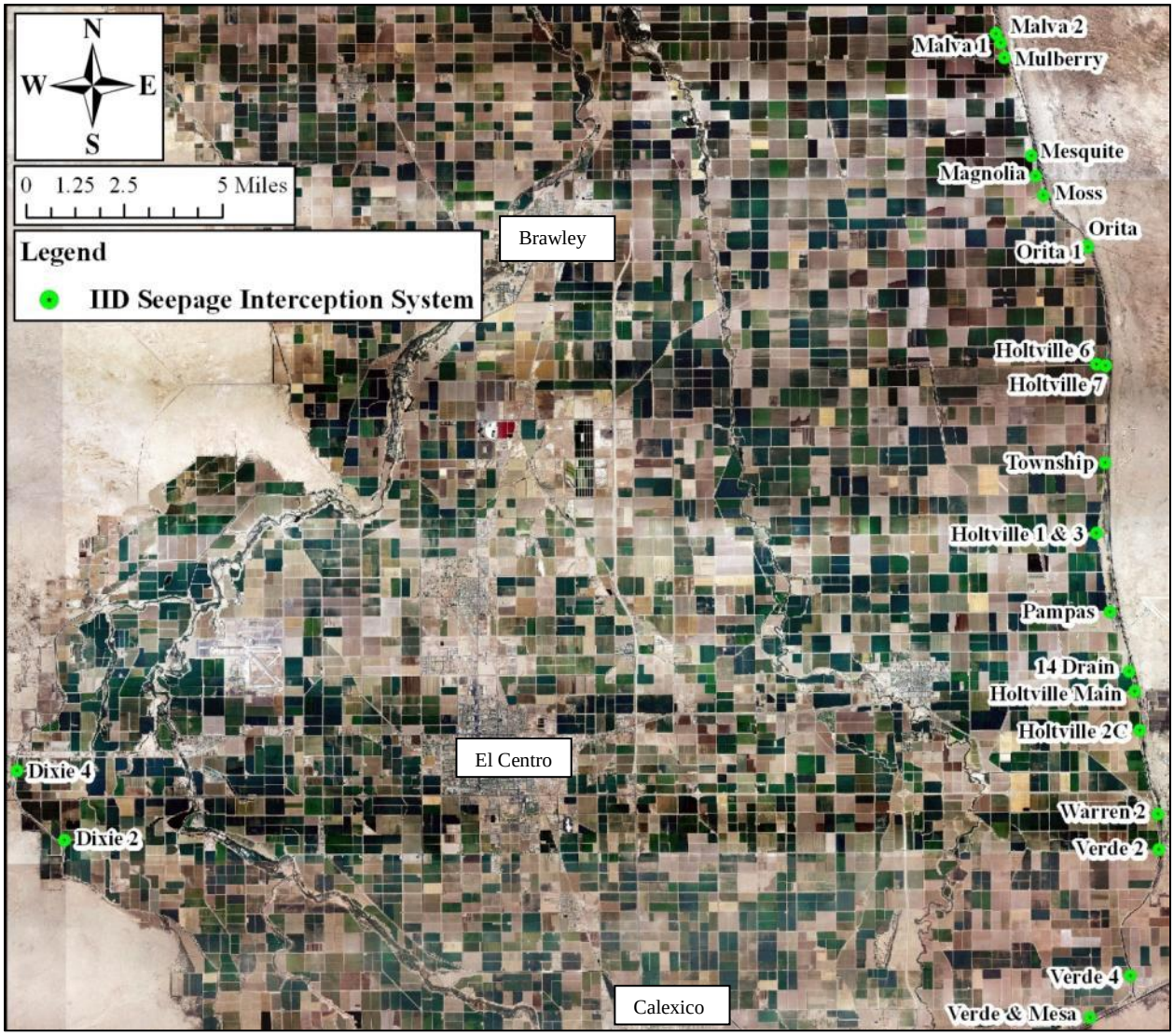


Figure 1. Map depicting locations of 22 Main Canal Seepage Interception stations

This seepage recovery project was designed to provide conserved water for transfer under the QSA; however, because the construction schedule for this project outpaced the conserved water delivery schedule required by the QSA, this extraordinary conservation project may produce conserved water in excess of the transfer requirements through at least 2015. As such, the excess conserved water is available for use by IID for other purposes including overrun payback and ICS until such time that the full conservation yield of this seepage recovery project is transferred under the QSA. IID estimates that the Main Canal Seepage Interception System will conserve 14,000 to 36,000 ac-ft in calendar year 2013. Some or all of this volume may be applied to transfer obligations under the QSA, potentially leaving up to 22,000 ac-ft available to satisfy scheduled IOPP obligations in 2013 and, at IID's election, early payback of 2014 IOPP obligations. In the unlikely event that excess conserved water remains after 2013 payback obligations are fully met through this and other measures, IID would request that any remaining water conserved by Main Canal Seepage Interception be stored as ICS.

IID will continue to cooperate with Reclamation in coordinating semiannual verification inspections of five percent of the Main Canal Seepage Interception sites. Flow data and volume summaries for selected sites will be made available to Reclamation. IID will also continue to provide Reclamation with quarterly summaries of volume pumped at each site.

Fallowing Program

IID's Fallowing Program is a voluntary program that allows willing landowners and/or lessees to contract with IID to receive payment for forgoing all delivery of irrigation water throughout the term of the agreement, usually one to two years. The water that otherwise would have been used for irrigation is conserved and becomes available for IID to use for other purposes such as transfer or mitigation under the QSA, overrun payback under the IOPP, or Extraordinary Conservation ICS.

