KLAMATH IRRIGATION DISTRICT

(WITH KLAMATH BASIN IMPROVEMENT DISTRICT)

Water Management and Conservation Plan 2021

16 August 2021

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EXECUTIVE SUMMARY

Klamath Irrigation District (Klamath ID) is a quasi-municipal corporation formed in 1917 pursuant to Oregon irrigation district law which is now codified as ORS Chapter 545. Klamath ID holds water rights in trust and performs operations and maintenance under contract with the Bureau of Reclamation as part of the Klamath Project (Project). Klamath ID is the backbone to the Project, providing service to eight (8) additional irrigation / improvement districts in addition to numerous individual Warren Act contracts. Klamath ID boundaries include 59,850 acres of the Project's "Main Unit" lands, Klamath Basin Improvement District (KBID) lands and individual contracted Warren Act lands. Klamath ID delivers water to over 122,000 acres of the 233,625-acre Project area in southern Oregon and northern California.

The mission of Klamath ID is to acquire, maintain, assure, and deliver an adequate irrigation water supply for beneficial use on qualified land within the Klamath Project.

NOTE: This plan also includes updates for the KBID. (Under various contracts, Klamath ID provides administrative and operational support for KBID as this entity has no delivery system, nor facilities; KBID's water management is performed by Klamath ID and others.)

Klamath ID's main goal is to optimize our water resources by improving flexibility and resiliency of our system. The key modernization objectives are:

1) Improve water tracking from diversion to drain
2) Maximize efficiency and flexibility of water deliveries
3) Bring people together
4) Upgrade failing infrastructure
5) Exploit opportunities for economic benefits
    a. Reduce power costs for the District and Patrons
    b. Reduce weed control costs.

The Klamath ID focuses resources towards infrastructure improvements on Federal facilities. We are improving data analysis systems to inform operations and on-going planning efforts to improve the irrigation delivery system, water savings, operational efficiency, and reduce spills, over-deliveries, and seepage. Efficiency improvements to the District's water management plan include modernization efforts to automate some system operations.

In 2018, Klamath ID entered into partnership with Farmers Conservation Alliance (FCA) to develop an irrigation modernization plan. We anticipate future recommendations by FCA will expand and enhance this document. Overall, Klamath ID expects to continue efforts to conserve and use water more efficiently across the Project; increase the production of hydropower at the C-Drop Hydro; reduce the risk of conflict between water users on the Project; enable farmers to make additional on-farm improvements in the future (including improvements that may be eligible for Natural Resources Conservation Service (NRCS) funding); and contribute to water supply reliability for the Klamath Project.

SECTION 0: DOCUMENT REQUIREMENTS AND PURPOSES

Klamath Irrigation District (Klamath ID) is not subject to Public Law 97-293 Section 210 Water Conservation as written in 1982. While generally Reclamation Manual Directives and Standards WTR 01-01 requires water conservation plans and suggests each one be resubmitted on a 5-year cycle, this guidance is irrelevant as Klamath ID has a 1954 operations and maintenance contract with the Bureau of Reclamation (Reclamation), as per Section 203, this provision of Public Law 97-293 does not apply to Klamath ID. It is assumed the earlier Klamath ID conservation plans were submitted to Reclamation in 2003 and 2011 as voluntary documents; this updated plan is also submitted voluntarily as an update to communicate how the District has developed an appropriate water conservation plan with definite goals, conservation measures, and time schedules should Reclamation require this information in the future.

As of the date of this document's resubmission to Oregon Water Resources Department (OWRD), Reclamation has not asked Klamath ID for an update to the plan approved in 2011; this update is solely in response to an 8 October 2019 letter received by Klamath ID from OWRD stating a OWRD final order specified that an updated Water Management and Conservation Plan be submitted to the Department no later than 6 April 2019. OWRD refused to grant any extension to the existing plan.

Upon inquiry to Reclamation officials as to the need to resubmit a conservation plan to the Federal government, the local Reclamation office responded with the plan was not a priority at the moment; Reclamation currently has no need for an updated conservation plan from Klamath ID. However, in October of 2019, Reclamation staff provided Klamath ID with Reclamation Manual Directives and Standards WTR 01-01, a 1996 guidebook for preparing agricultural water conservation plans, and a 2017 water management planner with a directed format. As to anticipate Reclamation's future requests, this directed format is modified to meet the other bureaucratic requirements listed below.

Oregon Revised Statue (ORS) 540.572.b requires an irrigation district to implement a conservation plan approved by the Oregon Water Resources Commission for the district to be authorized to "apply the certificated water to which such land is entitled to other irrigable lands within the legal boundaries of the district."

Oregon Administrative Rule (OAR) 690-086-220.1 requires agricultural water suppliers to have approved conservation plans to transfer water rights within the boundaries of the district.

OAR 690-086-220.5 states, "A water conservation plan prepared in accordance with criteria of the Bureau of Reclamation and substantially meeting the requirements of OAR 690-086-0225 to 690-086-0270 may be submitted to meet the requirements of these rules."

On 7 January 2021, OWRD stated the submission of a final draft of this plan expressing the effective date range of the period between 2020-2025 indicated Klamath ID anticipated resubmitting an updated plan by 2025 and that the wording in OAR 690-086-0225.6 was inflexible to accept a general date of 2025 and thus requires Klamath ID to provide a proposed date to submit an updated Water Management and Conservation Plan to OWRD.

OAR 690-086-0225.6 provides that a proposed date for submittal of an updated plan, based upon the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth of or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department.

Proposed date of submittal of an updated Water Management Conservation plan to OWRD required in OAR 690-086-0225.6: The submittal of an updated plan in the foreseeable future is unnecessary and should not be required before 1 January 2035 or upon a Reclamation directive consistent with our contract. The explanation why an updated plan is unnecessary is provided below as required in OAR 690-086-0225.6.

Justification: OAR 690-086-220.5 states, "A water conservation plan prepared in accordance with criteria of the Bureau of Reclamation and substantially meeting the requirements of OAR 690-086-0225 to 690-086-0270 may be submitted to meet the requirements of these rules." As this plan was prepared with Reclamation criteria, it should also be subject to update as per Reclamation criteria as to prevent bureaucratic, burdensome, redundant, and duplicate requirements with conflicting standards.

Under ORS 545, it is the role of the elected District Board of Directors to determine District policy, including a need to update this plan, availability of funds, priorities for the District, and progress of the plan. The Board of Directors determines when resources are allocated to update this plan. The future conservation measures described in this WMCP involve capital improvement projects which take significant time to implement given funding constraints and construction timelines.

Furthermore, the actions of Reclamation and OWRD in 2020 and 2021 are directly preventing Klamath ID from working with various conservation groups, such as Farmers Conservation Alliance and the Natural Resources Conservation Service, to perform water management and conservation studies within Klamath ID. The reduced amount of water available to Klamath ID dictated by Reclamation required Klamath ID to reduce irrigation delivery flows in 2020 eroding the economic foundation of the Klamath Basin. The further curtailment of irrigation water in 2021 by Reclamation combined with no action by OWRD to prevent Klamath ID stored water from being released from Upper Klamath to the ocean without a water right, nor beneficial use directly prohibited Farmers Conservation Alliance the ability to collect and analyze normal Klamath ID operation flow data, infrastructure loss data in 2020, and has further indirectly delayed the Natural Resources Conservation Service's development of a watershed study within the District scheduled for 2021.

As of this revision to the plan, Reclamation has communicated it plans to continue diverting stored water from Upper Klamath Lake without a water right to do so, is actively prohibiting Klamath ID from diverting live flow and/or stored water as per our established Oregon water right. Reclamation is threatening Klamath ID and Oregon residents with heavy fines, penalties, and criminal prosecution in addition to prohibiting Klamath ID from performing its contractual and legal obligations. Engagement and litigation to compel OWRD to protect the water rights of Oregonians with secondary claims to the stored water has been futile.

The significant loss in revenue to farmers and ranchers in 2020 and 2021 due to irresponsible Reclamation policy and OWRD failure to protect Oregonian's property will have lasting effects extending ten years or more on Klamath ID's ability to modernize and improve the efficiency of irrigation water delivery. **It is impossible to maintain or initiate new water management and conservation programs when the financial base for performing these activities is radically eroded from federal government overreach and state government inaction while both ignore the laws which are in place to protect Oregonians**.

Therefore, until Reclamation and OWRD meet legal and contractual obligations and the financial base for the District is restored, maintaining the current programs will be a significant challenge and any progress to improve District level conservation efforts will be drastically delayed until economic stability is returned.

SECTION 1: KLAMATH IRRIGATION DISTRICT DESCRIPTION

Contact Information

District Name(s): **Klamath Irrigation District (Klamath ID)** *with Klamath Basin Improvement District (KBID)*
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District Summary

Klamath ID is a quasi-municipal corporation, a public entity formed under law, pursuant to Oregon Revised Statute (ORS) Chapter 545. For the purpose of this document, Oregon Administrative Rule (OAR) 690-086-0040 defines the mission of Klamath ID as an 'agricultural water supplier'. Klamath ID performs operations and maintenance under contract with the Bureau of Reclamation (Reclamation) and is part of the Klamath Project (Project) as identified in Figure 1.

KBID, formed under ORS 552 does not meet the definition of an "agricultural water supplier" defined in OAR 690-086-0040. KBID takes no action to deliver water as this responsibility if fulfilled by Klamath ID and other districts.

The Klamath ID provides operations and maintenance on the Project's "Main Unit" lands and Warren Act lands. Construction of the Project's "Main Unit" distribution system occurred between 1870 and 1917. Klamath ID is the backbone of the Klamath Project, providing service to over 122,000 acres[1] through eight (8) partner irrigation/improvement districts within the Klamath Project.

Klamath ID's stakeholders include the owners of over 5,400 parcels of land, Reclamation, Tulelake Irrigation District, Enterprise Irrigation District, Pine Grove Irrigation District, Poe Valley Improvement District, Klamath Basin Improvement District, Van Brimmer Ditch Company, Shasta View Irrigation District, Malin Irrigation District (these Districts are depicted on the map in Figure 1), Klamath County Drainage and Service District and individual Warren Act Contractors as defined by contracts and intergovernmental agreements.

Indirect stakeholders include U.S. Senator's for Oregon Merkley and Wyden, U.S. Congressmen Bentz and LaMalfa, the Klamath Tribes, Oregon Senator Linthicum, Oregon Representatives Reschke and Iverson-Breese, U.S. Fish and Wildlife, the State of Oregon, Oregon Fish and Wildlife, Klamath County Commissioners, the Cities/Towns of Klamath Falls, Merrill, Malin, Bonanza, Keno, Tulelake, and Newell, in additional to agricultural equipment

[1] A.H. Lamm, Consulting Engineer, 24 May 1925 *Irrigation and Power Report to Klamath Irrigation Project*, page 4.

suppliers, seed producers, restaurants, hospitals, clinics, retail chains, and contracted national brands across Southern Oregon, Northern California, and Western Nevada.

District Location (General Location – OAR 690-086-240.1)

Klamath County, Oregon & Modoc County, California

The Klamath Irrigation District is located in southern Oregon, south and east of the city of Klamath Falls with a contractual obligation to provide operations and maintenance of infrastructure for a small area of the Tulelake Irrigation District in Modoc County, California.

The Klamath ID boundary (see Figure 2), extends from the head of the A Canal at the southeast portion of the Upper Klamath Lake (UKL), east into Poe Valley, south into Spring Valley, and southeast along the Lost River to the Oregon-California State Line. The exterior boundary includes 59,850 acres (53,638 are irrigated or are irrigable) and includes a large portion of the Klamath Basin Improvement District (KBID).

A. History of the Klamath Irrigation District

1. Date district formed, first Reclamation contract, original size, current year

Date District Formed: **8 December 1917** Date of First Reclamation Contract: **1905**[2]

Original Size Acres: **68,652**[3] Current Year: **2021**

Genesis of the Klamath Project and Klamath Irrigation District

Federal support for expansion of the 1870-1890s era of private irrigation development efforts in the Klamath Basin began pursuant to the Reclamation Act enacted on 17 June 1902 and was further expanded by Congress with the Warren Act on 21 February 1911. Significant portions of Klamath ID's infrastructure were originally part of the Ankeny-Henley Canal (established 1878 – now known as the A Canal) and the Adams Canal (completed in 1886- now known as the D Canal), a portion of the C canal developed by the Van Brimmer Ditch Company (established 1882)[4] with responsibilities to serve the Van Brimmer Ditch Company lands.

[2] Klamath Irrigation District vs. P.C. Carlson. 1943. The Supreme Court of the State of Oregon. Klamath ID was formed in 1917 due to a change in Oregon law allowing the Klamath Water Users Association to transfer Klamath Project financial responsibilities and contracts to the Klamath Irrigation District, absolving the Klamath Water Users from individual liabilities.
[3] I.S. Voorhees. 1912. History of the Klamath Project. Pg.10
[4] I.S. Voorhees. 1912. History of the Klamath Project. Pg.8-9

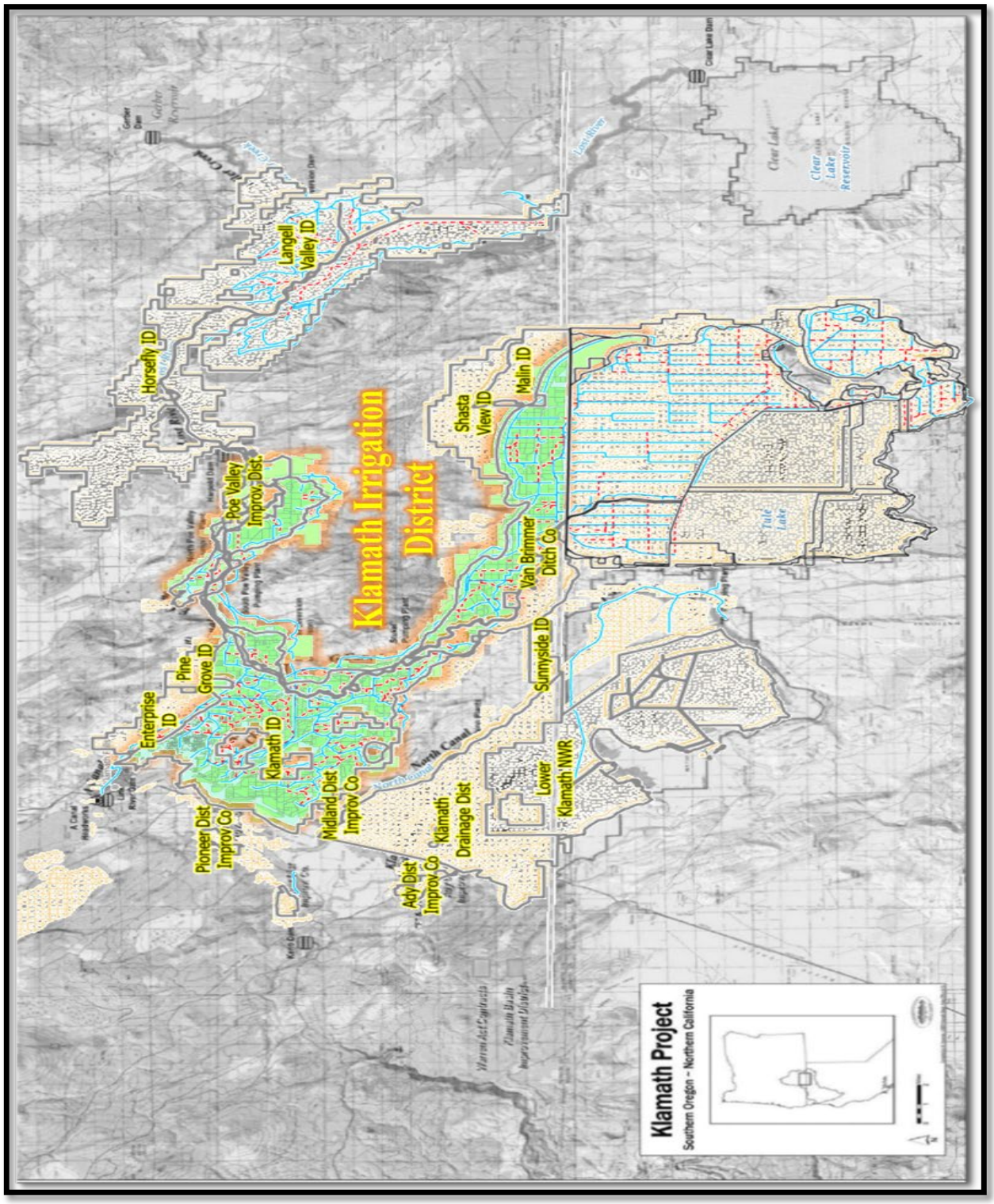

Figure 1 Klamath Irrigation Project Districts Map[5], Klamath ID Boundaries Highlighted

[5] Reclamation provides a similar map which articulates each individual district at klamath-Project-Irrigation.jpg (1692×1128) (usbr.gov)

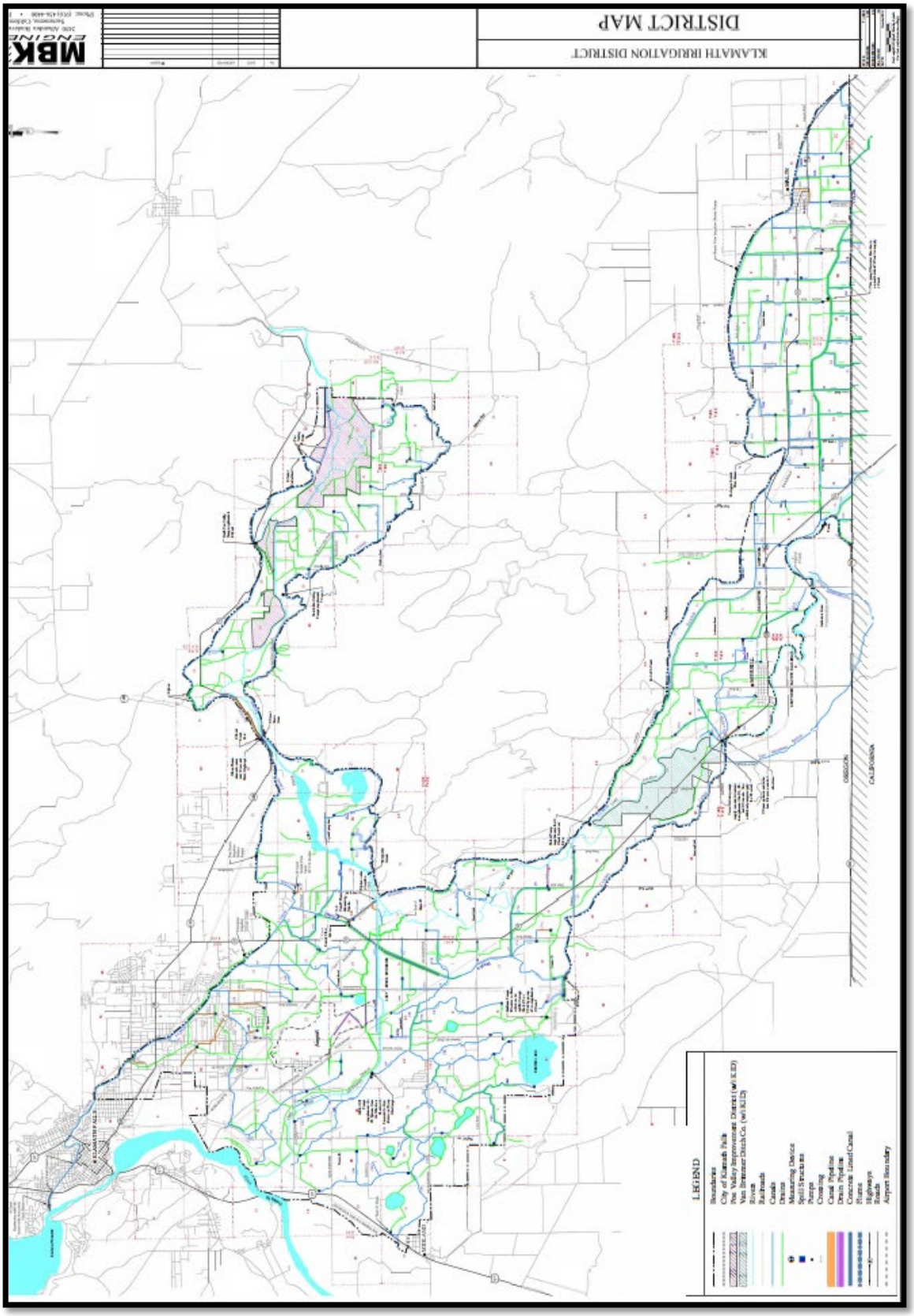

Figure 2 Klamath Irrigation District Boundaries and Infrastructure (without California O&M Lands)[6]

Formal notice of water appropriation for the Project was provided by J.B. Lippincott (Supervising Engineer for the Klamath Project) on 5 January 1905 for a capacity of **5,000 cubic feet per second from the Link River for irrigation** and other beneficial uses was acknowledged by C.G. Ricketson and filed with the Klamath County Court and the Oregon State Engineer.[7]

The United States Congress authorized the lowering of the levels of Tule Lake and the Lower Klamath Lake by drainage on 9 February 1905. The plan for the uncovered lands were to be used exclusively for agricultural development pursuant to the Reclamation Act of 1902.[8] This action exposed fertile farming ground in the southern portion of Klamath ID boundaries in addition to other Project districts.

Klamath ID's predecessor organization, the Klamath Water Users Association (KWUA), was incorporated on 4 March 1905 under the laws of the State of Oregon for the purpose of entering into a contract with the United States for the acquisition of the existing irrigation infrastructure and construction of the Klamath Project.[9] KWUA incorporated with a capital stock of $2,000,000 to invest in the Project development.

On 17 May 1905, Reclamation Service filed notice of intent to utilize ALL water of the Klamath Basin for the Klamath Project[10] with initial plans to irrigate 236,400 acres.[11] The General Laws of Oregon subsequently provided authorization for the bed of the Upper Klamath Lake as storage of water for irrigation operations and reclamation.[12] Upon execution of Reclamations 1905 contract with KWUA, "each landowner desiring to receive water through Project facilities entered into a "Water-Right Application For Lands In Private Ownership" with the Department of the Interior"[13] which has been captured by the State of Oregon on some parcel deeds. Other lands serviced by the District were granted water-right through the subsequent Homestead Act.

In 1906, over **200,000 acre feet of additional water rights** from Upper Klamath Lake were purchased within Klamath ID boundaries to include: 150,000 acre feet from the Klamath Canal Company; 20,000 acre feet reserved for Henley-Ankeny-Cantrell; 30,000 acre feet from the Little Klamath Ditch Company; 40 acre feet for the city of Klamath Falls; and a "great number of riparian rights from land owners"[14].

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[7] C.D. Lawrence. 12 January 1951. Notes concerning inspection of water filing at Salem Oregon. Lippincott Notices 1902-1909.
[8] I.S. Voorhees. 1912. History of the Klamath Project. Pg.11
[9] I.S. Voorhees. 1912. History of the Klamath Project. Pg.74
[10] Notice of Intent filed with the State of Oregon by the United States on 19 May 1905
[11] I.S. Voorhees. 1912. History of the Klamath Project. Pg.10
[12] I.H. Van Winkle, Oregon Attorney General. 7 July 1925. Response to Mr. Luper State Engineer.
[13] State of Oregon Water Resources Department Reference No. 003F00040137, Lead Case No. 3. 20 December 2004. Claimants Klamath Project Water Users' Opening Brief. Page 56
[14] Wilson S. Wiley. 21 February 1910. Letter to the Director of U.S. Reclamation Service; notice of appropriation. Pages 5-6.

Initial survey studies for the Klamath Project in 1906 provide the fact that **water did not flow freely from Upper Klamath Lake into the canyon southwest of the town of Keno** prior to Project development. The river was naturally constrained by two a basalt-lava reefs, one at Link River holding the waters of the lake naturally around 4,136 feet above mean sea level (MSL)[15] and the other near Keno, Oregon which naturally held the water level in the Upper Klamath Basin at over 4,084 feet above MSL. These natural barriers slowed the flow of the waters in the Upper Klamath Basin, allowing sentiment and natural pollutants to settle, holding back surface water inflow allowing it to flow in the marshes of Lower Klamath Lake where it, at times, mixed with Lost River water flowing towards Tule Lake in Southern Oregon and California.[16] These natural reservoirs also increased natural evaporation. In pre-historic times, it is estimated the entire basin was one single lake, about the size of Maryland, which was held back by a series of lava flows,[17] some researchers identify this water body as Lake Modoc. In analysis of the Klamath River, it is clear sea-going aquatic species would not have been able to travel from the sea into the Upper Klamath Basin as their path was blocked by at least two additional basalt reefs downstream from the Keno reef.

The water from the rivers covered over 182,000 acres of marsh in the Basin for 10 months during each year prior to 1906[18] indicating more than sufficient water supplies for agricultural purposes without reducing the natural flow to the Klamath River below the Keno Cut. Natural evaporation of waters sitting in the Lower Klamath Lake (below Upper Klamath Lake) not reaching the Klamath River prior to 1909 is estimated at over 60,000 acre feet annually.[19] Evaporation from Tule (Rhett) Lake is estimated as slightly more at 68,000 acre feet annually for a total of 128,000 acre feet of water which evaporated within the marshes and never made it to the Klamath River below Keno. EACH tule plant may retain/need up to 5 gallons of water; hundreds of thousand tule plants covered the Lower Klamath Lake, Tule Lake, Lost River Slough, and other marshes resulting in several hundred thousand acre feet of water per year which was retained in the Basin and not provided to the Klamath River below Keno.

On 20 February 1906, efforts began to cut channels into these natural reefs as part of the contracted construction of the Klamath Project. The Keno Cut on the McCormick tract created a channel for the Klamath River at Keno to allow water to pass at 4078 feet above sea level (6 feet lower than the natural reef). This **project increased flow to the Klamath River** and allowed for

[15] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.
[16] J.H. Quinton. 26 December 1906. Report on Reclamation of Marsh Lands Klamath Project.
[17] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1386
[18] J.H. Quinton. 26 December 1906. Report on Reclamation of Marsh Lands Klamath Project. Page 1.
[19] Louis W. Hall (Engineer). 19 June 1909. Lower Klamath, Proposed Order of Construction. Letter to Mr. W.W. Patch, Project Engineer.

waters from the Klamath Basin to drain for the purpose of land reclamation in the beds of the Lower Klamath Lake and Tule Lake.[20]

In 1908, Sweet and McBeth surveyed the Klamath Basin water supply, soils, and topography and prominently noted, **"the water supply is abundant."**[21]

Beyond the Keno Cut on the Klamath River, the California-Oregon Power Company (COPCO) surveyed the natural conditions of the Klamath River. **The natural barriers and hydrology prevented waters from freely flowing outside the basin in a consistency needed for power generation.** J.C. Boyle identified that "unless the United States carried out its plan of regulating the Upper Klamath Lake, **the [Klamath] river would often, if not regularly, be [naturally] extremely low during the summer months,** but if…regulation was carried out by the U.S. Government, a uniform flow of about 1500 second feet could be maintained in the Klamath River at Keno" while still meeting irrigation needs.[22]

Therefore, the California Oregon Power Company was given authority by Reclamation in 1916 to build and operate the Link River Dam, for downstream power generation, **with ONLY the waters <u>surplus</u> to Project needs** which was upheld in 1950 by the Oregon Attorney General.[23] In 1919, controlled storage of the Upper Klamath Lake began with a temporary structure which was replaced with a concrete dam in 1921. This structure increases the natural barrier of Upper Klamath Lake at 4136-4137 feet above sea level to an artificially controlled barrier at 4143.3 feet above MSL.[24] These structures, developed as part of the Klamath Project with water-rights obtained in 1905, increased controlled storage of water in Upper Klamath Lake from 140,000[25] acre feet to 584,000 acre feet of water for Project irrigation use.[26]

On 24 February 1917, Reclamation contracted COPCO to regulate the outflow of Upper Klamath Lake subject to the existing rights and the prior rights of the Klamath Project. Reclamation enforced these rights on 17 March 1924, when the local Reclamation office informed the California Oregon Power Company that "the draft on the lake for power purposes would have to be curtailed in order that there might be sufficient supply for irrigation…on 5 April 1924, the Commissioner wire the Project Manager authorizing him to take such action…as might be necessary to protect the project water supply…(subsequently) curves were delivered to (COPCO) showing a permissible elevation of the water surfaces every day between May 1st and

[20] Louis W. Hall (Engineer). 19 June 1909. Lower Klamath, Proposed Order of Construction. Letter to Mr. W.W. Patch, Project Engineer.
[21] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. page 1413
[22] J.C. Boyle. 1976. 50 Years on the Klamath. Page 34.
[23] Paul Simmons. 2019. A History of the Klamath River Basin Compact presented at the Oregon Institute of Technology.
[24] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.
[25] I.S. Voorhees. 1912. History of the Klamath Project. Pg.7
[26] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.

September 1st."[27]

In 1917, the Oregon legislature authorized irrigation districts to assume obligations to the United States for lands in the district and to become the agent of the United States. On 8 December 1917, voters approved the formation of Klamath ID to assume repayment responsibilities and other obligations of KWUA under its contract with the United States. In 1918, Klamath ID entered into a contract with Reclamation for repayment of the costs of Project works thus dissolving the KWUA. All repayment costs for the development of the project were fulfilled in accordance with the District contract.

After the completion of the regulating dam, dikes, and modifications to the natural flow of the Klamath River, "during all the cycle of dry years up to and including 1931, sufficient water was available from Upper Klamath Lake to irrigate all lands that were entitled to it from that source"[28] and meet down river needs.

In 1954, the District entered into another contract with Reclamation to assume operation and maintenance of the A, B, C, D, E, F, and G Canals; the C-G cutoff; and all the related distribution, drainage, and pumping plants. Under various Reclamation contracts, and by Project design, **Klamath ID is required to serve water users both within and outside of its boundaries**, including KBID, individual Warren Act Contractors, and areas within Tulelake Irrigation District boundaries in the State of California.

Between 1882 and 1985 Klamath ID has no record of Project irrigation water deliveries negatively impacting Federal Trust with area native peoples, contracts, or agreements, nor posing any negative environmental impacts. Nor does the District have any record of the Project being objected to by native peoples prior to 1985, eighty years of no objection.

In 2001, the Federal government temporarily curtailed water-rights for all irrigation diversions within the Klamath Project, to include Klamath ID, for waters stored in Upper Klamath Lake which was in excess of 4137 feet above MSL stored for irrigation purposes without due process resulting in on-going litigation.

In 2013, the Oregon Department of Water resources completed a 38-year Administrative Adjudication of the water-rights in the Klamath Basin resulting in **the State of Oregon confirming the Klamath irrigator's pre-1909 water-rights claim for up to 570,110 acre feet of irrigation water storage from Upper Klamath Lake**.[29]

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[27] Herbert D. Newell. Reclamation. 1924. Annual Project History and O&M Report Klamath Project. Pg. VII, 1, 47

[28] J.C. Boyle. 1976. 50 Years on the Klamath. Page 35.

[29] Oregon Water Resources Department. 2014. Amended and Corrected Findings of Fact and Order of Determination.

2. Current size, population, and irrigated acres

Klamath ID Current Size (acres): **59,850**[30] **(exterior boundary)** See figure 2.

Population Served Directly by Klamath ID: **5,134 Individual Accounts**[31] (Includes KBID)

Irrigated Acres within Klamath ID boundaries: **53,638**[32] (Includes KBID)

Note: The A Canal provides irrigation water outside Klamath ID boundaries to over 68,362 additional acres. (Includes Van Brimmer Ditch Co, Tulelake ID, Shasta View ID, Malin ID, Enterprise ID, Pine Grove ID, Poe Valley ID, Sunnyside ID, and other Warren Act contractors serviced through Klamath ID as part of the Klamath Project under various Reclamation contracts for the KA-1000 water right claim)[33]

Klamath ID, including service to KBID, provides service to 5,134 individual accounts and directly irrigates 53,638 acres of Nationally Significant Agricultural Land[34]. The use of irrigation water beyond the Klamath ID's point of delivery to other districts is beyond the scope of this plan; concurrent with Klamath ID's 2012 response to the Water Management and Conservation Plan deficiencies noted by the Oregon Water Resources Department (OWRD), each district is responsible to provide their own information and data to OWRD. Reclamation's contracts and intergovernmental agreements do not require other Districts to report to Klamath ID, nor require Klamath ID to report for these Districts.

3. Water supplies received in current year (Current Water Use - OAR 690-086-0240.4)

On 2 April 2021, Klamath ID received notice from Reclamation that the District is prohibited from performing its contractual obligations and **Klamath ID is ordered to violate the property rights of Oregonians by not diverting any water** from Upper Klamath Lake until further notice, that **Reclamation is, and plans to continue, to illegally divert stored water from Upper Klamath Lake without a water right for in-stream purposes**, and the OWRD will not prevent this illegal activity, not take charge in distributing the waters as required by Oregon State Law. Therefore, Klamath ID concludes it will likely not receive water in 2021 resulting in over $400,000,000 loss to the economy of the Klamath Basin, the State of Oregon, and the Federal government. Therefore, for the purpose of this document, Klamath ID provides data for the 2019 year for analysis.

2019 was a cooler year with above average late spring and early fall precipitation as compared to recent irrigation years for the Project. The lower temperatures combined with unusual precipitation cycles resulted in reduced agricultural demand across the Project in 2019.

To understand Klamath ID water diversions requires a detailed understanding of the complexity in the Klamath Project dynamics. There are 19 separate water user Districts in

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[30] MBK Engineers. 2002. Draft Water Management Plan. Pg. 3.
[31] Klamath Irrigation District Quickbooks. 2019. Extracted on 16 October 2019.
[32] Klamath Irrigation District Assessment Roll Books. 2019. Extracted on 16 October 2019.
[33] A.H. Lamm, Consulting Engineer, 24 May 1925 *Irrigation and Power Report to Klamath Irrigation Project*, page 4.
[34] Nationally Significant Agricultural Land. 2016. Accessed 28 April 2021 at https://databasin.org/maps/new/#datasets=105ed96a79dd4e2ab73a320f2953fb67

addition to multiple individual contractors within the Project, most of which draw from an annual Project supply, determined by Reclamation, from Upper Klamath Lake. In the Project design, Klamath ID provides water to eight (8) sister Districts and numerous individual contractors with their own individual contracts and reporting requirements to Reclamation and State departments. Most of Klamath ID's operational spill is recaptured by other Districts in a system deemed 92-98% efficient.[35]

In 2019, Klamath ID estimates the irrigators of the Klamath Project diverted 294,000 acre feet of water from the Upper Klamath Lake for agricultural use as depicted in Figure 3. An additional 38,000 acre feet of water was provided to the United States Fish and Wildlife Service's Lower Klamath National Wildlife Refuge through the Project as allowed by the refuge's adjudicated junior water right.

Historical Project Perspective: The Project's diversion of water for irrigation purposes between 1961 and 1995 ranged between 370,000 to 500,000 acre feet per year with an efficiency transfer calculated between 92-98% efficient as analyzed by Davids Engineering in 1997.[36]

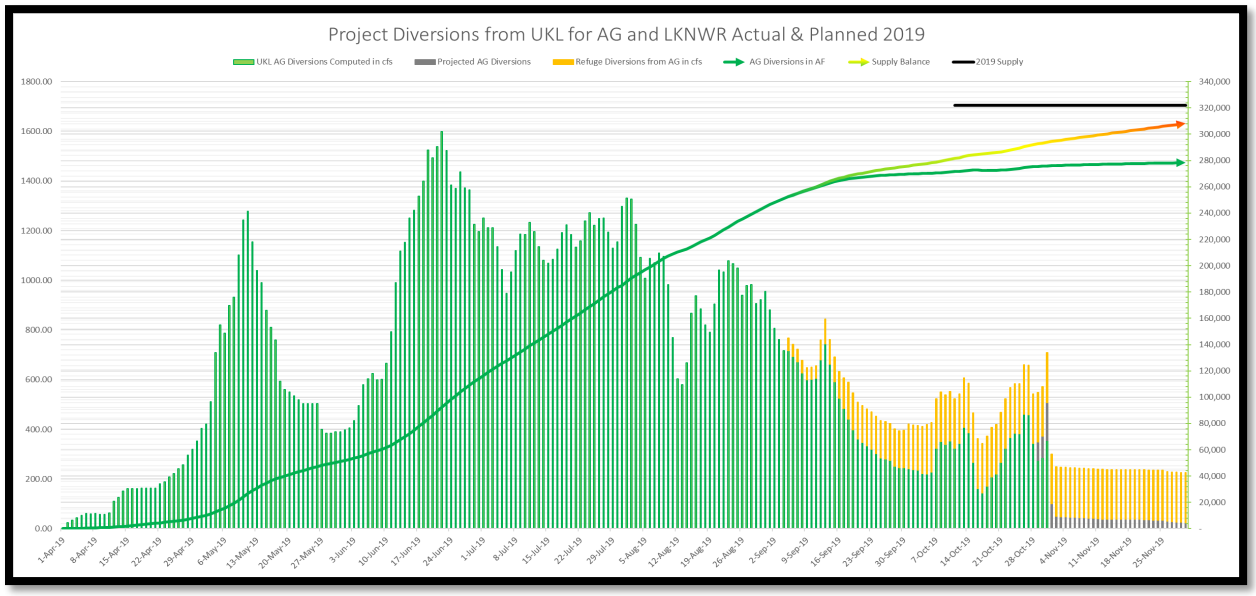

Figure 3 Klamath Project Diversions from UKL for 2019 (as of 1 Nov 2019)

From the Project's diversion of 322,000 acre feet of irrigation water, Klamath ID diverted 210,786 acre feet of water from Upper Klamath Lake through the A Canal (see Figure 4); Klamath ID diverted an additional 9,385 acre feet from the Miller Hill Pumping Station from the along the Lost River Diversion Channel for a total of 220,171 acre feet of water diverted for irrigation purposes within Klamath ID, eight other Districts, and individual contractors across 122,000 acres. For 2019, this is a reduction of 77,905 acre feet from the average diversions recorded from 1990 through 2000 which can be directly attributed to irregular precipitation patterns and cooler temperatures in 2019.

[35] Davids Engineering Inc, 23 February 1997. Klamath Project Water Use Analytical Tool. Chart 42
[36] Davids Engineering Inc, 23 February 1997. Klamath Project Water Use Analytical Tool. Chart 42

Water Diverted in 2019 by Klamath ID for the Project	AF
Federal urban water	0
Federal agricultural water	0
Oregon State water (not California SWP)	220,171.63
California State Water Project	0
Other Wholesaler	0
Local surface water	0
Upslope drain water	0
District groundwater	0
Banked water	0
Transferred water	0
Recycled water (treated urban wastewater)	0
Other	0
Total (For all Districts and Contractors)	**220,171.63**

Note: As defined in Oregon Revised Statute 468B.005(10) and further outlined in the Findings of Fact of the Final Order of Determination (OAH Case 003), "the corpus of the water-or the water itself-"belongs to the public" and is held in trust by the state."[37] *Therefore, the chart titled "Water Diverted in 2019", required by Reclamation in its 2017 Water Management Planner, is modified to account for water diverted from Oregon's public trust.*

Historical District Perspective: Between 2011 and 2019 (minus the 2018 data due to a Federal injunction and mild drought conditions), the average diversion from the A Canal was 222,115 acre-feet. The District average annual total diversion in the 1990s was 298,076 acre-feet as reported in Figure 49.

[37] Finding of Fact of the Final Order of Determination (OAH Case 003) Pg. 58.

