

NORTH UNIT IRRIGATION DISTRICT
Jefferson County, Oregon

RESOLUTION No. 2008-16

A RESOLUTION ADOPTING A CONSERVED WATER POLICY

The Board of Directors of the North Unit Irrigation District (Jefferson County, Oregon) (hereinafter referred to as “the District”) hereby adopts the following Conserved Water Policy.

**“North Unit Irrigation District
Conserved Water Policy”**

Authority & Purpose for Policy

The Board of Directors (Board) of the District is required to adopt a Conserved Water Policy pursuant to Oregon Administrative Rule (OAR) 690-018-0025. The rule requires that the District adopt a policy that, at a minimum:

- Describes how water saved by conservation measures will be allocated by the District;
- Describes how the District will address the allocation of conserved water percentages under ORS 537.470;
- Provides District patrons the opportunity to fund a share of the conservation project that is proportionate to the patron’s share of the water rights involved in the allocation of conserved water and to receive a corresponding share of the conserved water;
- Provides District patrons an opportunity to petition for a vote by all district patrons on the Policy pursuant to applicable statutes governing elections or recalls in the subject districts; and
- Provides District patrons an opportunity to appeal a proposed District conservation project to the District Board for failure to follow this Policy.

Conserved Water Program

Oregon’s “conserved water program” is a voluntary program under which the District may develop a water conservation project and then apply for use of the conserved water. ORS 537.455 through 537.500. This Policy directs how the District will assess proposed water conservation projects and details the required elements of OAR 690-018-0025.

District water conservation efforts benefit all patrons within the District. Water conserved by improving or modifying the District’s water delivery system or practices shall be considered water conserved by the District. All conserved water allocations resultant from District conservation efforts shall be made to the District, subject only to the right of District patrons to fund water conservation efforts as described below.

Conserved Water Application

As a prerequisite to utilizing conserved water under Oregon's conserved water program, the District must submit an application to the Oregon Water Resources Department (WRD) requesting an allocation of conserved water. ORS 537.465. The application must be accompanied by the appropriate fee and there may be costs required to provide notice. There is a state public review process for such applications.

To initiate a water conservation project proposal, District staff shall prepare either (i) the state application form according to WRD requirements, or (ii) a project summary including all project specifications, and an analysis of projected water savings, to the Board for review and approval. Because every conserved water project is unique, each Board approval shall specify how conserved water shall be used within the District and will describe the allocation of conserved water percentages under ORS 537.470. If approved by the Board, the District may submit the application to WRD for its review.

Allocation of Conserved Water

The Board will observe Oregon law when allocating conserved water, including without limitation the following regulations:

OAR 690-018-0020(4) "Conserved Water" means that amount of water that results from conservation measures, measured as the difference between:

- (a) The smaller of the amount stated on the water right or the maximum amount of water that can be diverted using the existing facilities; and
- (b) The amount of water needed after implementation of conservation measures to meet the beneficial use under the water right certificate.

OAR 690-018-0012(1) Pursuant to ORS 537.470(3), after determining the quantity of conserved water, if any, required to mitigate the effects on other water rights, the Commission shall allocate 25 percent of the remaining conserved water to the state and 75 percent to the applicant, unless the applicant proposes a higher allocation to the state or more than 25 percent of the funds used to finance the conservation measures comes from federal or state public sources. If more than 25 percent of the funds used to finance the conservation measures comes from federal or state public sources and is not subject to repayment, the Commission shall allocate to the state a percentage equal to the percentage of public funds used to finance the conservation measures and allocate to the applicant a percentage equal to the percentage of other funds used to finance the conservation measures. In no event, however, shall the applicant receive less than 25 percent of the remaining conserved water unless the applicant proposes a higher allocation to the state.

OAR 690-018-0012(2) A water right affected by an allocation of conserved water under this program shall retain its original priority date. The priority date of the conserved water rights shall be either the same as or one minute after that of the original right.

Patron Funding

District patrons may fund a water conservation project in an amount that is proportionate to the patron's share of the water rights involved in the allocation of Conserved Water. Patrons that provide funding to the District for a water conservation project in advance, or within one year of, the District first making expenditures for the conservation project shall be a "Funding Patron" and receive the portion of the conserved water allocated to the District by the Commission (the "District Allocation") to which the Funding Patron is entitled under this Policy.

Except for a Funding Patron, no patron shall be entitled to any of the District Allocation other than the amount necessary to maintain the patron's full rate and duty at its regular turn out(s). A Funding Patron shall be entitled to a portion of the District Allocation equal to the percentage of the funding for the water conservation project paid to the District by the Funding Patron.