Initial program parameters were established in the Phase I On-Farm Fallowing Program Plan[4] dated March 18, 2004. This document was revised in 2006[5] and is anticipated to be updated again in 2013. Additional minor program changes have been incorporated into IID's template agreement with participants on an annual basis as necessary. Links to annual fallowing program summary information, which includes agreement templates, can be accessed from IID's fallowing webpage[6].

Estimated conservation for fallowed fields is evaluated relative to field-specific baseline water use consisting of 10-year running average water delivery history with certain corrections. Individual fields may participate in fallowing programs two out of every four years and must comprise a minimum of ten irrigated acres. Proposed fields are screened for these and other eligibility criteria with consideration given to environmental impacts and administrative costs. In the event of oversubscription, eligible fields are selected utilizing a random selection process within major geographic areas to ensure adequate distribution.

Since 2003, IID has conducted ten separate fallowing programs yielding over 730,000 acre-feet of conserved water by paying participants a total of over $42 million to fallow approximately 117,000 acres of agricultural lands. IID recently extended the enrollment period for its eleventh fallowing program, FP 2012-13, which offers nine to 18-month terms with beginning and end dates ranging from January 1, 2012 to June 30, 2013. IID recently initiated solicitation for its first calendar year program, FP 2013, and is accepting applications for early enrollment with start dates ranging from July 1, 2012 to January 1, 2013 and end dates of December 31, 2013. A concurrent fallowing program, FP 2013-14, is anticipated to offer 12-month terms starting July 1, 2013.

Depending on final contract volumes, total projected Fallowing Program yield for calendar year 2013 is 183,707 to 251,375 ac-ft, of which 150,000 ac-ft is required to meet QSA obligations for transfer and environmental mitigation. Conditional on the yield of other conservation measures, 33,707 to 76,375 ac-ft of the 2013 fallowing yield may be applied to scheduled or early payback

[4] http://www.iid.com/Modules/ShowDocument.aspx?documentid=630
[5] http://www.iid.com/Modules/ShowDocument.aspx?documentid=611
[6] http://www.iid.com/index.aspx?page=190

of 2013 or 2014 IOPP obligations, respectively, with any balance being credited as ICS. IID will update Reclamation with final contracted volumes as they become available.

IID monitors fields enrolled in the Fallowing Program to ensure that no irrigation water is delivered during the term of the contracts. Where possible, delivery gates are locked to prevent water delivery to fields participating in the Fallowing Program. Where the same gate supplies a participating field and other water uses, physical obstructions such as berms or secondary gates are employed. Additionally, IID's water order entry and delivery tracking software is programmed to prevent the placement of water orders on participating fields and to provide a verifiable record that irrigation water has not been delivered to those fields.

IID will continue to cooperate with Reclamation in coordinating semiannual verification inspections of five percent of the total acreage enrolled in the Fallowing Program. One month prior to Reclamation's inspection visit or when Reclamation schedules the visit with IID, whichever is later, IID will provide a list of enrolled fields and acreages from which Reclamation may randomly select a sample of fields representing five percent of total enrolled acreage. Datasets detailing baselines and conservation volumes for selected fields will be made available for Reclamation inspection during the semiannual visits.

<u>On-Farm Efficiency Conservation Program</u>

IID is finalizing its On-Farm Efficiency Conservation Program which is anticipated to be implemented throughout the IID service area beginning October 2012 ongoing through 2047. The program's 2013 conservation goal of 2,000 to 24,000 ac-ft will be achieved by contracting with agricultural water customers to implement on-farm water use efficiency improvement measures. IID will offer to pay participants to reduce their seasonal delivery volumes through the use of approved conservation measures. Payments will be made per unit volume of delivery reduction. Interested customers are expected to propose a conservation measure and an anticipated delivery reduction volume. IID will then evaluate all proposals for certain eligibility criteria and randomly select for contracting those proposals needed to meet conservation goals. Contracts will specify a field- and crop-specific baseline delivery volume based on delivery records from the previous 10 years against which delivery reduction will be evaluated, after correction for actual weather conditions and season lengths. Please refer to the Appendix for a detailed description of baseline estimation methods. Participants will agree to accept a firm delivery limit equal to the baseline delivery volume less the contracted delivery reduction. It is anticipated that many of the conservation measures implemented will fall into the following categories: irrigation scheduling and event management, pressurized irrigation systems, tailwater reuse, and surface irrigation optimization. A brief description of each category follows.

Irrigation Scheduling and Event Management

Irrigation scheduling uses weather models and soil moisture measurements to estimate crop water requirements and optimize the timing and amounts of irrigation applications, considering such cultural constraints as harvest schedules and water and labor availability. Irrigation event management seeks to optimize such irrigation parameters as flow rate, event duration, application rate, and cut-off time to match crop water needs, soil

characteristics, and water availability. These two management-based measures are often combined with other hardware-based measures, but have also been proven to reduce irrigation delivery requirements as stand-alone measures. IID staff, customers, and irrigation consultants implemented a successful demonstration Irrigation Scheduling and Event Management Program in 2008-2009, yielding over 700 ac-ft for inadvertent overrun payback and ICS storage.

Pressurized Irrigation

Pressurized irrigation systems convey irrigation water to the location in the field of infiltration into the root zone rather than allowing water to run across the soil by gravity to reach the crop. Pressurized irrigation systems can be designed, maintained, and operated to apply water with good uniformity and to avoid runoff while minimizing deep percolation and evaporation losses, all of which serve to reduce the amount of irrigation delivery required. This category includes many variations of sprinkle irrigation, such as center pivots, wheel lines, solid sets, and micro sprinklers; and drip/trickle irrigation methods, including surface and subsurface drip systems.