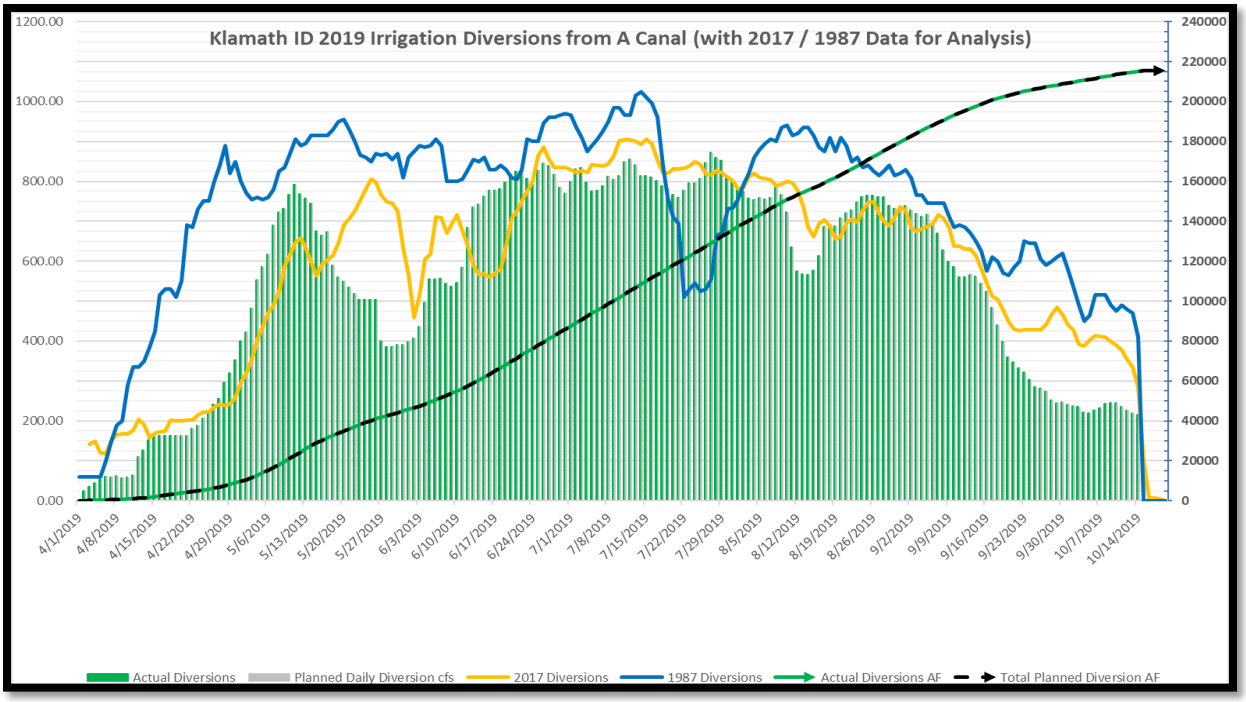

Figure 4 Klamath ID 2019, 2017, & 1987 Irrigation Diversions from A Canal in daily cfs (Note: 1987 and 2017 were similar in precipitation and temperature at the beginning of irrigation season)

4. Annual entitlement under each right/contract (Water Rights - OAR 690-086-0240.1)

a. Claim KA-1000 (aka Klamath Project Consolidated Claim 321-17/293/323-3)

Klamath ID is a claimant in the KA-1000 water-right claim in the State of Oregon[38] as part of the Klamath Project with a water right established on 19 May 1905. The KA-1000 water-right for Klamath ID season of use is 1 March through 31 October annually as outlined in Figure 5. KA-1000 provides claim to all Project irrigation districts, including the Districts and contractors Klamath ID provides water to with authority to claim up to 570,110 acre-feet of irrigation water stored in Upper Klamath Lake annually.[39]

In 1921, the natural barrier to Upper Klamath Lake was improved upon to create an artificially controlled barrier to raise the lake level to 4143.3 feet above MSL[40] which increased controlled storage of water in Upper Klamath Lake from 140,000[41] acre feet of natural storage to

[38] Table A for Klamath Project Consolidated Claim 321-17/293/323-3 (KA-1000 in WRIS) page 268 of 271.
[39] Oregon Water Resources Department. 2014. Amended and Corrected Findings of Fact and Order of Determination.
[40] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.
[41] I.S. Voorhees. 1912. History of the Klamath Project. Pg.7

584,000 acre feet of water for Project irrigation use.[42] Additional information can be found at https://apps.wrd.state.or.us/apps/wr/wrinfo/wr_details.aspx?snp_id=175345

Effective 2 April 2019, Reclamation's policies driven by political pressures unlawfully limited the maximum UKL irrigation water supply to 350,000 acre feet[43] for approximately 165,000[44] acres of agricultural lands. This maximum was further reduced in 2020 by 23,000 acre feet; effectively set the historical low diversions as the maximum water available at 327,000 acre feet per year. **The Federal government, without due-process or reparation, reduced the State adjudicated water-right for Project irrigators by 243,110 acre feet and illegally appropriated water stored for irrigation purposes only for other uses.**

TABLE A: RATE, DUTY, AND PERIOD OF ALLOWED USE BY SYSTEM, OPERATOR, OR CONTRACT, INCLUDING POINT OF DIVERSION AND/OR MEASUREMENT STATION LOCATIONS
THE DUTY PER PROJECT SYSTEM AND/OR OPERATOR AND/OR BOR CONTRACT(S) IS FURTHER LIMITED BY MAXIMUM RATES OF WATER USE ESTABLISHED AT MEASUREMENT STATIONS AS LISTED BELOW. A MEASUREMENT STATION MAY OR MAY NOT BE A POINT OF DIVERSION.

TABLE A for KLAMATH PROJECT CONSOLIDATED CLAIM 321-17/293/323-3 (KA-1000 in WRIS)

"SUMMER" SEASON PROJECT DUTY

System or Operator	Source of Water	POD and/or Measurement Station	QQ-T-S-R	Location Description	Maximum Rate (CFS) at Measurement Station	Limitations / Remarks	Season of Use	Duty (Acre-Feet)
Combined KID/TID*	UPPER KLAMATH LAKE	"A" CANAL	SW NE 30-38.00S-9.00E	1594 FEET SOUTH & 2071 FEET WEST FROM NE CORNER, SECTION 30	1150		Mar 1 - Oct 31	420,370 ACRE-FEET**
	KLAMATH RIVER	STATION 48	NE NW 31-39.00S-10.00E	70 FEET SOUTH & 2495 FEET EAST FROM NW CORNER, SECTION 31	650		Feb 15 - Nov 15	
	KLAMATH RIVER	NO. 1 DRAIN	NW NW 31-39.00S-10.00E	34 FEET SOUTH & 440 FEET EAST FROM NW CORNER, SECTION 31	100		Feb 15 - Nov 15	
	KLAMATH RIVER	MILLER HILL PUMPING PLANT	SE SW 27-39.00S-9.00E	1104 FEET NORTH & 1604 FEET EAST FROM SW CORNER, SECTION 27	105		Mar 1 - Oct 31	
	KLAMATH RIVER	KID PUMPING PLANT #1	NE NE 20-39.00S-9.00E	941 FEET SOUTH & 762 FEET WEST FROM NE CORNER, SECTION 20	10.0	CUMULATIVE PUMPING NOT TO EXCEED 10 CFS FROM ANY COMBINATION OF KID PUMPING PLANTS #1 THROUGH #10	Mar 1 - Oct 31	
	KLAMATH RIVER	KID PUMPING PLANT #2	NW NW 21-39.00S-9.00E	814 FEET SOUTH & 570 FEET EAST FROM NW CORNER, SECTION 21				
	KLAMATH RIVER	KID PUMPING PLANT #3	NE NW 21-39.00S-9.00E	877 FEET SOUTH & 1331 FEET EAST FROM NW CORNER, SECTION 21				
	KLAMATH RIVER	KID PUMPING PLANT #4	SW SW 25-39.00S-9.00E	46 FEET NORTH & 1354 FEET EAST FROM SW CORNER, SECTION 25				
	KLAMATH RIVER	KID PUMPING PLANT #5	NW NW 36-39.00S-9.00E	71 FEET SOUTH & 1354 FEET EAST FROM NW CORNER, SECTION 36				
	KLAMATH RIVER	KID PUMPING PLANT #6	SW SE 25-39.00S-9.00E	107 FEET NORTH & 1402 FEET WEST FROM SE CORNER, SECTION 25				
	KLAMATH RIVER	KID PUMPING PLANT #7	SE SE 30-39.00S-10.00E	206 FEET NORTH & 557 FEET WEST FROM SE CORNER, SECTION 30				
	KLAMATH RIVER	KID PUMPING PLANT #8	SW SW 29-39.00S-10.00E	458 FEET NORTH & 77 FEET EAST FROM SW CORNER, SECTION 29				
	KLAMATH RIVER	KID PUMPING PLANT #9	SW SW 29-39.00S-10.00E	509 FEET NORTH & 294 FEET EAST FROM SW CORNER, SECTION 29				
	KLAMATH RIVER	KID PUMPING PLANT #10	SW SW 29-39.00S-10.00E	541 FEET NORTH & 391 FEET EAST FROM SW CORNER, SECTION 29				
* (EID) (KBID) (KID) (MID) (LUSCOMBE) (WATHALL & INTER-COUNTY TITLE CO) (WINEMA HUNTING LODGE) (PGID) (PVID) (SVID) (SID) (TID) (VBDC)								
** The total duty for the KID/TID system includes water delivered to federal lands under Claim 317 (Tule Lake National Wildlife Refuge)								
KDD	KLAMATH RIVER	NORTH CANAL	NE NW 2-40.00S-8.00E	316 FEET SOUTH & 1964 FEET EAST FROM NW CORNER, SECTION 2	200	MEASUREMENT LOCATION FOR NORTH CANAL	Mar 1 - Oct 31	80,446 ACRE-FEET*
	KLAMATH RIVER	NORTH CANAL CONTROL STRCTURE	SE NW 1-40.00S-8.00E	3868 FEET NORTH & 1805 FEET EAST FROM SW CORNER, SECTION 1				
	KLAMATH RIVER	ADY INTAKE CHANNEL	SW NE 15-40.00S-8.00E	1195 FEET SOUTH & 2640 FEET WEST FROM NE CORNER, SECTION 15	400	MEASUREMENT LOCATION FOR ADY INTAKE CHANNEL		
	KLAMATH RIVER	ADY INTAKE CONTROL STRCTURE	NW NE 23-40.00S-8.00E	335 FEET SOUTH & 2766 FEET WEST FROM NE CORNER, SECTION 23				
*The total duty for the KDD system includes water delivered to federal lands under Claim 312 (Lower Klamath National Wildlife Refuge)								

PARTIAL ORDER OF DETERMINATION for OAH CASE 003

Claims 194, 211, 285, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 312, 317, 321-1, 321-2, 321-3, 321-4, 321-5, 321-6, 321-7, 321-8, 321-9, 321-10, 321-11, 321-12, 321-13, 321-14, 321-15, 321-16, 321-17, 321-18, 322-1, 322-2, 322-3, 323-1, 323-2, 323-3, and 324

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Figure 5 KA-1000 Water Right Extract[45]

b. Claim KA-1004 (aka Consolidated Claim 321-9)

Klamath ID claims a vested water right established on 21 March 1884. The KA-1004 water-right season of use is 1 March through 31 October with duty of 3.5 acre-feet per acre each year with an authorized constant 49 cubic feet per second (cfs) diversion. This water right serves

[42] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.

[43] Reclamation. April 2019. *Implementation of the Klamath Project Operating Procedures 2019-2014.*

[44] Klamath Water and Power Agency. 2014. *On-Project Plan.* Page 1-1

[45] Klamath Basin General Stream Adjudication. 2013. General Findings of Fact of the Final Order of Determination for Water Rights Claims OAH 003.

the Henley-Ankeny grounds and predates the Klamath Project by 21 years.

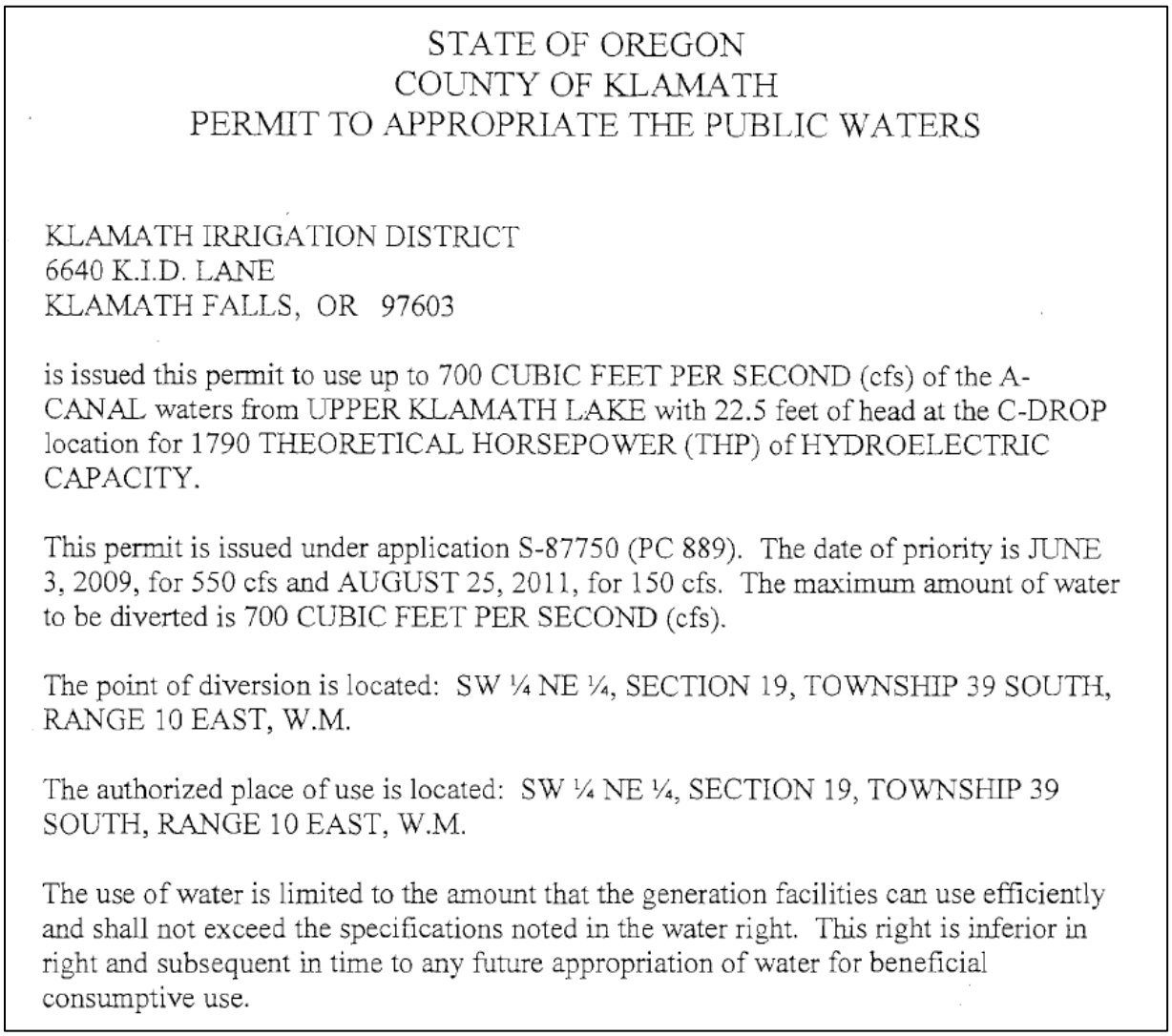
c. Lost River Decree (Certificate 2297)

Klamath ID services lands the United States has claimed a water right to through the Lost River Decree. Additional information can be found at https://apps.wrd.state.or.us/apps/misc/vault/vault.aspx?&Type=Decree&decree_image_id=97

The certificate of water right is located at https://apps.wrd.state.or.us/apps/misc/vault/vault.aspx?Type=Cert&cert_nbr=2297

d. Permit S 54785/ Certificate 94798 – Hydroelectric Use

Klamath ID further holds Permit S 54765 for use up to 700 cfs daily of A-Canal waters from Upper Klamath Lake with 22.5 feet of head at the C-Drop location for 1790 Theoretical Horsepower (THP) of Hydroelectric Capacity. (See Figure 6) Complete details are available at https://apps.wrd.state.or.us/apps/wr/wrinfo/wr_details.aspx?snp_id=174590



STATE OF OREGON
COUNTY OF KLAMATH
PERMIT TO APPROPRIATE THE PUBLIC WATERS

KLAMATH IRRIGATION DISTRICT
6640 K.I.D. LANE
KLAMATH FALLS, OR 97603

is issued this permit to use up to 700 CUBIC FEET PER SECOND (cfs) of the A-CANAL waters from UPPER KLAMATH LAKE with 22.5 feet of head at the C-DROP location for 1790 THEORETICAL HORSEPOWER (THP) of HYDROELECTRIC CAPACITY.

This permit is issued under application S-87750 (PC 889). The date of priority is JUNE 3, 2009, for 550 cfs and AUGUST 25, 2011, for 150 cfs. The maximum amount of water to be diverted is 700 CUBIC FEET PER SECOND (cfs).

The point of diversion is located: SW ¼ NE ¼, SECTION 19, TOWNSHIP 39 SOUTH, RANGE 10 EAST, W.M.

The authorized place of use is located: SW ¼ NE ¼, SECTION 19, TOWNSHIP 39 SOUTH, RANGE 10 EAST, W.M.

The use of water is limited to the amount that the generation facilities can use efficiently and shall not exceed the specifications noted in the water right. This right is inferior in right and subsequent in time to any future appropriation of water for beneficial consumptive use.

Figure 6 C-Drop Hydro Permit with Water Right

KBID holds Permit G-16209 for a supplemental irrigation well, operated by Klamath Irrigation District when conditions require.

e. Other stakeholder entitlements

KA-294. Reclamation holds rights to store water in Upper Klamath Lake **for the purpose of agricultural use between the elevations 4,136 to 4,143.3**, for a 486,282 acre feet of capacity above 4,136 feet above mean sea level.[46] This entitlement provides the storage capacity for Klamath ID and other Districts Klamath ID delivers to.

All other irrigation districts and contractors Klamath ID serves hold water rights, or permits, pursuant to the Reclamation Act of 1902 or the Warren Act of 1911 as outlined in the Amended General Findings of Fact of the Final Order of Determination published in 2014 before the Water Resources Department of the State of Oregon under Klamath Project Consolidated Claim 321-17/293/323-3 (KA-1000) or other claims within the Klamath Adjudication.[47] Pine Grove Irrigation District holds permit G-17530 supplemental irrigation, and Shasta View Irrigation District holds Permit G-15043 supplemental. Oregon legislation and Congressional action provided the disposition of lands with the 1902 Reclamation Act. Under the provisions of the Reclamation Act, lands were opened to homesteading and subject to water rights for both private and public lands.[48] Many of these rights, as outlined in numerous contracts, are still pending Oregon issuance of certificates.

President Theodore Roosevelt further established the Lower Klamath Lake area as the first Federal wildlife refuge for waterfowl in the Nation; a critical conservation effort. A key function of the refuge area is to decrease crop depredation on California's Central and Imperial Valleys; provisions for water rights included in Public Lease Lands agreements to provide for the growing of grain and cereal crops in the wildlife Refuge.[49] Water for this conservation effort is provided, in part, from the A Canal operated and maintained by the Klamath ID. Water rights for the Lower Klamath National Wildlife Refuge are discussed in OAH Case 003 previously mentioned.

d. Summary of major classifications of user account data (OAR 690-086-240.5)

Reclamation classifies land in the Klamath Basin based upon its contracts. Reclamation identifies the classifications of "A", "B", and "C" lands where "A" contracts are highest in priority (oldest water-right contract) and "C" users are lowest in priority. Figure 7 displays "A" and "B" contract lands/Districts serviced by Klamath ID (with the exception of Tulelake ID's "A" ground).

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[46] Klamath Project Consolidated Claim 321-17/293/323-3 (KA-1000 in WRIS) page 101-110.

[47] Water Right Claim (OAH Case 003)

[48] Reclamation. 2019. *Factual Data on the Klamath Project.* Homestead Lands.

[49] Reclamation. 2019. *Factual Data on the Klamath Project.* National Wildlife Refuges.

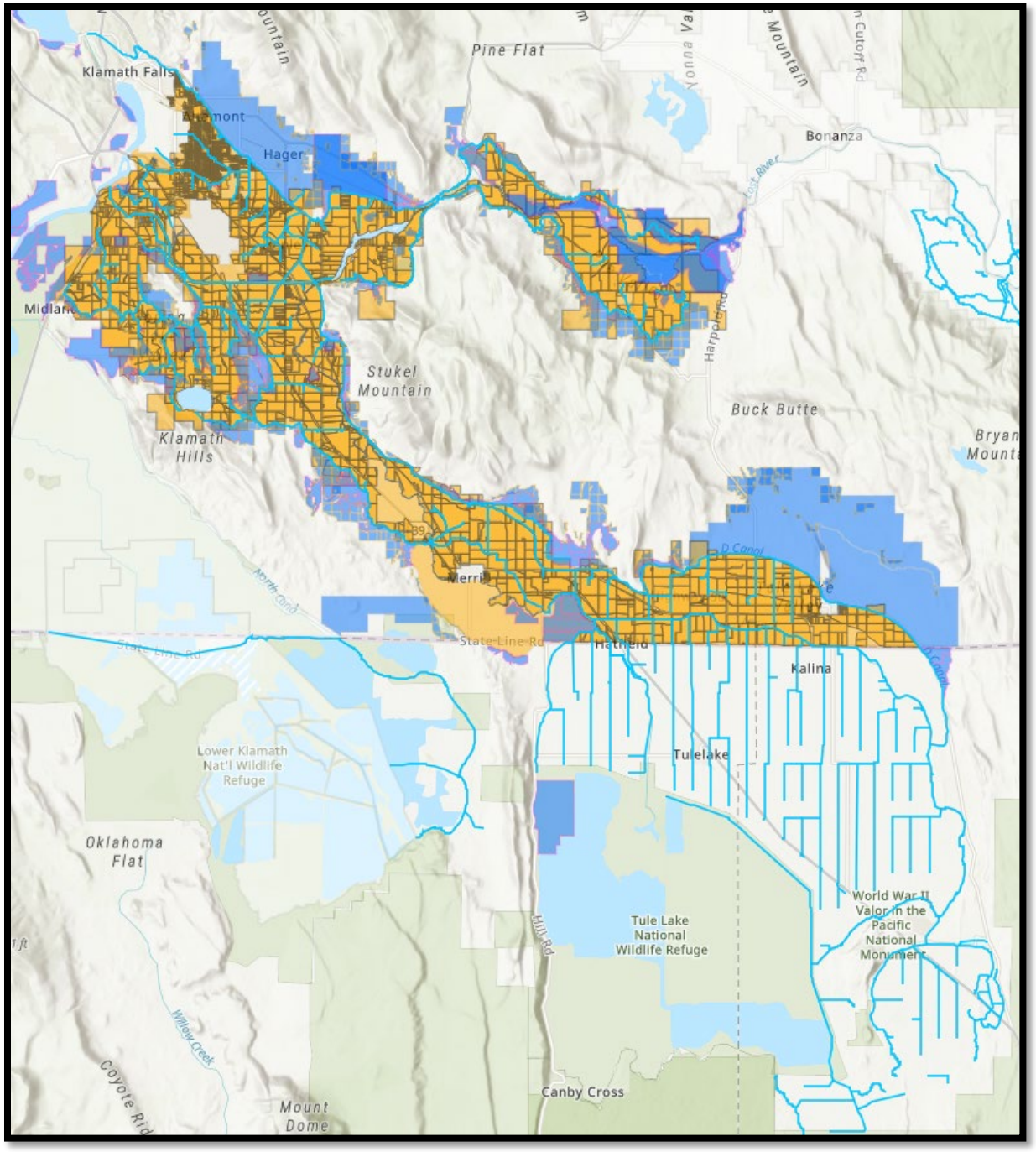

Figure 7 Reclamation "A" Lands (Klamath ID &Van Brimmer Ditch Co) in Amber (Tulelake ID boundaries not depicted); "B" Lands in Blue; "C" Lands too small to be displayed on this chart. Data used to create this chart was provided by the U.S. Bureau of Reclamation. Klamath ID is not the owner, nor the creator of the data.

In Figure 7, "A" lands within Klamath ID boundaries are depicted in an Amber color. "A" lands are primarily part of the Reclamation's "Main Unit" currently managed by Klamath ID. "A" land also includes Van Brimmer Ditch Co and the "Modoc Unit" managed by Tulelake ID (not depicted). "A" lands are entitled, by most Reclamation contracts, up to 3.5 acre feet of water per acre, per year with the exception to Van Brimmer. Van Brimmer has a dedicated minimum delivery through Klamath ID of 50 cfs during the irrigation season.

It should be specifically noted for those reading this document that the "Classification" method utilizing contracts and water rights may overlap on any specific tax lot. It is complicated to understand without having historical knowledge and access to Reclamation historical records, Reclamation detailed water rights maps, AND individual contract maps. The reader must understand these acres in the contracts are not duplicated, meaning there is NOT a stacking of water rights; it is simply a product of physics for "A" lands which could originally be flood irrigated in 1905, the division of lands by process of Klamath County, and "B" lands which were available to be irrigated by pumping following the 1911 Warren Act. One example of the complexity may be explained in this way: Tax lot R1234 05678 0009 0000 with a total of 40 acres within its boundaries and taxed by the county for 40 acres. Within this tax lot10 acres of this tax lot may be "A" assessed by Klamath ID under ORS 545, 5 acres of the same tax lot may be under a Reclamation "A" contract serviced by VBDC, an addition 15 acres of the tax lot could be "B" contract under a KBID assessment, and 2 acres could also be assessed as "B" under an individual Warren Act contract while 8 acres are unirrigable and not assessed under any contract or water right.

Major Classification "Reclamation "A" Contracts served by Klamath ID"

Klamath ID serves Reclamations "A" contract lands within its boundaries which account for 41,176 acres covered by Klamath Adjudication claims KA1000 and KA1004 and depicted in the color orange in Figure 7. There are 3149 parcels associated with this claim as of 28 April 2021; this number changes as parcels are split, divided, combined or otherwise modified through the Klamath County assessors office.

To assist OWRD understand the above information meets the requirements of OAR 690-086-0240(5), the following breakdown is provided.

Klamath ID "A" contract lands in KA1000 and KA1004 = 41,176 acres

Klamath ID "A" contract lands in KA1000 and KA1004 = 3149 parcels (aka in OWRD terms as "user accounts")

KA1000 and KA1004 are primarily used for irrigation, agriculture, frost protection, livestock as articulated in the OWRD Klamath Basin General Stream Adjudication, document titled "General Findings of the Fact of the Final Order of Determination" as a partial order of determination for OAH Case 003 as clearly written on page 42.

Under contract with Reclamation, Klamath ID is required to provide water to Van Brimmer Ditch Company "A" contract lands covered by Klamath Adjudication claim KA1001. The acres of Van Brimmer Ditch Company (VBDC) are specific to a Reclamation contract with VBDC. Klamath ID estimates VBDC has an estimated 5,047.7 acres of irrigable land. VBDC boundaries are depicted in a slightly lighter shade of orange in Figure 7.

To assist OWRD understand the above information meets the requirements of OAR 690-086-0240(5), the following breakdown is provided.

Klamath ID delivers KA1001 through the C Canal and the Lost River.

VBDC "A" contract in KA1001 is estimated at 5,047 acres.

Klamath ID has no need to know how many "user accounts" VBDC has.

As per OWRD records, KA1001 is primarily used for irrigation, agriculture, frost protection, and livestock.

Under contract with Reclamation, Klamath ID also provides water to Tulelake ID "A" contract lands covered by Klamath Adjudication claim KA1000. The acres of Tulelake ID are specific to a Reclamation contract with Tulelake ID. Tulelake Irrigation District boundaries are not depicted in any color in Figure 7 as Reclamation did not provide a shapefile in the dataset they shared with Klamath ID; however, the clear, straight, blue irrigation canal lines generally depict the area of this District. Klamath ID estimates Tulelake ID to be over 63,000 acres.

Major Classification "Reclamation "B" Contracts served by Klamath ID"

"B" lands belong to individual Warren Act contracts with Reclamation, most other Districts, and KBID lands. These lands vary in entitlement ranging from up to 2 acre-feet to 3.7 acre-feet per year. In Figure 7, "B" lands/Districts are depicted in Blue.

Klamath ID provides water, under contract with Reclamation, to Klamath Basin Improvement District considered a Reclamation "B" contract with a KA1000 claim. Klamath Basin Improvement District has 11,830 irrigable acres. The beneficial uses of this water is primarily irrigation, agricultural use, livestock use, and frost protection.

To assist OWRD understand the above information meets the requirements of OAR 690-086-0240(5), the following breakdown is provided.

KBID "B" contract lands in KA1000 = 11,830 acres

KBID "B" contract lands in KA1000 – 687 parcels (aka in OWRD terms "user accounts")

Klamath ID also directly provides water under individual Reclamation Warren Act "B" contracts with a KA1000 claim totaling 4,346 acres within Klamath ID boundaries. The beneficial uses of this water is primarily irrigation, agricultural use, livestock use, and frost protection.

To assist OWRD understand the above information meets the requirements of OAR 690-086-0240(5), the following breakdown is provided.

Warren Act "B" contract lands within Klamath ID with KA1000 = 4,346 acres

Warran Act "B" contract lands withing Klamath ID with KA1000 = 235 parcels (aka in OWRD terms "user accounts")

Klamath ID further provides "B" contract water with a KA1000 claim to Enterprise ID (estimated 7,146 acres).

Klamath ID provides "B" contract water with a KA1000 claim to Pine Grove ID (estimated at 2,726 acres).

Klamath ID provides "B" contract water to Poe Valley Improvement District with a KA1000 claim (estimated at 2,636 acres).

Klamath ID provides "B" contact water to Shasta View Irrigation District with a KA1000 claim (estimated at 4,141 acres).

Klamath ID provides "B" contract water to Malin Irrigation District with a KA1000 claim (estimated at 3,374 acres).

Klamath ID provides "B" contract water to Sunnyside Irrigation District with a KA1000 claim (estimated at 595 acres).

Major Classification ""C" Contracts served by Klamath ID"

"C" lands are dispersed in built-up areas and are too small to show on a full District Map and account for between 0 to 500 acres within the KA1000 claim boundaries. The acreage changes from year to year with water availability and water user needs. The beneficial uses of this water is irrigation and livestock use.

Former "Classifications" used in previous Klamath ID plans to be deleted in the next plan.

In previous Water Management and Conservation Plans, it appears Klamath ID attempted to classify lands by acre sizes. To what point or requirement the classification effort was directed by outside elements is unclear. The following is provided as an update as requested in OWRD's 7 January 2021 letter asking for additional clarification on changes in percentages of parcels by size. It is unclear what parameters, constraints, limitations, or other measures where used in previous reporting. As Klamath ID has updated its databases as of November of 2020, the following information is extracted for an unknown purpose to simply answer OWRD request for an explanation and will be deleted in future plans.

3,149 of the tax lots Klamath ID serves have an "A" contract assessment. Tax lots assessed at 40 acres, or more, represent 329 records or approximately 10.4% of the total Klamath ID "A" contract customers. Approximately 67.5% of Klamath ID "A" contract water users own 5 acres or less or 2,126 tax lots. The remaining 22.1% own lands between 5.1 to 39.9 acres as of the data pull date of 20 November 2020.

696 tax lots are associated with Klamath Basin Improvement District "B" contracts. There are 63 records for tax lots under Klamath Basin Improvement District totaling 40 acres or more, or 9%. There are 359 tax lots in Klamath Basin Improvement District under 5 acres or 51.6%. The remaining 39.4% of the tax lots within Klamath Basin Improvement District account for lands between 5.1 and 39.9 acres.

There are 235 tax lots associated with Warren Act "B" contracts. 35 of these tax lots are assessed at 40 acres or more. 103 tax lots are under 5 acres. The remaining tax lots are between 5.1 to 39.9 acres.

Klamath ID's contract with Reclamation does not provide stipulations for other Districts to report their classifications, nor acreages. KA1000 wording is crystal clear on the beneficial uses. If additional data on "classifications", other district "user accounts", or beneficial uses is needed by a reviewer of this document, one should first refer to the Amended and Corrected Finding of Fact for the Klamath Adjudication (AACFOD) or contact Reclamation.

5. Anticipated land-use changes

Although changes in Klamath County zoning is anticipated over the next five years, discussion of urban expansion, changes in solar siting laws, and sanitation district expansion, Klamath ID does not anticipate any change Klamath ID boundaries, responsibilities, or

diversions of water for beneficial use to irrigatable acres.

The South Suburban Sanitation District has proposed a 770+ acre project crossing Reclamation, Klamath ID, and KBID lands which is in its initial development stage. Currently the anticipated effects on irrigated acres by the South Suburban Sanitation District is beyond the five-year vision of this plan.

Of note, Klamath County Drainage and Service District's contract for the 1-C Drain System with Reclamation expired in May of 2020; Klamath County has requested an extension to renew this contract. Reclamation is exploring opportunities to transfer ownership of the drainage system to Klamath County. The 1-C Drain System no longer performs a primary agricultural function; however, as designed between 1906 and 1917, drainage water from the 1-C Drain System ultimately spills into Klamath ID's drainage system which then becomes available for reuse and recirculation by Klamath ID or other districts.

6. Cropping patterns (General characterization of crops OAR 690-086-240.7)

The primary crops grown in Klamath ID are alfalfa, pasture, potatoes, and cereal grains; however, row crops, orchards, strawberries, and landscape plants are also irrigated from the District's system. Klamath ID and KBID 2019 Crop Reports to Reclamation are included as Attachments M and N. The 2020 crop report is skewed as OWRD failed to prevent unlawful release of stored water from Upper Klamath Lake resulting in poor crops, economic down-turn, and unnecessarily idled lands. Although urbanization is affecting Klamath ID area of operation, all use of water is for irrigation and livestock use; no water is diverted for domestic nor municipal purposes.

Reporting indicates the crops produced in 1921 (see Figure 8) are fairly consistent with current cropping patterns. The crop changes are primarily due to an increase in potato and onion production. Since 2008 (see Figure 9) the crops were relatively unchanged through 2018 (see Figure 10). These figures represent acres of land irrigated by waters provided through Klamath ID for two separate, but related data sets. Of note, drought conditions combined with Environmental Species Act litigation created conditions in 2018 and 2020 which reduced all crop yields; the information depicted here shows the change in acres irrigated for these crops. Figure 49 shows the estimated average and peak consumptive usages of these crops as required by OAR 690-086-0240.7.

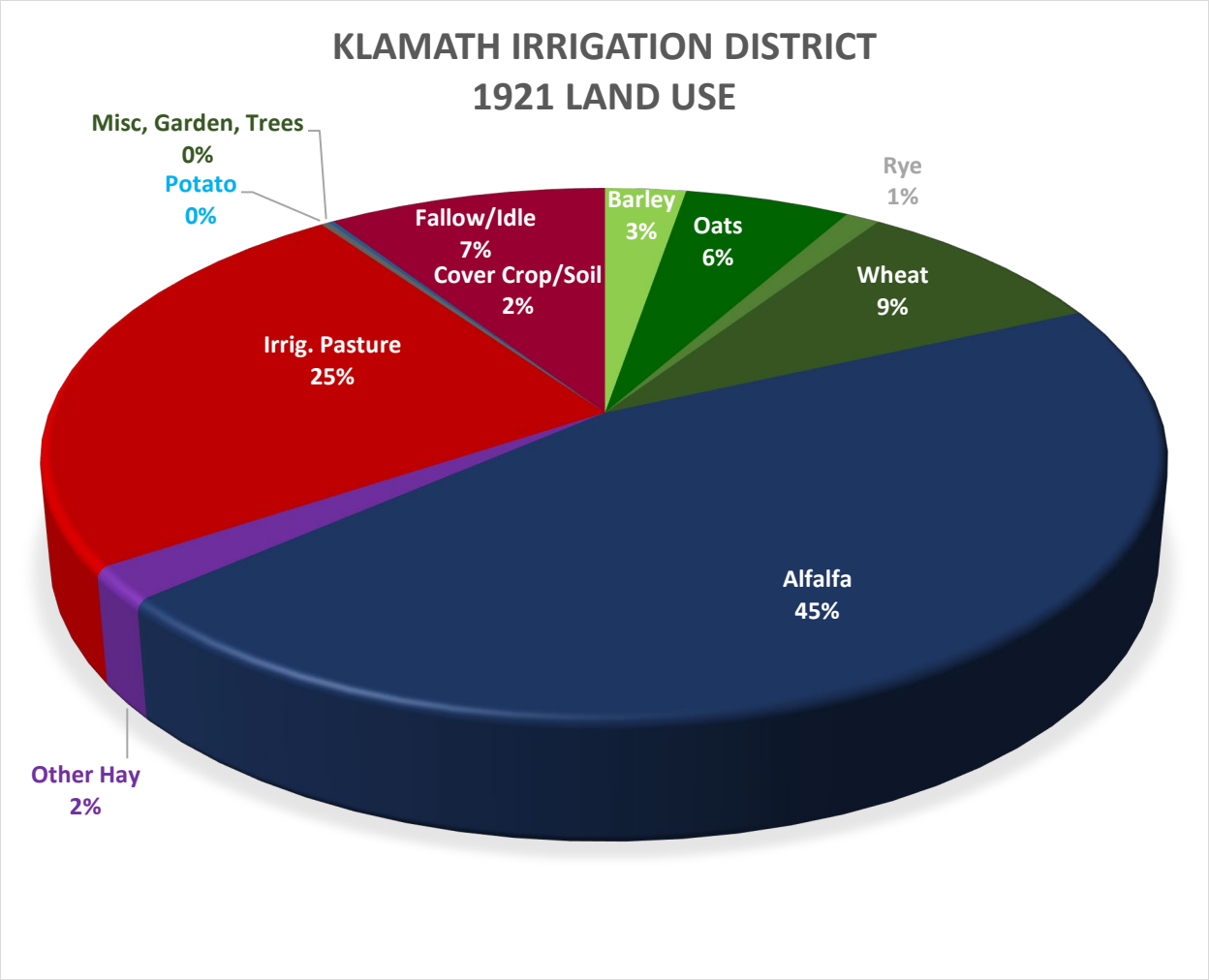

Figure 8 Klamath Irrigation District Land Use 1921[50]

[50] Extracted from Reclamation's Annual Project History and O&M Report for calendar year 1921.

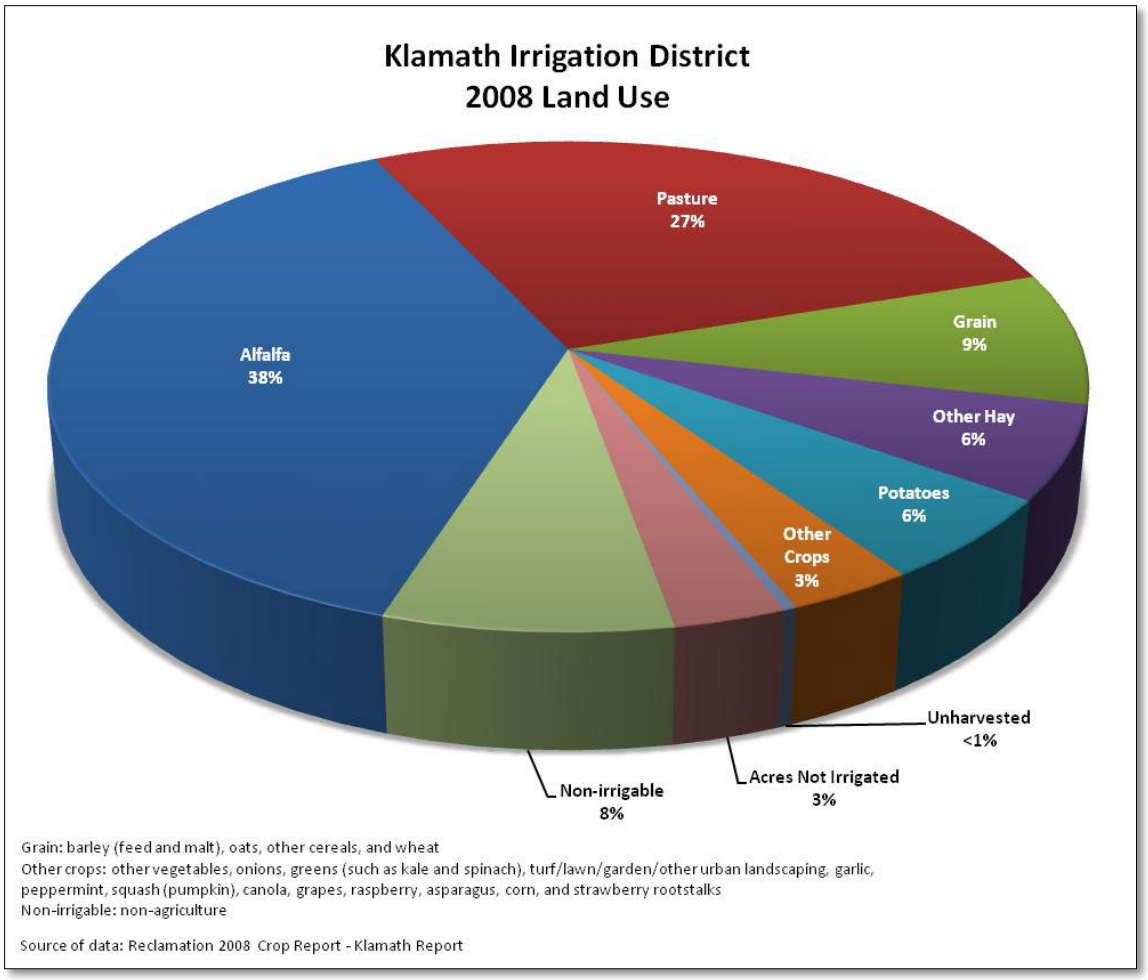

Figure 9 Klamath Irrigation District 2008 Land Use Report[51]

[51] TM3 On Project Plan. 2012. Figure 5.4.1 Page 5-28.