Appeal Process

If the Board approves a particular proposed water conservation project, any District patron in good standing may appeal the Board's decision.

Form of Request for Appeal: A District patron wishing to appeal a Board decision to pursue a water conservation project must submit to the Board a request for appeal. All such requests must:

- be in writing;
- be submitted within two weeks following the date of the Board's decision;
- include the name, address, and telephone number of the District patron appealing the Board's decision and a concise statement of the reasons the patron believes the proposed water conservation project should be modified to comply with this Policy.

Upon receiving a properly submitted request, the Board shall consider the appeal at one of the next two regularly scheduled meetings. The District shall provide notice to the requesting patron of the date the appeal will be heard.

Grounds for Appeal: The Board shall limit its consideration to whether the proposed water conservation project complies with this Policy. The District patron appealing the Board's decision shall have an opportunity to address the Board concerning the appeal.

Decision by the Board: On appeal, the Board may make one of the following determinations:

- grant the appeal and reject the proposed water conservation project;
- modify the proposed water conservation project as proposed by the appealing water user;
- direct the District manager to work with the applicant to modify the proposed water conservation project so as to comply with this Policy; or
- reject the appeal and approve the proposed water conservation project as proposed.

Petitions to Vote on Policy

District patrons may petition the Board to hold a vote of all District patrons on the approval of this Policy. The petition must be signed by fifteen percent of the total number of votes that may be cast in an election for a director pursuant to ORS 545.189(1) to be valid and to cause the District to hold a vote. Upon receiving a valid petition, the District shall hold a vote of all District patrons. The vote shall be whether to approve or reject this Policy. The vote shall be conducted according to the laws and procedures that govern District elections.

Policy Review and Updates

The Board shall review and update this Policy at the first regularly scheduled Board meeting following every fifth anniversary of the Board either adopting or reviewing and updating this Policy. The Board may, in its sole discretion, review and update this Policy at any other Board meeting. The Board shall follow the process and provisions of this Policy, as required by OAR 690-018-0025(2), whenever reviewing and updating this Policy.

Applicability

This Policy applies to all applications for allocations of conserved water filed with WRD by the District following the date of adoption described below. Pursuant to OAR 690-018-0025(3), this Policy does not apply to applications for allocations of conserved water filed by individuals, including District patrons.

THIS RESOLUTION SHALL TAKE EFFECT IMMEDIATELY.

ADOPTED BY THE BOARD OF DIRECTORS OF NORTH UNIT IRRIGATION DISTRICT AT A REGULAR MEETING HELD ON THE 7TH DAY OF OCTOBER, 2008, BY THE FOLLOWING VOTES.

AYES: 5
NAYS: -0-

ABSENT:


RICHARD MACY, Chairman

ATTEST:

MIKE BRITTON, Secretary-Manager

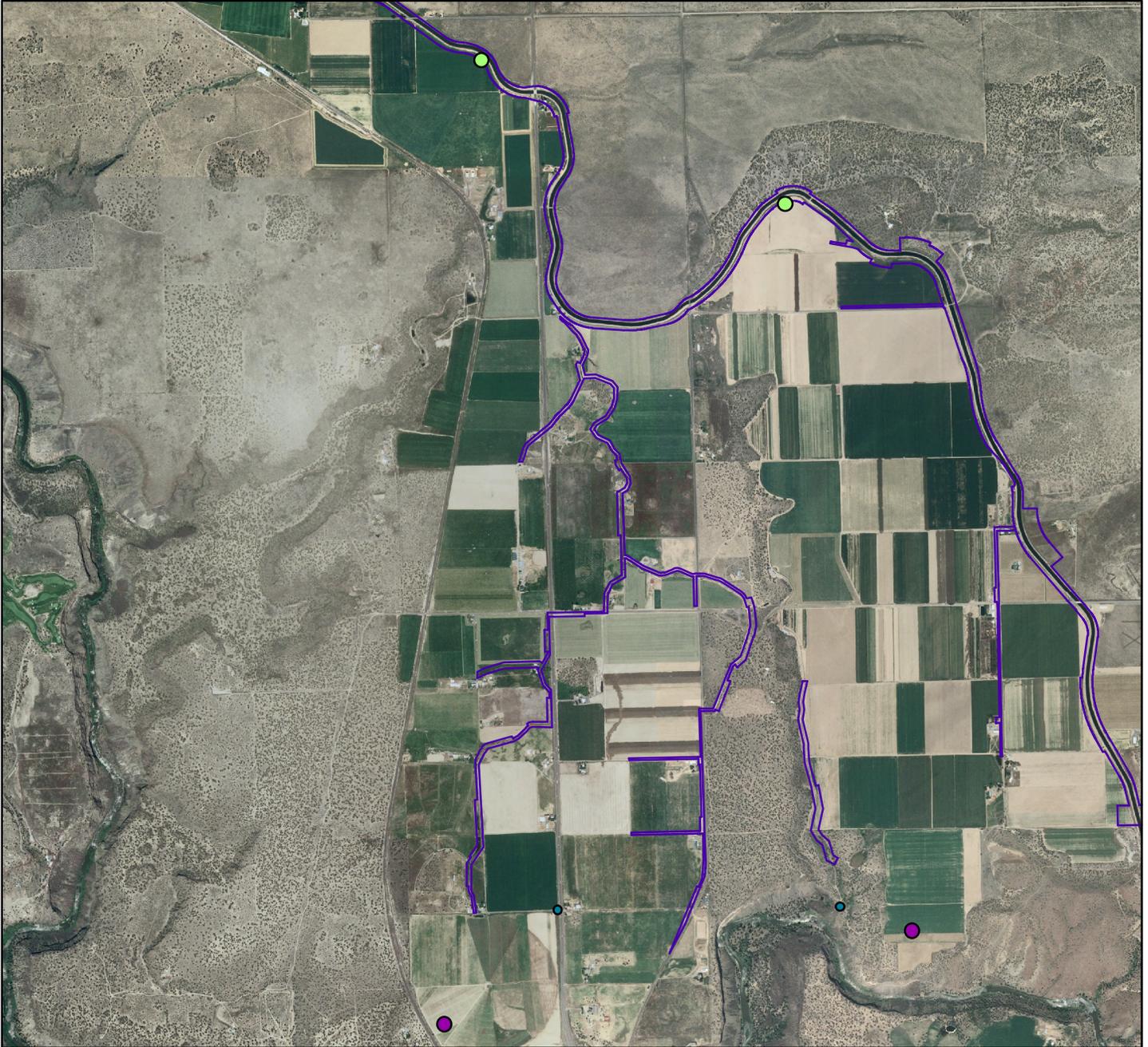
Plan Map

District: JEFFERSON SOIL & WATER CONSERVATION DISTRICT

Field Office: REDMOND SERVICE CENTER

Agency:

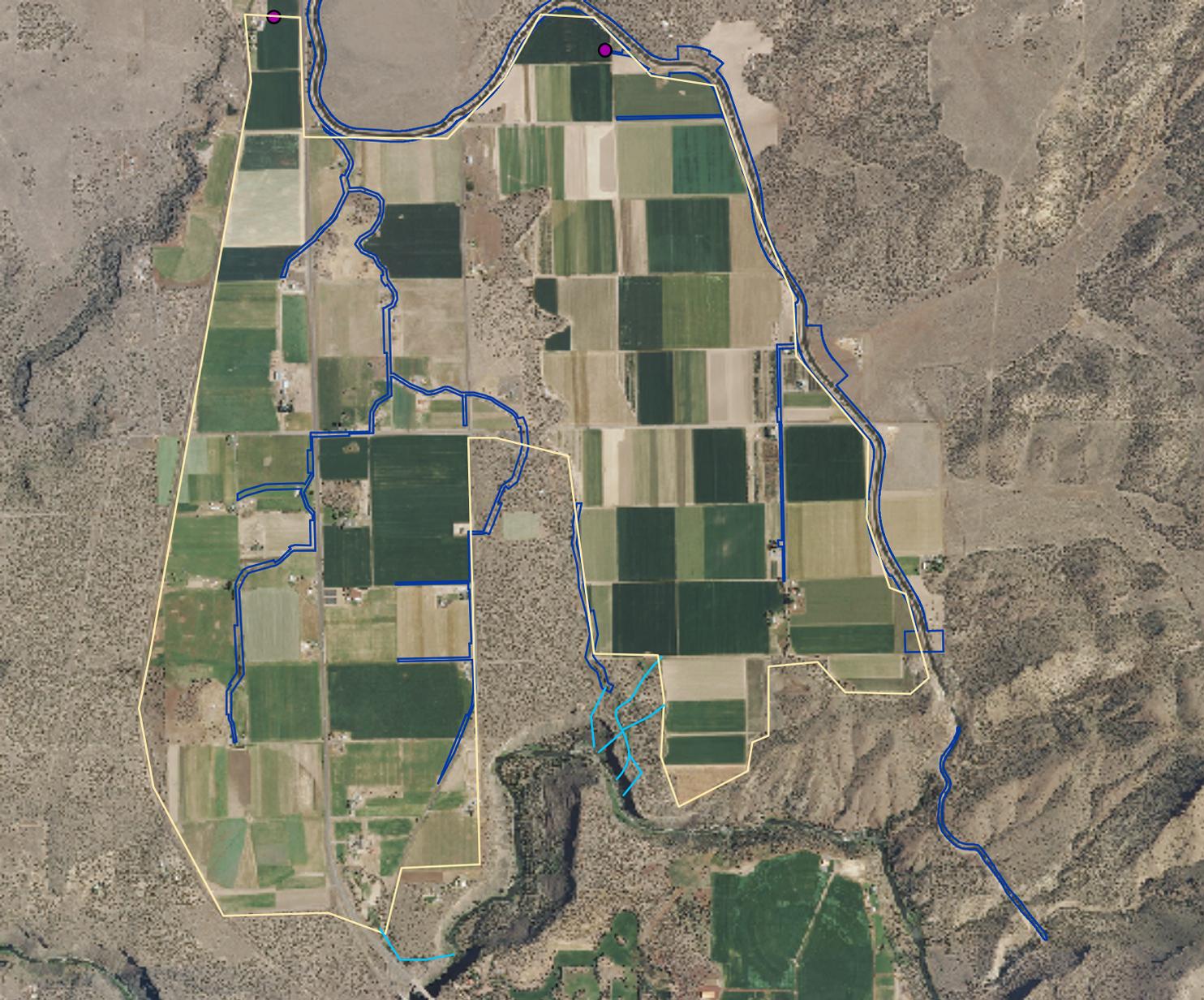
Assisted By: Roofener, Jan L



Legend

- Pipe End approx. location
- Pipe beginning
- GPS points
- CANALS



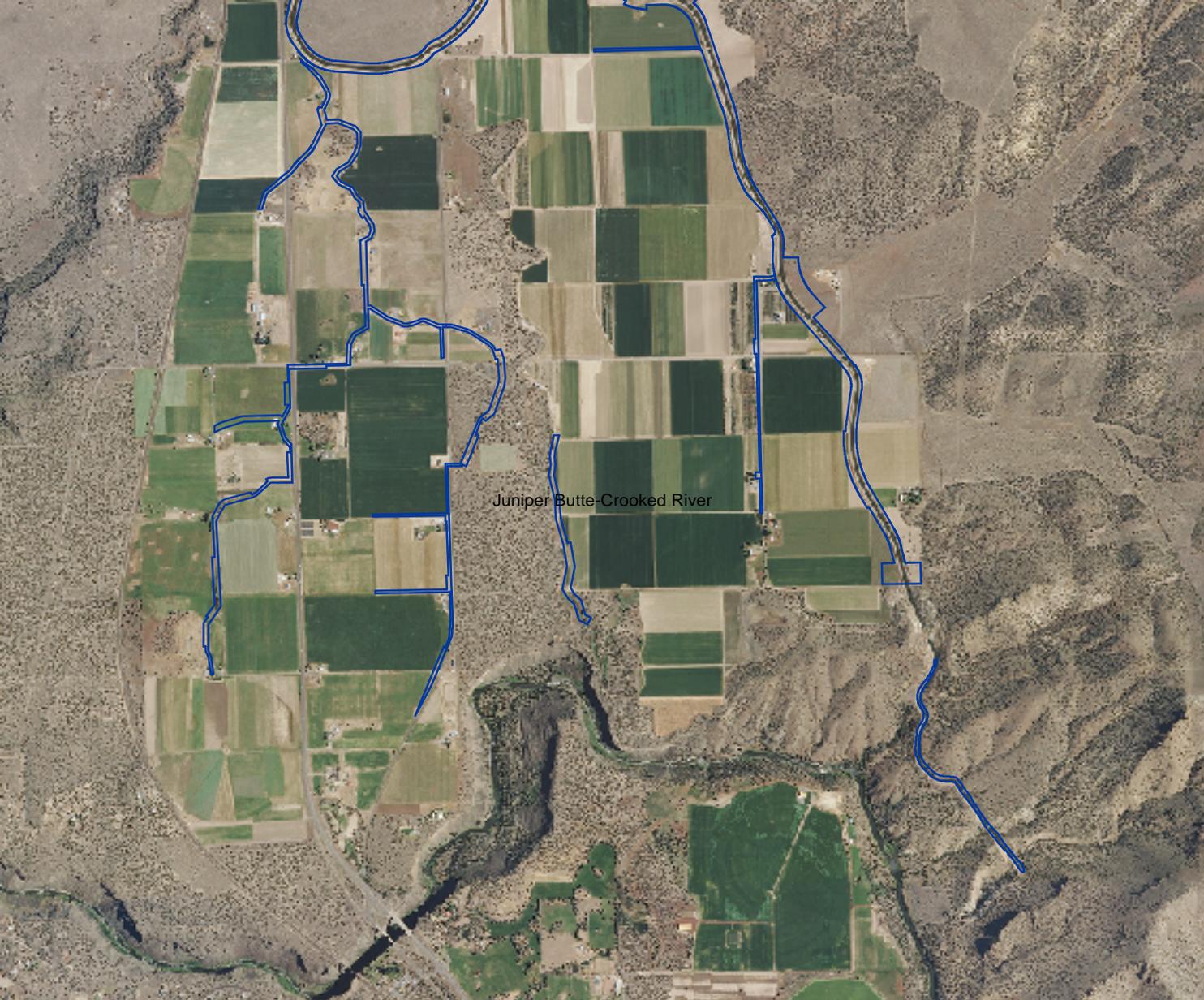












Juniper Butte-Crooked River

Estimating seepage loss in earthen ditches per Season

USE: This design spreadsheet has been developed for small, uncomplicated spring development projects.
 It's intended use is for a maximum NRCS Job Class of III under Practice Codes (PC) 516, 642, 574, and 614.

DATA INPUT: Gray areas (red no.'s). DATA OUTPUT: White cells (Blue no.'s).

Landowner:	South Juniper Butte canals	County:	Jefferson	District:	Jefferson
Address:	xxxxxx xxxxxxx	Location:	xxxxxx	Checked by:	_____
Prepared by:	Greg Card	Date:	26-Jul-01	Job Class:	_____
				Date:	_12/5/11

C Values Chart for Soil Texture

GIVEN data:		User Notes:
Soil	loam, sandy	
C value	1.50 (ft ³ /ft ² /day)	
Ditch Length	19000 (ft.)	
Given Q	2.5 (cfs)	
Flow area	2.5 (sqft.)	Use "Area" tab
Time	180 (days)	
Vegetative Loss	1.0% (%) loss per mile	

Gravel	0.34 -5.8
Gravelly sand	2.2 - 3.4
Sand, gravelly sandy loam	1.7 - 2.2
Loam, sandy loam	1.1 - 1.7