Tailwater Reuse

Tailwater reuse systems capture tailwater (runoff) from surface-irrigated fields and convey it to a point where it can be reused for irrigation either on the same field or nearby fields. Examples include tailwater return systems, whereby tailwater is collected at the lower end of a field or group of fields and pumped back to the head ditch of one or more originating fields, and tailwater cascading structures, which collect tailwater and direct it to the head ditch of a nearby lower-lying field. Both systems have been shown to supplement and reduce the volume of fresh water delivered to participating fields.

Surface Irrigation Optimization

This category includes many innovative measures to improve existing gravity-flow, surface irrigation systems, reducing inefficiencies and irrigation delivery requirements. Examples include major land leveling to optimize field slope or construct level basins and terraces, multiple head ditches to shorten run length, impermeable head ditch liners, gated pipe, surge flow, limited tillage programs to improve infiltration, optimized border width, and the use of surface irrigation modeling software.

Some or all of the estimated 2,000 to 24,000 ac-ft conserved through the 2013 On-Farm Efficiency Conservation Program will be used to satisfy QSA requirements and any remaining volume will be applied to overrun payback. Total contracted delivery reduction volumes will be made available after contracting is complete. Actual delivery reductions will be computed for each participating field after each crop season and/or following each calendar year. The volume *projected* to be applied to 2013 payback obligations may range up to 22,000 ac-ft, however the final verified volume will not be known until early 2014. IID will provide updates to Reclamation to narrow these estimated ranges as contracts are executed in 2012 and 2013.

In addition to performing field visits to enrolled fields during construction and operation activities, IID will track water deliveries to each enrolled field through the term of the contracts, limiting seasonal delivered water to the delivery baseline less the agreed upon delivery reduction. Reclamation is invited to make semiannual verification visits to randomly selected fields representing five percent of enrolled acreage. During field visits, IID and participating customers may demonstrate the effectiveness of implemented efficiency conservation measures. IID will also make available blind datasets detailing computed baselines, contracted delivery reductions, and year-to-date delivery volumes for the randomly selected fields. IID will also review with Reclamation inspectors the baseline calculation procedures for two of the selected fields.

Conservation/Supplementation Measure Yield Summary

Table 1. Summary of estimated yield ranges for IOPP Conservation/Supplementation measures

Conservation/Supplementation Measure	Estimated 2013 Conservation/Supplementation Volume in ac-ft			
	Total Potential	QSA Obligations	Overrun Payback	Intentionally Created Surplus
Intentionally Created Surplus Deduction	5,842	0	5,842	0
Exchange of Stored Groundwater	445-451	0	445-451	0
Delivery System Improvements	0-8,000	0-8,000	0-8,000	0
Main Canal Seepage Interception	14,000-36,000	14,000-36,000	0-22,000	0-12,000
On-Farm Improvements	2,000-24,000	2,000-24,000	0-22,000	0
Land Fallowing Program	183,707-251,375	150,000	33,707-76,375	0-25,000
Total	258,000-303,662	196,000	62,000-82,662	0-25,000

Additional Information

For more information see www.iid.com or visit IID's Water Conservation Implementation web link at www.iid.com/index.aspx?page=382 or the Fallowing Program web link at www.iid.com/index.aspx?page=190.

Appendix

IID On-Farm Efficiency Conservation Program

Summary of Conservation Baseline Computation Procedures

Solicitation, Contracting, and Verification Overview

The On-farm Efficiency Conservation Program solicits proposals from IID's agricultural water users who wish to implement efficiency improvement measures on their fields. Proposals indicate the desired term of agreement, describe the proposed conservation measure, and list the field location and cropping plan. The cropping plan contains the crops that may be grown during the term and their anticipated plant and harvest dates.

IID uses the proposal information along with historical water delivery, weather, and cropping records to project a water delivery baseline for the proposed crops. Applicants are notified of the projected baselines and asked whether they wish to enter agreements to implement conservation measures based on the projections, consult with IID regarding baseline determination, or abandon their proposals.

Throughout the term of each agreement, IID representatives inspect and track deliveries to enrolled fields to ensure conservation goals are met. Upon completion of each crop season, IID computes a verification baseline using actual season lengths and weather conditions and pays participants for verified conserved water according to the agreements.

Baseline Estimation

Crop Seasons Database

IID maintains a database of historical water deliveries to each of its delivery gates. The crop and acres irrigated are recorded as attributes to each delivery record. This allows total water deliveries, DW, for individual crop seasons to be summed and analyzed as the foundation for crop- and field-specific, historical water use baselines. A crop season is defined here to begin immediately following the harvest of one crop and end with the harvest of the next. Thus all water delivered to a gate in preparation for and during the production of a given crop on a given acreage is summed as the historical crop season delivery. In the case of perennial crops, intermediate crop seasons end with each calendar year prior to final harvest.

Actual crop evapotranspiration, ET_a, is also calculated for each historical crop season using estimates of reference evapotranspiration reported for CIMIS[1] weather stations located throughout the Imperial Valley combined with crop coefficient estimates derived for the area. Effective precipitation, P_e, for each crop season is estimated using data from the same weather station network and the NRCS TR-21 method[2].

An important metric computed for each crop season is the consumptive use fraction, CUF, defined as the fraction of delivered water needed to satisfy crop consumptive use, as given below:

[1] California Irrigation Management Information Systems; www.cimis.water.ca.gov
[2] NRCS National Engineering Handbook, part 623, chapter 2

Equation 1. $$CUF = \frac{CU}{DW}$$

Equation 2. $$CU = ET_a - P_e$$

where CU is consumptive use of delivered water or net evapotranspiration as defined by Equation 2 and DW is Delivered Water as recorded by IID.