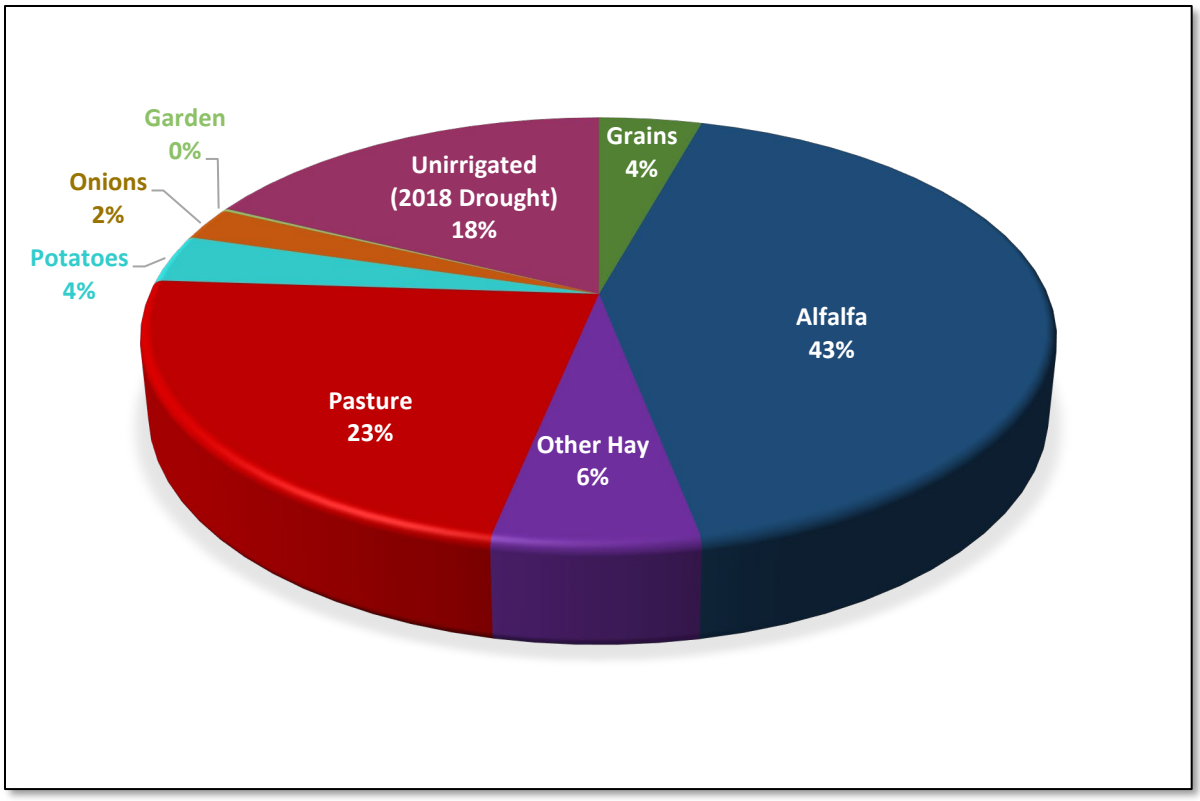

Figure 10 Klamath ID Crop Report (including KBID and Warren Act Contractors) 2018[52]

In 2019, Klamath ID identified indicators of crop change to include industrial hemp production. The 2019 crop report is still under analysis and initial observation indicates minimal industrial hemp being grown in 2020. As with any plan, changes to the environment, including crop change and political actions, may require modification to Klamath ID water management or operating procedures during the term of this plan.

7. Major irrigation methods (Types of on-farm irrigation systems OAR 690-086-240.6)

With the exception of pasture land and some grass hay production, which is mostly flood irrigated, the majority of all irrigation within Klamath ID is through the use of sprinklers, i.e. wheel-lines, solid set, and more frequently pivots. This minimizes tail water runoff from the sprinkler irrigated lands but increases evaporation loss and increased power costs to farmers. Approximately 12,000 acres are flood irrigated. Irrigation water is occasionally used for frost and temperature control on potato crops and is available for livestock watering.

[52] 2018 Crop Report. Extracted 16 October 2019 from KBID and KID Crop Reports.

B. Location and Facilities:

Source(s) of Water (OAR 690-086-0240.2)

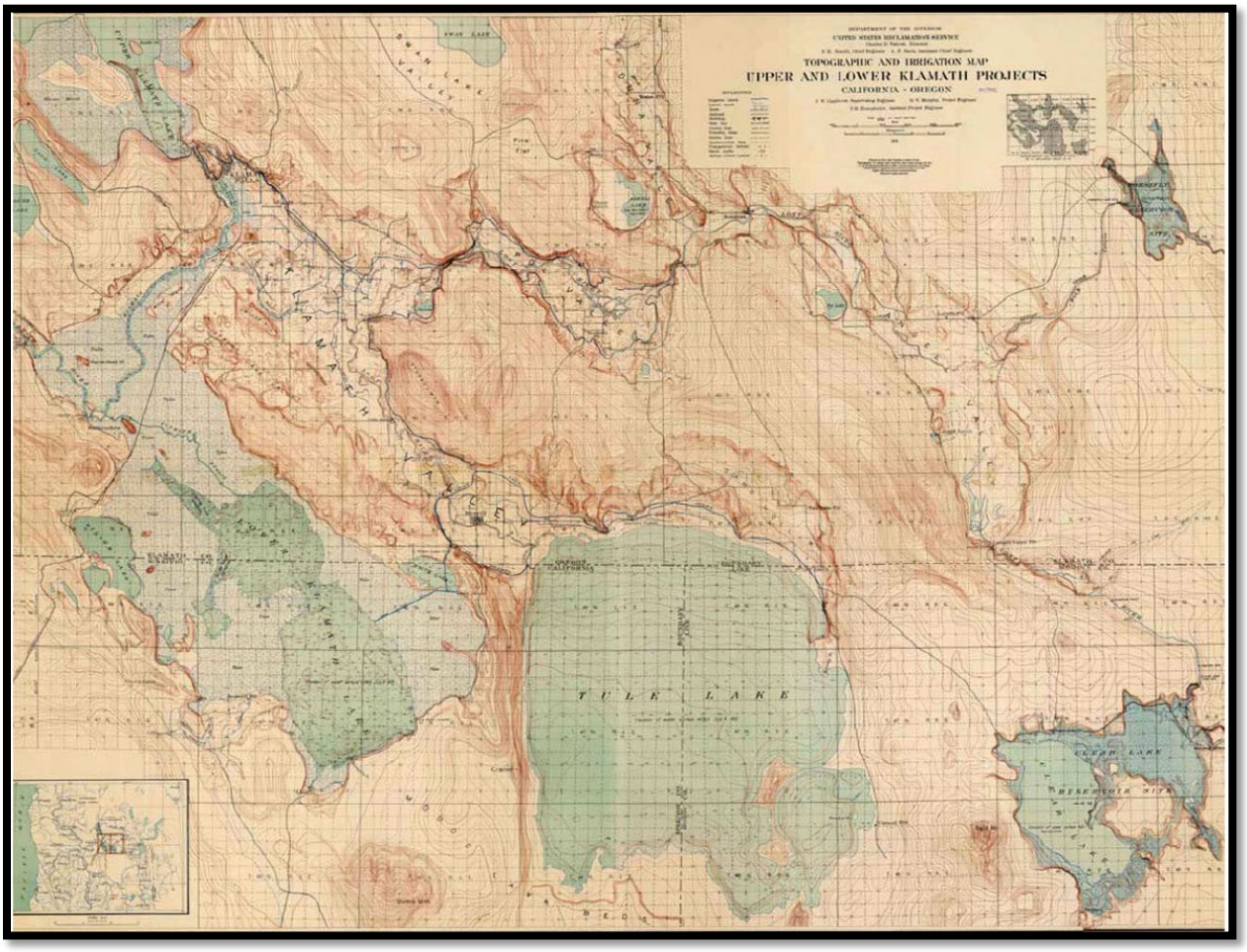

Figure 11 Klamath Reclamation Project Prior to Construction of Diversion and Other Federal Works (1906)[53]

The 1906 representation of the Klamath Project's natural water sources is provided in Figure 11. The Federal government contracted workers to expose swampy lakebeds and expanded irrigation to otherwise low-value and unfarmed lands. In the Klamath Basin, the fertile ground laid beneath the surfaces of swamps, sumps, and marshes of Tule Lake[54] and Lower Klamath Lake. The conserved and controlled water from Tule Lake and Lower Klamath Lake was envisioned in 1925 for expansion to serve approximately 315,000 acres.[55]

[53] Reclamation Service Map 1906

[54] "Tule Lake" is the proper noun for geographic features in the area. "Tulelake" is the proper noun for the town and irrigation district within the dried-up lakebed of Tule Lake as described in this plan.

[55] A.H. Lamm. Consulting Engineer, 24 May 1925 *Irrigation and Power Report to Klamath Irrigation Project*, page 3.

Figure 12 Historic Images of Klamath ID D-Lands in California.

Prior to 1905, none of the water from the Klamath Valley drainage into Lost River reached the Klamath River below Keno

"In 1890, a dike was built to prevent overflow of the Klamath River with Lost River and on into Tule Lake"[56] thus **increasing Klamath River flows above** natural conditions.

"One of the principle features of the Klamath Project [was] the reclamation of the lands in the bed of Tule Lake. These lands [were] being reclaimed in a double sense; first by causing the water to recede and, second, by constructing irrigation works to irrigate the lands uncovered. The lowering of the water surface in Tule Lake [was] brought about by evaporation from the lake itself and by preventing inflow…flood waters coming in Lost River below Clear Lake are diverted from Lost River into the Klamath River through the diversion channel;"[57] thus offsetting irrigation water diverted from the Upper Klamath Lake for irrigation purposes **and increasing flows in the Klamath River** which would have been retained in the Klamath Basin prior to Project development.

Tule "lake was a…body of water of material depth. The greatest depth [was] about 30 feet. The shore lines of the lake were practically free from swamp growth; in fact, aside from the fan deposited by Lost River, the water in the lake drops abruptly…from 15 to 30 feet depth within a short distance from the shoreline. One is almost inclined to the conclusion that Tule Lake was at one time a crater or a pot hole which subsequently became a receiving basin for higher watershed drainage."[58] Tule Lake naturally covered over 96,000 acres prior to reclamation efforts[59] and was a natural sump for waters of Lost River, drainage from the Klamath and Spring Valleys, and overflow from the Klamath River south of Klamath Falls. Much of the water which naturally would have been trapped in this sump and evaporated at about 3 feet annually (thus 3 feet over 96,000 acres would be over 288,000 acre feet of water in the basin lost) is now being utilized for beneficial use in Klamath ID and Tulelake ID or artificially increases flows down the Klamath River.

[56] J.C. Boyle. 1976. 50 Years on the Klamath. Page 51.
[57] Reclamation. Klamath Irrigation Project. 1922. *Information of Interest*
[58] W.H. Helleman. 1905. Report on Soils of Klamath Project. Pages 23-24.
[59] I.S. Voorhees. 1912. History of the Klamath Project. Pg.8

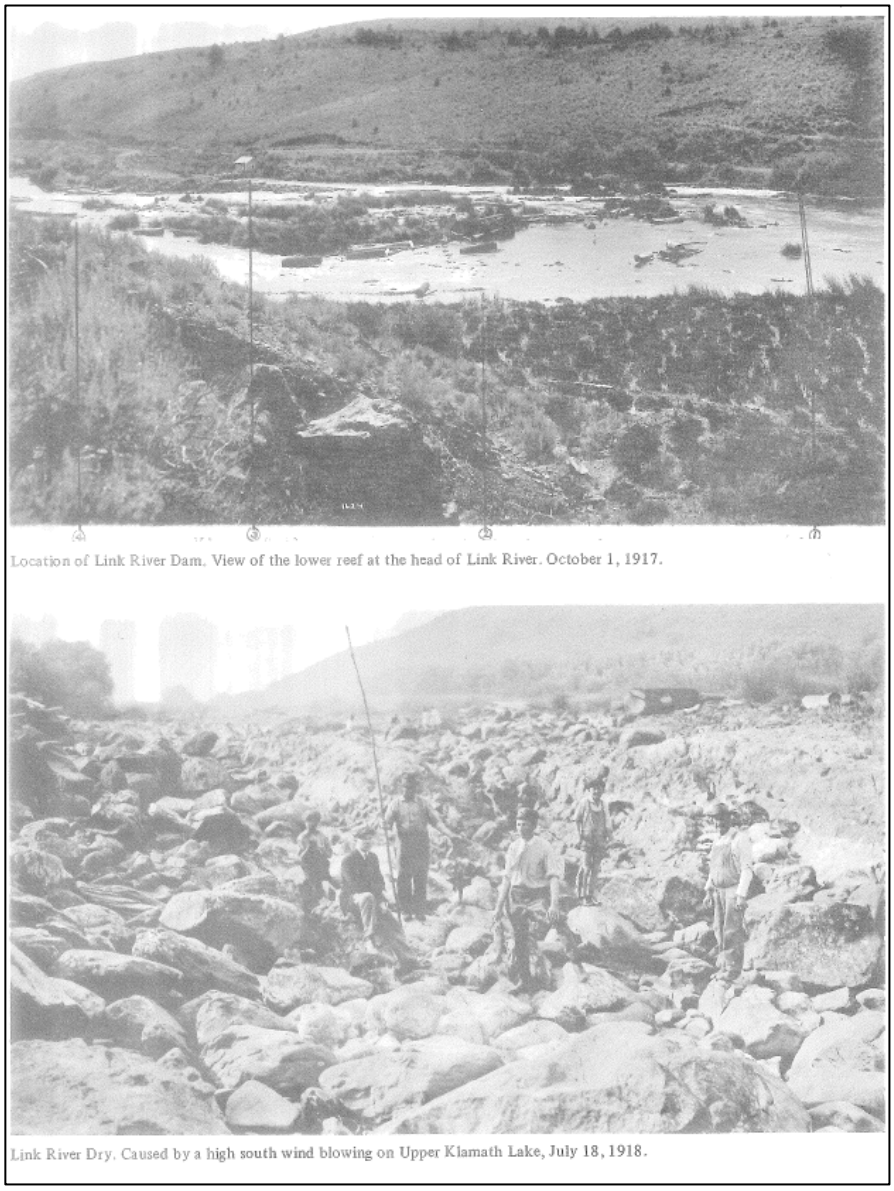

Figure 13 Prior to completing construction of the concrete dam structure on Link River in 1922, naturally occurring environmental conditions would occasionally dry up the Link River. This has not occurred since the completion of the dam.[60]

The natural flow of the Klamath River was significantly altered with the Klamath Project, unnaturally increasing flows to the Klamath River and artificially controlling storage for irrigation purposes. "At Keno there is a natural reef which crosses the channel which holds the water level, even at low water, to over 4,084' [feet above sea level] thus rendering it impossible to drain Lower Klamath Lake."[61] In 1908, A.T. Sweet described the narrow pass in the mountains near Keno, the Klamath River as obstructed by a natural basaltic dam and significant biomatter, preventing the lowering of the Klamath riverbed, and resulted in a chain of lakes and

[60] J.C. Boyle. 1976. 50 Years on the Klamath

[61] Joseph Jacobs. 5 March 1906. Engineer for the U.S. Reclamation Service.

wide areas of marshy land in excess of 88,300 acres[62] known as the Lower Klamath Lake "A wide channel several miles in length passes southward from the river, supplying the lower lakes and swamps. During seasons of heavy rainfall or during the long dry summers, the Klamath River flows southward through these straights, but at certain seasons, when the river begins to fall, this channel carries considerable water northward from the lower lakes into the Klamath River, thus presenting the anomaly of a river flowing in one direction during a portion of the year, and in the opposite direction at other times."[63]

Sweets further identifies that a "decrease in regional rainfall, and a wearing away of the barrier in the Klamath River at Keno, [Lower Klamath Lake] has become much shallower [than in pre-historic records], enabling the growth of tules to cover more than three-fifths of the former lake surface" creating "lake ooze" with considerable quantities of black alkali which interfered with crops on reclaimed lands.[64] An examination of this natural flow, LiDAR data, and historical records indicates natural waters covered a significant portion of the Klamath Basin currently used as farmland.

In 1919, the increased flows from Lost River Diversion Channel into the Klamath River created serious problems along the Klamath River between Klamath Falls and Keno. "The Klamath River meandered around through swamp and overflowed [about 15,000 acres of] lands for about 20 miles"[65] due to the dikes built to confine the Klamath River waters away from Lower Klamath Lake. Under natural conditions, water would first fill the Lower Klamath Lake (an area in excess of 88,300 acres) to an elevation of 4,084.8 feet above mean sea level prior to any waters from Upper Klamath Basin entering the Klamath River below Keno.

1. Incoming flow locations and measurement methods (Storage and Regulation Facilities – OAR 690-086-240.2)

Location Name	Physical Location	Type of Measurement Device	Accuracy
A Canal Headworks	SW NE 30-38.00S-0.00E	Programable Logistic Controller (PLC) with Accusonic flow meter	96% - Confirmed by Reclamation
Miller Hill Pumping Station	SE SW 27-39.00S-9.00E	G.E. Panametrics ultrasonic flow meters	99% - Confirmed by Reclamation

See Figure 14 for a detailed system schematic showing inflow locations, and outflow points, conveyance system, storage facilities, and operational loss recovery system.

The District has one major diversion of stored water, from Upper Klamath Lake into the A Canal, with a maximum capacity of 1,150 cfs. The primary diversion point is upstream from

[62] I.S. Voorhees. 1912. History of the Klamath Project. Pg.8
[63] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project.
[64] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1399
[65] J.C. Boyle. 1976. 50 Years on the Klamath. Page 51.

the Link River Dam placed into operation in 1921 to increase the natural barrier to an artificially controlled barrier at 4143.3 feet above MSL.[66] These structures, developed as part of the Klamath Project with water-rights obtained in 1905, increased controlled storage of water in Upper Klamath Lake from 140,000[67] acre feet to 584,000 acre feet of water for Project use.[68]

A secondary, minor diversion point is located along the Lost River Diversion Channel (LRDC) at the Miller Hill Pump Station with a maximum capacity of 105cfs. Almost all of tailwater and spill flows are reused by Klamath ID, Shasta View ID, Malin ID, Poe Valley Improvement District, KBID, or by Tulelake ID.

KBID has one well for groundwater augmentation in Klamath ID; this well is used only when storage in Upper Klamath Lake does not meet irrigation demands due to political or environmental conditions. Historically, Klamath ID does not utilize groundwater as a regular source of irrigation water; however, since Federal action prohibiting irrigation water diversions from Upper Klamath Lake in 2001, landowners have increased drilling for groundwater to augment shortages in surface water supplies due to political or environmental changes. Klamath ID supports Water Banking programs sponsored by Reclamation and in partnership with the Klamath Water Users Association, participates with the local Klamath Drought Resiliency Agency to identify opportunities for ground water augmentation during times of drought such as experienced during the 2020 drought.

Station 48 is listed as a point of diversion in Claim KA1004. Station 48 is operated by Tulelake ID. Klamath ID is not in the habit of utilizing water from Station 48 as our needs in this area are generally met with waters diverted from Upper Klamath Lake through the A Canal. Utilization of water from Station 48 by Klamath ID requires pumping from our low-capacity pumps designed to recapture spill increasing the overall cost to operations due to extremely high electricity costs in the basin.

The Number 1 Drain is listed as a point of diversion/measurement for Claim KA1000. Klamath ID is not in the habit of diverting water to, or through, the Number 1 Drain. This system is designed to capture operational spill and runoff, not for diversions. Klamath ID and Tulelake ID are able to recapture nearly all drain water with Klamath ID's low-capacity pumps designed to recapture spill, or dump the water directly into Tulelake ID's J Canal.

Klamath ID Pumping Plants #1-#10 listed in Claim KA1000 as points of diversion/measurement placed along the Lost River and Lost River Diversion Channel are privately owned for individual patrons, allowing them to capture water placed in these waterways by Klamath ID as part of the agricultural conveyance system listed below.

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[66] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.

[67] I.S. Voorhees. 1912. History of the Klamath Project. Pg.7

[68] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.

2. Current year agricultural conveyance system

a. Klamath Irrigation District Conveyance System

Miles Unlined Canal	Miles Lined Canal	Miles Piped	Miles-Other
~200	~5	~3	~200 Drains

Klamath ID operates and maintains of over 200 miles of supply canals and ditches with an additional 200 miles of drains as depicted in Figure 14. Automation of the system is limited to the A Canal Headworks and C-Drop Hydro Facility; most measuring points across the District use hand-placed weirs. Attempts to automate other elements of the District have not proven effective to date. The utilization of three (3) technical measuring devices continues to be a challenge. Klamath ID operates seven (7) re-use pumping stations to reclaim a portion of the tailwater spilled due to operational requirements.

The A-Canal is the primary water delivery feature of the Klamath Project. Under contract number 14-06-200-3784 with Reclamation, water diverted from Upper Klamath Lake into the A Canal is filtered through an Oregon Department of Fish and Wildlife approved fish screen with a capacity of 1150 cfs. This water then passes through a tunnel with a design capacity of 1500cfs. Water diverted into A-Canal is regulated by automated gates which are controlled by a PLC at the headworks. The flow can be controlled on site or from the Klamath ID office through a radio-controlled system. The A-Canal flow is measured by a 2002 era Accusonic flow meter. Water from the A Canal is delivered to 7 laterals and to the Enterprise Irrigation District in accordance with Reclamation contract number I1r-399 (5 September 1920) serving 2,981 acres. The A Canal flows southeast from the headworks about 9 miles where it delivers water into the B Canal and the upper C Canal.

At the head of B-Canal, the gate was designed to be automatically regulated by a PLC; the system installed in the 2000s has proven ineffective. The installed SonTek acoustic Doppler radar flow meter has been repaired and was reinstalled in 2020. The flow is reported through the use of telemetry and can currently only be controlled on site. This canal delivers water to Pine Grove Irrigation District in accordance with Reclamation contract number I1r-195 dated 6 November 1922 for service to 904 acres. The B Canal, which has a capacity of 260 cfs, flows east about 4 miles to the gap near Olene where it delivers water into the E and F Canals. The B Canal also provides a required operational spill into the Lost River at the Olene Flume.

The E Canal, which has a capacity of 35 cfs, continues east 10 miles serving water to the north side of Poe Valley and serves a portion of the Poe Valley Improvement District.

Water is delivered to the south side of Lost River through the Olene Flume with capacity of 120 cfs to the F and F1 Canals. The F Canal has a capacity of 90 cfs. This canal flows southeast 11 miles serving water to the south side of Poe Valley. The Olene Flume also discharges into the F-1 Canal with a capacity of 30 cfs which flows south and west about 5 miles to serve lands on the south side of Lost River.

Poe Valley Improvement District (contract 14-06-201-174 dated 20 July 1953) has private pumps which capture Klamath ID return flows from the E and F Canals to 2,636 acres.

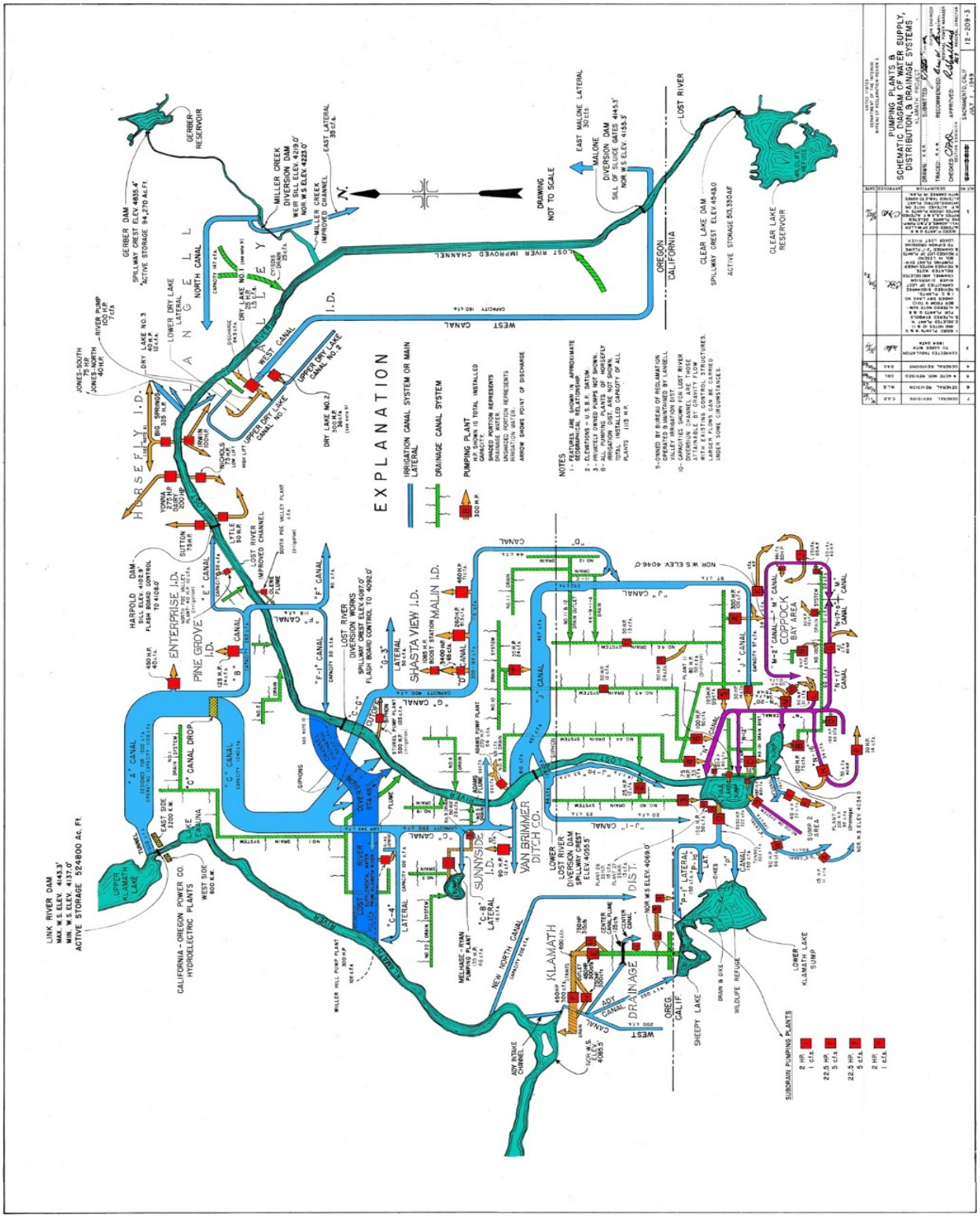

Figure 14 Klamath Project Detailed System Schematic[69]

[69] Reclamation Map 12-209-3 Pumping Plants & Schematic Diagram of Water Supply Distribution, & Drainage Systems, 1 July 1949. On 7 January 2021, OWRD requested a larger version of this

The upper C Canal, with a designed capacity of 1040 cfs, flows south about 1 mile to the C-G Cutoff, which has a capacity of 400 cfs. The flow of the Upper C Canal is managed by a PLC within the C-Drop Hydro facility. Modifications to the C-Drop Hydro facility are conducted manually on-site.

The gates at the mid-C-Canal are operated manually. Flows at the C-canal are measured with a Sontek flow meter and available to the SCADA system through telemetry. Flows at the G-canal are measured by a ramp flume and available to the SCADA system.

Water continues through the C-Siphon into the lower C Canal with a capacity of 345 cfs, it continues southwest about 2 miles to C-4 Lateral, which has a capacity 100 cfs, and flows to the west.

Additional water is added to the C-4 Canal system from the Klamath River through the Miller Hill Pumping Plant, which has a maximum capacity of 105 cfs and is located on the Lost River Diversion Channel. Water quantities pumped into the irrigation system from various pumping plants are all based on individual pump capacity, water horsepower, lift, and efficiency. The Miller Hill pumping plant was upgraded in 2009 with two new pumps and motors with VFDs. Flows are measured on all three pumps by G.E. Panametrics ultrasonic flow meters and are available on site and to the SCADA system through telemetry.

Below the C-4 Check, the C Canal, with a capacity of 330 cfs, flows southeast about 8 miles to where it discharges into Adams Siphon and Van Brimmer Ditch Company. The Van Brimmer agreement with Reclamation is dated 6 November 1909 for a contracted amount of no less than 50cfs. Water is transported through the Van Brimmer system to Sunnyside Irrigation District under contract I1r-174 dated 4 September 1922. Water coming through Adams siphon feeds the D-1 with a capacity of 50 cfs, the D2 with a capacity of 15 cfs, and the D3 with a capacity of 25 cfs. The canals serve the lands in the Merrill area.

Below the C-G Cutoff, the G Canal, with a capacity of 400 cfs, flows southeast about 8 miles to discharge into the D Canal with a capacity of 300 cfs.

The D-canal has a Sontek flow meter near Adams point. Measured flow information is available on-site to the Ditch rider. Measuring at this point allows for better planning in matching delivery to demand in the G-D canal system. The D canal feeds Shasta View Irrigation District in accordance with Reclamation's contract I1r-1531 dated 6 September 1922 for 3,991 acres. D Canal further provides service to 3,479 acres within the Malin Irrigation District under contract I1r-195 dated 9 September 1922. D Canal continues to flow southeast about 19 miles through Malin and across the State Line into California.

There are 2,236 acres of lands located between the J-Canal and the northern boundary of Tulelake Irrigation District. Although these lands are within the Klamath ID, they are delivered water from the J-Canal operated by Tulelake Irrigation District. Similarly, there are 1,480 acres of lands located in the northeast portion of Tulelake Irrigation District in California which are

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schematic. The schematic was created and is available by public request through the U.S. Bureau of Reclamation. Klamath ID has scanned this document and it is available for review at https://drive.google.com/file/d/1N6U6WQvi13UQSAydE3WijVWYB8-9s9_3/view?usp=sharing

between the D-Canal and J-Canal which are served water from the D-Canal by Klamath ID. The State boundary is the official District boundary; however, contractual obligations require Klamath ID to operate and maintain infrastructure for the D-Canal in California.

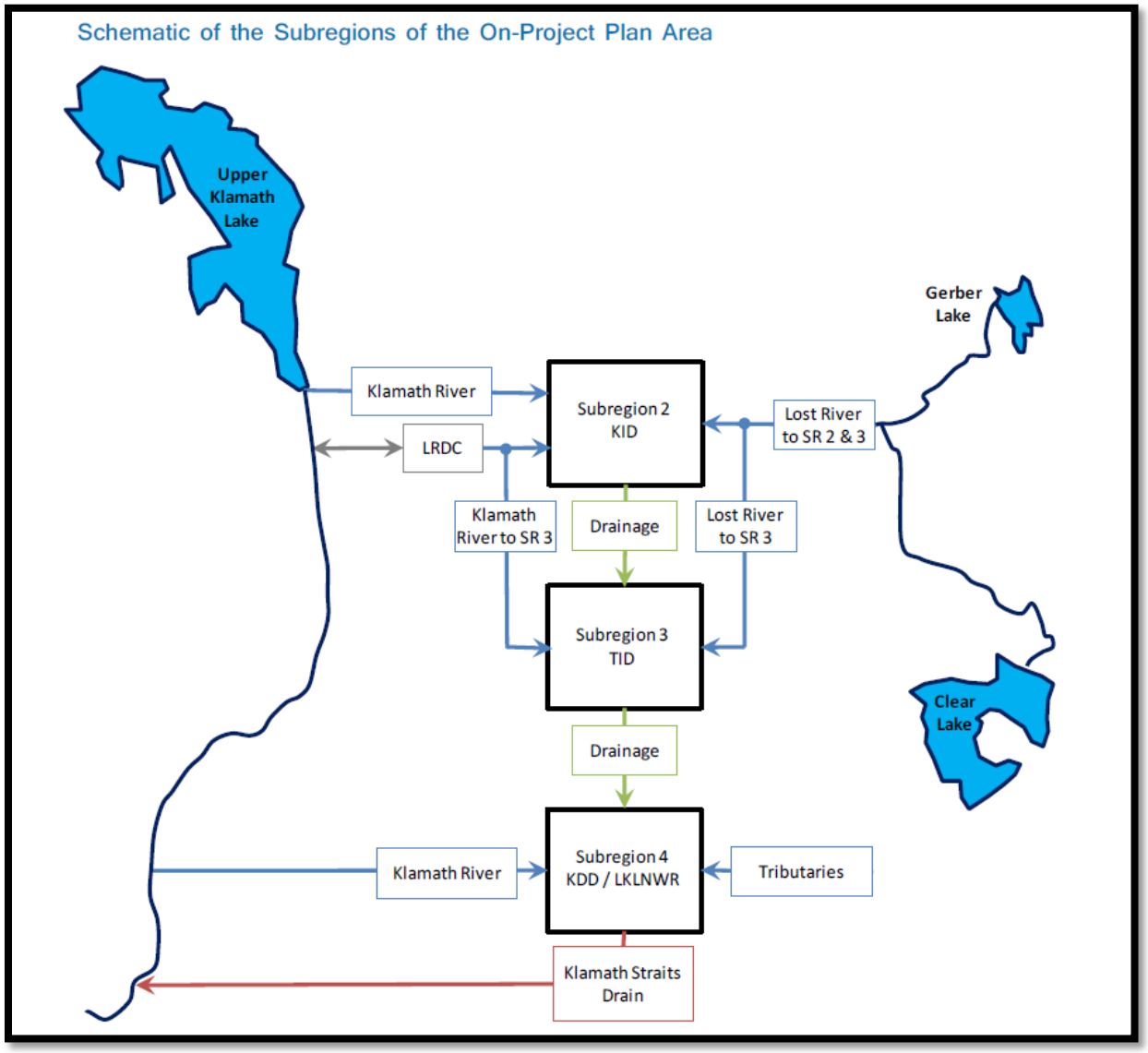

Figure 15 Simplified Klamath Project Schematic

Klamath ID provides service to Klamath Basin Improvement District under contract number 14-06-201 dated 25 April 1962 for service to 10,342 acres, individual Warren Act Contracts representing an additional 4,341 acres, and numerous other contracts from various canals within the District.

Note: Klamath ID does NOT operate Station 48, J Canal, Link River Dam, Wilson Dam, nor Anderson Rose Dam. Although within Klamath ID boundaries, this infrastructure is operated and maintained by other entities. A simplistic representation of the schematic described above is provided in Figure 15 from the 2014 On Project Plan showing irrigation water used by Klamath ID ultimately returns to the Klamath River through other responsible

government organizations.

3. Current year urban distribution system

Not Applicable as defined in Reclamations 2017 Water Management Planner.

Clarification for Reviewers: Portions of the District lie the urban growth boundaries of the city of Klamath Falls, Merrill and Malin. The District enjoys a reasonably good working relationship with these stakeholders.

Areas of the Klamath Irrigation District located within the Klamath Falls urban growth boundary experienced rapid development during the period from 2000 to 2006 as land historically used for agricultural purposes was subdivided for residential use. Generally, where land was subdivided for residential use, the landowners petitioned the District to suspend the land from the District. Over the past 25 years the District's Board of Directors has approved in excess of 1,272 suspension requests for approximately 1,350 acres of land consumed by urban expansion.

The majority of the land within the Klamath Falls urban growth boundary served by the District is by a "self use system." The district maintains a relatively small flow of water in the District open laterals and other laterals many of which are privately owned, and the water users take water upon a regular schedule. Using HDPE pipe provided by the BOR through the Field Conservation Program, the district has piped approximately 21,460 feet in urban areas to conserve water, reduce maintenance issues, and address safety issues that exist with open canals in residential areas.

The District is a party to an agreement made by and between the District, the BOR and the Klamath County Drainage Service District under which the Klamath County Service District took responsibility for the US owned drainage system in the South Suburban area and is responsible for the operation and maintenance of the 1-C Drain system.

4. List storage facilities (Schematic of the System - OAR 690-086-240.3)

Name	Type	Capacity	Distribution or Spill
Upper Klamath Lake	Natural lake with dam to control storage	735,000 acre feet [70] 570,110 acre feet storage for irrigation [71]	Distribution
Lost River sub-basin (including Clear Lake and Gerber Reservoirs)	Natural River with dams (operated by Reclamation, Horsefly ID and	504,270 acre feet [72]	Spill & Distribution

[70] Reclamation Factual Data on the Klamath Project. 2019 Link River Dam Capacity

[71] Table A for Klamath Project Consolidated Claim 321-17/293/323-3 (KA-1000 in WRIS) page 270 of 271.

[72] Reclamation. 2020. Teacup Diagram. https://www.usbr.gov/pn/hydromet/klamath/teacup.html

	Langell Valley ID) for flood control		

See Figures 14 and 15 or go to https://drive.google.com/file/d/1N6U6WQvi13UQSAydE3WijVWYB8-9s9_3/view?usp=sharing for schematics of the system.

5. Description of agricultural spill recovery system (OAR 690-086-0240.4)

Recapturing spill into the Lost River is performed through the Stukel and Adams Pumping Plants by Klamath ID and through the J Canal by Tulelake ID. The Stukel Pumping Plant has a capacity of 105 cfs and is located approximately midway down the G Canal. The Adams Pumping Plant has a capacity of 64 cfs and is located at the discharge end of the Adams Siphon and can supplement the D-1, D-2, & D-3 systems.

Klamath ID also has two pumping plants in Poe Valley on the Lost River which recapture Klamath ID operational spill. The South Poe Valley Pumping Plant has a capacity of 60 cfs, is located 4 miles downstream of the Olene Flume and supplements the F Canal. The North Poe Valley Pump has a capacity of 10 cfs is located about five miles downstream of the Olene Flume and supplements the E Canal.

Klamath ID's Melhase Ryan pumping plant captures return flow drainage from a natural sump from Spring Lake. These pumps have a capacity of 45 cfs and are used to control the level of Spring Lake in the winter and provide water through the #5 pump to supplement the C-canal or to Tulelake Irrigation District during the irrigation season with a capacity of 25 cfs.

Some of the water users within Klamath ID own and operate their own pumps which recapture Klamath ID spill into drains, the Lost River Diversion Channel, and Lost River.

D Canal spills directly into the J Canal for utilization by Tulelake ID. A study of the D Canal System Operational spills from 2006-2011 indicated the following:

Year	D Canal Operational Spill (ac/ft)	D Canal Lateral Operational Spill (ac/ft)
2006	9,704	11,419
2007	9,504	10,357
2008	7,678	8,639
2009	9,723	11,177
2010	Short Water Year	Partial Year Irrigation
2011	9,951	9,350
	Average: 9,312	Average: 10,188

Farmers Conservation Alliance was contacted to provide an updated assessment to the D System and begin data collection in 2020. Unfortunately, Reclamation policies and OWRD refusal to protect Oregon water rights for Oregonians in Klamath ID have significantly limited the use of these systems to perform at less than designed capacity which resulted cancelling this

data collection effort. If OWRD will enforce Oregon law and Reclamation will abide by Oregon law, this study can be conducted during the next irrigation season.

Operational spill in the Lost River, not recaptured by Klamath ID as described above, is available to Tulelake ID for recapture into the J Canal. Only when water is running over Anderson-Rose Dam does the Project have an operational spill.

Operational spill from Tulelake ID and the Project is available for reuse for the Lower Klamath National Wildlife Refuge. The United States Fish and Wildlife Service has the ability to absorb, distribute, and release Project water into the LKNWR. This water can be naturally filtered and delivered through the Straights Drain into the Klamath River.

b. Summary of transfers, rotation, exchange (OAR 690-086-0240.2)

Klamath ID did not transfer any potion of Klamath Project irrigation water in 2019.

c. Summary of intergovernmental agreements (OAR 690-086-0240.2)

Klamath ID services Reclamation intergovernmental agreements for conveyance, transport, and delivery of water include responsibilities to Reclamation[73], Tulelake Irrigation District[74], Enterprise Irrigation District[75], Pine Grove Irrigation District[76], Shasta View Irrigation District[77], Malin Irrigation District[78], Van Brimmer Ditch Company[79 & 80], Klamath Basin Improvement District[81], Sunnyside Irrigation District[82], Poe Valley Improvement District[83], and the Klamath County Drainage and Service District[84 & 85].