Gravelly clay loam, GSL, and SCL	.85 - 1.1
Very fine sandy loam	.72 - .85
Clay loam, silt loam ash loam	.58 - .72
Clay loam 2-3ft over hardpan	.4 - .58
Cemented gravel, hardpan, imp. clayL	.25 - .4
Concrete ditch and above grd pipe	.15 - .25
Ditch Side Vegetation	.5% to 1 % per mile
Conversion factor = 1cfs = 1.98 AF/day	

FIND earth ditch seepage loss per season:

Seepage =	294.4	(Acre feet)
	1.64	(Acre feet)

Note: Loss for given length - **per season**
 Note: Loss for given length - **per day**

FIND vegetative loss per season:

Est. Veg. Loss =	32.06	(Acre feet)
	0.0109	(Acre feet)

Note: Loss for given length - **per season**
 Note: Loss for given length - **per day**

FIND Total loss per season:

326.5	Acre Feet
0.832	(cfs)
33.3	(%)

Note: Loss for given length - **per season**
 Note: Continual Loss - **per day**
 Note: Percent Loss for given length - **per season**

Warning!! The accuracy with this method is no better than 0.5 acre feet.

Designer Notes:

This Sample run follows the NEW Irrigation Guide NEH Part 623, Chp. 2 page 2-184
 Table above was taken from NEW Irrigation Guide NEH Part 623, Chp.2 page 2-186, Figure 2-50