Although the IID's delivery records are suitable for their intended purpose of volumetric billing, in some cases the accuracy of secondary attributes such as crops and irrigated acreage is not sufficient for detailed analysis. Computed crop seasons are checked for accuracy using quality control procedures developed to identify crop seasons where computed values fall outside expected ranges. These ranges are defined for individual crops, grouped by soil type in certain cases, utilizing acceptance parameters related to evapotranspiration, delivered water, and season timing. Figure 1 illustrates the data sources used in estimating baselines.

Baseline Estimation Methods

Depending on the availability and reliability of crop season records for a proposed crop and field, one of three baseline estimation procedures is used to compute projected and verification baselines.

Delivered Water History Method

In cases where the proposed crop has been grown on the field during the baseline period (the 10 years prior to the year of enrollment) and the resulting crop seasons pass quality control checks, baselines are estimated directly using historical crop season data. Estimated baselines for pre-season projection and post-season verification are calculated according to Equations 3 and 4.

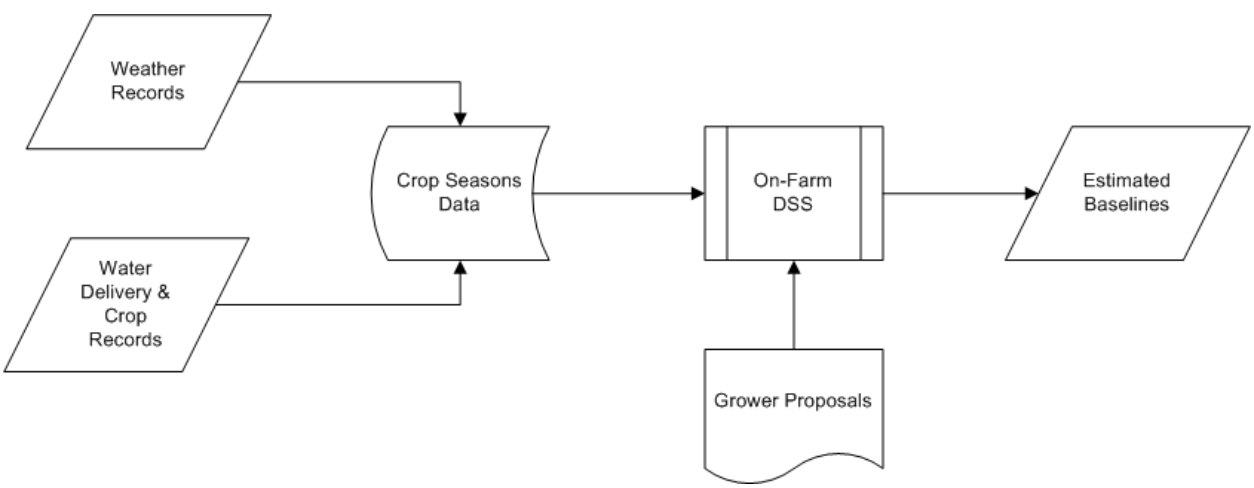


Figure 1. Basic data requirements for baseline calculation

Equation 3. $$BL_{prj} = DW_{hst}\left(\frac{CU_{prj}}{CU_{hst}}\right) = \frac{CU_{prj}}{CUF_{hst}}$$

Equation 4. $$BL_{vrf} = DW_{hst}\left(\frac{CU_{act}}{CU_{hst}}\right) = \frac{CU_{act}}{CUF_{hst}}$$

where BL_{prj} and BL_{vrf} are projected and verification baselines, respectively, DW_{hst} is average DW recorded for historical seasons at a given field matching a proposed crop, CU_{prj} is CU of delivered water projected for the proposed crop season based on CU computed for similar historical seasons district-wide, CU_{hist} is average CU computed for those historical crop seasons used to compute DW_{hst}, and CU_{act} is actual CU for the enrolled crop computed after season completion.

Performance Rank Method

Performance Rank – In cases where quality-controlled records are not available for the proposed crop and field, but qualifying records are available for other crops grown on the field during the baseline period, estimates are based on the rank of qualifying historical seasons relative to other historical seasons district-wide. This method uses CUF as a performance index to rank crop seasons on a given field against other seasons district-wide with the same crop and soil type. It assumes that a field's average CUF rank is similar for any crop season and can be used to estimate a CUF for a proposed crop. The estimated CUF is then used to compute BL_{prj} and BL_{vrf} after Equations 3 and 4.

Representative district-wide CUF distributions are developed based on historical crop seasons passing the quality control checks described previously. Sample distributions for alfalfa and carrots grown on three soil types are shown in Figures 2 and 3.

District-Wide Average Method

In cases where no reliable data is available for any crop on the field, district-wide averages of CUF by crop and soil type are used to estimate baselines for proposed crops after Equations 3 and 4.