6. Agricultural delivery system operation (Operations and Maintenance Program OAR 690-086-240.8)

Scheduled	Rotation	Other (Describe)
Patron request water NLT 7pm for 8am delivery	Suburban Customers – and as required by hydraulic conditions	None

[73] Contract 14-06-200-3784 as amended dated 1954 with Reclamation.
[74] Multiple Contracts and Agreements.
[75] Contract I1r-399 dated 5 September 1920 for 2,981 acres served by the A Canal
[76] Contract I1r-195 dated 9 September 1922 for 954 acres served by the B Canal
[77] Contract I1r-1531 dated 6 September 1922 for 3991 acres served by the D Canal
[78] Contract I1r-195 dated 9 September 1922 for 3,479 acres served by the D Canal
[79] Van Brimmer Ditch Co. Agreement dated 6 November 1909.
[80] Contract #18r-1065 dated 3 February 1943 for 4,752 acres served by the C Canal
[81] Contract #14-06-201-174 dated 25 April 1962 for 10,342 acres served by various canals
[82] Contract # I1r-174 dated 24 September 1922 for 595 acres delivered through Van Brimmer Ditch Co.
[83] Contract # 14-06-201-174 dated 20 July 1953 for 2,636 acres delivered which pumps Klamath ID return flows from Lost River above Wilson Dam.
[84] Intergovernmental Cooperation Agreement dated 3 September 1992 for the operation and maintenance of the 1-C Drain System
[85] Contract 5-07-20-W1196 dated 3 May 1995 for the operation and maintenance of the 1-C Drain System

Operations

Klamath ID employs eight regular full-time ditch riders and four relief riders to operate the irrigation system. We operate a decentralized control system; each ditch rider is responsible for a designated area of the District and its associated customer, canals, and drains. They coordinate with their water users and each other in the field, by phone or radio, manipulating their canals and structures within the canals daily from 8:00 AM to 2:30 PM to provide the water needed to meet the demand of their customers. Unlike a centralized control system, operations for Klamath ID are bottom-up driven.

To keep the water diversions and the water usage as closely matched as possible, Klamath ID's water ordering system, managed by the ditch riders, is communicated to the District's Water Master. Orders are taken by ditch riders between 5:30pm and 7pm each day. With few exceptions, all water delivered by Klamath ID, whether it be to other districts or individual users, must be ordered at least 12 hours in advance of delivery. The exceptions are in the suburban areas or subdivided parcels where small heads of water are provided on an established schedule.

Klamath ID must also deliver water to eight other districts in addition to individual contractors, which receive water through the canal system maintained and operated by Klamath ID. This requires careful coordination and operation of the facilities because travel time for water in the system may require up to 96 hours during low flows as experienced in 2020. These Districts are depicted in Figure 1.

Maintenance

During the irrigation season a full-time maintenance crew of 9 operates equipment for ditch and structure repair, mowing, application of herbicides, mechanical aquatic weed control, repair of equipment, and other miscellaneous maintenance activities.

During the period when no irrigation deliveries are taking place, typically October 15 – March 31, canals are drained, and inspections are made on District facilities and structures. Maintenance activities are prioritized and scheduled and as much work as can be completed with the available resources is done before the next irrigation season begins. Klamath ID has 1203 turnout gates, supported by numerous check structures, pipe crossings, 100 wooden bridges, 7 pump stations with 17 pumps, 200 miles of canals and 200 miles of drains, miscellaneous concrete lined canal sections, flumes, siphons, etc., all of which need routine maintenance attention. Most of the system is unchanged from the original 1906 design.

7. Restrictions on the district's water sources

Source	Restriction	Cause of Restriction	Effect on Operations
Federal Government (Reclamation – under pressure from NMFS, Tribal Governments, and Environmental Extremists)	Annual Limits to Water Right and use of Project Supply for non-irrigation purposes Maximum Supply Reduced below State established Water-Right	Political Pressure Environmental extremists utilizing biased theories to leverage elements of the Endangered Species Act	Increased cost for inter-District efforts Increased ground-water pumping In-fighting across Klamath Basin Stakeholders Delayed Operations (2021) Curtailed operations (2021) Minimal operations (2020) Delayed operations (2018) Curtailed operations (2018) Suspended operations (2001)
California Based Tribal Governments	Water Right Calls for In-Stream flows to Reclamation (bypassing OWRD)	Misinterpretation of Interstate Agreements in relation to Winters vs. U.S.	Curtailment of farmers stored water deliveries for in-stream purposes
Oregon DEQ	Pending – TMDL mandated flows	Poor policy implementation	Pending analysis
Oregon Water Resources Department	See Restrictions imposed by Federal Government	OWRD failure to enforce KA1000 water right and allows illegal releases of stored water from UKL	See effects on operations by Federal Government
Federal Government US Fish and Wildlife Service	Unnaturally high lake levels requirements in UKL	Political Pressure	See effects on operations by Federal Government

8. Proposed changes or additions to facilities and operations

No additions to facilities or operations are planned over the course of this plan.

Changes to facilities include SCADA updates and improvements, piping and lining critical areas. Additional changes are being examined with our partnership with Farmers Conservation Alliance.

Klamath ID's SCADA system is outdated and no longer functional with the Windows 10 environment. We are partnering with Farmers Conservation Alliance and Sierra Controls to analyze, install, and upgrade the primary system and add sensors across the system to inform multiple District operations. Klamath ID recently was provided initial notification that up to $500,000 in matching funds is available to Klamath ID through Reclamation's WaterSMART grant program.

C. Topography and Soils

1. Topography of District and impacts on water operations & management

Figure 16 Google Earth 3D Topographic View of Klamath ID as viewed from the South

The Cascade Range, Lava Beds National Monument, and a series of fault lines bound the Klamath Basin with a single point of outflow. The canals of Klamath ID are primarily in a north-trending structural basin with the northwestern-most part of the Basin and Range Province.[86] The Klamath Valley floor is generally 4100 feet in altitude above MSL, surrounded on ALL sides by mountains of greater elevation. The only outlet to the Basin for surface water drainage is through the Klamath River on the western edge of the Project.

Numerous north trending normal faults, which formed as part of Basin and Range extension are present across the District as shown in Figures 16 and 17. Northwestern striking

[86] Incorporated Research Institutions for Seismology. 2019. Basin and Range Province.

faults primarily in the south part of the Klamath Basin may have a strike-slip component and be the northern extent of a fault system that trends southeastward into northern California and central Nevada.[87] Faults in the region may still be active as suggested by two near 6.0 magnitude earthquakes in 1993.

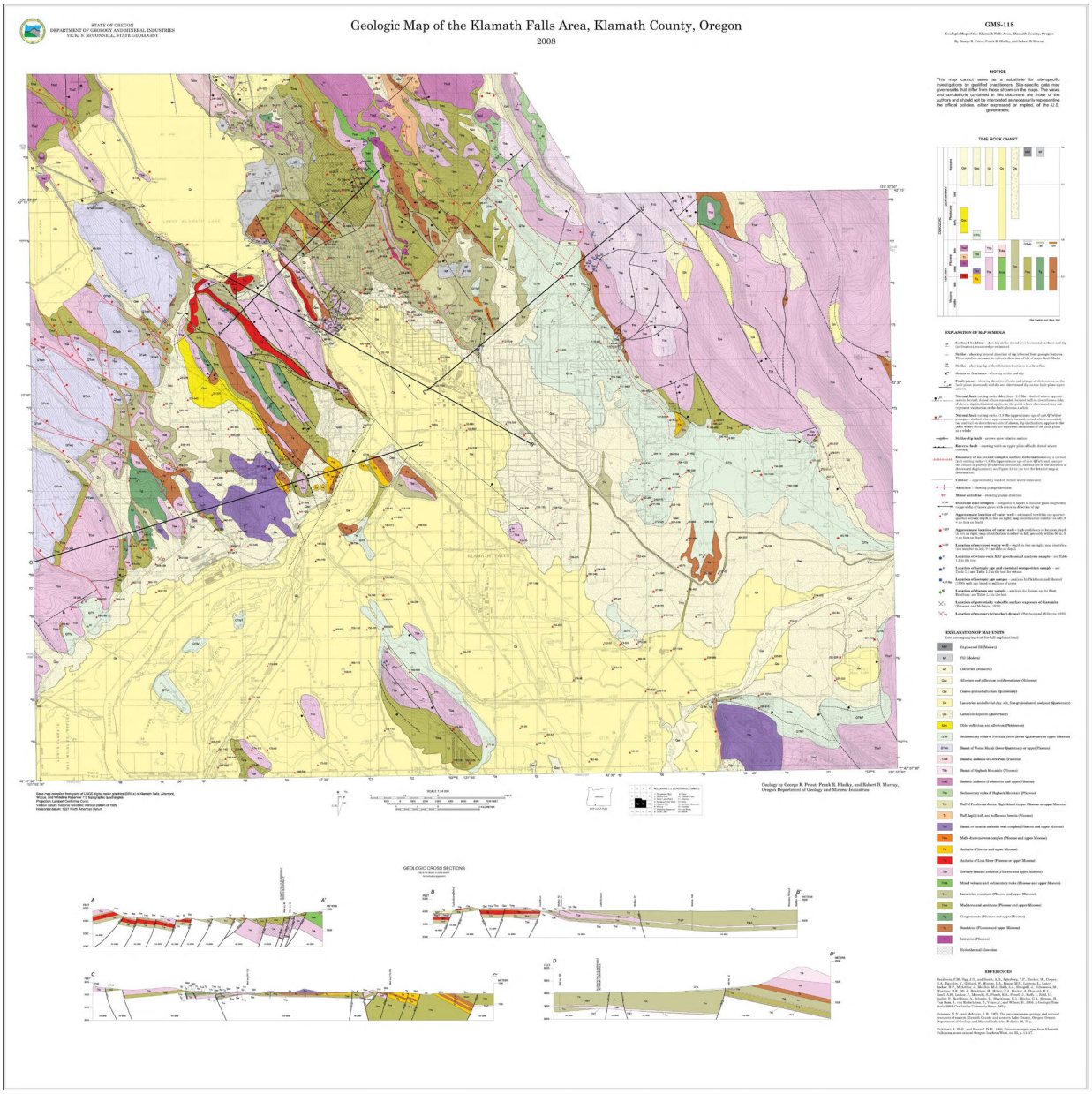

Figure 17 Geologic Map of the Upper Klamath Valley 2008

Although Klamath ID is bounded by many mountains and hills, the irrigated lands are relatively flat which were initially developed for flood or furrow irrigation. A rendering of the 3D topography is shown in Figure 16 showing the northern portion of Tule Lake northwest

[87] Reclamation. 2012. A Canal – Canal Condition Assessment Report of Findings. page 6.

through the Klamath Valley towards the city of Klamath Falls. The topography of the mountains, hills and valleys influenced the design of the canal systems to move water from Upper Klamath Lake to Newell, California with an average of 1.8 foot drop per mile over 48 miles as shown in Figures 24 and 25.

This topography, combined with the hydrology, allows for reuse of return flows and spills through an extensive drainage system and Lost River, which traverses Poe Valley and then flows southeast through Klamath ID to the boundary at the state line and into the Tulelake Sump.

A Canal specific topography: From the headworks to the A Canal Tunnel, the canal is cut into a chalk rock hardpan covered with basalt and volcanic soils. See Figures 18, 19, & 20.

Figure 18 A Canal (looking east) at its Headworks

The A Canal Tunnel, built by the Klamath Canal Company in 1904[88] and widened by Reclamation contracts in 1907, is cut from milepost 0.3 to 0.6 under the city of Klamath Falls. (See Figures 19 & 20) It is concrete lined for 3,300 feet.

Downstream of the tunnel, portions of the A-Canal disrupt or intersect the natural drainage patterns of the area as shown in Figure 21 and follows the general path of the original Ankeny Canal developed in 1878 which irrigated some of the best lands in the Klamath Valley

[88] Klamath Project. Status of Investigation. Estimated published date 1905, likely compiled by J.B. Lippincott. Page 10.

with pre-Project capacity to irrigate up to 16,000 acres.[89] The left side (north side) of the canal is mostly cut into the existing hill banks; the right side (south side) of the canal is mostly fill with material excavated from the invert of the prism by equipment mostly powered by horse and cattle.[90]

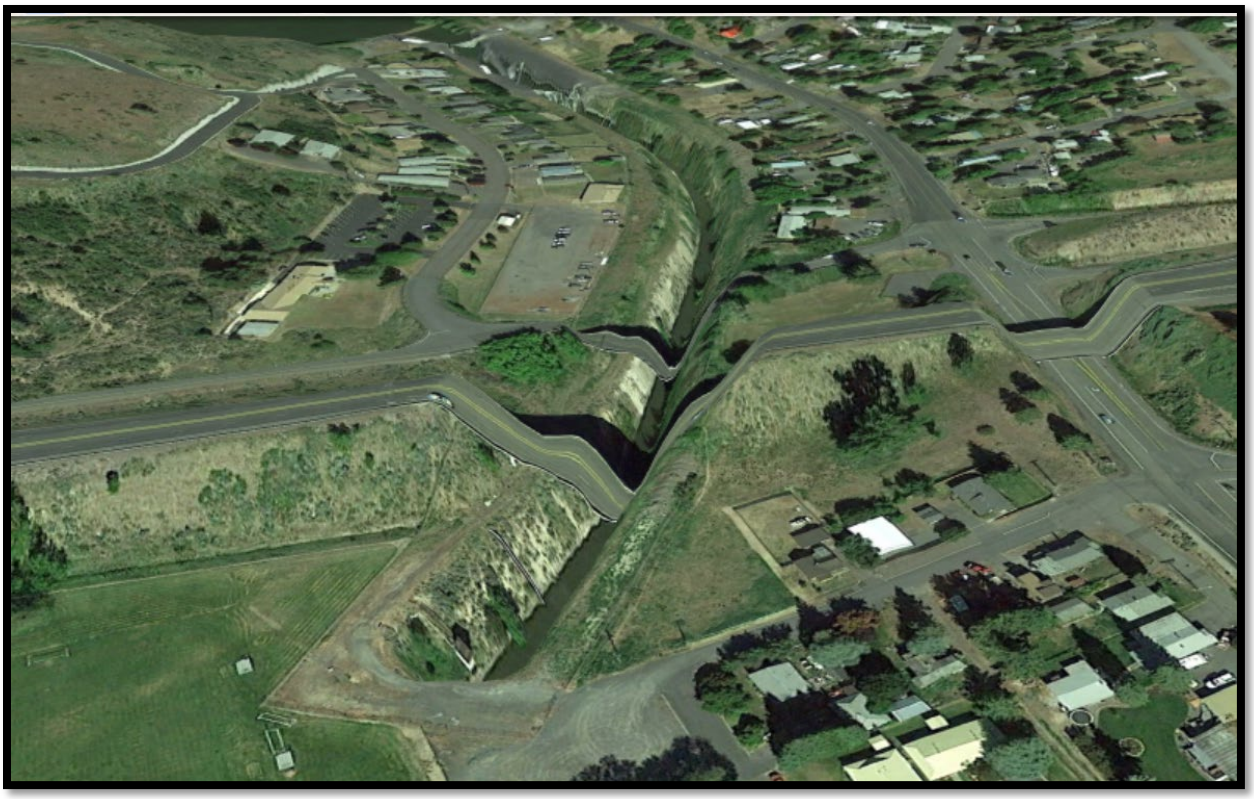

Figure 19 Google Earth Imagery of A Canal from Headworks to Tunnel Entrance

[89] I.S. Voorhees. 1912. History of the Klamath Project. Reclamation Service. Page 8.
[90] Reclamation. 2012. A Canal – Canal Condition Assessment Report of Findings. page 6

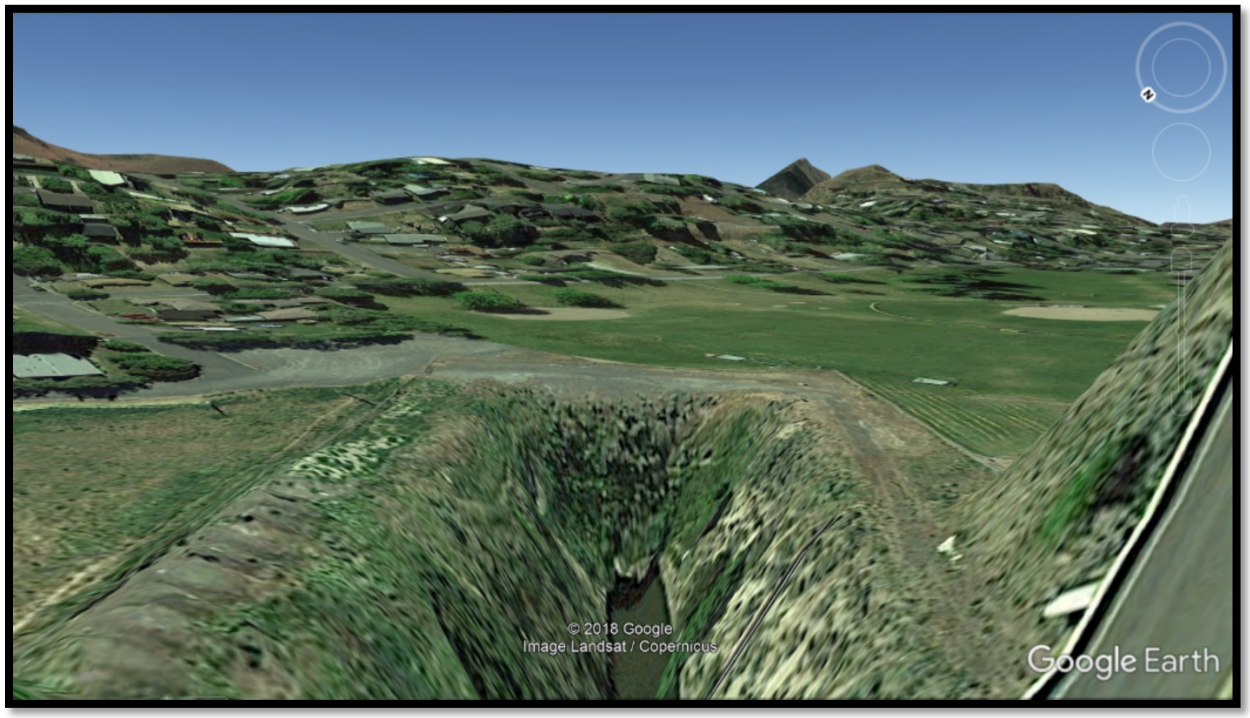

Figure 20 Google Earth Imagery of A Canal Tunnel Entrance Looking East

Figure 21 Google Earth Imagery of A Canal from Tunnel Exit through Klamath Falls Intersecting Natural Drainage

Poe Valley specific topography: East of the northern part of the Klamath Valley, but separated from it by rather high hills, is a small triangular basin known as "Poe Valley" containing approximately 9,000 acres.[91] At Olene gap, near the northwestern corner of this valley, Lost River passes through a low gap from Poe Valley to Klamath Valley as shown in Figures 22 and 23. Irrigation water enters the Poe Valley from the west through the E (originally referred to as the East Canal) and F Canals after traversing the A and B Canals from Upper Klamath Lake.

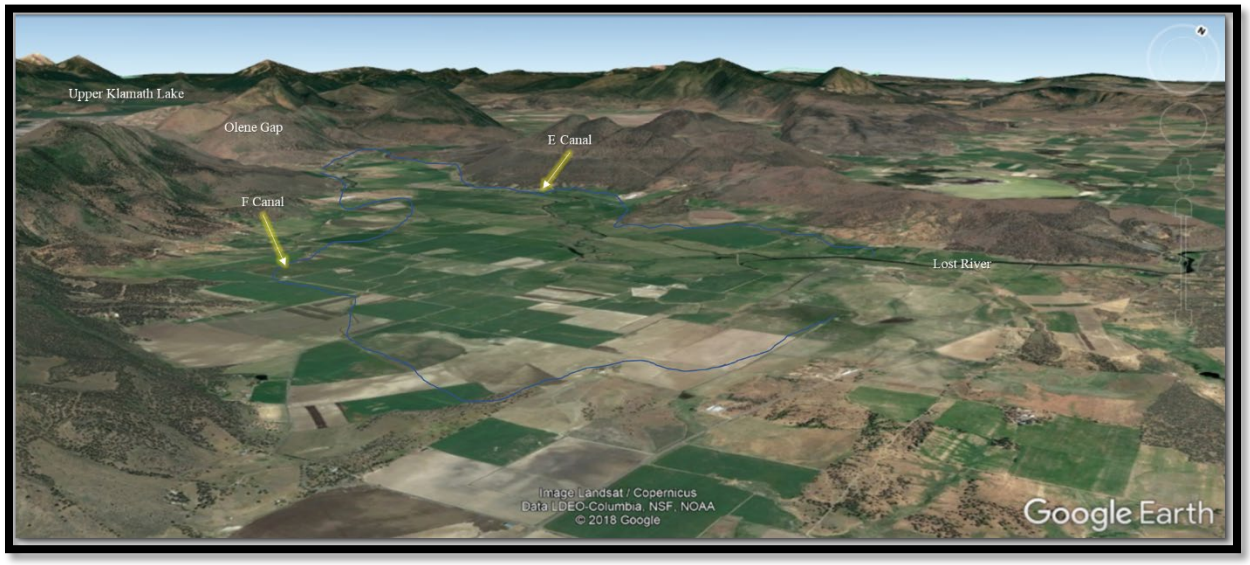

Figure 22 Google Earth Imagery of Poe Valley - Northeastern portion of Klamath ID

Figure 23 Google Earth Imagery of the Northern Reach of Klamath ID with Entrance to Poe Valley through Olene Gap

[91] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project.

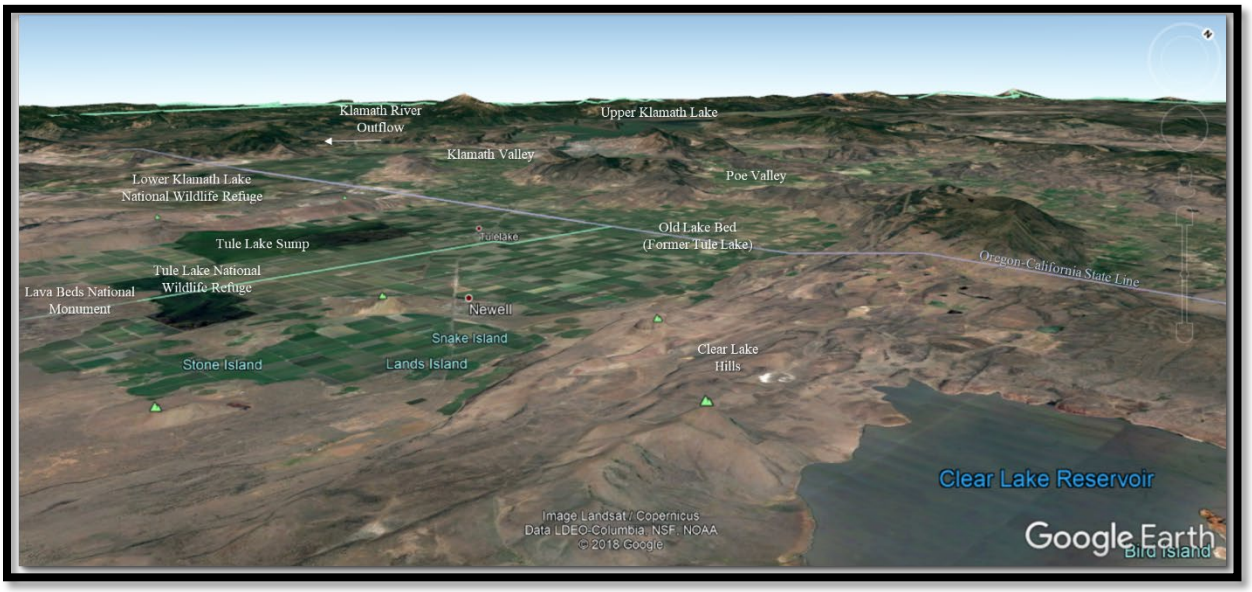

Figure 24 Google Earth Imagery of the southern reach of Klamath ID and Tule lake ID

The southern reach of Klamath ID is generally flat with no elevation changes in the D canal system as it traverses the former shoreline of Tule Lake and spills into the J Canal System. Klamath ID drain water from the D Canal system, Shasta View ID, Malin ID, Van Brimmer Ditch Co, and Sunnyside ID is available to Tulelake ID; this drain water requires pumping, with high power costs, for beneficial use within the J Canal system. Ultimately, all Project drain water will terminate in the Tule Lake National Wildlife Refuge unless pumped into the Lower Klamath Lake National Wildlife Refuge by Tulelake ID.

The D Canal, originally part of the "Adams Canal", followed the contour of Tule Lake prior to Reclamation efforts to drain the lake. Figures 25 and 26 show LiDAR imagery of portions of the D Canal developed in the late 1800's. Adams Canal, developed 20 years prior to the Project, originally supplied water from the Lower Klamath Lake; "it was recognized that it would be impossible to drain the Lower Klamath Lake without cutting off the water supply for this canal"[92] resulting in the requirement for the Project to divert water from the Upper Klamath Lake to fulfill this irrigation requirement and established water-right.

[92] I.S. Voorhees. 1912. History of the Klamath Project. Reclamation Service. Page13

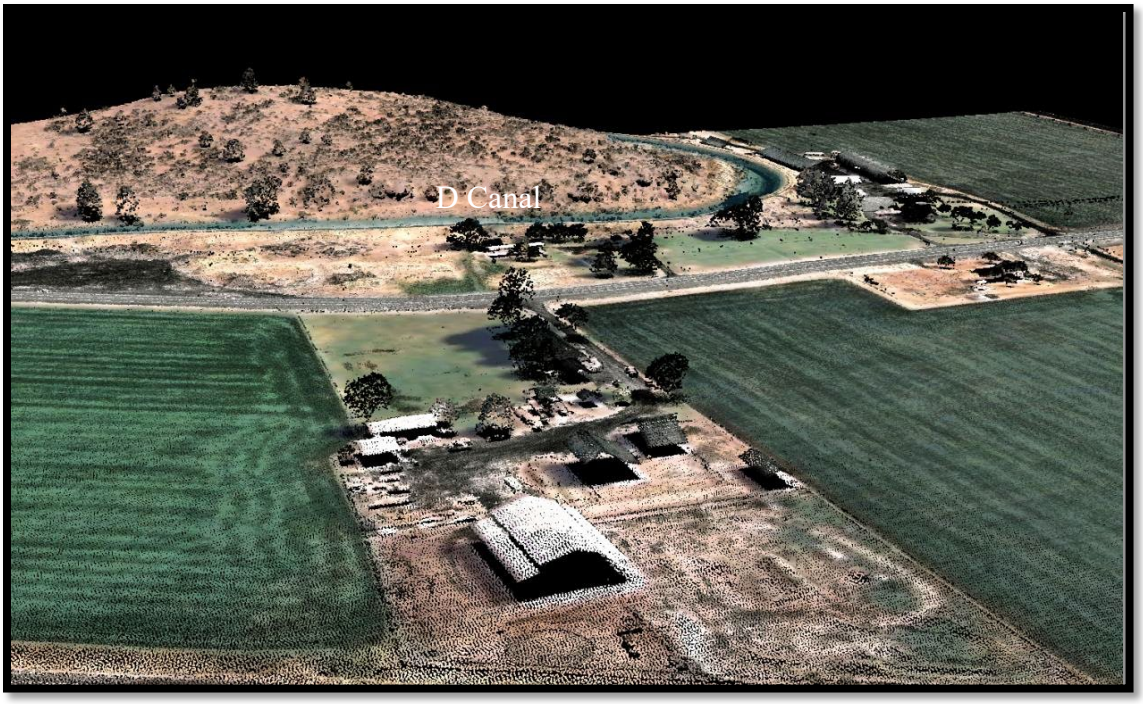

Figure 25 LiDAR Imagery of D Canal near Lost River High School following the contour of the land[93]

Figure 26 LiDAR image of the D Canal and Old Malin Highway Looking West Towards Merrill, Oregon[94]

[93] KBOR Delivery 2. 24 May 2011. LiDAR Remote Sensing
[94] Ibid

2. District soil association map (Ag only)

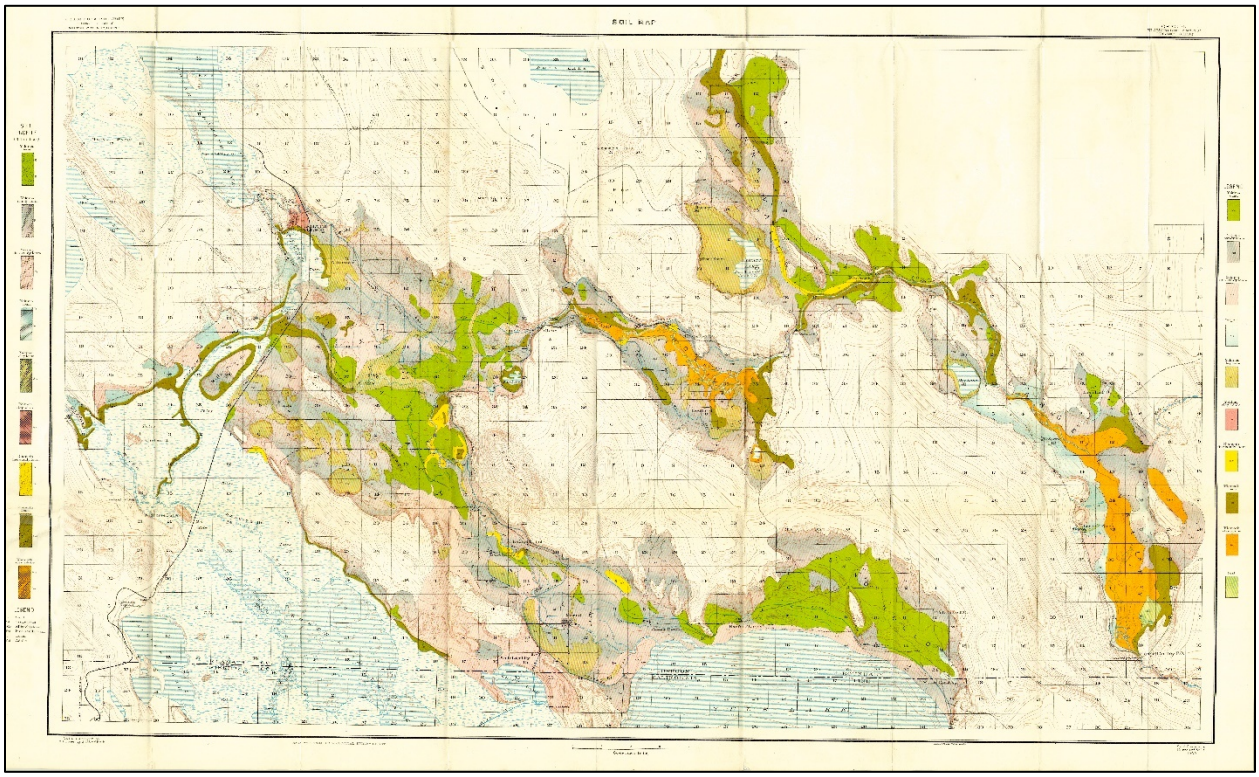

Figure 27 Klamath Project Soils as recorded in 1908 by A.T. Sweet and I.G. McBeth[95]

The Klamath ID is in consultation with the Natural Resources Conservation Service to develop an updated assessment of our watershed. NRCS's 2004 assessment of the Upper Klamath East Region requires a more micro analysis similar to the 1908 analysis provided at https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/oregon/klamathOR1908/klamathOR1908.pdf

The Klamath Basin is bounded by mountains composed of tilted volcanic rock (primarily basalts and basaltic andesites) and lacustrine mudstone. The volcanic rock is typically found above the valley floor, with the mudstone typically underlying the volcanic rocks.[96] Generally the soil has three general hydrologic layers:

1) Base: Highly permeable basalt with an older depositional age serving as the principle aquifer. "The basement rocks are unknown, but are probably Micocene andesitic and basaltic flows, volcanic breccias, and minor tuffs similar to the volcanic rocks of the Western Cascades. These lavas probably correlate with units in northern California near Butte Valley and Macdoel, and are at least 12,000 ft (3,600 m) thick near the Oregon-California border."[97]

[95] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Book Insert.
[96] Reclamation. 2012. A Canal – Canal Condition Assessment Report of Findings. page 6
[97] Lienau, Culver, Lund 1989. Klamath Falls Geothermal Field. OIT Geo-Heat Center. Page 5

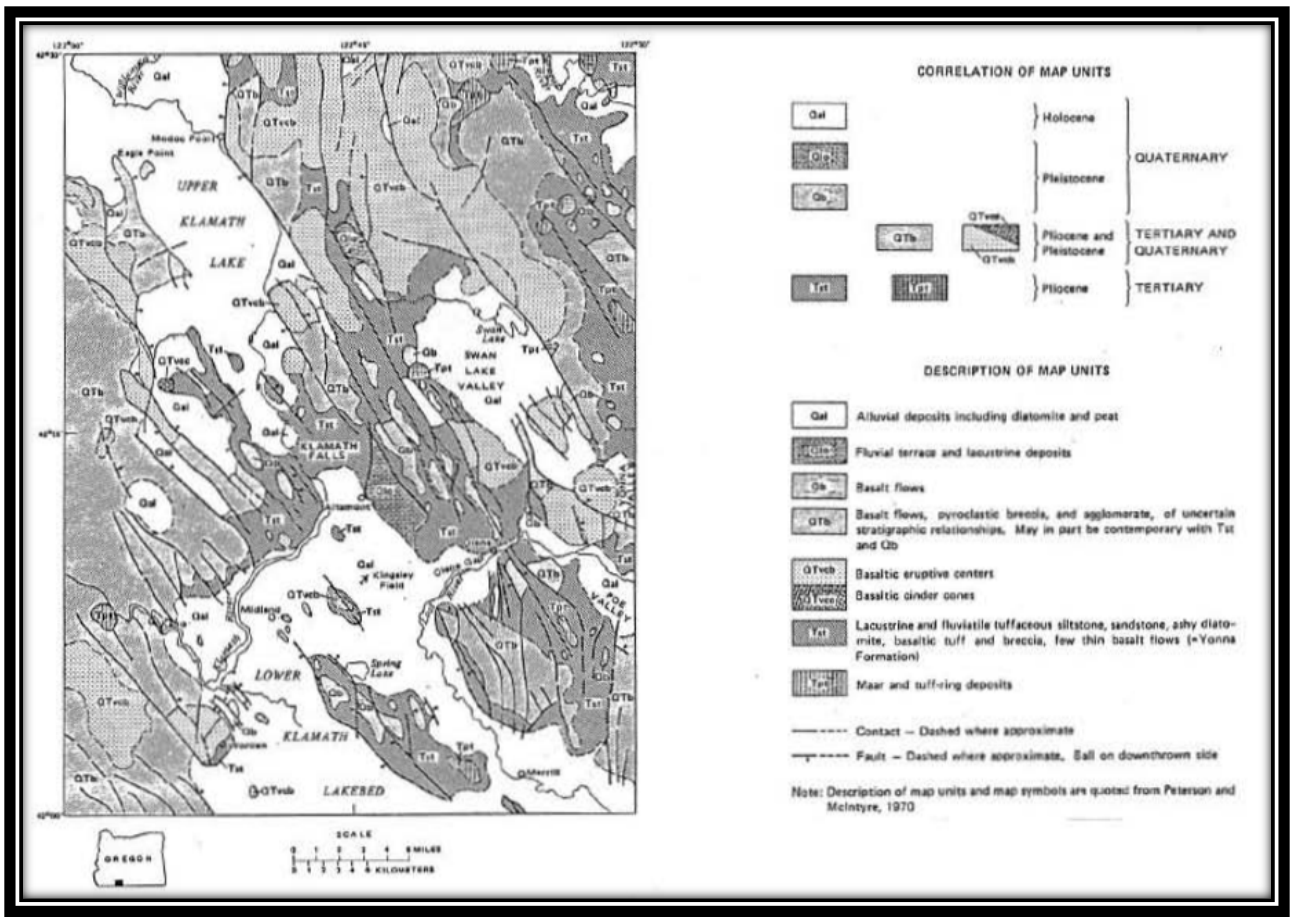

Figure 28 Geology of the Klamath ID[98]

2) Mid-layer: Fluvial deposits (also referred to as diatomaceous mudstone) made up of tuff, shale, agglomerate, sandstone, and volcanic ash that are collectively known as the Yonna Formation and act as a deep groundwater cap. This layer is typified by a white to tan, lightweight chalk-like appearance (referred to locally as "chalk-rock", "chalk", or "hardpan"). In places, tests with hydrochloric acid indicate the presence of considerable quantities of carbonate lime. "Examination of this material from different parts of the area by means of the electrolic bridge showed considerable variation in the soluble salt content, as a whole it carries a much higher percentage of such salt than is carried by the sand or sandy loams."[99] It is likely this layer covering the entire basin was formed through the damming of the Klamath River by a lava flow, creating a lake about the size of the state of Maryland, and collected significant volumes of volcanic ash from the Cascade volcanic activity. This large shallow lake, together with the diatomaceous earth resulted in highly unproductive soil. This formation is estimated to be from 200 to 1,000 ft (60 to 300 m) thick. **Little water is able to permeate through the fluvial deposit layer to the principle aquifers.** This layer, when exposed, does not produce any agricultural benefit leaving the land generally barren.

[98] Lienau, Culver, Lund 1989. Klamath Falls Geothermal Field. OIT Geo-Heat Center. Page 4
[99] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1387

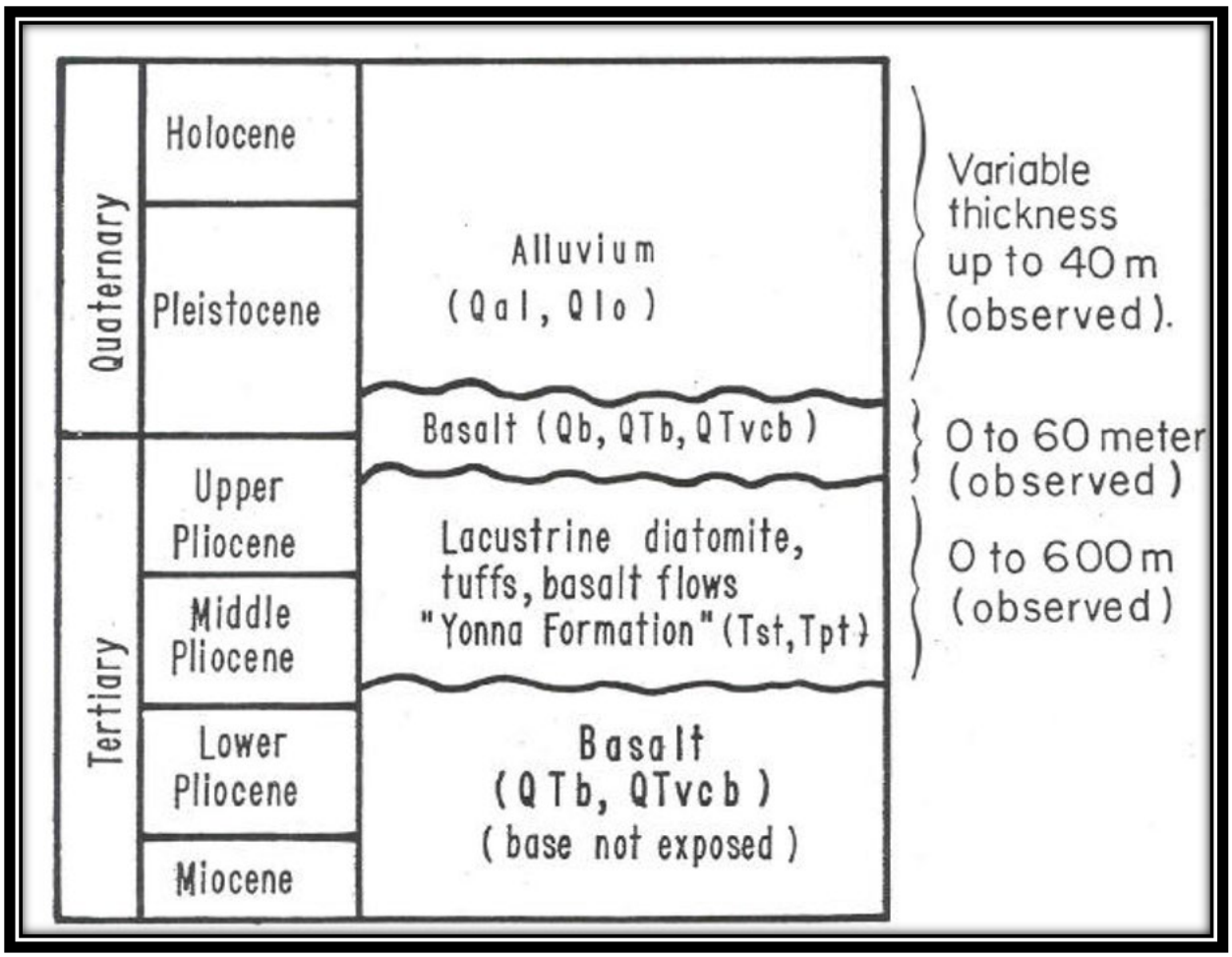

Figure 29 Stratigraphic section of the Klamath Falls Area[100]

3) Top-Layer: More recent eruptive volcanic deposits or loamy sand that overlie the aquifer. The surface layer is medium acid and strongly acid in areas of soils that have been irrigated for many years and fertilized for potatoes. The soil formed over the basaltic lava flows and associated beds of volcanic ash "are, as a rule, highly productive and of lasting fertility."[101] There are two series of soils; uplands and swamps (or lake bottom).