Water Savings Estimator for Irrigation System Planning and Ranking



Applicant: South Juniper Butte
 Farm/Tract ID: all
 Date: 11/29/11

County: Jefferson
 Field ID: general
 Evaluator: Jan Roofener

Climatic Region: Region16 Madras-Redmond

Crop Rotation	EXISTING		PLANNED	
	Annual Net Irrig Req (in)	Peak ET Rate (in/day)	Annual Net Irrig Req (in)	Peak ET Rate (in/day)
Year 1	Grain (Winter) 21.7	0.27	Grain (Winter) 21.7	0.27
Year 2	Alfalfa Hay 26.0	0.24	Alfalfa Hay 26.0	0.24
Year 3	Alfalfa Hay 26.0	0.24	Alfalfa Hay 26.0	0.24
Year 4	Grass Seed (Fall) 32.2	0.30	Grass Seed (Fall) 32.2	0.30
Year 5	Grass Seed (Fall) 32.2	0.30	Grass Seed (Fall) 32.2	0.30
	Average: 27.7		Average: 27.7	
	Alternative NIR Value: <input type="text"/>		Alternative NIR Value: <input type="text"/>	

Water right (ac-in/ac):

Application System Predominant Soil: Loamy Sand

Existing Application System: Hand/Wheel Line > 15 yr

Planned Application System: Hand/Wheel Line UPGRADE

Application System

Conveyance System Predominant Soil: Loamy Sand

Existing Conveyance System: Ditch-Unlined-Poor

Planned Conveyance System: Pipeline

Conveyance System

Planned Level of IWM: Non-intense

IWM

Estimated EXISTING water use: 63.6 acre-in/acre

Estimated PLANNED water use: 39.6 acre-in/acre

Annual Water Savings Estimate: 24.0 acre-in/acre

Annual Water Savings Estimate: 37.8%

Total Annual Water Savings Acres: 4,700

Estimated savings for this field **ONLY**: 9415.1 acre-ft

Estimated Water Savings

	Existing System	Planned System
System Efficiency:	<u>43%</u>	<u>70%</u>
Quality Criteria Potential Efficiency:	<u>56%</u>	<u>70%</u>
Quality Criteria Met?	<u>No</u>	<u>Yes</u>

Quality Criteria

15% Increase in Irrigation System Efficiency? Yes

Water Savings Estimator for Irrigation System Planning and Ranking



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Crop Rotation	EXISTING		PLANNED	
	Annual Net Irrig Req (in)	Peak ET Rate (in/day)	Annual Net Irrig Req (in)	Peak ET Rate (in/day)
Year 1	Grain (Winter) 21.7	0.27	Grain (Winter) 21.7	0.27
Year 2	Alfalfa Hay 26.0	0.24	Alfalfa Hay 26.0	0.24
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Year 4	Grass Seed (Fall) 32.2	0.30	Grass Seed (Fall) 32.2	0.30
Year 5	Grass Seed (Fall) 32.2	0.30	Grass Seed (Fall) 32.2	0.30
	Average: 27.7		Average: 27.7	
	Alternative NIR Value: <input type="text"/>		Alternative NIR Value: <input type="text"/>	

Water right (ac-in/ac):

Application System Predominant Soil:	<u>Loamy Sand</u>	<i>Application System</i>	
Existing Application System:	<u>Hand/Wheel Line > 15 yr</u>		
Planned Application System:	<u>NEW Center-Pivot</u>		
Conveyance System Predominant Soil:	<u>Loamy Sand</u>	<i>Conveyance System</i>	
Existing Conveyance System:	<u>Ditch-Unlined-Poor</u>		
Planned Conveyance System:	<u>Pipeline</u>		
Planned Level of IWM:	<u>Non-intense</u>	<i>IWM</i>	
Estimated EXISTING water use:	<u>63.6 acre-in/acre</u>	<i>Estimated Water Savings</i>	
Estimated PLANNED water use:	<u>32.4 acre-in/acre</u>		
Annual Water Savings Estimate:	<u>31.3 acre-in/acre</u>		
Annual Water Savings Estimate:	<u>49.2%</u>		
Total Annual Water Savings Acres:	<u>4,700</u>		
Estimated savings for this field ONLY:	<u>12252.8 acre-ft</u>		
	Existing System	Planned System	<i>Quality Criteria</i>
System Efficiency:	<u>43%</u>	<u>85%</u>	
Quality Criteria Potential Efficiency:	<u>56%</u>	<u>85%</u>	
Quality Criteria Met?	<u>No</u>	<u>Yes</u>	
15% Increase in Irrigation System Efficiency?	<u>Yes</u>		

BLACK ROCK CONSULTING

Kevin L. Crew, P.E.