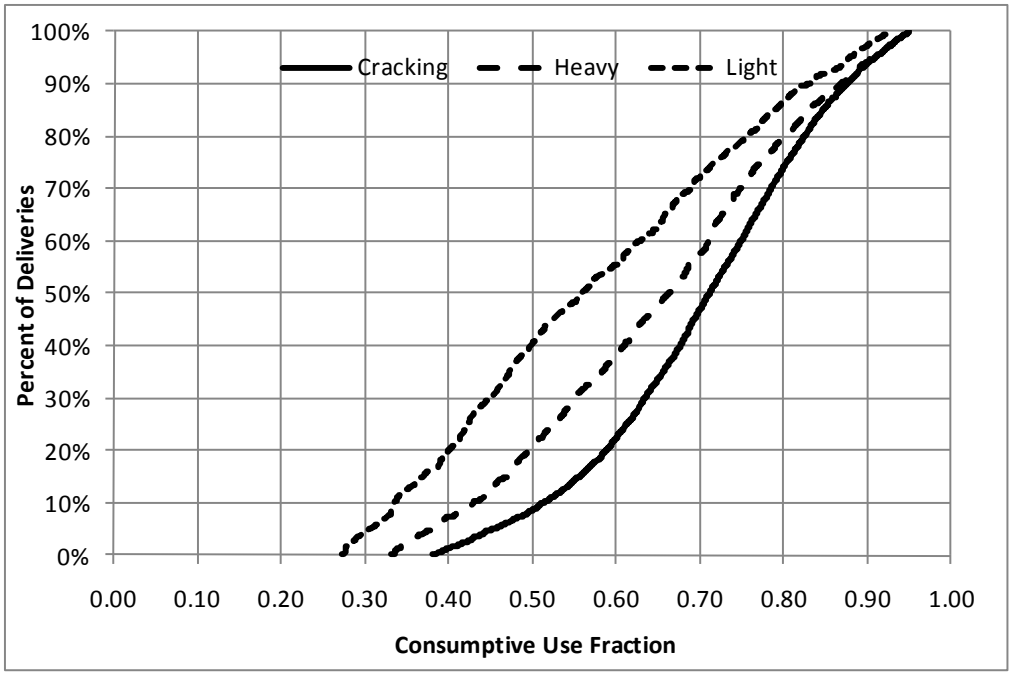


Figure 2. Sample CUF distributions for alfalfa grown on different soil types

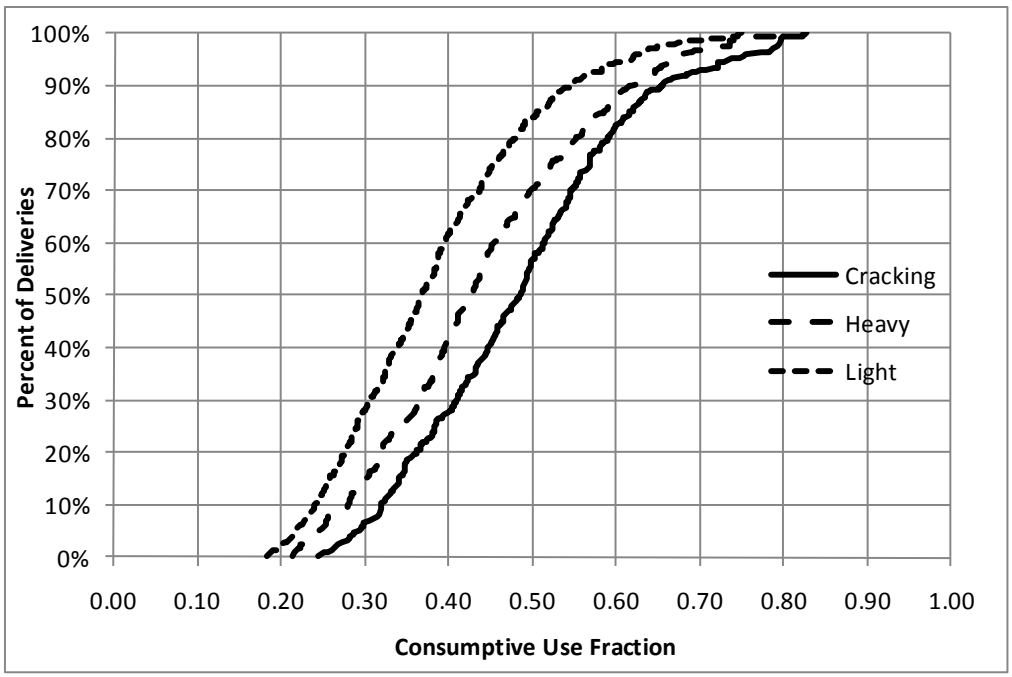


Figure 3. Sample CUF distributions for carrots grown on different soil types

Additional Information

Further details regarding baseline estimation and program management are available at:

www.iid.com/onfarmconservation

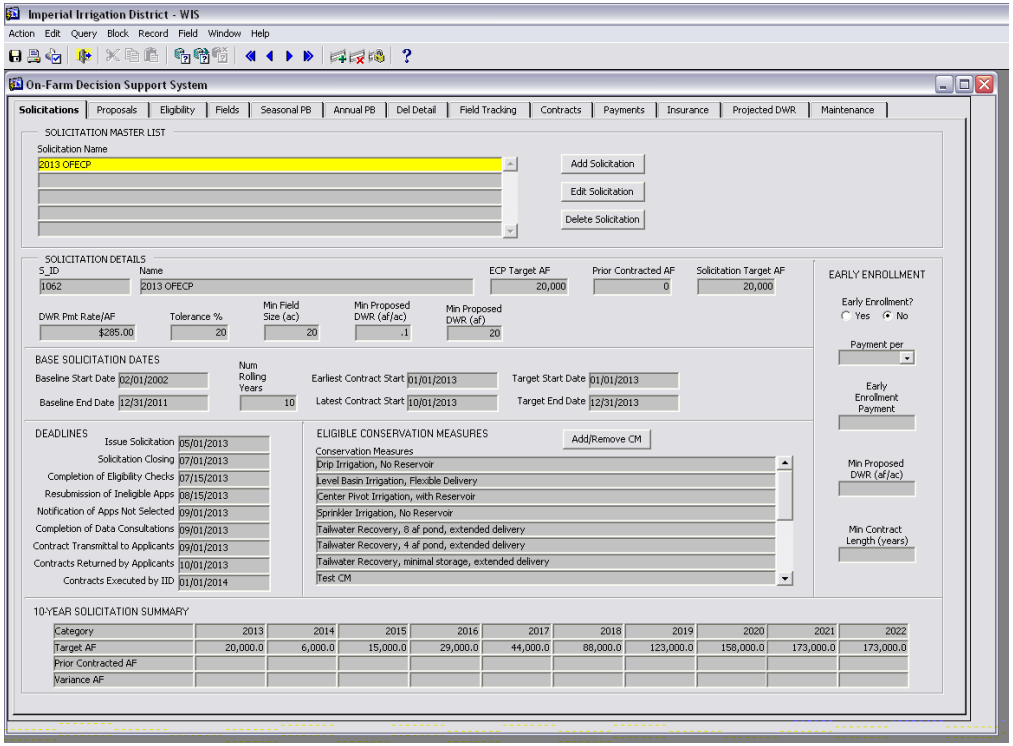
On-Farm Efficiency Conservation Program: Baselines and Decision Support System