The solids in the uplands are usually very fine grained and would be classified as fine sandy loams and silt loams. They are composed of the disintegrated and partly weathered products of the lava beds, mixed with more or less ash. These soils are particularly adapted to the growing of grain.[102]

The swamp and lake bottom soils are very different in character from the uplands. The vegetation in 1905 was largely tule and cat tail flags with lesser quantities of smaller swamp loving plants. The underlying soil is the result of continued growths of this swamp vegetation.

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[100] Lienau, Culver, Lund 1989. Klamath Falls Geothermal Field. OIT Geo-Heat Center. Page 7
[101] I.S. Voorhees quoting Thomas Means. 1912. History of the Klamath Project. Reclamation Service. Page 6.
[102] Ibid

Interstratified with the organic matter are layers of volcanic ash and sedimentary material, the whole forming a soil of excellent tilth and fertility.[103] "The water in [these areas was] quite shallow, but a deep deposit of floating sludge and black muck lies below it. This sludge is often piled in spots by the movements of wind and water, obstructing navigation."[104] The southern reach of the Klamath ID includes the former bed of Tule Lake which is composed of decomposed plant materials and is highly organic.[105]

Figure 30 Impenetrable Chalk Rock Layer Traps Irrigation Water

Alkali. The amount of alkali in the soils is, as a rule, small; both black and white are seen occasionally when standard irrigation practices are ignored.[106] The smallest quantities are found in the well-drained sands and loam generally near hill slopes without exposed chalk rock. Where chalk rock is close to the surface or exposed, alkali is found in higher concentrations which are injurious to plant growth. Hot springs in the area also carry a considerable amount of alkali.

The predominant topsoil type in the uplands of Klamath ID is Fordney loamy fine sand which represents 18% of the land. Typically, the surface layer is very dark grayish brown loamy

[103] Ibid.
[104] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1376.
[105] Oregon State Water Resources Board. June 1971. Klamath Basin. Geologic History. Page. 220.
[106] Ibid.

fine sand about 8 inches thick. The underlying material is very dark grayish brown loamy sand. This layer includes coarse and fine grained alluvium (Qa, Qal), volcaniclastic sediments (Tbas), and mudstone (Tm).[107]

Quaternary Fine Grained Alluvium (Qa) consist of elastic silt, lean clay, and minor occurrences of fat clay with variable amounts of sand and some gravel. Elastic silt has a high liquid limit with void in spaces between silt particles allowing for the retention of an abundance of water, similar to a sponge.[108]

Permeability is rapid. Roots commonly penetrate to a depth of more than 60 inches. Runoff is very slow, and the hazard of erosion is slight. There is a moderate hazard of wind erosion in the spring when wind speed is high and the surface layer becomes dry. Available water holding capacity is about 5.5 to 8.5 inches.

Other soils that represent 5% or greater of the land within Klamath ID include the following: Poe Loamy Fine Sand (7%), Modoc Fine Sandy Loam (7%), Calimus Loam (6%), Laki-Henley Loams (6%), Henley-Laki Loams (5%). These soils are generally characterized with permeability as moderate, slow runoff, and roots penetrating from 20 to 60 inches. These soils, together with the Fordney loamy fine sand make up 50% of the land within Klamath ID.

In places, the sandy loam becomes heavy; these places often occur in the vicinity of a small intermittent streams such as the south side of Poe Valley, near Spring Lake, and Nuss Lake.

3. Agricultural limitations resulting from soil problems (Ag only)

Drainage is the most serious problem for Klamath ID. Beneath the top-soil, the chalk rock forms an impermeable layer, preventing surface water from entering the deep aquifer. Storm water, or excess irrigation water, runs along this layer until it encounters the Lost River. During irrigation season, without care, some flood irrigated fields will show the soil to be saturated, inhibiting conditions for best plant development and thereby stunting plant growth. Drainage ditches, which carry away this excess water, are a critical component of the Klamath ID system.

For most of the area, the water table is at a depth of 3.5 to 5 feet during the period of irrigation due to the impervious chalk rock. Seepage from unlined canals and ditches may raise the surface ground water table. This soil is better suited to sprinkler irrigation than to other irrigation methods because of the high-water intake rate. When flood irrigating, large quantities of water is often needed to irrigate the lower end of borders and furrows. Excess water that is not used by crops raises the water table. The rate of application of water may need to be carefully adjusted with sprinklers to supply proper moisture to crops without raising the water table. The need to apply hearty volumes of irrigation water can readily leach plant nutrients, including nitrogen, below the root zone of crops.

Comparatively deep cuts can be made in leveling a field without exposing layers of contrasting texture and fertility. Little or no runoff occurs with any method of irrigation. Tail water disposal is of a moderate concern for Klamath ID which requires coordination with other

[107] Reclamation. 2012. A Canal – Canal Condition Assessment Report of Findings. page 6
[108] Reclamation. 2012. A Canal – Canal Condition Assessment Report of Findings. page 6

Districts to ensure efficient operations.

The canals were constructed between 1876 and 1917 with natural materials which can be prone to seepage. When seepage is identified, it can be prevented by lining canals and ditches that cross this soil. Deep drains, often cutting into the mid-layer chalk rock are also required to lower the water in areas having high water tables.

Some portions of the district have large concentrations of alkali. Near some hill slopes, the soil becomes shallower and areas of chalk rock or basalt are exposed. These areas are best suited for dry farming, grain, and potatoes. These soils support a dense growth of sagebrush and greasewood. The highest concentrations of alkali are found in the low areas where water is trapped, unable to drain, and allowed to evaporate. Some areas contain increased amounts of alkali when the area has been filled with excess irrigation water in years past and allowed to evaporate (vice drain) resulting in alkali deposits. If ground water is not permitted to accumulate in low areas, but carried off by proper drainage, little or no harm is done.

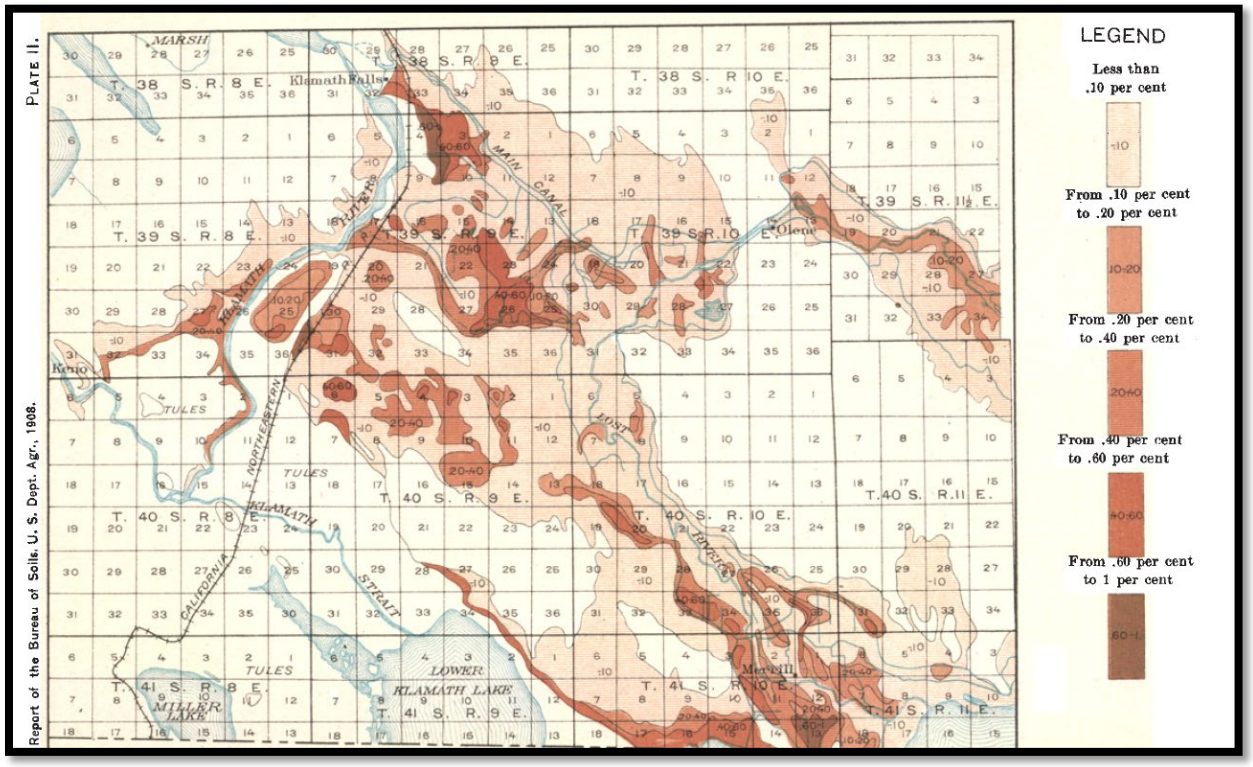


Figure 31 1908 Alkali Map of the Klamath Project[109]

In poorly drained areas where accumulation of alkali has already taken place, the total quantity in the soil to a depth of 6 feet is often small and is frequently concentrated at the surface. Such areas can often be repaired by providing good drainage, cultivating the soil, flooding it, cultivating it again and immediately sowing a rapidly growing crop of barley or oats. Repeating this process for 2-3 years can sufficiently free alkali from the soil to allow for a good

[109] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1408.

crop of alfalfa to take root.[110]

D. CLIMATE

The two primary patterns of climate variability which impact the Klamath Project are the El Nino/Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO). The two climate oscillations have similar spatial climate patterns, with very different temporal behavior; PDO events persist for 20-30 year periods, while ENSO events typically persist for 6-18 months.[111]

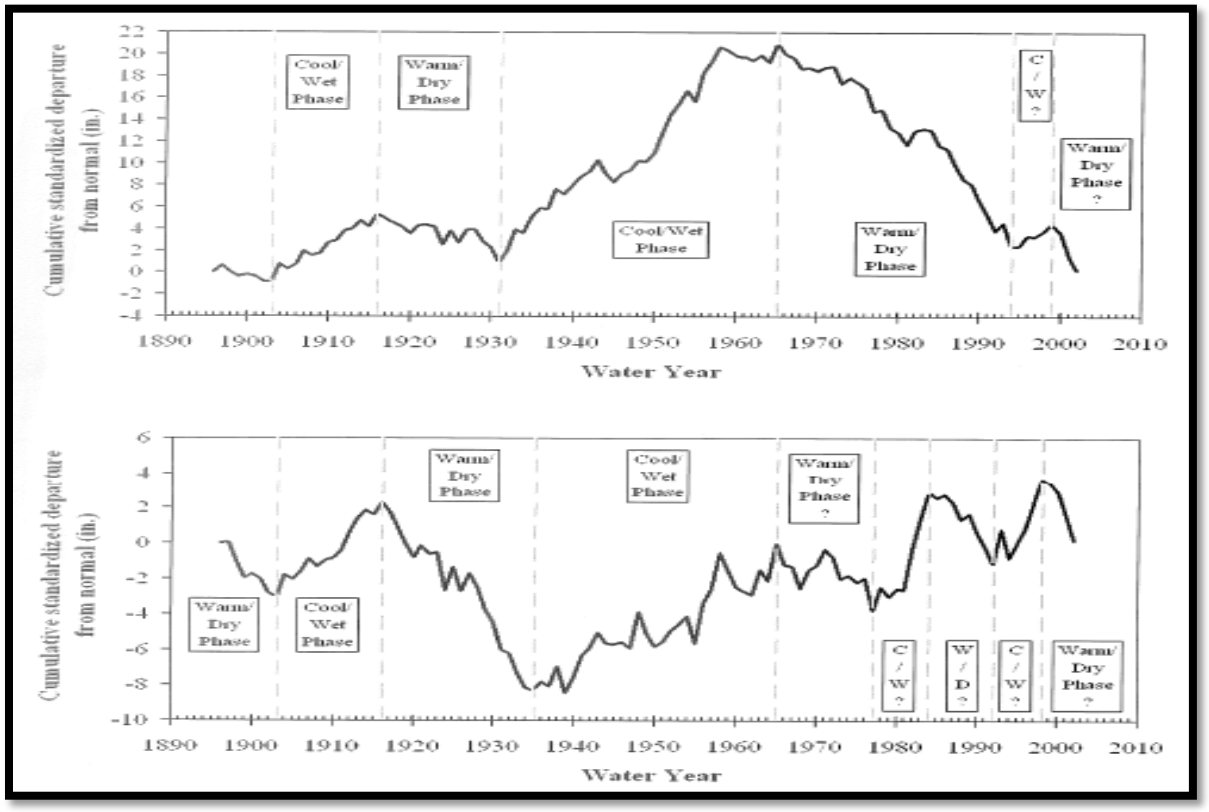


Figure 32 Cumulative standardized departure from normal of annual precipitation for Oregon Climate zones impacting the Klamath Project. Local PDO cycles are shown as vertical dashed lines.[112]

Within these climate variability models, the Klamath Project is split between two climate zones as defined by the Oregon Climate Service. The northern and mountainous portions of the Basin are included within climate zone #5 while the southern and eastern lower elevation portions of the Basin are contained in climate zone #7.

[110] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1408.
[111] David Evans and Associates Inc. 27 April 2004. Upper Klamath Basin Hydrological Analysis. Page 10.
[112] David Evans and Associates Inc. 27 April 2004. Upper Klamath Basin Hydrological Analysis. Page 10.

Studies suggest five distinct PDO cycles have occurred since the late 1880s which impact water supply, water demand, and water management strategies:

1890-1924 (cool/wet)	1947-1976 (cool/wet)	1995-2005 (cool/wet)
1924-1946 (warm/dry)	1977-1995 (warm/dry)	2006-present (warm/dry)

1. General climate of the District service area

a. Period of record and weather station ID used

The period of record is from 1884 to 2021, which reflects a wide range of hydrologic conditions.

The Klamath Falls 2 SSW weather station is representative of the northern portion of Klamath ID which is located approximately 1.72 miles south of the City of Klamath Falls.

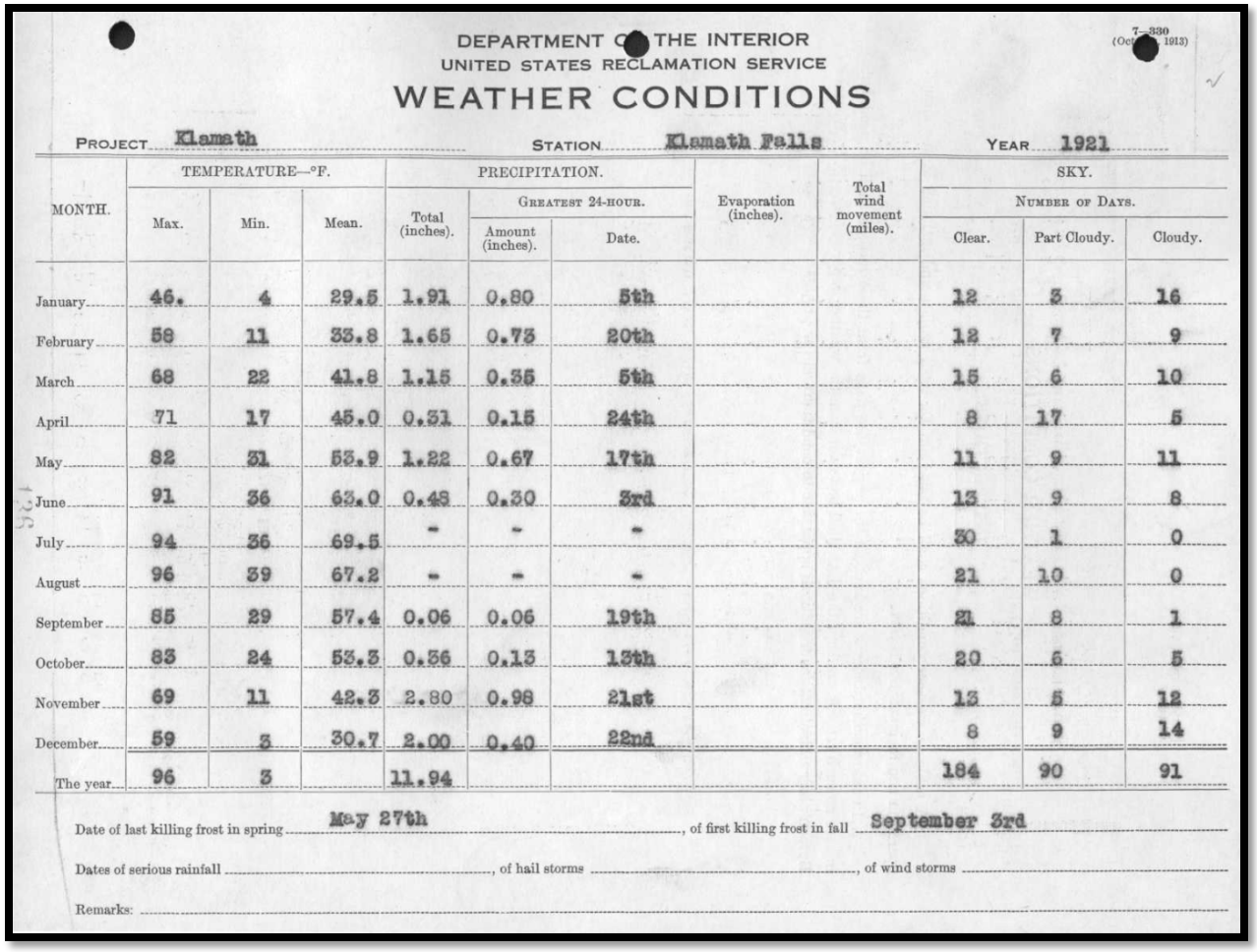
The Tulelake weather station is representative of the southern portion of Klamath ID and is located in Tulelake, California.

b. Average precipitation (by month and annual)

The annual average precipitation in the Klamath Basin has increased since Project devleopment. I.S. Vorheese reports in 1913, "the rainfall is light averaging from 10 to 12 inches; the land therefore requiring irrigation, and without it, few crops can be raised with certainty."[113] Vorheese continues to note "unusually light rainfall in the winter of 1887-8 the water level of White Lake receded to a new low stage which left the Adams Canal high and dry. It became necessary to cut through a neck of tules lying between Lower Klamath and White Lakes in order to secure a better water supply from the former lake."[114]

[113] I.S. Vorhees, Reclamation. 1913. Department of the Interior, United States Reclamation Service. History of the Klamath Project Oregon-California From May 1, 1903 to December 31, 1912. Page 10

[114] Ibid. Page 14.



DEPARTMENT OF THE INTERIOR
UNITED STATES RECLAMATION SERVICE
7—330 (Oct. 1913)

WEATHER CONDITIONS

PROJECT Klamath STATION Klamath Falls YEAR 1921

MONTH.	TEMPERATURE—°F.			PRECIPITATION.			Evaporation (inches).	Total wind movement (miles).	SKY.		
					Greatest 24-hour.				Number of Days.		
	Max.	Min.	Mean.	Total (inches).	Amount (inches).	Date.			Clear.	Part Cloudy.	Cloudy.
January	46.	4	29.5	1.91	0.80	5th			12	3	16
February	58	11	33.8	1.65	0.73	20th			12	7	9
March	68	22	41.8	1.15	0.35	5th			15	6	10
April	71	17	45.0	0.51	0.15	24th			8	17	5
May	82	31	55.9	1.22	0.67	17th			11	9	11
June	91	36	63.0	0.48	0.30	3rd			13	9	8
July	94	36	69.5	-	-	-			30	1	0
August	96	39	67.2	-	-	-			21	10	0
September	85	29	57.4	0.06	0.06	19th			21	8	1
October	83	24	53.3	0.56	0.13	13th			20	6	5
November	69	11	42.3	2.80	0.98	21st			13	5	12
December	59	3	30.7	2.00	0.40	22nd			8	9	14
The year	96	3		11.94					184	90	91

Date of last killing frost in spring May 27th, of first killing frost in fall September 3rd

Dates of serious rainfall ..., of hail storms ..., of wind storms ...

Remarks: ...

Figure 33 Klamath Falls Weather Conditions 1921[115]

In contrast, the annual average precipitation at Klamath Falls is now increased to 13.95 inches as shown in Figure 34. Rainfall in Klamath Falls is fairly evenly distributed throughout the year. The wettest month of the year is January with an average rainfall of 2.03 Inches.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Inch	2.03	1.42	1.53	0.93	1.10	0.69	0.36	0.50	0.58	0.85	1.95	2.01	13.95

Figure 34 Klamath Falls 2 SSW Weather Station Reporting between 1932 and 2019

[115] Herbert D. Newell. Reclamation. 1922. Annual Project History and O&M Report of the Klamath Project Oregon-California for Calendar Year 1921.

The Tulelake weather station reports an average precipitation of 11.35 inches.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Inch	1.35	1.18	1.26	0.90	0.97	0.79	0.35	0.53	0.60	0.87	1.27	1.28	11.35

Figure 35 Tulelake Weather Station Reporting between 1932 and 2019

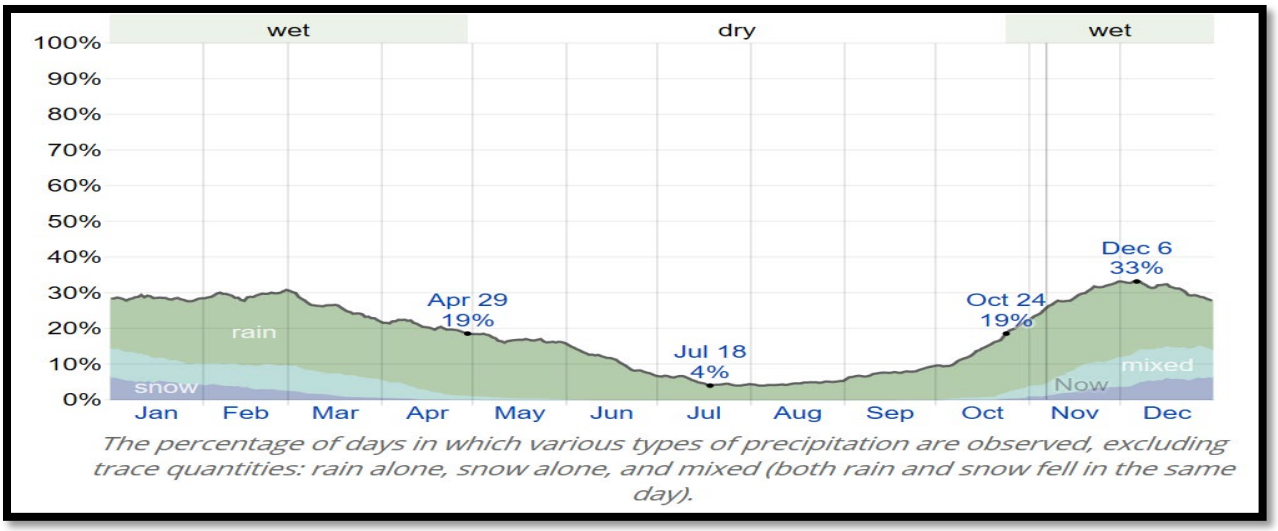


Figure 36 Klamath Falls Daily Chance of Precipitation

c. Average, maximum and minimum temperatures (by month and annual)

Recorded temperatures have ranged between 105 to -25 degrees.[116] The winter temperatures are fridgid while summer temperatures are mild. In the period measured from 1884 to 1908, there is not a noticeable shift in temperatures as compared to the period between 1932 to 2001 nor 2002 to 2019. Average winter temperatures range from the low to mid 30's to occasional lows below 10 degrees.

Typically, the growing season for most of Klamath ID begins in April and ends in mid-October. Summer temperatures range from an average of 65 to 75 degrees with occasional highs above 90 degrees.

Of note, modern concrete does not fair well with the freeze-thaw cycles within the Klamath Basin. Klamath ID is constantly removing and replacing concrete structures and liners less than 30 years old which deteriorate at a rapid rate in this climate.

[116] Reclamation. 1954. The Basin Today. Pg. 5

Mean monthly temperature for Klamath Falls.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1884	29	26	37	42	54	56	61	65	49	44	42	29
1885	34	37	47	53	56	58	72	71	56	51	39	35
1886	31	43	38	47	56	61	64	65	57	47	38	41
1887	39	28	46	47	55	57	66	64	58	50	38	31
1888	20	38	38	51	55	56	64	.....	64	50	38	36
1889	28	36	44	51	54	66	69	65	58	49	.....	.....
1894	.....	.....	42	46	57	57	72	73	.....	.....	.....	.....
1895	.....	.....	.....	.....	54	64	67	67	57	56	44	.....
1897	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31
1898	26	36	37	.....	.....	62	72	71	60	46	35	29
1899	33	33	39	46	49	62	70	61	66	.....	.....	.....
1900	39	.....	.....	.....	54	60	.....	.....	.....	45	41	34
1901	25	31	38	44	55	57	68	70	55	52	41	33
1902	30	38	39	45	53	61	63	68	64	47	38	33
1903	32	27	37	46	.....	63	65	.....	.....	.....	.....	34
1904	27	31	35	47	58	59	.....	.....	.....	50	45	33
1905	36	36	43	48	47	.....	.....	.....	.....	.....	.....	.....
1906	28	32	35	48	55	59	75	69	51	.....	.....	.....
1907	.....	42	35	48	54	58	68	52	56	58	39	35
1908	33	35	38	49	.....	55	.....	65	.....	.....	.....	.....
Average for period..	31	34	39	47	54	59	67	69	58	49	39	33

Figure 37 Mean Monthly temperature for Klamath Falls 1884-1908[117]

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max °F	39.9	45.7	51.8	59.3	68.2	77.1	85.7	85.2	77.0	64.6	47.4	39.5	61.8
Mean °F	30.9	35.7	40.3	45.8	53.7	61.5	68.8	67.8	60.3	49.8	37.6	30.8	48.6
Min °F	21.9	25.6	28.8	32.3	39.1	45.8	51.9	50.4	43.6	34.9	27.7	22.1	35.3

Figure 38 Mean Monthly Temperatures for Klamath Falls 1932-2019

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max °F	39.1	45.3	51.9	59.4	67.7	75.8	83.5	83.1	76.2	64.7	47.0	38.7	61.0
Mean °F	29.3	34.2	38.9	44.5	52.1	59.2	64.7	63.2	56.5	47.2	35.7	29.0	46.2
Min °F	19.5	23.0	25.8	29.5	36.4	42.5	45.8	43.3	36.8	29.6	24.3	19.2	31.3

Figure 39 Mean Monthly Temperatures for Tulelake 1932-2019

[117] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1379.

d. Wind velocity and frost – free days

Generally, there are 92-141 frost-free days.[118] The winter months across Klamath ID see days of frost, typically from mid-October through late April.

The average hourly wind speed in Klamath Falls experiences mild seasonal variation over the course of the year. The windier part of the year is typically between October to June, with average wind speeds of more than 5.7 miles per hour. The windiest days of the year are in March, with an average hourly wind speed of 6.7 miles per hour. The calmest time of the year is typically early August, with an average hourly wind speed of 4.8 miles per hour.

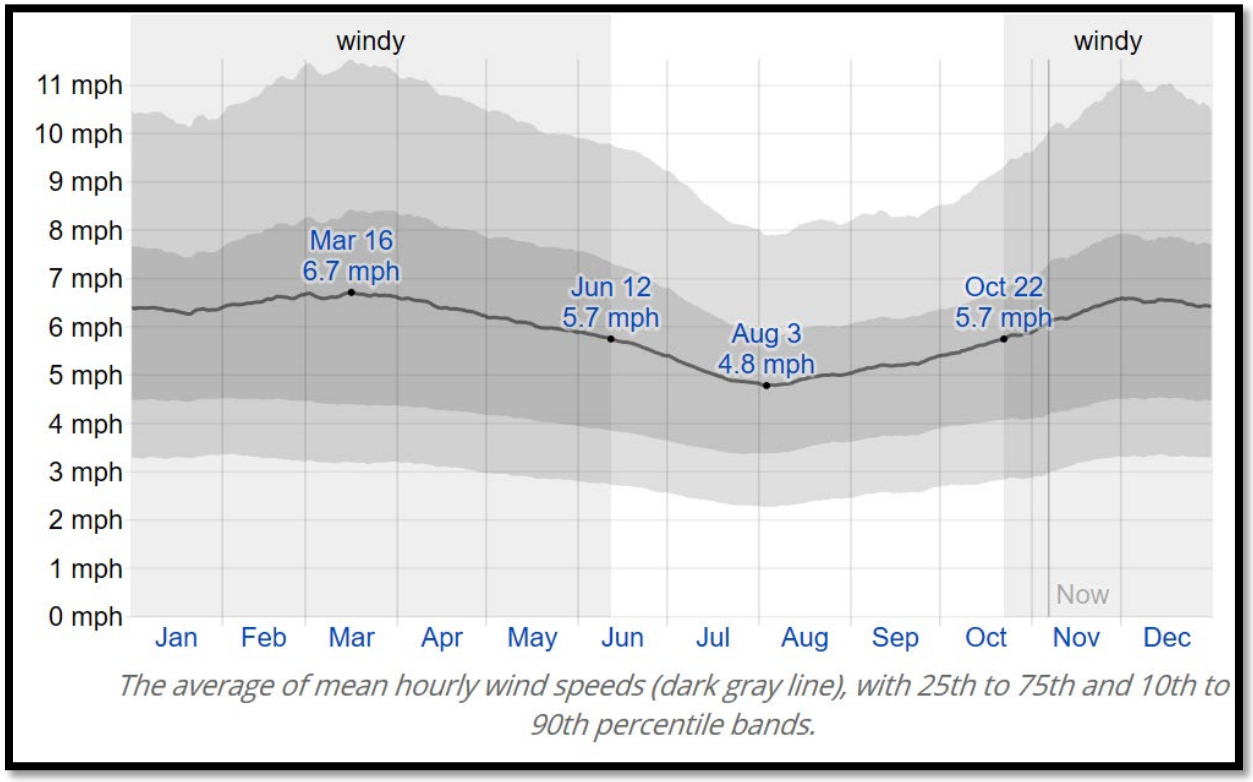


Figure 40 Klamath Falls Average Wind Speed by Month

[118] Reclamation. 1954. The Basin Today. Pg. 5

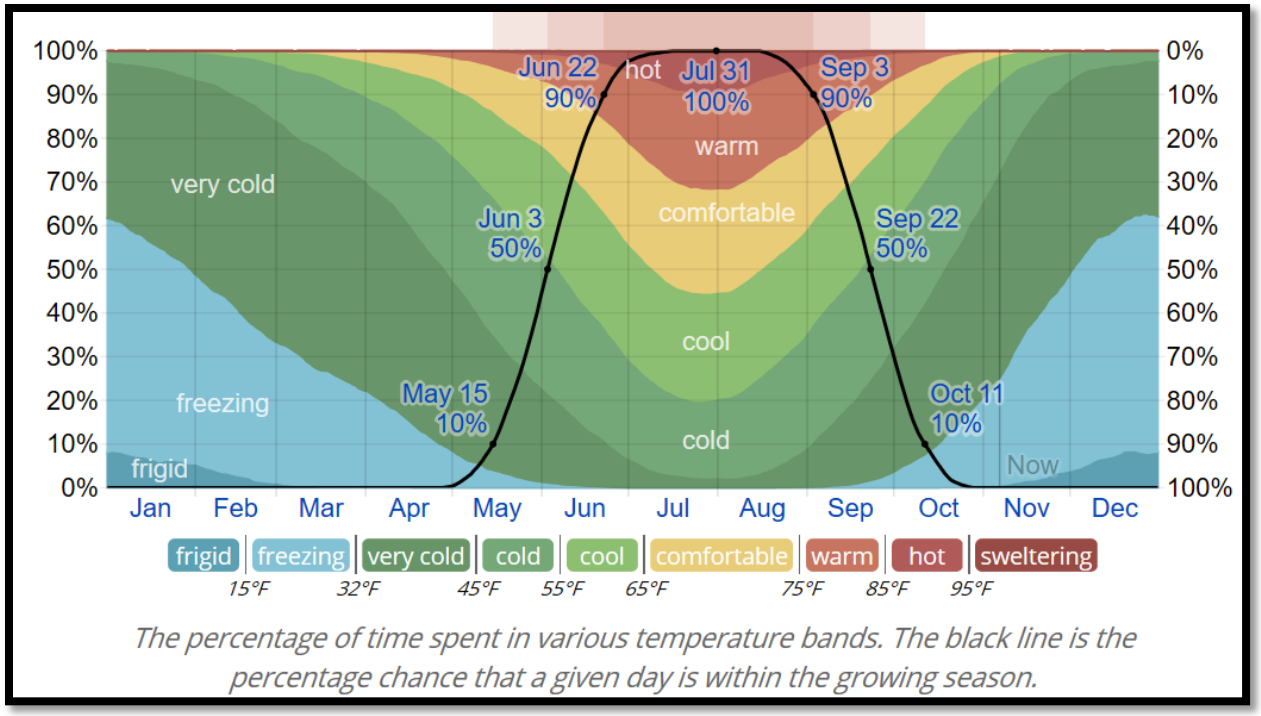


Figure 41 Klamath Falls Temperature Bands and the Growing Season

2. Impact of any microclimates on water management within the District

Conditions in the Poe Valley tend to be slightly offset from the majority of Klamath ID. The enclosed valley has a modified wind pattern from the larger Basin which impact temperature and precipitation. Rapid weed development in the shallow canals of Poe Valley is an issue with water management. Crops in Poe Valley are usually 2 weeks behind the remainder of the District.

Similarly, the southern reach of Klamath ID is often subject to frost conditions not observed in other areas of the District resulting in calls for water to prevent frost damage to crops.

E. Natural and Cultural Resources

1. Identify natural resources within the District

Name	Estimated Acres	Description
Upper Klamath Lake	128,000	Storage reservoir for the Klamath Project.
Lost River		Natural drainage system and historical Landmark
Spring Lake	417	Natural drainage system and wildlife habitat
Anderson Rose Dam	2	Historical Landmark (Managed by Tulelake ID)
Wilson Dam Reservoir 'aka Horseshoe Dam Lake'	168	Reclamation controlled resource
Nuss Lake	174	Privately owned and managed
Crystal Springs		Privately owned water source
Bald Eagle Habitat	58,000	Farmland provides rich habitat across the Basin
Migratory Waterfowl Habitat	58,000	Farmland provides rich habitat across the Basin

2. Describe management of resources, past or present, by District.

Upper Klamath Lake: This lake is managed by PacifiCorps with minimal oversight from the Bureau of Reclamation. Klamath ID diverts water from this reservoir in coordination with Reclamation's annual operations plan.

Lost River: This natural drainage feature provides for the reuse of water from Horsefly ID, Langell Valley ID, Poe Valley Improvement District, Klamath ID, Van Brimmer Ditch Co, Enterprise ID, Pine Grove ID, and Sunnyside ID. Reclamation primarily controls the flow of this resource. Tulelake ID diverts water from this drain at the Anderson Rose Dam in coordination with Reclamation.

Spring Lake: Klamath ID manages and maintains the level of Spring Lake to prevent localized flooding. This water is recaptured for irrigation purposes.

Anderson Rose Dam: This facility is managed by Tulelake ID.

Wilson Dam Lake: Managed by Reclamation. Klamath ID pays Reclamation fees for maintaining Wilson Dam.

Nuss Lake: Privately owned. Klamath ID does not manage this resource.

Crystal Springs: Privately owned. Klamath ID does not manage this resource.

Bald Eagle Habitat: Klamath ID does not manage this resource.

Migratory Waterfowl: Klamath ID does not manage this resource beyond transporting

water available for farmland and for the National Wildlife Refuges.

3. Identify recreational and/or cultural resources areas within the District

Name	Estimated Acres	Description
A Canal Bike Path	4 linear miles	Klamath County developed. Out of O&M contract
Klamath County Fairgrounds	38	Klamath County Recreational Facility
Anderson Rose Dam	2	Historical Cultural Site
Wilson Lake Park	168	State of Oregon Game Commission Fishing
Stukel Park	0.5	City of Klamath Falls Recreational Facility
Klamath Union High School Filed	5	City of Klamath Falls Recreational Facility
Mazama High School Field	20	City of Klamath Falls Recreational Facility
Henley High School Field	49	County Recreational Facility
Lost River High School Field	21	County Recreational Facility
Town of Merrill Parks	7	Town of Merrill Recreational Facility
Town of Malin Parks	20	Town of Malin Recreational Facility
Kiger Stadium	7	City of Klamath Falls Recreational Facility
Klamath Falls KOA	1	Private Recreational Facility
Crest Park	4	City of Klamath Falls Recreational Facility
South Suburban Little League Park	11	Klamath County Recreational Facility
Brixner Jr. High School Field	22	Klamath County Recreational Facility
Applegate Trail	UNK	Historic Sites

F. Operating Rules and Regulations

1. Attach a copy of the District's operating rules and regulations

See Attachment B

2. Describe agricultural water allocation policy

Various contracts between the Federal government, landowners, and Districts prescribe water allocation.

Klamath ID provides for the orderly, efficient, and equitable distribution, use and conservation of the available water resources to deliver irrigation water, consistent with the terms of the applicable water rights, the physical and operational limits of the delivery system facilities, and the availability of water for diversion in accordance with law.

Water rights for irrigation water provided by Klamath ID are prioritized as follows:

a. *Van Brimmer Ditch Company:*

50 cubic feet per second from April 15 to October 1

b. *Henley-Ankeny Lands*

49 cubic feet per second, up to 3.5 acre feet per acre annually

c. *Klamath Irrigation District & Tulelake Irrigation District "A Contracts"*

Up to 3.5 acre feet per acre annually (or as defined by contract)

d. *Inter-District/Project contracts for "A Contract Addendums or deliveries"*

Up to 3.5 acre feet per acre annually (or as defined by contract)

e. *Warren Act contractors "B Contracts" (Equal - Not prioritized)*

2 to 3.7 acre feet per acre annually as defined by contracts

f. *Inter-District/Project contracts for "B Contract Addendums or deliveries"*

2 to 3.7 acre feet per acre annually as defined by contracts

Rental contracts "C Contracts"

2 to 3.7 acre feet per acre annually as defined by contracts

3. Describe lead times for water orders and shut-off (Ag only)

All landowners must order water deliveries "on" no later than 7p.m. the day prior to use and order deliveries "off" no later than 7p.m. the day prior to ceasing use.

4. Describe policies surface & subsurface drainage from farms (Ag only)

All water discharges from a parcel must be made into the area designated as a "drain". Each landowner is responsible for the quality of drain discharges. Anyone placing unauthorized material or creating a blockage in the drain shall be responsible for the maintenance, repair, and/or correction by the District.

5. Describe policies on transfers by District and its customers

Klamath ID tracks water usage to landowners based upon total allocation to lands held

within the Klamath ID. The landowner shall only apply water delivered by Klamath ID to land included on the maps of irrigated land within a property deed with water rights. The landowner shall not apply any water furnished by Klamath ID to land that is subject to any land idling contract, or other similar agreement.