Principal

Education

B.S., Engineering, 1987,
California State University,
Humboldt – Magna Cum Laude

Registration

Professional Civil Engineer, OR
(17425), 1994

Professional Civil Engineer, CA
(45602), 1990

Contracted Designer – NRCS and
Jefferson Co. SWCD

Professional Affiliations

Oregon Water Resources
Congress

Past Board Member, OWRC
Council

Board Member, Swalley Irrigation
District

International Association of Arson
Investigators

Consulting Engineers Council of
Oregon

Honors, Awards, Speeches, Publications

A.S.C.E. Young Engineer of the
Year, 1987

Post Audit Analysis of the Helms
Pump-Back, February 1987

Eastern Municipal Water District
Administrations Facility, *Building
Profit*, Spring, 1995

Consulting Engineers Council of
Oregon, *Engineering Excellence
Honor Award*, TID Water
Conservation Project, 2001

American Consulting Engineers
Council, *National Recognition
Award*, TID Water Conservation
Project, 2001

Presenter, American Fisheries
Society/Wildlife Society, *Water
Conservation*, Portland, 2001

Presenter, APWA Fall
Conference, *Blue Lake Fish
Ladder and Screen*, 2006

Mr. Crew is a civil engineer with 24 years of experience in personnel management, project design and management, hydraulic analysis, construction management, and public presentations. Mr. Crew has prepared water master plans and water conservation plans for various agencies in Oregon. He plans, manages and designs, domestic and irrigation water supply, hydropower, fish screening and passage, transportation, grading, sewer, and stormwater facility projects. His focus is on irrigation piping projects, hydropower projects, fish screening and fish passage projects. Mr. Crew has completed large and small multifaceted projects for the public sector, including the military, and for private developers. He has prepared a variety of engineering feasibility studies, rate studies, and facility master plans. Mr. Crew has managed as many as 63 permanent staff. He is an experienced plan checker. Mr. Crew has been in responsible charge of over \$150 million in water resources related projects. He resides in Tumalo, Oregon where he enjoys his wife and family with 3 children and irrigating his own horse property.

Bend Feed Canal Project Group, Tumalo Irrigation District, Deschutes County, Oregon

Mr. Crew served as client and project manager on this award winning project that included piping the open stretches of the Tumalo Irrigation District's 25,000 l.f. Bend Feed Canal. The \$5 million project conserved 20 c.f.s. of water and provided 17.1 c.f.s. of water rights to the state of Oregon in Tumalo Creek. This new water right served to re-wet the dry reach of Tumalo Creek, restoring connectivity with the Deschutes River and delivering much needed flows and cool water to that river. The pioneering use of the Oregon Water Conservation Statutes, the solution of complicated hydraulic modeling issues and the use of innovative 84-inch diameter pipe material, as well as increasing public safety and trail systems, earned this project a Consulting Engineers Association of Oregon Honor Award and ACEC National Recognition Award.

Central Oregon Irrigation District/ODOT Piping Project in Redmond, Oregon

Mr. Crew served as project manager on this project that included the design, coordination, and installation of just under 1 mile of 96-inch diameter, 150-PSI rated welded steel pressure pipe to avoid the impacts of the Redmond, Oregon ODOT reroute project.

Central Oregon Irrigation District Juniper Ridge Hydropower Project

Mr. Crew is currently serving as Technical Project Lead on this project that is to include the installation of over 2 miles of 108-inch diameter pressure pipe, a forebay, and a new 5 MW hydroelectric facility located along the COID Pilot Butte Canal in Bend, Oregon. The project is currently being processed through the Oregon Department of Energy and is to commence construction in the Fall of 2009. The project falls under the FERC conduit exemption category.

Tumalo Irrigation District Flume Replacement Projects, Bend, Oregon

Mr. Crew served as project manager on these projects, which included survey, design and installation of two AWWA-C200 and M-11 compliant inverted siphons to replace aged irrigation flumes. The siphon improvements included a design for the demolition and removal of existing aerial flumes and replacement with inverted siphon pipes with sufficient calculated hydraulic capacity to convey the irrigation district's required flows. Mr. Crew also performed the hydraulic calculations and analysis necessary to justify siphon pipe diameters, open channel flow impacts, and entrance/exit structural geometry, which was a critical component of these projects.

Water Master Plan and Water Conservation Plan, Tumalo Irrigation District, Deschutes County, Oregon

Mr. Crew co-authored the Tumalo Irrigation District Master Plan and Water Conservation Plan prepared for the Oregon Water Resources Department. This plan was one of the first approved Water Conservation Plans for an irrigation district east of the Cascades. The plan provided an aggressive conservation plan for piping the major reaches of the District's system thus conserving as much as 2/3 of the water diverted from the Deschutes River.