Imperial Irrigation District
29 May 2013

Presented to Reclamation by IID via web conference

On-Farm Decision Support System (OFDSS)

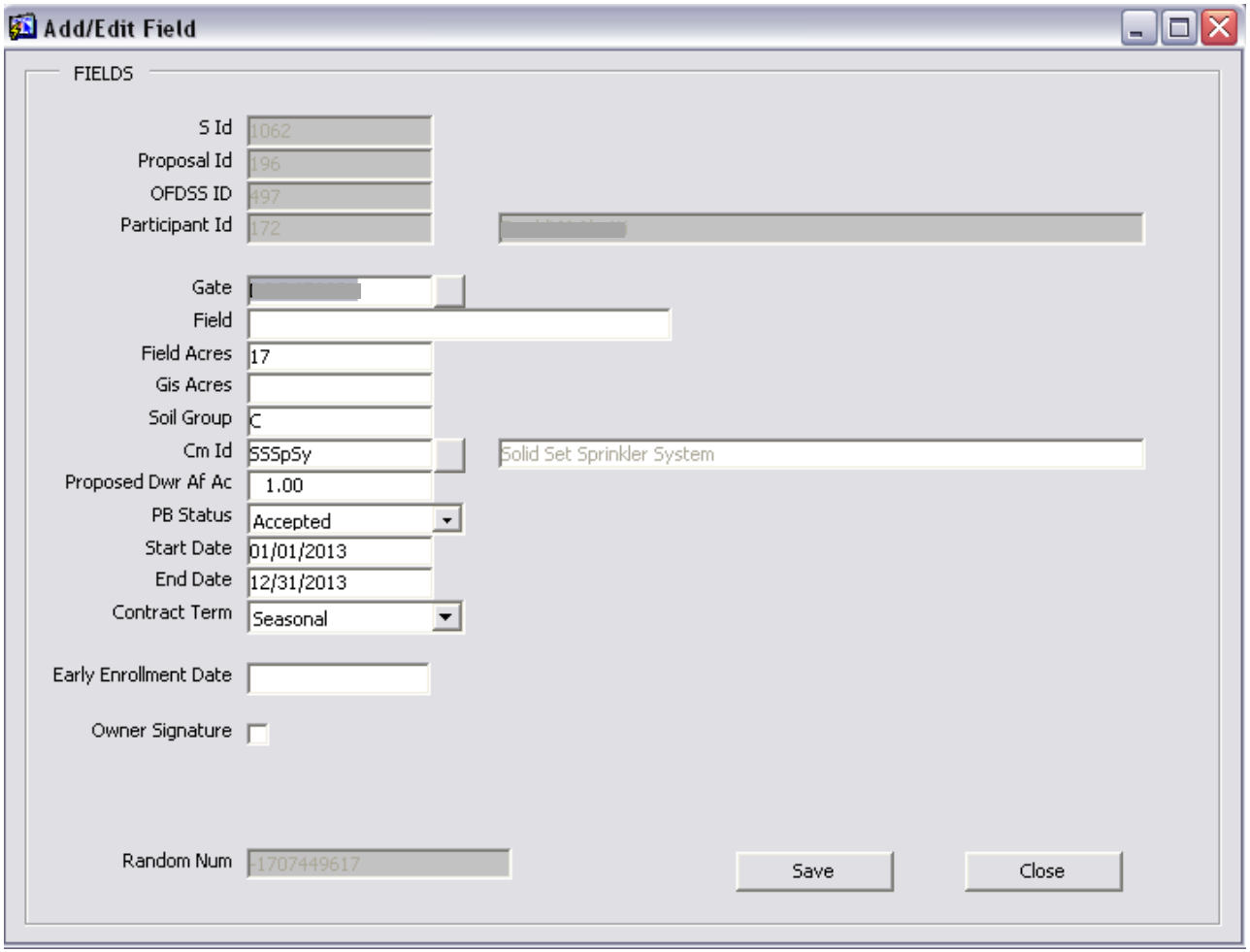
- Create Solicitation
- Enter Cropping Plan
- Determine Baseline
- Track Water Usage
- Document Visits
- Verify Conservation
- Determine Payment



Steps to Enter Proposal/Determine Baseline

- Enter Proposal
  - Field & Conservation Measure
  - Cropping Plan
- Review/Accept Baseline
  - Delivered Water History
  - CUF Rank
  - Delivered Water Average