Transfers of KA1000 water may only occur under written authorization by the Klamath ID Manager. A landowner must provide written notice and documentation to Klamath ID HQ that they have elected to use a portion of their allocation from a separate parcel so that the amount will be deducted from parcels with remaining water credits. Upon review and confirmation of additional water allocation for a landowner, the Klamath ID Manager will issue a written temporary transfer order to authorize ditch riders to allow or curtail deliveries.

G. Water Measurement, Pricing, and Billing

1. Agricultural customers

a. Total number of farms

5,134 Individual Accounts (Includes KBID)

b. Total number of delivery points

1,203

c. Total number of delivery points serving more than 1 farm (account)

56

d. Total number of measured delivery points

1,203

e. Percent of delivered water measured at delivery point

100%

f. Measurement device table

Manual turnout slide-table stick measurements with head pressure.

2. Urban customer

(Omitted – Not Applicable)

3. Agricultural and urban customers

a. Describe/attach current year water charges

Klamath ID does not charge for water; in the State of Oregon, the water is owned by the public and is a property right or as allocated on each property deed. As per our contract with Reclamation and ORS 545, Klamath ID collects an annual assessments from landowners at a flat rate per acre for the recoupment of costs for operation and maintenance of the delivery system.

As per Oregon Revised Statue 545.381.1, "Annual assessments…determined by the board of directors shall make a computation of the whole amount of money necessary to be raised by the district for the ensuing year…so that each acre of irrigable land in the district shall be assessed and required to pay the same amount."

The rate structure at Klamath ID is determined through the budgeting process for District operations and maintenance as per Reclamation Contract 14-06-200-3784; rates are approved by the Board of Directors and charged as a per assessed acre basis with contractors paying all or a fraction of the Klamath ID rate on a per contract acre basis.

All charges for other Districts are set in contracts by Reclamation. Some contracts express no charge ($0 charges), while other contracts have percentage, rate, or duty requirements with no flexibility in the contract.

KBID rates are established separately as described in ORS 385 (1)(a) and ORS 545.391 and include Reclamation contractual requirements.

b. Annual charges collected from customers (fixed and volumetric)

Fixed Charges 2020			
Charges ($ by unit)	Charge Units ($/AF, etc)	Units Billed During Year (AF, etc)	Total $ Collected ($ Times Units)
$75.75/acre (KID "A" contract lands)	Irrigatable acre	39,832 acres	$2,889,480 (several delinquent accounts)
$80.75/acre (KID "C" contract lands)	Irrigatable acre	177 acres	$14,318
"A" and "B" District O&M Contracts	$0 to 50% of Klamath ID rate as required per Reclamation Contracts	Per Reclamation Contract	$469,193 (one delinquent account)

c. Describe or attach water-use data accounting procedures

Water-use accounting is performed by ditch riders and reported to the Water Master. Each turnout is tracked via cfs measured by the ditch rider and recorded manually on a turnout tracking sheet shown in Figure 42. These manual records are provided every 30 days to the Water Master for auditing the water orders. At the end of each irrigation year, ditch riders compile a list of irrigated crops by acres to provide data for a consolidated report to Reclamation as required by contract. Klamath ID crop reports are provided in Appendix M.

Acct.# 2954

Klamath Irrigation District

Daily Water Use Report

Ride # 3

Month June

Lateral A Canal

Owner: D. McFarland **User:** _____ **Structure#** T337

Diversion Type:

Day	Time	Person Ordering	Order +/-	CFS	Time on	Time off	Stem Inches	Comments
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	9:25	Con	+2.0					
12				2.0	8:00			
13				2.0				
14				2.0				
15	11:33	Con	-2.0	2.0				
16				0		8:00		
17								
18								
19	5:00	Con	+1.5					
20				1.5	8:00			
21				1.5				
22				1.5				
23				1.5				
24				1.5				
25	8:15	Con	-1.5	0		8:00		
26	7:58	Con	+2.0					
27				2.0	8:00			
28	5:58	Con	-2.0	2.0				
29				0		8:00		
30								
31								

Figure 42 Example Klamath ID Daily Water Use Report by Turnout

H. Water Shortage Allocation Policies (OAR 690-086-0260)

1. Frequency and magnitude of past supply deficiencies and current capacity limitations (OAR 690-086-0260.1)

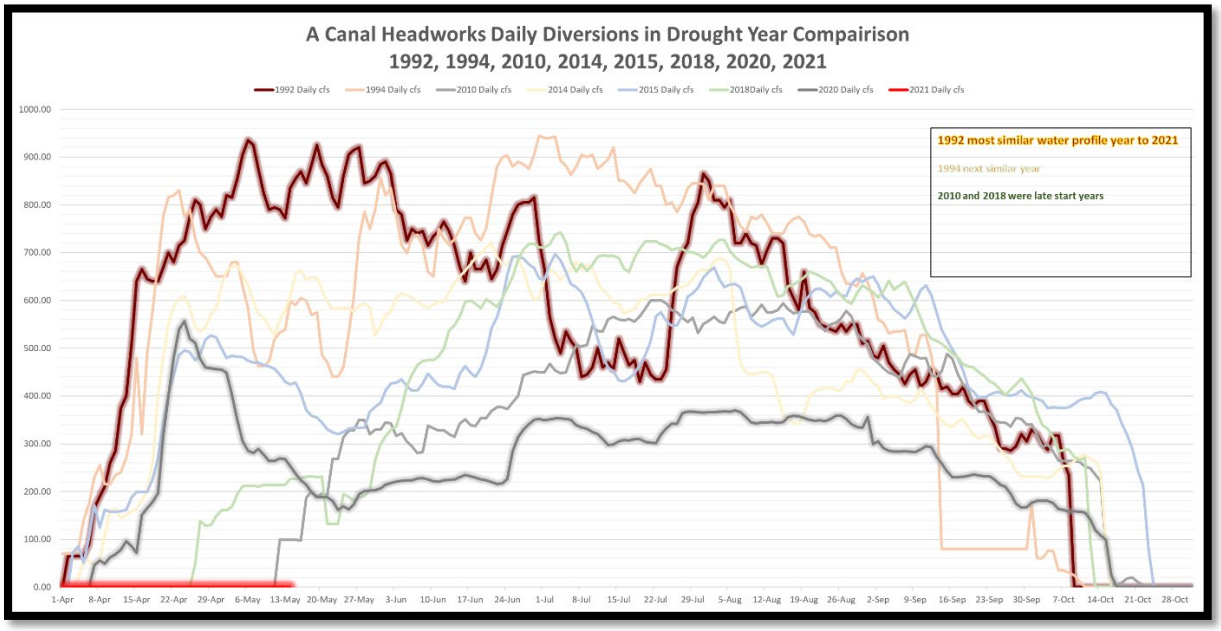


Figure 43 A Canal Headworks Daily Diversions Drought Year Compairisons

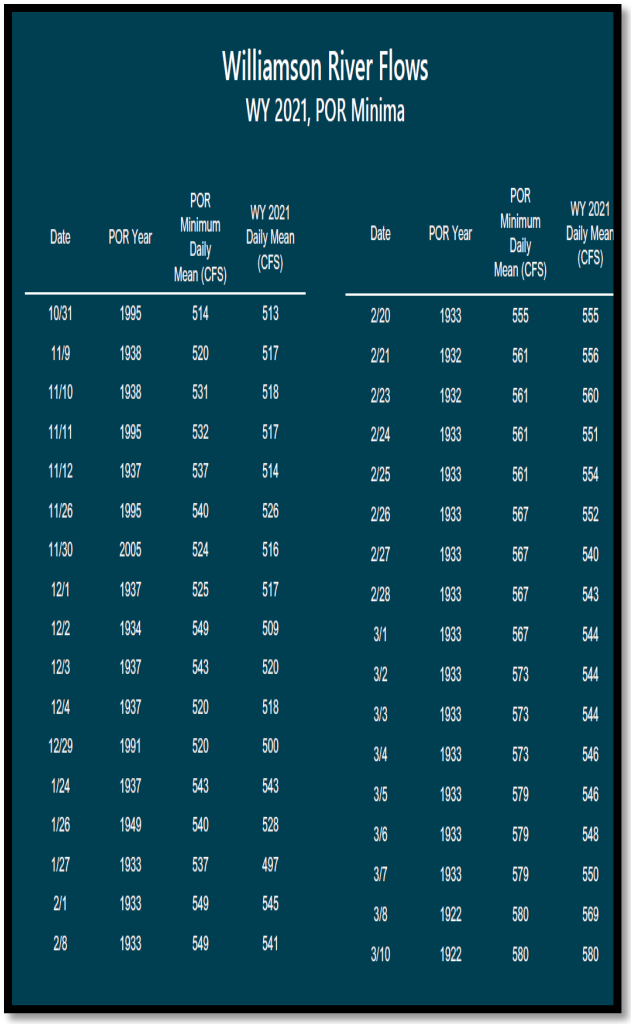
Capacity: The capacity limitation of Klamath ID is determined by the headworks at A Canal and the A Canal tunnel. Currently this capacity is limited to 1150 cfs. This current capacity of the A Canal, as designed and expanded upon in 1906, is sufficient.

Flood Damage: Water shortages due to floods damaging infrastructure have never occurred in the Klamath ID.

Damaged Infrastructure: The Klamath ID maintenance team, consisting of full-time employees, immediately address damages delivery systems and mechanical failures. In the history of Klamath ID, damaged delivery systems result in delayed deliveries, not shortages. Historic delayed deliveries occur infrequently and last from a few hours to a few days.

Water Quality: The waters of Upper Klamath Lake have always been of poor quality and do not impact supply. Lieutenant Henry Abbot, while exploring the Klamath region recorded in his 1855 journal, "a wide field of tule prevented approach to the water…the water taken from the lake had a dark color and a disagreeable taste, occasioned apparently by the decayed tule…the taste of the water was so disagreeable that several vain attempts were made to discover a spring the vicinity."[119]

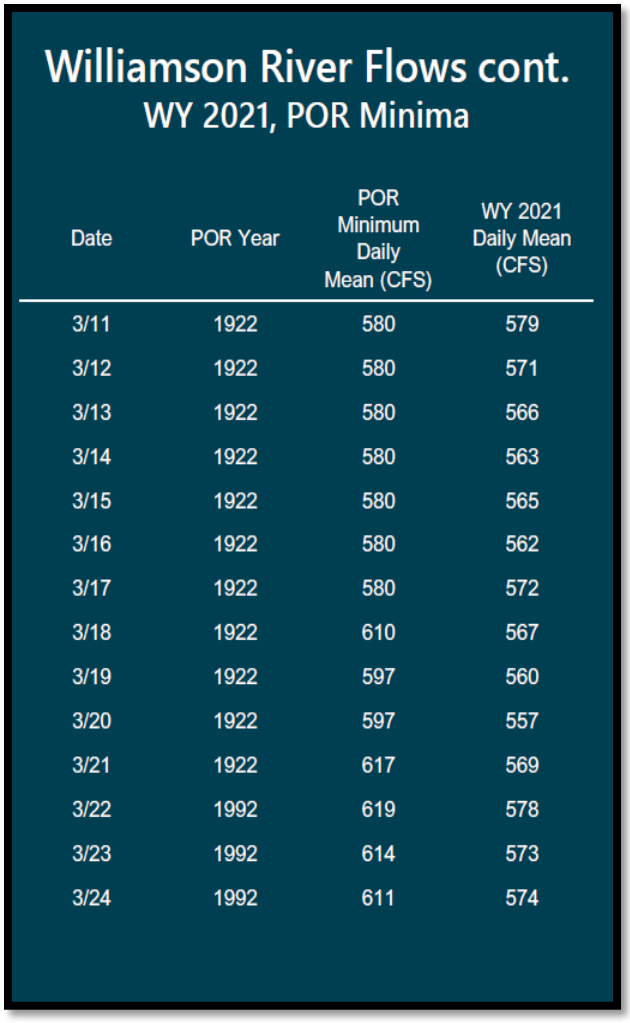
[119] LT Henry Abbot, Corps of Topographic Engineers, United States War Department. 1855. Journal Extract. Page 67.



Williamson River Flows
WY 2021, POR Minima

Date	POR Year	POR Minimum Daily Mean (CFS)	WY 2021 Daily Mean (CFS)
10/31	1995	514	513
11/9	1938	520	517
11/10	1938	531	518
11/11	1995	532	517
11/12	1937	537	514
11/26	1995	540	526
11/30	2005	524	516
12/1	1937	525	517
12/2	1934	549	509
12/3	1937	543	520
12/4	1937	520	518
12/29	1991	520	500
1/24	1937	543	543
1/26	1949	540	528
1/27	1933	537	497
2/1	1933	549	545
2/8	1933	549	541
2/20	1933	555	555
2/21	1932	561	556
2/23	1932	561	560
2/24	1933	561	551
2/25	1933	561	554
2/26	1933	567	552
2/27	1933	567	540
2/28	1933	567	543
3/1	1933	567	544
3/2	1933	573	544
3/3	1933	573	544
3/4	1933	573	546
3/5	1933	579	546
3/6	1933	579	548
3/7	1933	579	550
3/8	1922	580	569
3/10	1922	580	580

Figure 44 Williamson River Period of Record Inflows to Upper Klamath Lake - Williamson River is the largest and primary contributor to Upper Klamath Lake Inflows.

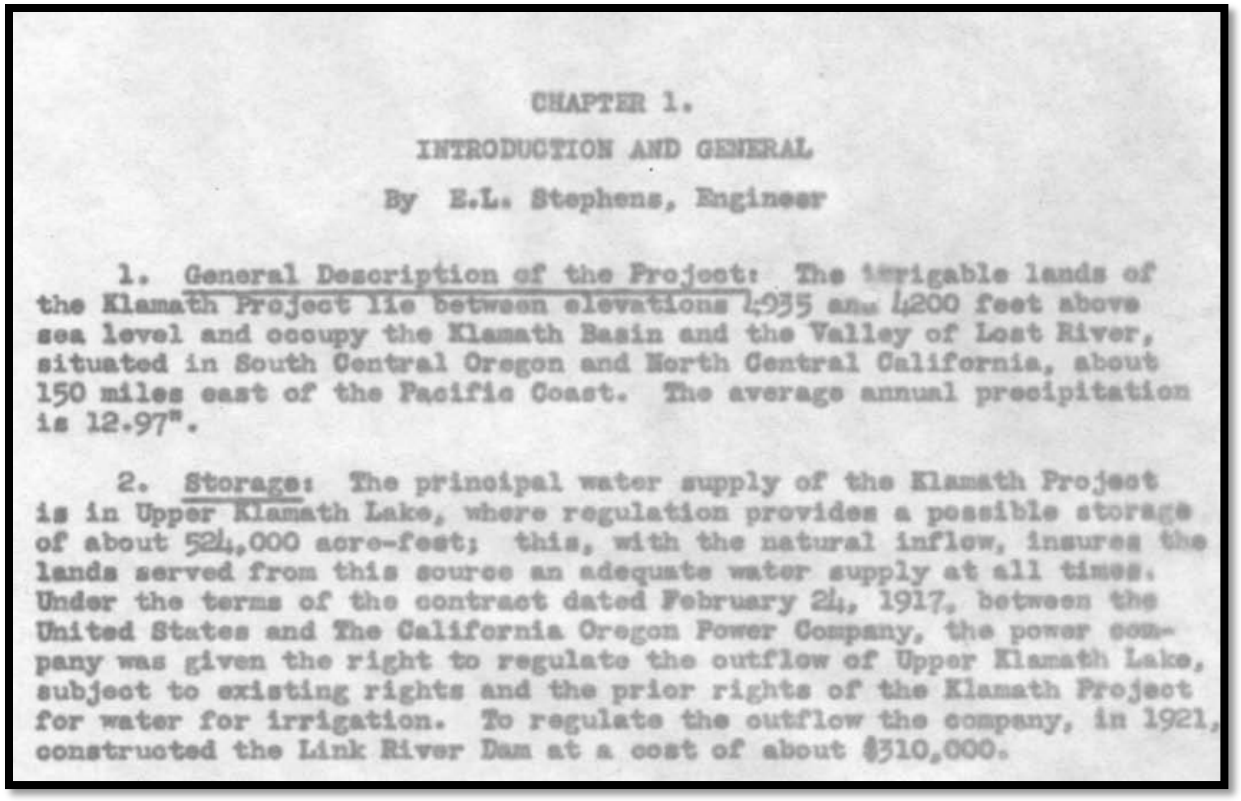


Williamson River Flows cont.
WY 2021, POR Minima

Date	POR Year	POR Minimum Daily Mean (CFS)	WY 2021 Daily Mean (CFS)
3/11	1922	580	579
3/12	1922	580	571
3/13	1922	580	566
3/14	1922	580	563
3/15	1922	580	565
3/16	1922	580	562
3/17	1922	580	572
3/18	1922	610	567
3/19	1922	597	560
3/20	1922	597	557
3/21	1922	617	569
3/22	1992	619	578
3/23	1992	614	573
3/24	1992	611	574

Figure 45 Williamson River Minimum Period of Record Inflows t Upper Klamath Lake. Williamson River is the largest and primary contributor to Upper Klamath Lake inflows.

Drought: **<u>All</u> Klamath ID water supply deficiencies since 1995 are a product of politically caused drought which are increasing in frequency and duration**. Figure 48 shows the annual in-flow of water into Upper Klamath Lake over the past 41 years. The lowest year of in-flow in this dataset is 1992, records indicate 1992 was the strongest return of Salmonoids to the Klamath River from this cohort. This was also the last year of reported sucker recruitment in Upper Klamath Lake. Figure 43 shows Klamath ID began irrigation deliveries on time, diverted 226,675 acre-feet of water from Upper Klamath Lake through the A Canal and ended the season a bit early by shutting off delivered on 10 October and curtailing deliveries to new crops/seed effective 9 September.



CHAPTER 1.

INTRODUCTION AND GENERAL

By E.L. Stephens, Engineer

1. General Description of the Project: The irrigable lands of the Klamath Project lie between elevations 4,935 and 4200 feet above sea level and occupy the Klamath Basin and the Valley of Lost River, situated in South Central Oregon and North Central California, about 150 miles east of the Pacific Coast. The average annual precipitation is 12.97".

2. Storage: The principal water supply of the Klamath Project is in Upper Klamath Lake, where regulation provides a possible storage of about 524,000 acre-feet; this, with the natural inflow, insures the lands served from this source an adequate water supply at all times. Under the terms of the contract dated February 24, 1917, between the United States and The California Oregon Power Company, the power company was given the right to regulate the outflow of Upper Klamath Lake, subject to existing rights and the prior rights of the Klamath Project for water for irrigation. To regulate the outflow the company, in 1921, constructed the Link River Dam at a cost of about $310,000.

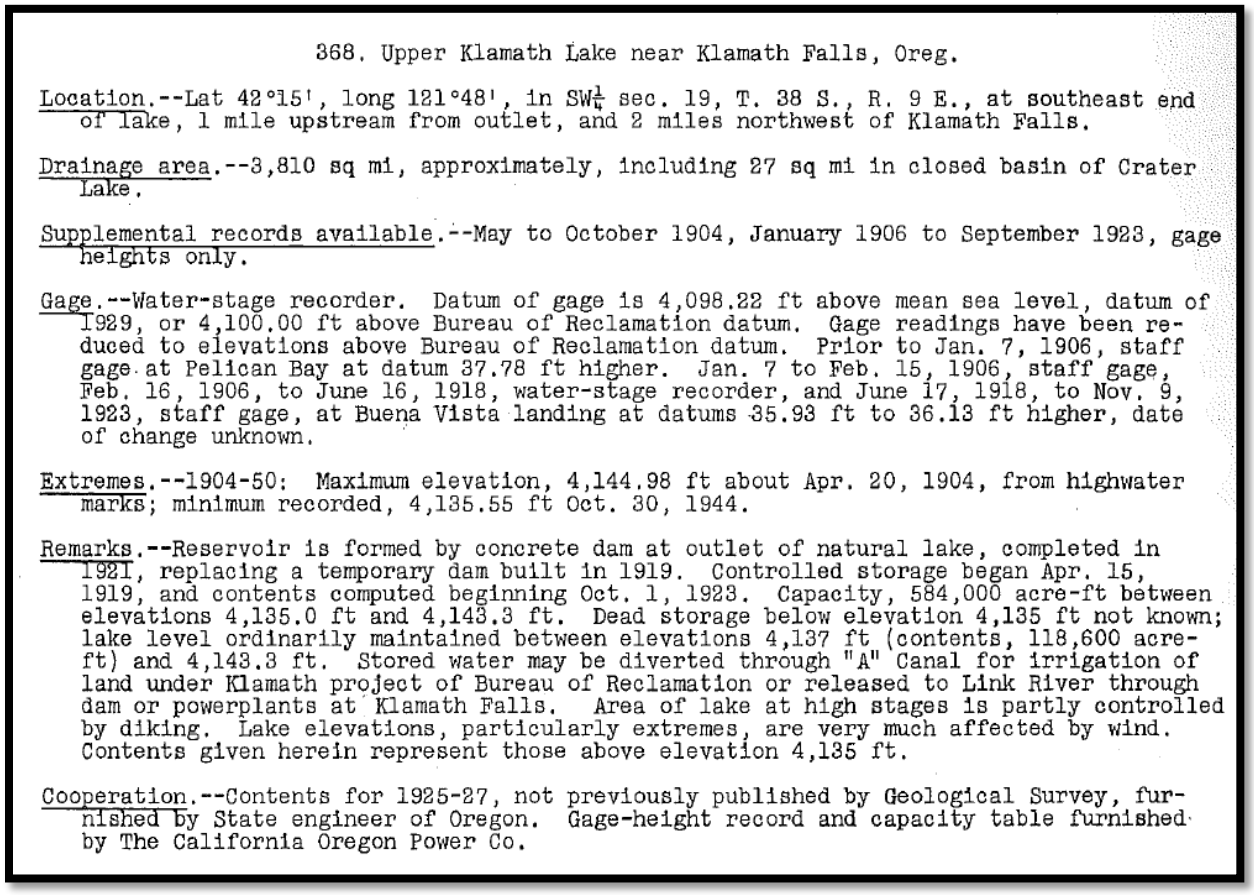
Figure 46 Klamath Project Annual Report 1942

E.L. Stephens, Assistant Engineer Reclamation states multiple times in several Klamath Project Annual Histories, "The principle water supply of the Klamath Project is in Upper Klamath Lake, where regulation provides a possible storage of 524,000 acre feet, this with the natural inflow **INSURES THE LANDS SERVED FROM THIS SOURCE AN ADEQUATE WATER SUPPLY AT ALL TIMES**." [120] (emphasis added) He stated this at the end of the 1933 irrigation water season after observing the consistently lowest recorded inflows to Upper Klamath Lake, the lowest lake elevations in 1931observed to this point, a forced Upper Klamath Lake elevation management plan in 1924, and multi-drought years. Stephens was well aware of the lowest observed hydrological conditions experienced in 1924, 1926, 1928, 1929, 1930, and 1931 when he wrote this statement (see Figures 43 and 44).

These low water years are similar to the hydrologic cycle patterns observed in 2010, 2015, 2018, 2020, and 2021. The 1933 Annual History of the Project in Klamath ID's vault has handwritten notes on page 8 of Stephens 1933 report, assuming by B.E. Hayden, Superintendent of the Klamath Project in 1933 which rewords Stephens later statement, "the surface elevation was the highest in years and project lands were assured an ample water supply at all times" to "the water surface elevation assured Project lands and abundant water supply at all times."[121]

[120] E.L. Stephens. Assistant Engineer. Reclamation. 1933. Annual Project History and O&M Report. Pg. 1

[121] E.L. Stephens. Assistant Engineer. Reclamation. 1933. Annual Project History and O&M Report. Pg 8.



368. Upper Klamath Lake near Klamath Falls, Oreg.

Location.--Lat 42°15', long 121°48', in SW¼ sec. 19, T. 38 S., R. 9 E., at southeast end of lake, 1 mile upstream from outlet, and 2 miles northwest of Klamath Falls.

Drainage area.--3,810 sq mi, approximately, including 27 sq mi in closed basin of Crater Lake.

Supplemental records available.--May to October 1904, January 1906 to September 1923, gage heights only.

Gage.--Water-stage recorder. Datum of gage is 4,098.22 ft above mean sea level, datum of 1929, or 4,100.00 ft above Bureau of Reclamation datum. Gage readings have been reduced to elevations above Bureau of Reclamation datum. Prior to Jan. 7, 1906, staff gage at Pelican Bay at datum 37.78 ft higher. Jan. 7 to Feb. 15, 1906, staff gage, Feb. 16, 1906, to June 16, 1918, water-stage recorder, and June 17, 1918, to Nov. 9, 1923, staff gage, at Buena Vista landing at datums 35.93 ft to 36.13 ft higher, date of change unknown.

Extremes.--1904-50: Maximum elevation, 4,144.98 ft about Apr. 20, 1904, from highwater marks; minimum recorded, 4,135.55 ft Oct. 30, 1944.

Remarks.--Reservoir is formed by concrete dam at outlet of natural lake, completed in 1921, replacing a temporary dam built in 1919. Controlled storage began Apr. 15, 1919, and contents computed beginning Oct. 1, 1923. Capacity, 584,000 acre-ft between elevations 4,135.0 ft and 4,143.3 ft. Dead storage below elevation 4,135 ft not known; lake level ordinarily maintained between elevations 4,137 ft (contents, 118,600 acre-ft) and 4,143.3 ft. Stored water may be diverted through "A" Canal for irrigation of land under Klamath project of Bureau of Reclamation or released to Link River through dam or powerplants at Klamath Falls. Area of lake at high stages is partly controlled by diking. Lake elevations, particularly extremes, are very much affected by wind. Contents given herein represent those above elevation 4,135 ft.

Cooperation.--Contents for 1925-27, not previously published by Geological Survey, furnished by State engineer of Oregon. Gage-height record and capacity table furnished by The California Oregon Power Co.

Figure 47 United States Geological Survey Report 1950 page 826

30 October 1944 is the lowest recorded elevation on Upper Klamath Lake. Datum discrepancies between the United States Geological Survey and Reclamation indicate the lake was at 4135.55 feet above sea level using Reclamation datum; Reclamation records, utilizing USGS data indicates the level was 4137.55 feet above sea level. Regardless of the level, there were no reported Project irrigation shortages, nor impacts to Klamath River flows, nor fish, nor other environmental damage identified in either the 1945 nor the 1946 Reclamation Annual Reports. **"While the inflow into project reservoirs was only about 77 per cent of average, the project had an ABUNDANT supply for all irrigation requirements and ended the irrigation season with about 336,430 acre feet hold-over storage for 1945**."[122] This sentence was repeated in the 1945 annual history with 356,750 acre-feet hold over storage for 1946. **It is clear, in reading Reclamation's historical operations reports, supply deficiency is not the problem in the Klamath Basin.**

[122] Reclamation. Klamath Project Annual History 1944. Part III, Pg. 2

2. Description of the water supply situation that cause water deliveries to be limited or curtailed (OAR 690-086-0260.2):

Supply deficiencies are solely a product of political climate change. Prior to the Project subjugation to poor Agency interpretation of the Endangered Species Act, the Project supply was never deficient. Identified factors for supply deficiencies for Farmers since 1991:

- Changing political climates creating policies to intensify drought impacts
- Federal Agency decisions and policies which ignore Oregon State water law
- Loss of power or failure of a recycle pump
- Ditch breaks
- Aquatic weed growth in canal limiting capacity
- Unusually hot weather increasing summer demand impacting fall/winter supplies

Reclamation is contractually obligated to provide a sufficient supply for the Project's repayment contractors, Klamath ID and Tulelake ID.[123] The amount of Project surface water from Upper Klamath Lake and Klamath River needed to satisfy the demands of Klamath ID and Tulelake ID is based on a number of factors, such as current and projected hydrologic conditions, anticipated return flow patterns, particularly through the Lost River drainage, and existing cropping patterns. Reclamation estimates the available Project Supply from Upper Klamath Lake and the Klamath River is sufficient to meet the full irrigation demands of Klamath ID and Tulelake ID[124]. Historically, Reclamation notifies Klamath ID of actions to take in regards to other Reclamation contracts Klamath ID serves and has claimed responsibility for updating allocations based upon best available information.

In 1924, Reclamation issued its first drought plan for the Upper Klamath Lake watershed. This plan was issued two years after the completion of the Link River Dam, and after record low inflows to Upper Klamath Lake in 1922 and 1923 similar to conditions observed in 2020 and 2021. This plan limited releases from Link River Dam for water-rights holders with junior rights to the Project. The 1924 plan directed COPCO to limit releases across Link River Dam for power generation purposes and to maintain daily lake elevations through 1 September 1924.[125] **No limits were placed upon the irrigators** when Reclamation was building, operating, and maintaining the system and Klamath ID patrons were in a repayment contract.

Even in the worst prolonged drought period on record from 1930 to 1935, the A Canal was delivering full demand of up to 219,000 acre feet annually to irrigators and delivering between 579 to 886 cfs through Link River to the Klamath River meeting ALL requirements.[126]

Beginning in 1975 with the initial litigation of *United States vs. Adair*, the supply deficiencies have been subject to a changing political climate. These issues are further

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[123] Reclamation. 2018. https://www.usbr.gov/mp/kbao/programs/docs/2018-klamath-project-drought-plan.pdf

[124] Reclamation. 2018. https://www.usbr.gov/mp/kbao/programs/docs/2018-klamath-project-drought-plan.pdf

[125] Herbert D. Newell. Reclamation. 1924. Annual Project History and O&M Report for 1924.

[126] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.

complicated by changing administration and Agency policies to implement and expand the Congressional intent of the Endangered Species Act.

In 1990, Reclamation issued its second drought plan for the Upper Klamath Lake watershed. This plan did not predict any irrigation shortages; the plan recommended conservation measures to be considered.

Subsequent Reclamation drought plans issued to Klamath ID simply articulate priority of delivery by Reclamation contract dates as the primary method for responding to changing water management policies at the federal level.

Unfortunately, in political situations, similar to those observed in 2010 when limited water was made available by Reclamation to initially get crops started, Reclamation issued drought plans to Klamath ID to specifically curtail deliveries to all its B and C contractors in the spring and reduced supply to a point in which taxpayers were forced to pay for ground water pumping for 125,000 acre-feet of water and idling ground for 18,000 acres

In 2014, Reclamation issued Klamath ID a drought plan directing the District to provide no rental water deliveries and limited "B" contracts to 1 acre-foot per acre. Records indicate Klamath Irrigation District facilitated water transfer applications through Reclamation to move "A" contract water to more fertile and productive "B" contract lands.

In 2015, Reclamation again issued Klamath ID a drought plan directing the District's responsibilities in relation to various Reclamation contracts. Reclamation directed no water deliveries to "B" contractors, nor rental contracts. Records indicate Klamath Irrigation District again facilitated water transfer applications through Reclamation to move "A" contract water to more fertile and productive "B" contract lands.

In 2016, Reclamation's solicitor wrote an opinion that all water bank and other water conservation funding opportunities where inappropriate in the Klamath Basin which **eliminated the Water User Mitigation Program** administered by the Klamath Water and Power Association, a non-profit organization. Reclamation's solicitor opinion is likely the sole cause of destruction the programs to minimize impacts of water shortages. The contract was terminated and funding for water conservation programs was eliminated; the Klamath Water and Power Association was forced to be dissolved.

Klamath ID with other stakeholders lobbied Congress for relief to Reclamation's solicitors removal of the Water User Mitigation Program. Congress responded and declared $10M, on average, would be made available to the Klamath Basin to mitigate short water supplies. Reclamation's solicitor's interpretation of the new law purposefully disallowed the approved funding from being directly available for water shortage mitigation.

In 2018, Reclamation issued Klamath ID another drought plan directing a late start to the irrigation season. As the Klamath Water and Power Association was no longer available to facilitate the coordination of a basin wide water bank, ground-water pumping, or idling program, the three largest irrigation districts in the Project initially formed and funded a new non-profit organization known as the Klamath Project Drought Response Agency.

In 2020, another Reclamation issued drought plan severely limited and then eliminated Klamath ID responsibilities to Reclamation "B" contractors. This drought plan further reduced the amount of water available to "A" contractors which required Klamath ID to conduct daily synchronization with other Reclamation diverting districts to stretch the limited supply for crops

that were already in the ground. Klamath ID was forced to the shut-down of the C-Hydropower Plant due to low flows. Patrons within Klamath ID boundaries idled nearly 9,000 acres through the landowners applying for assistance from the Klamath Project Drought Response Agency Program.

In both 2018 and 2020, Project irrigators had to voluntarily sell water to the United States Fish and Wildlife to receive funding for the Klamath Project Drought Response Agency. The puddle of the adequate amount of stored water Reclamation had stored under KA294 provided to irrigators had to be further reduced to fund programs for idling acres and offsetting the cost of placing a pull on our ground water to meet demands. In 2020 over 39,000 acres of land were idled across the district. Over 14,000 acre feet of water had to be sold, and not put to beneficial use, to gain access to funds Congress had allocated for helping the Basin, as the United States government wasted over 439,000 acre feet of water between April and September (more than the entire live inflow) by sending it directly to the ocean without beneficial use. The idled lands were compensated with only $185 per acre which did not cover the cost of the mortgage, irrigation district assessments, weed control, and sunk costs in seed fertilizer, equipment and labor.

In 2019, Reclamation did not issue a drought plan for any of its contractors; in 2020, Reclamation directed Klamath ID and other district to abide by its drought plan found at https://kwua.org/2020-annual-operations-plan-drought-plan/. However, even with a 132% snow pack, and over 100% of average precipitation to start the 2019 irrigation season, the Project was limited to 322,000 acre feet (of the maximum 350,000 acre feet cap imposed by Reclamation in 2019) of water for agricultural purposes (a 77.5% reduction to the Oregon adjudicated water-right of 570,110 acre feet). This maximum was further decreased by 23,000 acre feet by Reclamation through negotiation with environmental extremists in 2020.

Past practices of Reclamation indicate Federal Agencies prefer to take action at the Federal level to allocate reduced water supplies. In 2018, 2020, and 2021, Reclamation curtailed deliveries to its "B" and "C" contracts while sending water to in-stream purposes not authorized by Oregon Water Resources Department's ACFFOD while legitimate KA1000 water right holders were curtailed.

Reclamation policy is expected to continue to direct irrigation water shortages across the Klamath Project impacting Klamath ID. As adjudicated in claim KA294, Reclamation holds the right to store water in Upper Klamath Lake **up to 570,110 acre feet of water for EXCLUSIVE irrigation use and is tasked with ensuring sufficient storage** by the Klamath Basin Adjudication's Amended and Corrected Findings of Fact and Order of Determination (ACFFOD) and our 1954 contract with Reclamation.

Reclamation is subject to political pressures to reallocate the farmers stored water and live flow under claim KA1000, 1001, and 1004 to other purposes which then create supply situations for Klamath ID and other irrigators. Reclamation determines the triggers for these allocations which are adaptive change bi-weekly.

Warnings and public notices are usually delayed until Reclamation announces allocations in their annual plan with any additional restrictions; these announcements from Reclamation have typically occurred after the first of April when farmers have already invested in seed, labor, and equipment. These notices are posted on the Klamath Irrigation District website, sent out in newsletters, and communicated through the Klamath Water Users Association network.

Listing a fish species does not usurp property rights guaranteed by the 5th Amendment to the Constitution without just compensation. The water shortages Klamath ID has experienced since 2001 to present is a clear violation of the 5th Amendment as the federal government has taken water property from farmers without just compensation for the take.

a. District's current year water shortage policies

Water shortages for Klamath ID in 2021 is primarily caused by political climate change, poor federal policy, and OWRD failures. Klamath ID has informed its users, contractors, and other stakeholders to encourage action to maximize available resources for beneficial use. Klamath ID has informed its Patrons that Reclamation has unlawfully directed a delayed start date, prohibited Klamath ID from making any diversions until otherwise directed, and issued threats to the District, its officers, and its patrons.

Reclamation has not yet directed a drought plan for 2021; however, had directed Klamath ID to not divert water during the critical germination period when most crops can best put the water to beneficial use. There was 332,337 acre-feet currently stored in the lake. Water available for irrigation use is currently being released into the Klamath River without being placed into beneficial use and Klamath ID is prohibited from taking a drop.

The Klamath Project Drought Response Agency, is currently working to secure a contract with Reclamation, provides the Klamath Project Districts with the communication platform to declare emergencies, and is the sole agencies to provide resources to offset the impacts of a shortage in the Klamath Basin. The mission of the Klamath Project Drought Response Agency is specifically to balance supply and demand. Klamath ID relies heavily upon the Klamath Project Drought Response Agency to perform this function as the District does not have the staff, nor resources to pursue, independently of the 17 other Klamath Project districts within the program.

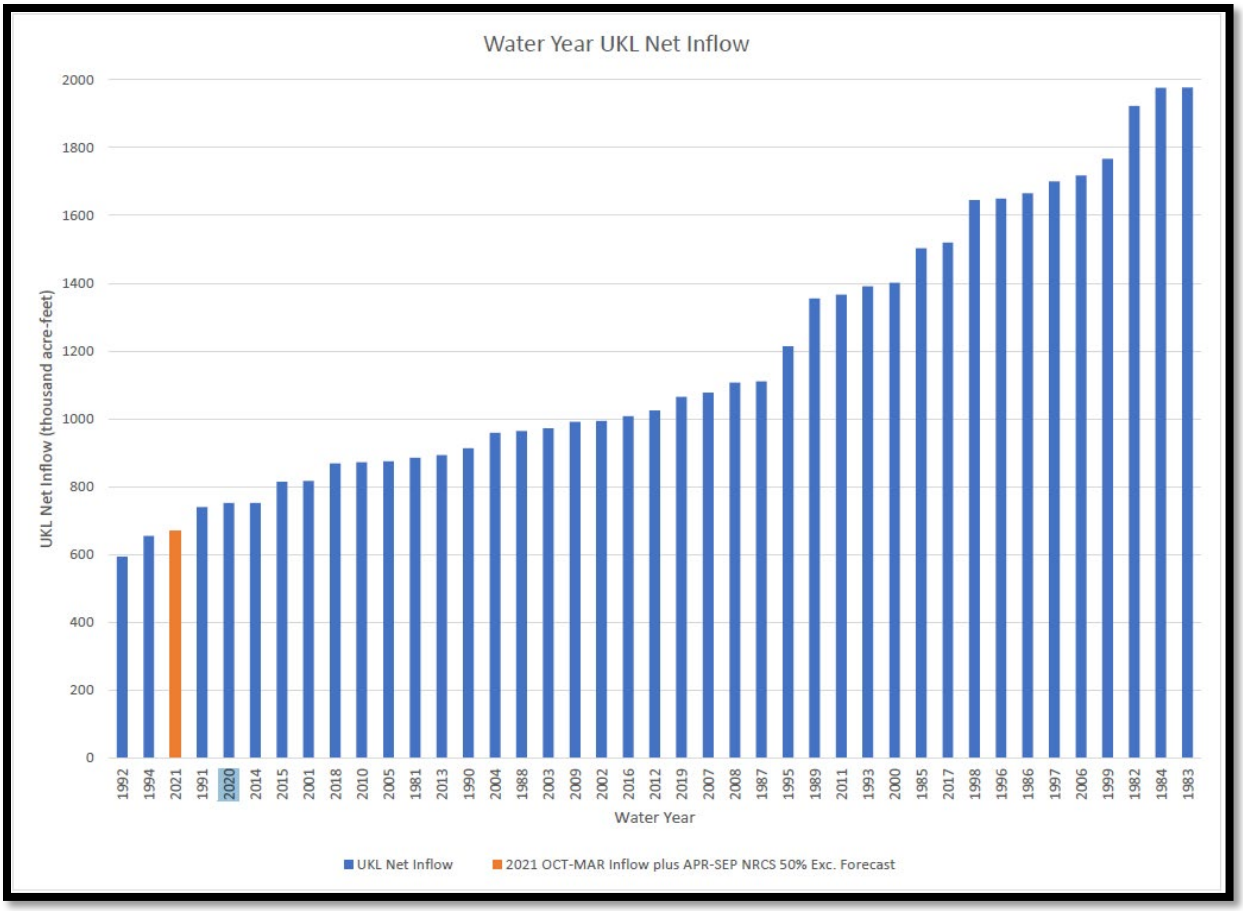

Figure 48 The Past 40 years of Net Inflow to Upper Klamath Lake demonstrate that hydrologic conditions are not the problem for supply. Irrigation requirements were being met to a large part in low precipitation years such as 1922, 1924, 1931, 1933, 1944, 1992, 1994, and 1991. All of these years were worse than 2001 and prior to the politically caused drought policies and management.

b. Describe how reduced water supplies are allocated (OAR 690-086-0260.3)

Litigation: Klamath ID anticipates Reclamation and OWRD policies will create future periods of inadequate water supply to divert and deliver irrigation water as experienced in 2001, 2010, 2014, 2015, 2018, 2020 and 2021. Political and policy created water shortages will result in Klamath ID modifications to delivery policy based upon directives from Reclamation and prioritization of water rights under Oregon law and litigation when property rights are ignored.