City of Bend North Area Gravity Sewer Interceptor Project, Bend, Oregon

Mr. Crew served as project engineer on this approximate 5-mile gravity sewer interceptor project located at the north end of the City of Bend, Oregon and traversing a variety of railroads, irrigation canals, State Highways, and private and public properties. This project included a GPS survey, field survey, base mapping, hydraulic calculations, easement coordination and preparation, property owner contacts, utility locating and design for the project.

Water Wonderland Improvement District (WWID) Water Master Plan and Water Management Plan, Bend, Oregon

Mr. Crew prepared a water facility plan and a water conservation plan for the Water Wonderland Improvement District in Deschutes County. The evaluation included an inventory and review of the existing facilities, a hydraulic analysis of existing and proposed piping, pump and well facilities, and development of a phased master plan for implementation of necessary improvements over the next 20 years.

City of Bend Municipal Airport Well, Bend, Oregon

Mr. Crew served as project manager and designer on this project that included the survey, base mapping and design for a 350 g.p.m. chlorinated municipal well and supply system to an on-site reservoir.

Fish Screening and Passage Design – Blue Lake (Camp Caldera), Oregon

This unique project involved provision of screening and passage at the Blue Lake 20 HP hydropower site. The 25 CFS fish screening was designed as vertical flat plate profile bar wire compliant with ODFW passive cleaning criteria. The fish passage at the project was a unique stainless steel design utilizing micro-pile supports. The ladder was developed using the insight of renowned sculptor, Lee Kelly. The project has won several engineering excellence awards both in Oregon and nationally and has presented a viable alternative to traditional concrete ladders.



Fish Screen Feasibility Study and Design, Santiam Water Control District, Stayton, Oregon

Mr. Crew served as project manager on this project and conducted a feasibility study and alternative analysis to screen approximately 1,000 cfs of combined hydroelectric power plant supply and irrigation system supply from the Santiam River. Two alternatives were ultimately evaluated: screening the entire canal with an upstream screen and downstream adult fish barrier; and limited screening and fish by-pass around the hydroelectric plant. The preferred alternative of screening the entire canal was approved by ODF&W in September, 2000. The screen and adult fish barrier designs were completed in 2004 and approved by NOAA Fisheries and the ODFW. The project was subsequently constructed and has been operational for 4 years.

Fish Screen Feasibility Study and Design, Tumalo Irrigation District, Bend, Oregon

Mr. Crew served as project manager. The proposed screen was designed based upon Oregon Department of Fish and Wildlife draft fish screening and bypass criteria. The final design for the screen, screen cleaner assembly, trash rack, new reinforced concrete channel and fish return bypass were approved in 2003. The District installed the screen and it has been in successful operation for 4 years.

Fish Screen Design - Main Canal, for the Central Oregon Irrigation District, Bend, Oregon

Mr. Crew managed this project to provide design and construction services for a 650 cfs vertical flat-plane fish screen and fish return for the District's diversion off of the North Dam on the Deschutes River. The screen design included the screen structure, removable screen panels, a screen hoist system, wiper type screen cleaning assembly and a 24-inch HDPE fish return pipe.

Tumalo Feed Canal Fish Screen and Passage Feasibility Study and Design, for the Tumalo Irrigation District, Bend, Oregon

This project involved a feasibility study, design and construction management services for a new 160 cfs vertical flat-plate fish screen, fish by-pass and fish ladder at the District's Tumalo Creek diversion. Mr. Crew was the project manager. The proposed screen design was based upon Oregon Department of Fish and Wildlife draft fish screening and by-pass criteria. The fish screen channel and screen portion of the project are complete and operated during the 2006 irrigation season. The passage and headgate portion of the project are currently under final design.

Fish Screen Concept Study, for the North Unit Irrigation District, Madras, Oregon

As the project manager, Mr. Crew was responsible for evaluating the NUID's 153 cfs Crooked River pumping facility and for preparing conceptual designs for upgrading the plant's screens. The plant had non-compliant vertical-drum type screens with an approximately 1/4-inch mild steel mesh. The proposed design included the installation of a vertical flat-plate type screen with a water-burst flushing system, channelizing wall and major head and tail gate structures.

Fish Screen for 480 cfs Agricultural Pumping Plant - Columbia River, Oregon

In October, 2000 Mr. Crew was responsible for the upgrade of a 480 cfs water pumping plant to comply with National Marine Fisheries Service anadromous juvenile fish criteria. Over a record three week period, Mr. Crew directed the work of fabricators and divers to repair and upgrade the 21 on-site screens.