Enter Proposal



Enter Cropping Plan

Imperial Irrigation District - WIS

Action Edit Query Block Record Field Window Help

Add/Edit Crop

EDIT CROPPING PLAN

S ID 1062
Proposal ID 196
OFDSS ID 497
Crop ID 441
Plot
Field

PROPOSED

Crop Code 301 Crop ALFALFA, FLAT
Acres 17
Proposed First Irrigation Date 01/01/2013
Proposed Plant Date 01/01/2013
Proposed Harvest Date 12/31/2013
Is Projected PB Accepted? Yes No

ACTUAL

Crop Season Status: Crop Season HAS NOT been finalized
Actual First Irrigation Date
Actual Plant Date
Actual Harvest Date
Crop Season ID

Closeout Year
Finalize Pmt Benchmark Save Close

Baseline Goals

- Determine field- and crop-specific water conservation baseline
- Account for variations in season length and weather

Background Information
Crop Seasons

- Delivery Records assigned to crop season
  - Jan-Dec for perennial crops
  - Pre-irrigation to harvest for annual crops
- Calculations
  - Delivered water per acre
  - Crop water use (CU)
  - CUF (Consumptive Use Fraction)
- Verification
  - Quality Control Procedures

Delivered Water History Baseline Example

- DWHIST – Preferred Baseline method
  - Display valid crop seasons for proposed crop
  - Project Crop ET for Proposed Season
  - Projected ET / Payment Benchmark CUF = Payment Benchmark

PROPOSED CROP BENCHMARK

Crop	Proposed Plant Date	Proposed Harvest Date	IID Avg CUF	Field Avg Del Water w/o Cons Prog af/ac	Average Historical Net Crop ET af/ac	Projected Net Crop ET af/ac	Payment Benchmark af/ac	Payment Benchmark CUF	Payment Benchmark Method	Proposed/ Offered Delivered Water af/ac	Proposed/ Offered Consumptive Use Fraction	Recommendation	Offered DWR af/ac	Is Accepted
ALFALFA, FLAT	01/01/2013	12/31/2013	.71	5.64	4.02	4.92	6.90	.713	DWHist	5.90	.83	Issue Contract	1.00	Y

CROP BENCHMARK HISTORY

Crop Season ID	Crop	Crop Acres	First Irrig	First Crop Irrig	Last Irrig	Harvest Date	Delivered Water w/o Cons Prog af/ac	Rainfall af/ac	Effective Rainfall af/ac	Total Crop ET af/ac	Total Evap af/ac	Crop ET Applied Water af/ac	Consumptive Use Fraction	CUF Filter
1.01	ALFALFA, FLAT	17	01/31/2008	01/31/2008	12/01/2008	12/21/2008	7.42	.06	.06	5.32	.00	5.27	.710	OK
1.011	ALFALFA, FLAT	17	05/18/2009	05/18/2009	12/13/2009	04/21/2010	3.86	.02	.02	3.40	.00	3.38	.875	OK
2.002	ALFALFA, FLAT	16	05/18/2010	05/18/2010	12/13/2010	08/24/2011	5.62	.09	.08	3.47	.00	3.40	.605	OK
2.002	ALFALFA, FLAT	16	01/19/2011	01/19/2011	08/04/2011	08/24/2011	5.65	.08	.06	4.10	.00	4.04	.714	OK
						Average	5.64	.06	.05	4.07	.00	4.02	.713	

View Del Detail | View PB Detail | Accept | Edit Crop Season | Show All IID Valid for Crop | Show CUFRank CS | Show Crop CS | Show Group CS | Show All

CUF Rank Baseline Example

- Sugar Beets proposed on field with valid Bermuda history
- Payment Benchmark CUF translated to Sugar Beet history
- Assumes average field for crop A will be average for crop B

PROPOSED CROP BENCHMARK

Crop	Proposed Plant Date	Proposed Harvest Date	IID Avg CUF	Field Avg Del Water w/o Cons Prog af/ac	Average Historical Net Crop ET af/ac	Projected Net Crop ET af/ac	Payment Benchmark af/ac	Payment Benchmark CUF	Payment Benchmark Method	Proposed/ Offered Delivered Water af/ac	Proposed/ Offered Consumptive Use Fraction	Recommendation	Offered DWR af/ac	Is Accepted
SUGAR BEETS	09/27/2012	06/01/2013	.59			2.16	3.66	.591	CUFRank	2.66	.81	Issue Contract	1.00	Y