Maintenance: When conditions occur which impact deliveries to Farmers, impacting their lively hood, and a $195,000,000 market value[127] is attacked, Klamath ID takes immediate action to address the problem. In most cases not involving political decisions, normal deliveries are not interrupted for more than a few days as the maintenance team addresses repairs. Negotiation ad litigation with those who create the water supply shortage is time consuming.

Backup / Secondary Supply: None!!! Klamath ID does not own any wells. Furthermore, Klamath ID has been told OWRD has denied applications for private landowners to develop new

[127] USDA. 2017. 2017 Klamath Basin Census of Agriculture.

irrigation wells in the Klamath Basin, and many approved applications have been prohibited by OWRD from being completed. Utilizing well water is not an option for the District to meet demand. As the Klamath Project infrastructure was developed, Klamath ID is entirely dependent upon surface water stored for the specific use of irrigation under KA294 which is currently being withheld from Klamath ID for political reasons in violation of Oregon State law and the 5th Amendment.

Klamath ID works with property owners to assist in the physical transfer of groundwater through the canal system to authorized lands.

Emergency Declaration: Klamath ID offers that since 2001, every year in the Klamath Basin seems to be an emergency. Since 2013 Reclamation has failed to follow Oregon State law artificially creating emergency conditions. Declaring a District emergency is just ineffective; the emergency declaration requires both Oregon and California governors to issue a declaration after our County Commissioners have asked for assistance once Reclamation announces they do not plan to follow Oregon State law. OWRD is not listening to the alarm.

Reclamation has historically published their supply determination on the 1st of each month in April, May, June, and July. These supply determinations generally identify if there is enough supply for all contracts, or is accompanied by a letter to Klamath ID to notify which contracts Reclamation is limiting or curtailing. These letters inform the need for the allocation of available funds provided to the Klamath Drought Response Agency recently formed in response to the disbanding of the Klamath Water and Power Association which previously handled funds used for supplemental water pumping.

Priority: If Reclamation does not issue a drought plan, Klamath ID follows the seniority water rights previously described and directed by Reclamation as outlined in the 2018 Drought Plan.[128] Those landowners and Districts with lower priority water rights will be curtailed from those with more senior rights. Klamath ID tracks water deliveries to ensure water is applied in accordance with contracts and Oregon law. When duties are reached, Klamath ID informs farmers and begins curtailment of irrigation water.

Water deliveries should be allocated by priority as outlined in Oregon State Water Law and informed by the Klamath Basin Adjudication's Amended and Corrected Findings of Fact and Order of Determination (ACFFOD). Historically, Reclamation dictates water supply allocations to the Project and Klamath ID. Reclamation published reduced allocation plans to Klamath ID in 1991, 1992, 2010, 2012, 2014, 2015, 2018, 2020, and 2021. In the event of a water shortage which Reclamation does not issue directives, the Klamath ID Board of Directors will provide the final decision for curtailment and allocation of water within Klamath ID and our supported contracts.

Unfortunately, Reclamation's grading system is difficult to implement at the operational level as the "B" ground is often intermingled with "A" ground utilizing the same turnout on the same tax lot; "A" ground and "B" ground are not distinguished by separate tax lots and with modern irrigation practices, oftentimes difficult to discern without professional grade surveying equipment. To further complicate the problem, our water ordering system, technical water

[128] Reclamation. 2018. https://www.usbr.gov/mp/kbao/programs/docs/2018-klamath-project-drought-plan.pdf

tracking systems, and water management systems are separate, requiring diligent oversight by our District water master.

In allocating the available Project water supply from Upper Klamath Lake and the Klamath River, the first consideration is the Van Brimmer Ditch Company (VBDC) which obligates Reclamation to deliver fifty (50) cubic feet per second (cfs) of water from April 15 to October 1 of each year through the C Canal operated by Klamath ID, in satisfaction of the water rights VBDC originally claimed to waters from Lower Klamath Lake and the Klamath River established in 1883 and have a1909 Settlement Contract between the United States and the Reclamation interprets this settlement contract as requiring that VBDC's right to 50 cfs must first be satisfied before water is made available to the remainder of the Project. The next consideration is claim KA-1004 for the Henley Ankeny lands at 49cfs. The VBDC and Henley Ankeny requirements demand generally represents a small portion of total Project demand.

Rotational Use System: In times of short water supply, over demand on certain sections of the delivery system, or other causes, water delivery may be based upon a rotational use system or as directed by its board of directors.

Rate Limitations: Klamath ID Board of Directors may modify policy to limit the amount of monthly irrigation water available per acre.

Klamath ID policy does not assess the type of crop or need to formally distinguish water deliveries; the water provided must be used only for irrigation and in "a beneficial manner and without waste". Klamath ID provides operation and maintenance of federal facilities under contract. It is Reclamation's contracts and ever-changing directives which make establishing stable water allocation procedures beyond a reasonable expectation for Klamath ID. As per the Klamath Basin Adjudication, Reclamation holds the water right to store water in Upper Klamath Lake for Klamath ID and other Project stakeholders in accordance with the water right established in claim KA-294. Reclamation does not have an established water right to put this water to beneficial use, that right remains with the Districts and individual contractors with claim to its waters. However, Reclamation routinely denies legal water right holders, Districts, and Oregon citizens, access to the stored water and live flow through ever changing policies. Klamath ID has no ability to predict how to "allocate water" due to a Reclamation induce shortages for any plan longer in duration than the ability of Reclamation to write a memo.

2. District's current year policies that address wasteful use of water and enforcement.

Any landowner who wastes water by flooding or sprinkling roads, vacant lands, neighboring properties, or land previously irrigated, or who wastes water in any other way, either willfully, carelessly, or on account of defective or inadequate canals or other conduits or facilities or inadequately prepared land, or who floods a portion of land to an unreasonable depth or amount to properly irrigate other portions will be subject to District enforcement as outlined in pages 17-20 of the Patron Water Management and Delivery Policy provided in Attachment B.

3. Description of causes for water allocation curtailment implementation (OAR 690-086-0260.2)

Causes for allocation curtailment implementation is subject to actions by changing political agendas. Reclamation utilizes a closely held, cyclic, analytical process to anticipate irrigation demand and determine available supply.

I. Evaluate Policies of Regulatory Agencies

1. Discuss modifications and solutions for improved water management

a. Progress report on conservation measures 1905-2019 (OAR 690-086-0250.1)

As outlined by David's Engineering Inc[129] in 1998, the overall efficiency of the Project design is 92%. As this applies to Klamath ID, all tail water and spill water from the District is recaptured or put to beneficial use by other Districts.

1905-1999: Efforts primarily focused on reducing subbing in the larger canals across the District by reconstruction and compaction of the original canal embankment or adding concrete lining as appropriate. Additional efforts were made to replace or build checks and staff gauges for more precise control of the water flow. The Adams and E-Canal Flumes were replaced with siphons. Pumps were introduced to the original system in an effort to recapture and recycle drain and spill waters.

2000-2003:

(1) Fish Screen: Reclamation installed a $17.6M fish screen on the A Canal headworks.
(2) Education: Klamath ID became actively involved with a number of conservation education programs supported by various partners. Of significant value, the District participated in education opportunities provided by the Irrigation Training and Research Center (ITRC), California Polytechnic State University.
(3) Canal Relining: As funds allowed.

2003-2008:

(1) Installment of rudimentary SCADA system: Intended to provide a more responsive and measured control of the irrigation system. These systems are now obsolete with Microsoft's decision to no longer support the Windows 7 operating system and 20-year-old programmable logic controllers.
(2) Effective aquatic weed control herbicides proved beneficial for water conservation; however, the effective herbicides are no longer legal to use.
(3) Education: Klamath ID participated in an ITRC modernization study which found most of the conservation improvements had already been made by Klamath ID.
(4) Piping: 6.34 miles of HDPE pipe installed in urban areas with funding assistance by Reclamation. Reclamation did not provide funding to develop a pressurized system to maximize efficiencies.
(5) Lining: 200 feet of concrete lining replaced.
(6) Communications: In 2006, cell phones improved communications for greater flexibility in water deliveries.
(7) Aqualast Polymer application: Reduced leaks in C Canal Flume
(8) Installation of Variable Speed Drives on pumps: Poor electrical design increased pump failure rate.
(9) Solar Power Installation: Two 10KW arrays installed.
(10) Piping 4000 feet of the E Canal reduced notable seepage.

[129] Davids Engineering, Inc. 1998. Klamath Project Historical Water Use Analysis.

2009-2011:

(1) Water Supply Reliability: Participated in the OWRD Klamath Basin Adjudication.
(2) Upgraded Water supply curtailment plan in association with the On Project Plan: Delayed due to OWRD Klamath Basin Adjudication. Abandoned with the failure of the Klamath Water and Power Agency's efforts to implement the On Project Plan.
(3) Replaced turnout structures to improve flow measurement: Minimal progress as higher priority maintenance costs prohibited investment in replacing functional structures.
(4) Relined portions of the C-Canal as risk mitigation: 2200 feet relined
(5) Relocated the #9 spill on the D Canal: Complete. Poor engineering of the redesign increases risk to railroad, highways, and adjacent farmland.
(6) Upgraded and automated Upper C Gate structure with C-drop Hydro: Complete. Not fully integrated with outdated SCADA system.
(7) Site solar installations to produce revenue: Not viable.
(8) Installed Variable Speed Drives on North and South Poe Valley pump stations to assist in recycling water: Poor electrical design increased pump failure rate and operational cost in addition to **rising power costs reduced the amount of recycled water as shown in the table below.**

Year	Acre Feet of Spill Water Recovered by N.Poe VFD Pump	Power Costs	Cost per Acre Foot
2004	2,540	$663.62	$0.26
2009 VFD	942	$1,008.77	$1.07
2011 VFD	865	$1,054.41	$1.22
2019 VFD	282	$2,645.64	$9.38

Year	Acre Feet of Spill Water Recovered by S.Poe VFD Pump	Power Costs	Cost per Acre Foot
2004	10,557.5	$3,730.80	$0.35
2009 VFD	4,300	$5,778.55	$1.34
2011 VFD	7,083	$18,678.65	$2.63
2019 VFD	5,177	$34,129.96	$6.60

Note: The increase in power costs is directly correlated with less efficient operations; less water is being recovered by pumping due to extreme increases in power costs since 2006.

Note: These costs do not include maintenance on the pumps. In 2019 and 2020, Klamath ID has spent nearly $70,000 in maintenance for the S. Poe Valley Pump Station.

2012-2019

(1) Klamath Basin Restoration Agreement (KBRA) – Failed to be supported by Congress The KBRA failed in conservation efforts requested by Klamath ID as now a gross amount of water is being released by Reclamation over Link River dam without going to any beneficial use. Although Klamath Water Users Association (which Klamath ID is a member) supported and lobbied for the KBRA to go forward to conserve water, Congress failed to fund the program and thus undermined this conservation effort at no fault to Klamath ID.

(2) Water Supply Reliability: The 2013 ACFFOD confirmed claim to water rights. The 2013 ACFFOD is being ignored by Reclamation and other Federal government agencies and OWRD. This legal document which Klamath ID is party to identifies that Reclamation has the authority and responsibility under KA294 to store water in Upper Klamath Lake for the sole purpose of irrigation, a critical element to our conservation plan. OWRD is failing to hold Reclamation accountable to prevent the unlawful release of water stored for the sole purpose of irrigation from being released for in-stream purposes and thus undermining this conservation effort which Klamath ID argued for and provided justification for conserving water in Upper Klamath Lake. Both Reclamation and OWRC are directly contradicting this conservation measure.

(3) Installed C-Hydro Facility. The C-Hydropower facility improved the efficiency of controlling the level on the A Canal across 9 miles of open canal. Prior to the C-Hydro facility controlling the level on the A Canal, adjustments to water releases were needed on a routine basis to create head pressure on the B Canal headgates to push water uphill across the Olean gap. By having a control structure maintain a static water level, additional releases from Upper Klamath Lake are not necessary to achieve this effect.

(4) Replaced C Flume with C Siphon. The concrete C-Flume structure was leaking an insignificant amount of water from its 100-year-old seams. This federally mandated $7,000,000+ project eliminated this insignificant loss.

(5) Replaced Olene Flume liner. Similarly to the C Flume, the Olene Flume liner was leaking about the same amount of water as the C-Flume structure over a shorter distance. While a majority of this water was recaptured in the Lost River, the replacement of the liner in the Flume eliminated this loss and prevented damage to the structure.

(6) Changed Aquatic Weed Control Herbicide: Less effective than previous measures. The requirement by Federal and State agencies to eliminate the use of the effective magnicide product from the Klamath Irrigation District toolbox, and replace it with a less effective product, has resulted in additional water being required to push water through a heavily vegetated, warm, canal system. This government directive significantly undermined this conservation effort by Klamath ID.

(7) Water reuse and return flows:

Capturing spill water with recirculation pumps is a common practice to improve conservation and efficiencies. The utilization of these pumps over time has proven effective. However, the Oregon PUC allowing for significant increases in power costs since 2006 has resulted in a cost / benefit challenge for the District. More conservation and efficiencies gained by running these pumps significantly increases the cost to annual assessments per acre as required by ORS 545 resulting in higher costs to farmers to produce the same or less benefit.

In 2004, the District average pumping costs for recycling water was under $10,000.
In 2019 the cost to recycle less water exceeded $105,000.
In 2020 the cost to Oregon tax payers to recycle water exceeded $167,000.

b. Description of Klamath ID water measurement program (OAR 690-086-0250.2)

Klamath ID's water measurement program complies with the measurement and reporting standards in OAR 690, division 85. The Programable Logistic Controller (PLC) with Accusonic flow meter at the A Canal Headworks and the G.E. Panametrics ultrasonic flow meters at the Miller Hill Pumping Station are 99% accurate. SonTec 1500 SL devices are utilized to measure flow in a few major canals when conditions allow. The weir method is utilized on canals and laterals.

Klamath IDs SCADA system, when operational, provides daily reports to Reclamation and Oregon Water Resources Department from the A Canal and Miller Hill Pumping Station diversions. These reports were previously sent to USGS via file transfer protocol (ftp), the current report is available in near-real time through One Drive. Klamath ID's Water Master provides annual reports to OWRD.

c. Description of other conservation measures currently implemented (OAR 690-086-0250.3)

See Section I.I.1.a

d. Short term goals of Klamath ID to improve water management (OAR 690-086-0250.4)

Recent improvements in water management SCADA technologies will allow for greater opportunities to enhance conservation stewardship, stretch scarce water supplies, and inform operational decisions. Klamath ID seeks to expand, enhance, and update its SCADA water management system in 2020.

Reclamation's *Master Development Plan*, *Conceptual Overview of System Improvements for the Klamath Project,* dated March 2008 by the Irrigation Training and Research Center (ITRC) includes Category 1 recommendations for new monitoring stations and office SCADA improvement which are included in this project. Reclamation's Master Development Plan was created by Dr. Charles Burt and Beau Freeman of California Polytechnic State University.

In October 2018, Klamath ID entered into a partnership with Farmers Conservation Alliance to begin exploring opportunities to modernize the irrigation system. This SCADA installation will inform future projects not included in this work.

In July 2019, Klamath ID entered into contract with Sierra Controls to inspect and

evaluate the current water management system controllers to provide recommended solutions to install automation components and measuring devices to improve water savings, reduce spills, and reduce over-deliveries at critical points in the system. This effort will also positively impact the other seven irrigation districts linked to Klamath ID. See Annex C for additional information on the planning work done with Sierra Controls.

Both ITRC and Sierra Controls identified SCADA improvements are needed at the A Canal headworks to reduce over deliveries and allow for the installation of an integrated control system from the Klamath ID headquarters to improve operational efficiency. The A Canal flows southeast for about 9 miles where it terminates and delivers water into the B Canal and the C Canal.

Both studies indicate additional sensors are needed along the A Canal to reduce over-deliveries to the B and C Canals. Discharges and diversions along the A Canal inhibit an accurate measurement of water being delivered to the B and C Canals.

Improvements to the B Canal SCADA system are required to allow for an automated integrated control system from the Klamath ID headquarters to improve operational efficiency. The B Canal flows east about 4 miles where it terminates and delivers water into the E and F canals. The current system is manual and inefficient, and provides inaccurate flow rates.

Improvements to the C-Drop SCADA system are required to allow for an automated integrated central control system from the Klamath ID headquarters to improve operational efficiency and reduce spill. The current system is manual and spills over-deliveries into the Upper C Canal with no automated reporting to the headquarters resulting in inefficient deliveries.

The existing SCADA system on the C Canal requires automation upgrades to integrate with the installation of remote controllers on the existing C-Siphon gates which will integrate with modernized central control system at the Klamath ID headquarters. Water flows south from the C-Hydro about 1 mile to the C-G Cutoff, continues southwest about 2 miles to C-4 Lateral, and flows to the west.

The spill of the C Canal is currently not monitored. Installation of sensors which report back to the Klamath ID headquarters at the C Canal spill will improve opportunities to capture water savings by reducing spill and informing Tulelake Irrigation District operations to adjust diversions from Station 48 on the Lost River Diversion Channel.

Existing SCADA systems at the C-G Cutoff are not efficient, and do not allow for remote operation of the mechanical devices. A new SCADA package is needed at the C-G Cutoff to reduce over deliveries and reduce spill.

Improvements to the D Canal (aka Covington Station) is required to allow for an automated integrated central control system from the Klamath ID headquarters to improve operational efficiency and reduce spill. Below the C-G Cutoff, the G Canal flows southeast about 8 miles to discharge into the D Canal.

Installation of sensors, which report back to the Klamath ID headquarters at the D Canal spill, will improve opportunities to capture water savings by informing Tulelake Irrigation District operations to adjust diversions from Station 48 on the Lost River Diversion Channel. The spill from the D Canal goes directly into the J Canal operated by Tulelake Irrigation District. Currently the D Spill is uncensored and over-deliveries result in increased spill and operational cost for pumping by Tulelake ID.

The Number 1 (#1) Drain captures storm water, spring water, and irrigation runoff which is then deposited into the Lost River and delivered to Klamath ID patrons along the river, the City of Merrill, and Tulelake ID. The #1 drain currently is not monitored in real time. Installing remote sensors, which report back to Klamath ID and Tulelake ID headquarters in real time allows for both districts to adjust operations, reduce unneeded diversions, and attempt to recapture spill without waste.

The Number 5 (#5) Drain captures storm water, spring water, and irrigation runoff which are then deposited into the Lost River and delivered to Klamath ID patrons along the river, the City of Merrill, and Tulelake ID. The #5 drain currently is not monitored in real time. Installing remote sensors, which report back to Klamath ID and Tulelake ID headquarters in real time allows for both districts to adjust operations, reduce unneeded diversions, and attempt to recapture spill without waste.

The District has seven reuse pumping stations (Miller Hill, Stukel, Adams, South Poe Valley, North Poe Valley, Melhase Ryan, and the #5 Pump) with a total of 17 pumps. These pumps require SCADA upgrades to facilitate corrections to water deliveries from a centralized SCADA operations system.

Due to the extensive drainage system, reuse of operational spills, losses and agricultural return flows, combined with the interdependency of Districts on these flows, it is difficult to monitor and evaluated the effectiveness of one particular conservation effort. Implementing conservation efforts without fulling understanding second and third order effects have a negative and lasting impact on other District activities.

e. Long-term goals of Klamath ID to improve water management (OAR 690-086-0250.4)

The vision of Klamath ID is to work with Farmers Conservation Alliance to modernize the irrigation system, which includes an intent to pipe areas of the project to reduce required operational spill, eliminate seepage, minimize evaporation, reduce weed control expenses, and pressuring the system to reduce power costs. Piping is not viable in some areas and may impact the recharge of some ground water wells. In these areas Klamath ID anticipates adding a rubberized lining to reduce seepage or to add turnouts to wells which are known to recharge from the irrigation canal system.

Overall Project reduction in water use is difficult to measure on a yearly, semi-yearly basis. The number of variables with temperature, precipitation, crop changes, weed abatement, and political climate make projecting savings a complicated matter requiring decades of analysis.

In general, piping and lining of canals is likely to reduce seepage, evaporation losses, and reduce aquatic weed control needs. Assuming an initial significant investment, annual operations and maintenance costs could decrease for a short period depending on the material used; Reclamation's current CAT II requirement to replace 250+ feet of concrete liner per year taxes the maintenance team's ability to add additional lining projects. Concrete liners are not cost effective in the Klamath ID as the **winter conditions in the Klamath Basin greatly deteriorate the integrity of the concrete.** Installation of new structures, staff gauges, telemetry, flow meters, automated controllers, variable frequency drives, and water ordering systems may allow Klamath ID to manage water deliveries in a more efficiently, although the benefits are currently unquantifiable.

Improved communication systems between Districts and waters users may also translate

into more effective water management. Improving communications may improve water delivery adjustments to be more responsive to changes in the environment, equipment malfunctions, or changing crop requirements.

Communication systems between Districts require near-real-time visibility to capitalize on efficiencies to be gained. Klamath ID monitors Tulelake ID daily spreadsheet report, which is emailed with 24-48 hour old data, to identify if adjustments are needed in the Klamath ID system to reduce impacts on Tulelake ID which could result in increased costs for pumping from drains or out of the Tulelake Sump at D Plant.

Recommendations in Reclamation's 2012 study[130] to incorporate re-regulation reservoirs is being reexplored with our partnership with Farmers Conservation Alliance.

On-going upgrades and modernization of our pumps incorporate a variable frequency drive (VFD) component. VFDs allow the District to more precisely control water management and potentially reduce power costs when installed and operated correctly.

In 2006, the District average pumping costs for recycling water was under $10,000. In 2019 the cost to recycle the same amount of water exceeded $105,000. In 2020, it is anticipated this cost will reach $150,000. Reducing power costs is high on the priority list to address with Farmers Conservation Alliance.

f. Opportunities to improve water use efficiency (OAR 690-086-0250.5)

(1) Description of losses of water from canals, pipelines, and laterals, including operational spill (OAR 690-086-0250.5a)

It must be highlighted again that Klamath ID system losses and operational spills are additive and necessary for the Project. System operational spills are required to operate the entire system as designed and engineered by Reclamation. Since 2019, all spill is recaptured by pumping plants, Poe Valley ID, Van Brimmer Ditch Company, or Tulelake ID. In addition, some of the seepage losses provide some shallow well groundwater recharging and are no doubt recovered in our drainage system and reused by our pumping plants and other Districts.

In 2021, Klamath Irrigation District experienced no losses of water from its canals as Reclamation locked Klamath Irrigation District out of its headgates in violation of our contract, and Oregon Water Resources Department utilized non-standard accounting practices to avoid protecting Oregonian's water rights. Klamath Irrigation District lost no less than 329,095 acre feet of storage from Upper Klamath Lake due to Reclamation releasing the water from Upper Klamath Lake through Link River Dam without any water right to release storage for in-stream purposes and Oregon Water Resources Department false claims stored water was not being released.

Existing water loss data studies for the District indicate that between the years of 1991 and 2000, approximately 20 percent of Klamath ID diverted water was lost in end spills (all of which is recaptured by other Districts), 14 percent was lost to lateral seepage, 1 percent was required for filling and draining the system, and the remaining 65 percent reached Klamath ID patrons.

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[130] Reclamation. April 2012. Klamath Project Yield and Water Quality Improvement Options Appraisal Study Workbook

While 20 percent spill may seem excessive, other Districts recapture this spill for a 92 percent efficiency rating across the Project.

Klamath ID was working with Farmers Conservation Alliance to update the loss study in 2020. However, OWRD's failure to prevent stored water from being released by Reclamation without a water right to do so has prevented hydrologists and scientists from Farmers Conservation Alliance to perform this study. When OWRD and Reclamation begin complying with the law, Klamath ID could coordinate with Farmers Conservation Alliance to renew efforts to update the analysis.

(2) An assessment of the extent to which water deliveries are insufficient to meet crop needs ((OAR 690-086-0250.5.b)

Insufficient water deliveries to crops occur with political imbalance for Klamath ID. In most years between 1878 through 1991, most crop needs were sufficiently met, even with flood irrigation methods, for all contracts Klamath ID serves. Surprisingly, during the severe drought periods between 1931 and 1936 water was made available to meet most crop needs.[131] Only since 1992, with political change, have water deliveries to Reclamation "A" contracts not met crop needs.

Since 1992, Klamath ID water supplies dictated by Reclamation are difficult to quantify on a consistent basis. Even with the final order in the Klamath adjudication issued in 2013, supplies are subject to political pressures. Reclamation's Klamath Project drought plans[132] for 1990, 1991, 1992, 2010, 2014, 2015, and 2018 clearly articulate Reclamation's "A" contracts, with Klamath ID as one of the highest priorities, received an amount of water which would meet most crop needs; this changed in 2020. Reclamation only curtailed Klamath ID in the years of 2001 (severe drought and political pressure from environmental extremists) and 2018 (political pressure from a Federal injunction misinformed by environmental extremists) when Klamath ID was unable meet the needs of Reclamation's "A" contracts.

The 2020 irrigation year required more than 410,000 acre feet for the Project and more than 290,000 acre feet for Klamath ID as the spring, summer, and fall precipitation was 8.5 inches below normal. In 2020, Klamath ID was shorted 162,220 acre feet to meet all District and contract obligations (290,000 acre foot need minus the 127,780 acre feet Klamath ID actually diverted in 2020). The Klamath Project Drought Response Agency enrolled 9,832 acres within Klamath ID and an additional 6,000+ acres in Districts Klamath ID delivers to for $185 per acre (no enough money to cover mortgages, District assessments, weed control, sunk seed and labor costs, and other overhead for the farmer). This effort saved 47,496 acre feet resulting in a net shortage of 114,724 acre feet of water. **At least 32,899 acre feet of this water was illegally released by Reclamation without OWRD taking action** during the April flushing flow. **An additional 90,414 acre feet of stored water was illegally released from Upper Klamath Lake by Reclamation without OWRD protecting Oregon citizens**. By my records, this 123,313 acre feet (32,899 + 90,414) would have fulfilled the water rights of Klamath ID and ALL the

[131] USGS. 1950. Compilation of Records of Surface Waters of the United States through September 1950. Part 11-A. Pacific Slope Basins in California except Central Valley. Pages 825-862.

[132] Reclamation Drought Plans. https://www.usbr.gov/mp/kbao/programs/ops-planning.html

Districts it supports.

The situation is different for the other Districts and Warren Act Contractors (including KBID included in this plan) which Klamath ID serves. Reclamation's drought plans since 1990 have included measures which have **curtailed water deliveries for KA 1000 water right holders in 1992, 2001, 2010, 2015, 2018, and 2020**. Under the current Reclamation proposed action, this trend will be observed in 2 out of every 3 years.

(3) A list of alternative conservation measures to reduce the losses of water identified in OAR 690-086-0250.5.a (OAR 690-086-0250.5.c)

Klamath ID provides and promotes conservation efforts of numerous partner organizations. Klamath ID is currently in contract with Farmers Conservation Alliance to study and implement a modernization plan. We routinely provide updates during our monthly board meetings, on our website, through our LinkedIn page, and on-site when visiting with patrons.

Klamath ID is currently in contract with NRCS for a watershed study of the District.

Klamath ID promotes efforts of Energy Trust to all our patrons.

Klamath ID promotes efforts by PacifiCorp (Pacific Power).

Klamath ID promotes and partners with Sustainable Northwest.

Klamath ID partners with Department of Agriculture, and Reclamation to share emerging and updated conservation information.

At this time, an analysis of OAR 690-086-0250.5.c required by OAR 690-086-0250.6.h and 690-086-0250.6.i is not feasible due to Reclamation illegally releasing water stored for irrigation purposes and OWRD failing to protect Klamath ID patron water rights.

(4) Address insufficiency of water deliveries identified in OAR 690-086-0250.5.b (OAR 690-086-0250.5.c)

Insufficient water deliveries are political in nature. The enforcement of Oregon law requires the State of Oregon to the administer the adjudication of the water rights confirmed by the Oregon Water Resources Division in 2013 with the Klamath Adjudication Amended and Corrected Finding of Fact of Determination.[133] Current practices by Reclamation's yearly operational plans do not acknowledge Oregon's Klamath Adjudication of water rights. It is abundantly clear OWRD has no interest in upholding Oregon state law to address insufficient water deliveries to legal water right holders in the Klamath Project created by the illegal release of stored water by Reclamation.

(5) Assessment of existing and future alternatives to finance conservation measures (OAR 690-086-0250.5.d)

Financing options through WaterSMART, OWRD, DEQ, FEMA, EnergyTrust, SDAO, PacificPower, Regional Conservation Partnership Program, and others are being explored with

[133] Oregon Water Resources Department. 2014. Amended and Corrected Finding of Fact of Determination. Available at https://www.oregon.gov/OWRD/programs/WaterRights/Adjudications/KlamathRiverBasinAdj/Pages/ACFFOD.aspx

our partnership with Farmers Conservation Alliance.

WaterSMART has 5 separate programs. Klamath ID has successfully competed for three of these water conservation grants since 2019. Two grants for piping are anticipated to eliminate seepage, evaporation, and spill on two small laterals. A third grant is being coordinated with Reclamation to upgrade and expand SCADA sensors and controls; when implemented, the improved visibility and control of spill is anticipated to create conservation by reducing diversions and improving structure control to minimize spill. The saved water is anticipated to meet the irrigation demand which Reclamation and OWRD are currently prohibiting Klamath ID from accessing and using the water right to beneficial use. As work with Farmers Conservation Alliance continues, addition WaterSMART grant opportunities will be explored.

An application submitted to OWRD in 2020 to conduct a feasibility study on a hydropower facility which would create a SCADA structure control to improve efficiency, control, and conservation in addition to adding to the WaterSMART SCADA program was denied by OWRD and is no longer an option being considered at this time.

As OWRD grants require a portion of the water to be returned to "in-stream" purposes, and Klamath ID needs are not being met. Klamath ID will not pursue any OWRD grant programs which require an "in-stream" return until Klamath ID's needs are met.

FEMA funding may be relevant to improve efficiencies and conserve water in the A Canal. Piping the A Canal and A Canal tunnel will eliminate seepage, evaporation, and reduce risk to the urban areas. Efforts to influence United States Congress to provide funding for infrastructure improvements is ongoing through our Senators and Representatives.

Farmers Conservation Alliance, in partnership with EnergyTrust /PacifiCorps, and Sustainable Northwest are working with Klamath ID to find opportunities where Solar and Hydropower improvements can fund conservation work within the District. No projects have been identified as of the May 2021 update to this document.

2. Federal Endangered Species Act impact.

The Federal Endangered Species Act is negatively impacting Klamath ID and the Project. The disproven theories of Federally funded biased scientists with known ties to environmental extremists are still being used to inform Reclamation operations and Service biological opinions. For over 20 years these biased "scientists" have demanded "more water" for all threatened species. The water demanded by these extremists is provided from water legally stored for to sole purpose of irrigation and was never part of the natural flow; however, **over 20 years of "scientific solutions" have provided no measurable results in improved species numbers.**

Demands for more water for endangered species, either in the Upper Klamath Lake or in-stream on Klamath River, have been illegally taken solely from the Klamath Project, Klamath ID, and the farmers of the Klamath Basin.[134] No other options for endangered species have been implemented, nor other stakeholders put at risk, no actions to restore flows from Hyatt and Howards Prairie Reservoirs have been explored to provide alternative water sources for endangered species, no discussion of restoring water from the Trinity system to the Klamath

[134] Marion County Court, Oregon. 2020. Case No. 20VC17922. *Klamath Irrigation District v. Oregon Water Resources Department.*

River are on the table. None of the millions of dollars invested to protect these species have developed options to increase storage capacity, remove dikes, nor restore habitat.

Little to no action is being taken to expand coho fish hatcheries to supplement losses due to extravagant off-shore fishing.

Suggestions to address C-Shasta spores in the Klamath River through removing the infected fish intestines during on-going sampling has fallen on deaf ears across the Federal and State government agencies. Polychaeta infection rates are directly correlated to fish infection rates as part of a cycle. Removing fish intestines infected with C-Shasta would likely reduce Polychaeta infections, thus reducing fish infections.

Sucker fish populations within the Lost River, Lake Ewana, Gerber Reservoir, Clear Lake Reservoir, and Tulelake Sump 1A appear to be at adequate severely low levels for the environmental conditions. The higher water temperatures and lower water levels in these bodies of water appear to be a direct contributing factor to these healthy and resiliant populations. However, the data purchased through biased contractors by Federal agencies ignore these healthy populations and the conditions in which they thrive.

3. Oregon DEQ water quality policy impact.

Currently Oregon Water Quality policies require Klamath ID to maintain a National Pollutant Discharge Elimination System permit for herbicide application within the canal system. Our herbicides help reduce the amount of water needed for deliveries, reduce risk of canal breach in urban areas, and are administered in accordance with the product label by a licensed applicator. This permit is an expensive cost to apply a product approved by the Environmental Protection Agency within a system which is not impacting natural navigable waterways. Oregon DEQ actions to increase permit fees in 2021 is expected to increase costs to all farmers and ranchers which Klamath ID serves. Due to the nature of the agricultural market, these State caused increased costs are not able to be passed on to consumers and undermines the Basin market share.

Oregon DEQ's 2018/2020 Integrated Report defines areas within Klamath ID as "impaired waters" which are tied to "Total Maximum Daily Loads" as per Oregon water quality standards. Oregon water quality standards are not in line with the natural conditions for the water bodies in the Klamath Basin; a historical analysis shows temperature and conditions of the natural water in the Klamath Basin prior to the Project was very poor at best. Furthermore, California is attempting to exert influence over Oregon irrigators to hold farmers to a different TMDL standard than Oregon DEQ for waters which flow across the State border. Over the next 5 years, DEQ enforcement of unattainable standards may severely impact the farmers of the Klamath Basin, Klamath ID and our stakeholders.

The earliest records of surveyors to the Klamath Basin indicate the waters of the Upper Klamath Lake's water quality were so poor the horses and dogs would not partake, even in the warm conditions. On 14 August 14 1855, Lieutenant Henry L. Abbot, leading an exploration party to survey a line for a proposed railroad running north from the Sacramento River to the Columbia River commented the "dark color" and "disagreeable taste" of the waters of Klamath Lake. Abbott's camped in the vicinity of Cove Point for a few days. His report states, "the taste of the water was so disagreeable that several vain attempts were made to

discover a spring in the vicinity."[135]

This information is expanded on later in Section II, Item D, Subsection 2.

SECTION II: INVENTORY OF WATER RESOURCES

A. SURFACE WATER SUPPLY

In a 1998 draft report entitled, "Klamath Project Historical Water Use Analysis" by Davids Engineering the overall effective efficiency of the Project as a whole was found to be between 90 and 95 percent. This high level of Project efficiency must be considered when evaluating and undertaking improved water management activities within Klamath ID. Average annual diversions of water for irrigation purposes prior to the 2001 drought is provided in Figure 49; peak flows are normally in late June with steady high demand through July and early August. Klamath ID believes water management activities should focus on reducing irrecoverable losses only and to be extremely cautious when affecting recoverable losses which could impact and reduce the overall Project efficiency. Klamath ID's primary supply is the UKL as described in Figure 5 with a water right to both live flow and stored water.

1. AF amounts of surface water delivered to the District by each of the Districts sources

Klamath ID diverted (or more precisely, returned) 215,382 acre feet of surface water from Upper Klamath Lake through the A Canal (see Figure 4) for delivery to areas which naturally would have drained to the former Tule Lake.

In 2019, Klamath ID ~~diverted~~ returned an additional 9,385 acre feet of surface water from the Miller Hill Pumping Station from the Project Supply along the Lost River Diversion Channel for a total of 224,767 acre feet of surface water for irrigation purposes within Klamath ID, eight other Districts, and individual contractors across 122,000 acres. For 2019, this is a reduction of 73,309 acre feet from the average deliveries recorded from 1990 through 2000.

[135] PacifiCorps. November 2006. Causes and Effects of Nutrient Conditions in the Upper Klamath River. Page. 7.

Month (1997)	Net supply	Lateral Tail Water		Lateral losses		Delivered to farms in Klamath ID	
	acre-feet	acre-feet	% of Net	acre-feet	% of Net	acre-feet	% of Net
Apr	17,707	6,276	35%	2,458	14%	6,931	39%
May	45,286	10,069	22%	4,990	11%	28,943	64%
Jun	54,830	9,591	17%	6,522	12%	38,500	70%
Jul	67,685	10,341	15%	9,752	14%	47,456	70%
Aug	61,063	10,934	18%	9,080	15%	41,030	67%
Sep	40,221	9,689	24%	6,011	15%	24,504	61%
Oct	11,284	3,622	32%	1,865	17%	5,752	51%
Total	298,076	60,522	20%	40,678	14%	193,116	65%

Note: A small amount of water, approximately 1% of the net supply, is not accounted for in the above table. This quantity of water is believed to be part of the main canal losses which includes the initial filling of the system and the end of year draining of the system. Most of lateral losses and tail water is reclaimed by pumping stations or other irrigation districts in the Klamath Project. **Only when water flows over the Anderson Rose Dam into Tule Lake Sump does it become an irrecoverable loss to irrigation**; at this point the water is pumped to the Lower Klamath National Wildlife Refuge at significant cost to Tulelake Irrigation District.

Figure 49 Klamath ID Average Monthly Water Diverted for Irrigation 1991-1997 (OAR 690-086-0240.4)

B. Groundwater Supply

1. AF amounts of groundwater pumped and delivered

Zero (0) AF of groundwater was pumped in 2019. Several groundwater wells were recharged with surface water through irrigation in 2019; however, data does not currently exist as to the extent and number of groundwater wells recharged.

Changes in water management and environmental restrictions resulting in unreliable surface water supplies over the last decade in the Klamath Reclamation Project have increased use of groundwater resources since 2001.

Private pumping of groundwater in 2020 is on-going and anticipated to match or exceed

water pumped in previous drought years due to the conditions created by politics and refusal of Oregon Water Resources Department to prevent unlawful release of stored water from UKL.[136]

2. Description of groundwater basin(s) that underlie the District

Name	Size (Square Miles)	Usable Capacity (AF)	Safe Yield (AF/Y)
Large Volcanic Aquifer	UNK	UNK	UNK
Lost River Sub basin	UNK	UNK	UNK
Tule Lake Sub basin	UNK	UNK	UNK

The Klamath Basin receives, an average, over 6.5 million acre-feet of precipitation per year. Precipitation rates within the basin range from less than 15 inches per year on the valley floors to over 60 inches per year in the Cascade Range near Crater Lake. A portion of the precipitation that seeps into the ground in the Klamath Basin allows for groundwater recharge, raises water table elevations, and increases natural groundwater discharge.[137]

"The areas in which groundwater recharged is taking place within the Klamath Basin are the Cascade Mountains, Yamsay Mountain, Winter Rim, and similar elevated areas possessing permeable conditions and receiving large amounts of rainfall. It is difficult to accurately locate recharge boundaries. In the Klamath Basin, it is assumed the groundwater boundaries lie well beneath the topographic divides."[138]

Ground water moves through the spaces between rock particles or fractures in solid rock. Rarely are these spaces larger than a fraction of an inch. Geothermal activity and thermal springs in the Basin indicate some groundwater is not tied to other sources of groundwater. Reports of underground rivers and lava tubes in the Klamath Basin indicate additional research is required.

The Sedimentary Aquifer of the Klamath Basin is a water bearing formation composed of alluvium, alluvial terrace, and shallow lake deposits with some interbedded basalt, rhyolite ash deposits, and pumice. This sedimentary aquifer is found through the Klamath Basin which generally provides only quantities of water sufficient for domestic purposes at 0.01 to 5 gallons per minute.[139]

The Volcanic Center Aquifer is composed of basal and volcanic ejecta consisting of ash, cinders, and agglomerate. These units represent eruptive centers of old volcanos commonly located in the mountainous areas; however, a few local exposures are found on the valley floor. Wells in these areas vary from less than 1 gallon per minute to over 100 gpm.[140]

The Klamath Basin also has a Lower Basalt Aquifer, which is of volcanic origin. This unit underlies the Yonna Formation (chalk rock) which can yield large amounts of water for irrigation wells in the Klamath Basin. Generally, these areas are greater in depth exceeding

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[136] Marion County Court, Oregon. 2020. Case No. 20VC17922. *Klamath Irrigation District v. Oregon Water Resources Department.*

[137] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 222.
[138] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 222.
[139] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 223.
[140] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 223.