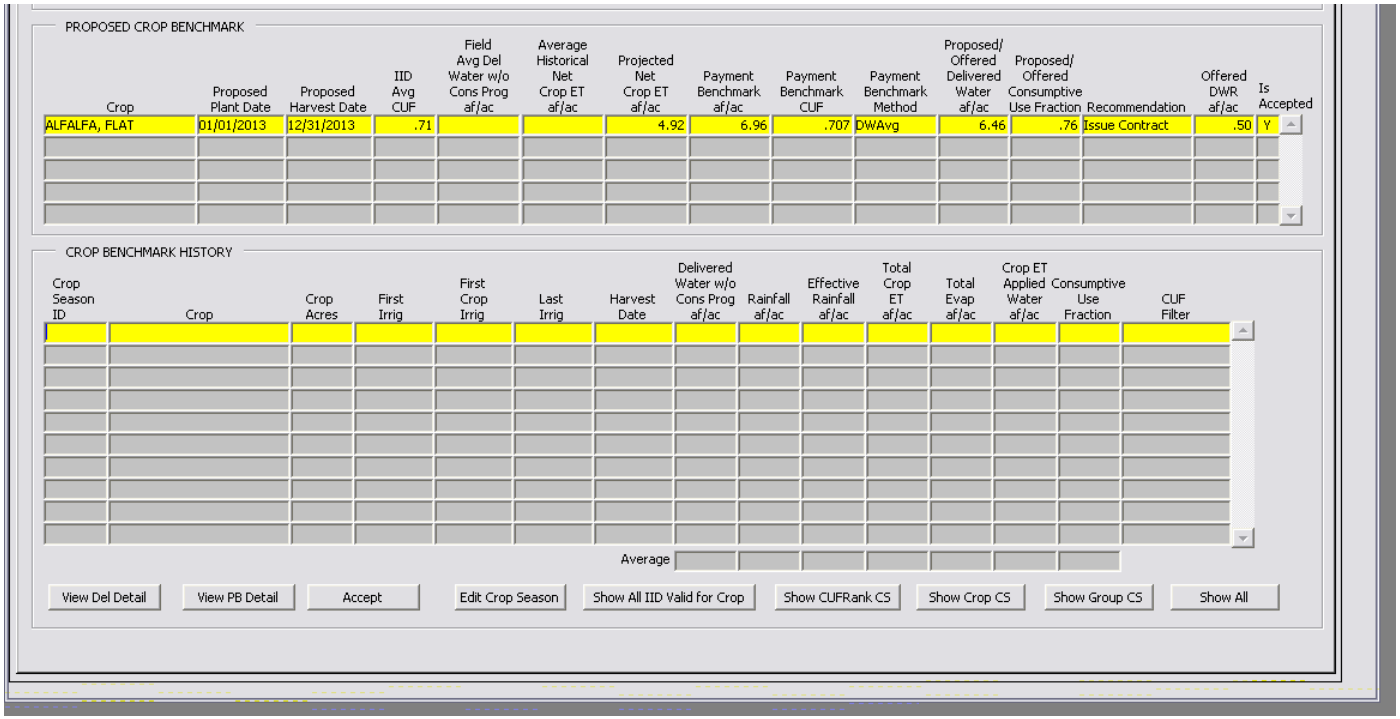
CROP BENCHMARK HISTORY

Crop Season ID	Crop	Crop Acres	First Irrig	First Crop Irrig	Last Irrig	Harvest Date	Delivered Water w/o Cons Prog af/ac	Rainfall af/ac	Effective Rainfall af/ac	Total Crop ET af/ac	Total Evap af/ac	Crop ET Applied Water af/ac	Consumptive Use Fraction	CUF Filter
1.008	BERMUDA GRASS	87	02/21/2002	02/21/2002	11/02/2002	11/27/2002	5.76	.03	.03	4.79	.00	4.76	.825	OK
1.009	BERMUDA GRASS	87	03/04/2003	03/04/2003	10/21/2003	11/15/2003	6.97	.12	.12	4.33	.00	4.22	.605	OK
1.01	BERMUDA GRASS	87	03/15/2004	03/15/2004	09/25/2004	10/20/2004	5.30	.08	.08	4.09	.00	4.01	.757	OK
1.014	BERMUDA GRASS	87	02/26/2008	02/26/2008	12/12/2008	10/14/2009	7.43	.06	.06	5.03	.00	4.97	.669	OK
1.014	BERMUDA GRASS	87	03/01/2009	03/01/2009	09/19/2009	10/14/2009	5.27	.04	.04	4.90	.00	4.86	.922	OK
2.001	BERMUDA GRASS	76	03/06/2010	03/06/2010	09/28/2010	10/23/2010	7.17	.06	.06	4.46	.00	4.40	.613	OK
						Average	6.32	.07	.06	4.60	.00	4.54	.718	

View Del Detail | View PB Detail | Accept | Edit Crop Season | Show All IID Valid for Crop | Show CUFRank CS | Show Crop CS | Show Group CS | Show All

Delivered Water Average

- If no valid history exists, a field will be assigned the average consumptive use fraction for the crop and soil type.



PROPOSED CROP BENCHMARK

Crop	Proposed Plant Date	Proposed Harvest Date	IID Avg CUF	Field Avg Del Water w/o Cons Prog af/ac	Average Historical Net Crop ET af/ac	Projected Net Crop ET af/ac	Payment Benchmark af/ac	Payment Benchmark CUF	Payment Benchmark Method	Proposed/ Offered Delivered Water af/ac	Proposed/ Offered Consumptive Use Fraction	Recommendation	Offered DWR af/ac	Is Accepted
ALFALFA, FLAT	01/01/2013	12/31/2013	.71			4.92	6.96	.707	DWAvg	6.46	.76	Issue Contract	.50	Y

CROP BENCHMARK HISTORY

Crop Season ID	Crop	Crop Acres	First Irrig	First Crop Irrig	Last Irrig	Harvest Date	Delivered Water w/o Cons Prog af/ac	Rainfall af/ac	Effective Rainfall af/ac	Total Crop ET af/ac	Total Evap af/ac	Crop ET Applied Water af/ac	Consumptive Use Fraction	CUF Filter
						Average								

View Del Detail | View PB Detail | Accept | Edit Crop Season | Show All IID Valid for Crop | Show CUFRank CS | Show Crop CS | Show Group CS | Show All

Baseline Statistics

235	Baselines accepted as of Feb 28, 2013			
	166	71%	Baselines Determined by Program	
		103	44%	Delivered Water History
		56	24%	CUF Rank
		7	3%	Delivered Water Average
	69	29%	Baselines over-ridden by staff	
		x		Delivered Water History
		7	3%	Group Delivered Water History
		1	0%	CUF Rank
		61	26%	Delivered Water Average

OFDSS Functions

- Track Field Visits
- Calculate Final Baseline (Actual CU)
- Verify Conservation Volume
  - At Field
  - District Wide
- Initiate Payment Process