1,000 feet below the surface in most valley's in the Klamath Basin. Yields have been recorded between 33 to 6000 gallons per minute.[141]

A Volcanic Ash Aquifer is located below the Lower Basalt Aquifer. This unit is similar to the Sedimentary Aquifer as it is composed of volcanic ash, tuff, breccia, sedimentary materials, and some basalt flows. Little is known of this hydrologic characteristics of this unit as few wells have been constructed into these tuffaceous sediments due to cost and availability of other water sources. East of the Klamath Basin, in Lake County, this formation has several outcrops which yield moderate to low flows as compared to the Sedimentary Aquifer.[142]

Volcanic aquifers in the basin can provide a substantial quantity of groundwater to supplement surface water supplies because of their high permeability and vast area extent. High-yielding wells in the groundwater basin are generally located where water is needed for irrigation and do not necessarily indicate specific areas of high groundwater conductivity. Wells are generally screened from depths of less than 100 feet to deeper than 2,000 feet.[143]

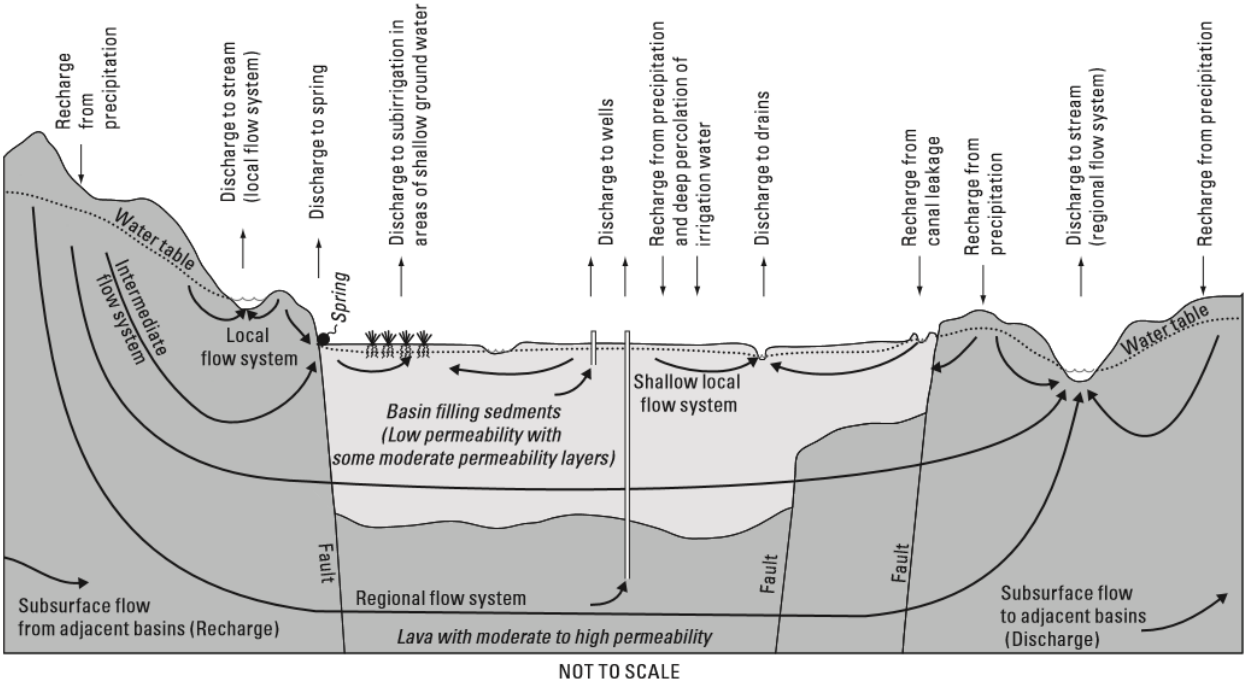

Figure 50 Representation of Sources of Ground-Water Recharge, Flow Paths, and Mechanisms of ground-water discharge[144]

Geothermal groundwater is found in the northeastern residential area of the Klamath ID. This heated water from naturally occurring springs provide minimal flows to the A Canal and associated drains. Northeast of the Klamath ID, over 350 wells have been drilled to extract thermal groundwater for use in heating requirements for residences, schools, swimming pools,

[141] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 224.
[142] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 224.
[143] Klamath Water and Power Agency. 2014. On-Project Plan Summary Report. Page 2-7.
[144] USGS. 2007. Ground Water Hydrology of the Upper Klamath Basin, Oregon and California

and business establishments[145] which has reduced the amount of natural hot-water springs along the canals identified in historical records prior to 1902.

Historical observations of groundwater levels in response to various pumping regimes provide insight into the long-term viability of groundwater use within the Upper Klamath Basin aquifer system. Groundwater production rates prior to 2000 appear to have resulted in little to no appreciable drawdown, except in areas near Bonanza (outside of Klamath ID boundaries). Groundwater production rates increased with the curtailment of surface water supplies and the initiation of water bank programs and activities following 2001. This increase in groundwater production, coupled with the reduced rainfall in drought years, has resulted in seasonal decreases in groundwater levels of 10 to 20 feet, with a total drawdown from 2001 to 2008 of approximately 15 feet. Continued groundwater-level monitoring, climate forecasting, stream/ spring-flow monitoring, and groundwater modeling are proposed to support future groundwater use.[146] Figure 49 shows the most recent focus recharge areas highlighted in yellow and red.

3. Map of District operated wells and groundwater recharge areas

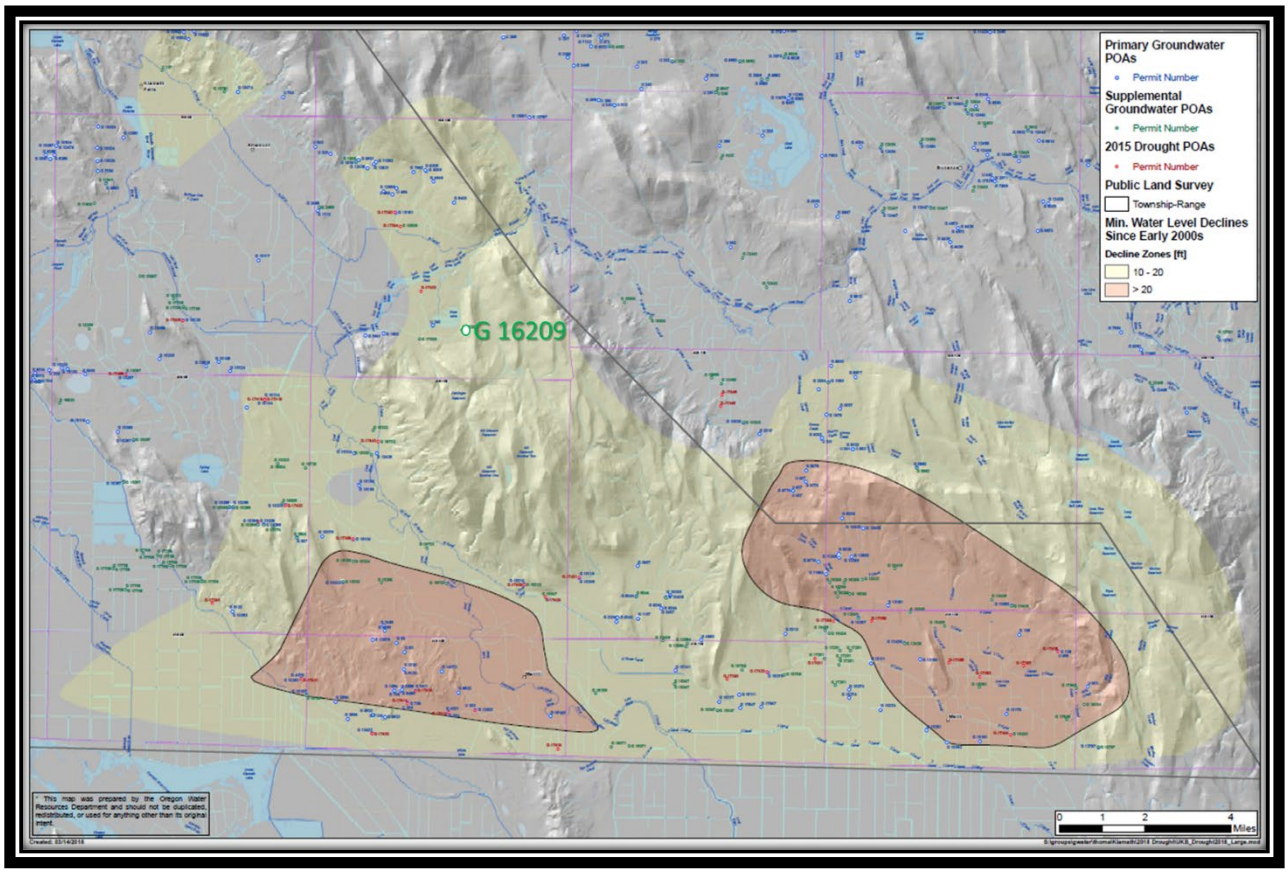

Figure 51 Klamath Basin Wells (including KBID's well under and Water Level Declines Since Early 2000s

KBID has one groundwater well (marked as G16209 on Figure 49) which is operated by Klamath ID when political or environmental conditions negatively impact irrigation diversions

[145] Oregon State Water Resources Board. June 1971. Klamath Basin. Page 224.

[146] On Project Plan Summary Report. 21 January 2014. Klamath Water and Power Agency.

from Upper Klamath Lake.

4. Description of conjunctive use of surface & groundwater

Conjunctive use of surface and groundwater with Klamath ID occurs during drought conditions. Ground water sources are utilized to augment shortages from storage in Upper Klamath Lake, Clear Lake, Gerber Reservoir, and natural precipitation in the Basin.

5. Groundwater management plan (for managed ground water basins)

Klamath ID is not currently in a managed ground water basin.

Tulelake ID is subject to the Sustainable Groundwater Management Act; their groundwater management plan information can be found at www.tulelakeid.com.

6. For participation in groundwater banking, attach water banking management plan

Water Banking programs for the Klamath Project were initially created by Reclamation to offset shortages; however this program has been discontinued. These programs varied from year to year and involved land idling and ground water substitution elements. The current program is managed by the Klamath Project Drought Response Agency are outside the purview of Klamath ID.

C. Other Water Supplies

1. Long term water supplies not described above (see table 1) (OAR 690-086-0270.3 & 4)

None Identified

2. Estimate of Klamath ID long-term water demand for 20 years (OAR 690-086-0270.1)

Irrigation demand across Klamath ID has generally trended downward over the past 25 years as indicated in Figure 52. During the cool/wet Pacific Decadal Oscillation (PDO), one can assume less water was required to be diverted than during warm/dry conditions where an increase in irrigation water is needed due to transport evaporation and plant needs.

Using the logic that higher power costs to recycle water per acre foot (see Section I.I.1.a) has resulted in reduced Klamath ID efficiency, that the cost of power to pump and run pivots or wheel lines is resulting in observing farmers return to flood irrigation techniques, **Klamath ID anticipates this downward diversion trend is expected to reverse over the next 20 years** without significant modernization improvements to infrastructure, water tracking systems, and reduced power costs to promote on-farm efficiencies. Klamath ID believes no less than 250,000 acre feet or more will be needed from Upper Klamath Lake for Klamath ID during warm/dry PDO cycles.

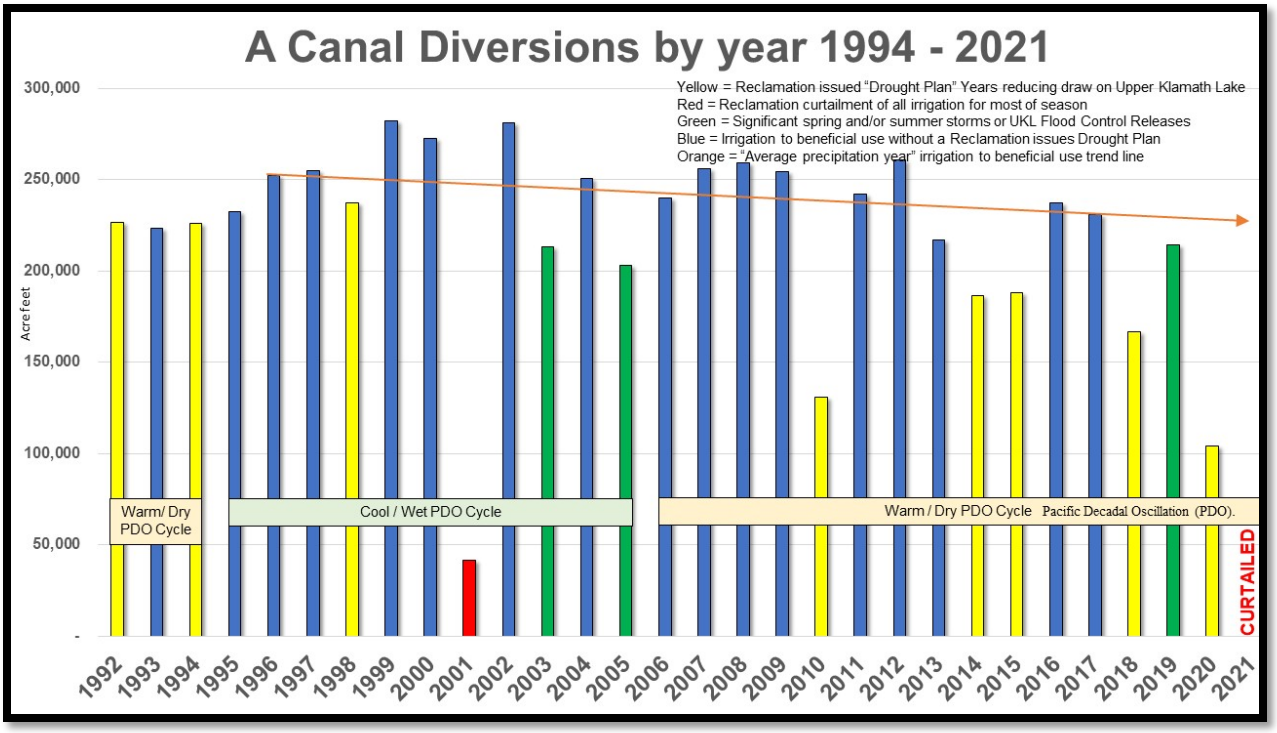

Figure 52 The orange trendline from 1996 through 2017, when average conditions were observed, is an indicator irrigation water demand is currently on a downward trend.

Urbanization: Urbanization is within Klamath ID is stunted by the urban growth boundary, a depressed economy due to poor federal and state policies, and a lack of amenities to attract younger generations; therefore, demand will not be decreased by urbanization.

Changing Climate: The climate is consistently changing and cycles can be observed. The physical impacts of climate in 2021 are constant with conditions in 1922, 1933, and 1992 with similar demands for irrigation water. In 1922 and 1933 the demand for water was met because the law was not being ignored and the political priority was feeding the Nation. Consistently changing climate conditions will increase water demands in dry years and reduce water demands in wet years as it has for the 5000 years of agricultural history. Brilliant minds identified resources like dams and reservoirs to account for such change to benefit agriculture and was the foundation of the Reclamation Act of 1902. Unfortunately, the idea of storing water for dry conditions are no longer shared by environmental extremists negatively influencing our federal government, Oregon, and OWRD.

Future agricultural trends: Knowing future agricultural and industry trends is unknowable with the complexity and volatility of Federal policy. Therefore Klamath ID is unable to see the future where changes will occur which create opportunities for economic prosperity in the Klamath Basin to provide a Federal, State, and County tax base.

1. Comparison of projected water needs and the size and reliability of water rights (OAR 690-086-0270.2)

The climate of the Klamath Basin generally meets the needs of Klamath ID for the foreseeable future; the ACFFOD provides reasonable certainty of water-rights based upon observed conditions. **Our uncertainty in each irrigation season is primary dependent upon**

political decisions and Agency misinterpretation of laws which misappropriate stored water away from irrigation for other purposes without an established water right.

Conversions from flood irrigation to sprinkler irrigation has continued at a steady pace; unfortunately, the power costs for pressurizing lines and running pivots is over three (3) times the average for similar projects. Within Klamath ID, many farmers are paying near 0.16 cents per KW when our neighbors in the Pacific Northwest, on average, are paying under 0.05 cents per KW. This increased cost cannot be passed on to their customers as the neighboring districts are in the same market.

Water rights are not the problem. The AACFOD provides the Project 570,110 acre-feet, of which, Klamath ID is the primary diverting District servings its lands and eight other districts. KA1000, 1001, and 1004 are sufficient to meet Project demand. To meet some of the Project need, Klamath ID will need to divert 250,000 to 290,000 acre feet of water for irrigation per year on average.

Long Range Needs Assessment (OAR 690-086-0270.3) At primary risk in the future is continued federal overreach which ignores state water rights in violation of the Public Law 97-293; every acre foot of water taken away from the Project supply all of the Districts and individual Warren Act contractors Klamath ID delivers irrigation water to.

Water Right Assessment: KA1001 = Sufficient water rights to irrigate Van Brimmer Ditch Company at 50cfs from 1 April to 1 October for 5,047 acres.

Water Right Assessment: Klamath ID "A" contract lands in KA1000 and KA1004 = 41,176 acres = Sufficient water rights to irrigate District lands from 1 March to 31 October for 3.5 acre-feet per acre.

Water Right Assessment: "B" contract lands in KA1000 = sufficient rights to irrigate lands from 1 March to 31 October at 3.5 acre-feet per acre if the contract allows.

Klamath ID need is for 290,000 acre feet of water from Upper Klamath Lake each year; KA1001, KA1004, and KA1000 provide sufficient water rights to the need. The failure of OWRD to enforce Oregon State Law to prevent the stored water for KA1001, KA1004, and KA1000 from being used for in-stream purposes in the comparison OWRD needs to make.

2. Potential resources to meet anticipated demand (OAR 690-086-0270.2)

Meeting water demands from the Klamath Basin require more pragmatic discussions and actions to change various Federal misinterpretation of law, and State leaders enforcing existing laws to meet all demands. Current policies do not allow for the ability to work towards long-term solutions across stakeholders; the practice to date has been to reduce or eliminate water supplies directly from Project irrigators without exploring other options, other sources, and other stakeholders with junior water rights.

Current Federal and State policies encourage inter-District strife. Each District has separate contracts with Reclamation, separate funding strategies and sources, and separate boards of directors with conflicting needs for specific patrons with a Reclamation induced class system. Oregon State refusal to uphold Oregon water rights in accordance with the ACFFOD.

Short of policy change and leadership following the law, investment in water banking and land idling programs provide only short-term solutions.

As OWRD fails to protect Oregonian's property rights by allowing stored water to be released without a water right, discourages ground water pumping with threats of creating a critical groundwater area, and no other sources of water are available in the basin, our only option to meet long term needs is lengthy and expensive litigation against OWRD, Reclamation, and other agencies who fail to follow the law or perform their duty.

OAR 690-086-0270.4: Comparison among the potential sources of additional water: The cost of litigation against OWRD, Reclamation, and other agencies who fail to follow the law or do not perform their duty is small in comparison to the benefit of protecting property owners 5th amendment rights and the water rights granted by the State of Oregon. As no other sources of water are available, and the federal government is prohibiting use of our water-right, our only recourse is continued litigation.

Klamath Irrigation District has sufficient water-rights that expending resources to identify additional sources of additional water for the District is fraud, waste, and abuse of public resources. The need to increase costs to tax-payers to augment property which is already theirs is unacceptable. Oregon Water Resources Department MUST protect the water rights of Oregon citizens.

Expending unnecessary costs to stress groundwater resources is irresponsible of the District as sufficient water-rights are available. The need to increase costs to tax-payers to explore and develop access to groundwater is unacceptable and an unnecessary cost. Oregon Water Resources Department MUST protect the water rights of Oregon citizens. Klamath Irrigation District will utilize litigation against Oregon Water Resources Department to force them to enforce our water rights.

Surface water resources are allocated as per the Klamath Basin Adjudication and the Lost River Decree. Klamath Irrigation District has sufficient and senior water rights with KA 1001, KA 1004, and KA 1000 to meet our demand if Oregon Water Resources Department would perform their duties to protect Oregon citizen's property from Federal government overreach. Klamath Irrigation District will utilize litigation against Oregon Water Resources Department to force them to enforce our water rights. Further waste of taxpayer money on exploring unavailable surface water rights is irresponsible.

Klamath Irrigation District would offer that the U.S. Bureau of Reclamation should purchase existing senior water rights from either the Klamath Tribes or Klamath Project irrigators in lieu of stealing the water from the farmers who have a legal claim. It is irresponsible for Klamath Irrigation District to purchase rights it already owns when the Federal government has exceeded its authority and is stealing water from Klamath Project families.

3. Evaluation of regional options for meeting future water needs (OAR 690-086-0270.5.a)

Since 1978, no less than three large studies have been paid for by Reclamation. Davids' Engineering, The Irrigation Training and Research Center, MBK Engineering, and KWAPA have made numerous recommendations to Reclamation to modernize the Project. These studies have been provided to Reclamation and OWRD.

Another effort to analyze opportunities is currently on-going with our partnership with Farmers Conservation Alliance to evaluate where efficiencies can be gained and economic funding opportunities to sustain conservation efforts can be found without increasing the burden on a struggling farmer who has no guarantee of his 5th Amendment rights, his water right granted

by the State of Oregon, and is in daily jeopardy of losing their mortgage, their livelihood, their pride, their contracts with National chains, and their lives as this attack on agricultural communities eliminates opportunities for younger generations.

As the partnership with Farmers Conservation Alliance is stalled due to not enough/no water provided in 2020 and 2021 to assess future conservation improvements, and the anticipated 2021 economic disaster prohibits the ability of the District to fund additional research, no additional information is currently available.

4. Evaluation of urbanization and other land-use trends (OAR 690-086-0270.5.b)

Although changes in Klamath County zoning is anticipated over the next five years, discussion of urban expansion, changes in solar siting laws, and sanitation district expansion, Klamath ID does not anticipate any change Klamath ID boundaries, responsibilities, or diversions of water for beneficial use to irrigatable acres.

5. Local Government comprehensive plans regulating agricultural land, urbanization, water resources, water supply, public facilities, and services under a long-term supply plan (OAR 690-086-0270.5.c)

The South Suburban Sanitation District has proposed a 770+ acre project crossing Reclamation, Klamath ID, and KBID lands which is in its initial development stage. Currently the anticipated effects on irrigated acres by the South Suburban Sanitation District is beyond the vision of this plan and is not further considered in this plan.

Of note, Klamath County Drainage and Service District's contract for the 1-C Drain System with Reclamation expired in May of 2020; Klamath County has requested an extension to renew this contract. Reclamation is exploring opportunities to transfer ownership of the drainage system to Klamath County. The 1-C Drain System no longer performs a primary agricultural function; however, drainage water from the 1-C Drain System ultimately spills into Klamath ID's drainage system. At this time, no affect is current anticipated with the transfer of ownership.

D. Source Water Quality Monitoring Practices

1. Potable water quality - attach current water quality report (Urban only) – Not Applicable

2. Water quality concerns (Ag only)

Based upon the available records, **the natural conditions of water quality in the Basin has been poor at best.** Any attempts to improve water quality must take into account the natural conditions existing prior to the Project. Klamath ID is concerned with recent actions by Oregon's Department of Environmental Quality to implement water quality standards above conditions found historically in nature.

Klamath ID is in partnership with Farmers Conservation Alliance to analyze our system and identify projects which may improve water quality.

The Upper Klamath and Lost River Subbasins Temperature Total Maximum Daily Load (TMDL) and Water Quality Management Plan in addition to documents relating to impaired waters of the State utilize flawed models to direct policy and actions. The Clean Water Act requires temperature TMDLs to be based upon the stream temperature that will "assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife,"[147] rather than a numeric temperature criteria. The current numeric temperature criteria presented by Oregon DEQ is unachievable; the impaired waters documents are nondescriptive; and there are no standards established which identify waivers, exemptions, or achievements. Furthermore, observation of healthy fish and wildlife in and along the Lost River indicate any science utilized to promote unachievable standards is flawed.

One anecdotal record indicates Jesse Applegate purposely planned the "Southern Road" (aka Applegate Trail) south, away from Upper Klamath Lake, to avoid the smelly, nasty, ooze in the shallow area of Upper Klamath Lake. Jesse Applegate studied Captain John C. Fremont's reports from 1843-1844 exploration through Oregon and Nevada. He was aware of the land bridge over the Lost River, the features of the Klamath Basin, and Fremont's encounters with the Tlamath (Klamath) natives.[148] A route further north (going through what would later become Fort Klamath along the "military wagon road" and continue through Lakeview) was discounted by the Applegates.

On 17 May 1848, Isaac Pettihohn, diarist for a party heading east on the Applegate Trail wrote of the Lost River, "It is rather a cultus (No-good-Ed.) looking stream…and produces little else than sage."[149]

One of the earliest surveyor records of the Klamath Basin indicate the waters of the Upper Klamath Lake's water quality were so poor the horses and dogs would not partake, even in the warm conditions. On 14 August 1855, Lieutenant Henry L. Abbot, leading an exploration party to survey a line for a proposed railroad running north from the Sacramento River to the Columbia River commented on the "dark color" and "disagreeable taste" of the waters of Klamath Lake. Abbott's camp in the vicinity of Cove Point for a few days, where he reports, "the taste of the water was so

[147] 33 U.S.C. Subsection 1313 (d)(1)(D)
[148] Klamath County Historical Society. 1976. Klamath Echoes. The Applegate Trail II.
[149] Klamath County Historical Society. 1970. Klamath Echoes. They also passed this way… page 8.

disagreeable that several vain attempts were made to discover a spring in the vicinity."[150]

The "impurities" of Upper Klamath Lake's water became the focus of a 1905 controversy in Klamath Falls regarding possible "disease laden ice." One Klamath Falls citizen commented "there is no pure ice in Klamath county … the waters of the lake are not fit to drink …" while another held that "the ice on the Upper [Klamath] Lake runs a chance of being infected with the flotsam and jetsam of that great body of water. A great many fish of the sucker species die and float into the waters of the lake, which give a chance for impurity."[151]

"Dick" Breitenstein (born 1878) records that as a teen, he "used to work on the Ankeny ditch (an early irrigation ditch cut along Link River, through Linkville, and then along the area now known as "A" Canal) shoveling muck" from the lake out of the canal.[152] Indicating the source of water from Upper Klamath Lake was not pristine.

Judge U.E. Reeder (sometime between 1895 and 1905) reports, "We always tried to haul lumber to the Lower Lake in the spring when the water was running through the Straits into Lower Klamath Lake. And in the fall, we hauled hay [north] through the Straits into the [Klamath] river, when the water was draining out of the Lower Lake."[153] This indicates, late summer/fall water, in very shallow conditions of Lower Klamath Lake and marshes, heated by the hot summer sun, with significant evaporation, was flowing heated water into the Klamath River at the Keno Cut while minimal to no water from Upper Klamath Lake was making its way past Keno.

In 1908, A.T. Sweet and I.G. McBeth of the U.S. Reclamation Service reported, "The water in this lake is quite shallow, but a deep deposit of floating sludge and black muck lies below it. This sludge is often piled in spots by the movements of wind and water, obstructing navigation. The principal source of water for this group of lakes is Upper Klamath Lake, through Link River. The outlet is Klamath River, which flows through the upper part of the basin, then turns west through a narrow pass in the mountains near Keno. At the entrance to this pass a basaltic obstruction has prevented the lowering of the river bed, and resulted in this chain of lakes and wide area of marshy land. A wide channel several miles in length passes southward from the river, supplying the lower lakes and swamps. During seasons of heavy rainfall or during the long dry summers, the Klamath River flows southward through these straits, but at certain seasons when the river [flows from Upper Klamath Lake] begins to fall this channel carries considerable water northward from the lower lakes into the Klamath River, thus presenting the anomaly of a river flowing in one direction during a portion of the year and in the opposite direction at other times."[154] Again, evidence that temperature of the water exiting the Klamath Basin has historically been high and an abundance of water remained in the Basin prior to the Project lowering the Keno Cut.

The Klamath Republican reported on 1 July 1909 that "the high south wind yesterday nearly dried up the {Upper Klamath} lake. The big launch Curlew grounded in her stall in the boathouse

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[150] PacifiCorp. November 2006. Causes and Effects of Nutrient Conditions in the Upper Klamath River. Page 7.
[151] PacifiCorp. November 2006. Causes and Effects of Nutrient Conditions in the Upper Klamath River. Page 7.
[152] Klamath Republican. 1 July 1909. As recorded by the Klamath County Historical Society in Klamath Echoes. 1964. Volume 1, Number 1. Pages 28-29.
[153] Klamath County Historical Society. 1965. Klamath Echoes. As Told to Me…by Judge I.E. Reeder. Recorded by Devere Helfrich. Page 18.
[154] A.T. Sweet and I.G. McBeth. 1908. Soil Survey of the Klamath Reclamation Project. Page 1376.

and there was a fair current up the lake all day."[155] One must note, the average flow at Link River in July of 1909 was higher than those recorded in the U.S. Government than those of 1905, 1908, 1910, 1915, 1916, 1917, 1918 (drought period where photos of a dry Link River are preserved)[156], 1919, 1920, and 1921,[157] after this point in history, the Link River became controlled by a dam. This structure increases the natural barrier of Upper Klamath Lake from 4137 MSL to an artificially controlled barrier at 4143.3 feet above MSL. This structure increased controlled storage of water in Upper Klamath Lake from 140,000[158] acre feet (pre-dam) to 584,000 acre feet of water for Project irrigation use.[159] Historic mean temperatures between 1884 and 1908 are similar to temperatures recorded today (as previously presented in Figures 37, 38, and 39), thus at much lower lake level/storage capacity, the waters in the Upper Klamath Lake were definitely warmer and shallower than are found today.

The Klamath Republican also reported on 1 July 1909 that the "new resort at Eagle Cape (Eagle Ridge) [will pump] water from the great white sulfur spring which boils up near the lake level" for white sulfur baths.[160] Sulfer and Phosphorus are similar elements and both are naturally occurring in the Klamath Basin soils.

In the late 1930s, researchers from the Department of Entomology at Oregon State College, D. E. Bonnell and D. C. Mote, noted *Aphanizomenon flos-aquae* to be "abundant," but not always the predominant form of algae. They reported that the vast masses of suspended blue-green algae were "filamentous in form (*Aphanizomenon*) and during the summer so dense as to give the water only a quasi-liquid appearance".[161]

There are numerous natural hot springs, scalding to the touch, feeding the Lost River. These springs naturally increase the water temperatures of the river.

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[155] Klamath Republican. 1 July 1909. As recorded by the Klamath County Historical Society in Klamath Echoes. 1964. Volume 1, Number 1. Page 17.
[156] J.C. Boyle. 1976. 50 Years on the Klamath.
[157] U.S. Geological Survey. 1960. Compilation of Records of Surface Waters of the United States through September 1950. Page 827.
[158] I.S. Voorhees. 1912. History of the Klamath Project. Pg.7
[159] Geological Survey – Water Supply. Compilation of Records of Surface Waters of the United States through 1950. Pages 825-833.
[160] Klamath Republican. 1 July 1909. As recorded by the Klamath County Historical Society in Klamath Echoes. 1964. Volume 1, Number 1. Page 23.
[161] PacifiCorp. November 2006. Causes and Effects of Nutrient Conditions in the Upper Klamath River. Page 7.

Figure 53 Olene Gap Natural Hot Springs Entering Lost River at 192.4 degrees Fahrenheit

(River Temperature is 129 degrees 16 feet out into the Lost River in February)

Figure 54 Natural Scalding Hot Springs feed the Lost River in Numerous Places

3. Water quality testing program and the role of each participant (Ag only)

Klamath ID is currently not required to participate in a water quality testing program.

4. Current water quality monitoring programs

a. Water quality monitoring programs, surface (Ag only)

Analysis Performed	Frequency	Concentration Range	Average
NA	NA	NA	NA

b. Water quality monitoring programs, groundwater (Ag only)

Analysis Performed	Frequency	Concentration Range	Average
NA	NA	NA	NA

E. Water Uses Within the District

1. Agricultural

2019 Crop Name (See Annex's M and N for Crop Reports)	Acres	Crop ET (AF/Ac)[162]	Leaching Requirement (AF/Ac)	Cultural Practices (Frost, pre-irrigation, harvest)	Effective Precipitation (AF/AC)	Appli. Crop Water Use (acre-feet)
Alfalfa	22,518	0.24	UNK		Varies	Irrelevant
Pasture	14,409	0.23	UNK		Varies	Irrelevant
Other Hay	1,417	0.23	UNK		Varies	Irrelevant
Potatoes	6,648	0.22	UNK	Frost Pre-harvest irrigation	Varies	Irrelevant
Beets/Onions	1,200	0.19	UNK	Frost Pre-harvest irrigation	Varies	Irrelevant
Wheat	2,642	0.24	UNK	Post harvest irrigation	Varies	Irrelevant
Other Grains	1,243	0.24	UNK	Post harvest irrigation	Varies	Irrelevant
Garden/Orchard	1,969	0.20	UNK		Varies	Irrelevant
Cover Crop	477	0.20	UNK		Varies	Irrelevant
Other	1,115	UNK	UNK	Frost	Varies	Irrelevant

The total water demand for each crop is irrelevant to implement a pricing structure for irrigation water and drainage water disposal. ORS 545.484, the amount charged "shall be apportioned by the board to the lands owned or held by each person so that each acre of land in the district that is entitled to irrigation is required to pay the same amount."[163] Therefore, Reclamation's 2017

[162] As per document provided at https://ucanr.edu/sites/irecBETA/files/218740.pdf

[163] Oregon Revised Statute 545. 2020. https://www.oregonlaws.org/ors/545.484

Water Management Planner Guidebook, page 3-21 discussing **tiered water pricing systems is neither legal, nor applicable in the Klamath Irrigation District.**

2. Types of irrigation systems used by crop type and acre (Ag only)

Crop Name	Total Acres	Level Basin-Acres	Furrow-Acres	Sprinkler Acres	Low-Volume Acres	Multiple Methods Acres
Alfalfa	22,518	TBD	TBD	TBD	TBD	All
Pasture	14,409	TBD	TBD	TBD	TBD	All
Other Hay	1,417	TBD	TBD	TBD	TBD	All
Potatoes	6,648	TBD	TBD	TBD	TBD	All
Beets/Onions	1,200	TBD	TBD	TBD	TBD	All
Wheat	2,642	TBD	TBD	TBD	TBD	All
Other Grains	1,243	TBD	TBD	TBD	TBD	All
Garden/Orchard	1,969	TBD	TBD	TBD	TBD	All
Cover Crop	477	TBD	TBD	TBD	TBD	All
Other	1,115					

3. Urban use by customer type in current year

Customer Type	Number of Connections	AF
Single Family	0	NA
Multi-Family	0	NA
Commercial	0	NA
Industrial	0	NA
Landscape Irrigation	--Ill Defined Term--	NA
Wholesale	0	NA
Recycled	0	NA
Other (Agriculture)	--Ill Defined Term--	NA
Unaccounted for	0	NA
Total		

4. Urban wastewater collection & treatment systems

Treatment Plant	Treatment Level	AF	Disposal to
NA	NA	NA	NA

5. Groundwater recharge/management/banking

Recharge Area	Method of Recharge	AF	Method of Retrieval
Klamath Valley	Flood Irrigation	UNK	Private Pumpers

6. Transfers and exchanges into or out of the service area

From Whom	To Whom	AF	Use
NA	NA	NA	NA

7. Trades, wheeling, wet/dry exchanges or other transactions

From Whom	To Whom	AF	Use
NA	NA	NA	NA

8. Any other uses of water

Other Uses	AF
NA	NA

F. Outflow from the District (Ag only)

See the Facilities Map for the locations of surface and subsurface outflow points, outflow measurement points, outflow water-quality testing locations.

1. Provide a description of each surface and subsurface outflow point

Outflow Point	Location Description	AF	Type of Measurement	Accuracy	% of Outflow	Acres Drained
D Canal	D-J Spill	UNK	None	NA	UNK	NA
#1 Drain	Lost River to J Canal	UNK	Surface Monitor	UNK	UNK – potential recapture by Stukel or Adams Pumps before becoming available to Tulelake IR	11,026
#5 Drain	Lost River to J Canal	UNK	Surface Monitor	UNK	UNK – potential recapture by Stukel or Adams Pumps before becoming available to Tulelake IR	12,273
#10 Drain	Pump to J Canal	UNK	Tulelake ID pumping records	UNK	UNK	6,756

Outflow Point	Where the Outflow Goes	Type Reuse
D Canal	J Canal	Spill to TID
#1 Drain	J Canal via Lost River	Spill to TID
#5 Drain	J Canal via Lost River	Spill to TID
#10 Drain	J Canal via TID Pump	Pumped by TID

2. Description of outflow water quality testing program

All Klamath ID outflow water is recaptured for agricultural use. No water quality issues currently exist.

3. Analysis of outflow water

Analysis Performed	Frequency	Concentration Range	Average	Reuse Limitation
NA	NA	NA	NA	NA

4. Involvement in water quality control board requirements

Klamath ID is not involved with the Central Valley Regional Water Quality Control Board programs or requirements for remediating or monitoring any contaminants that would degrade water quality in the receiving surface waters.

Klamath ID is currently not involved in Oregon water quality control programs.

G. Water Accounting (Inventory)

Table 1 Surface water supply for 2019

2019 Month	Federal AF Water	Federal Non-Ag Water	State Water (AF)	Local Water (af)	Other Water (AF)	Transfers into district	Upslope drain water	Total AF
January	0	0	0	0	0	0	UNK	0
February	0	0	0	0	0	0	UNK	0
March	0	0	0	0	0	0	UNK	0
April	0	0	9,500	0	0	0	UNK	9,500
May	0	0	37,100	0	0	0	UNK	37,100
June	0	0	42,000	0	0	0	UNK	42,000
July	0	0	50,994	0	0	0	UNK	50,994
August	0	0	44,767	0	0	0	UNK	44,767
September	0	0	30,689	0	0	0	UNK	30,689
October	0	0	6,603	0	0	0	UNK	6,603
November	0	0	0	0	0	0	UNK	0
December	0	0	0	0	0	0	UNK	0
Total	0	0	220,171	0	0	0	UNK	220,171

TABLE 2 GROUNDWATER SUPPLY

2019 Month	District Groundwater (AF)	Private Agriculture Groundwater (AF)
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0
Total	0	0

TABLE 3 TOTAL WATER SUPPLY

2019 Month	Surface Water Total (AF)	Direct Groundwater (AF)	Recycled M&I Wastewater	Total District Water Supply (AF)
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	9,500	0	0	9,500
May	37,100	0	0	37,100
June	42,000	0	0	42,000
July	50,994	0	0	50,994
August	44,767	0	0	44,767
September	30,689	0	0	30,689
October	6,603	0	0	6,603
November	0	0	0	0
December	0	0	0	0
Total	220,171	0	0	220,171

TABLE 4 DISTRIBUTION SYSTEM

2019 Precipitation Worksheet					2019 Evaporation Worksheet			
Month	Inches Precip[164]	Ft Precip	Acres	AF/Year	Inches Evap	Ft Evap	Acres	AF/Year
January	1.49	0.12	53,638					
February	2.05	0.17	53,638					
March	0.82	0.07	53,638					
April	1.64	0.14	53,638					
May	1.62	0.14	53,638					
June	0.08	0.01	53,638					
July	0.07	0.01	53,638					
August	0.63	0.05	53,638					
September	1.87	0.16	53,638					
October	0.39	0.32	53,638					
November	0.11	0.01	53,638					
December	1.67	0.14	53,638					
Total	12.44	1.04	53,638	55,605				

Note: The Precipitation Worksheet in Reclamation's 2017 Water Management Planner does not work and does not calculate the totals required for this table.

Infrastructure	Length (Ft)	Width (Ft)	Surface area (Ft2)	Precipitation AF	Evaporation AF[165]	Spillage AF	Seepage AF	Total (AF)
A Canal	47,520	75	4,752,000		16.3	0	~15	31.3
A-1								
A-2				Abandoned				
A-2.5								
A-3	43,801	9	394,209					

[164] NOAA.gov. https://www.wrh.noaa.gov/mfr/fcst/index.php

[165] Assuming a 0.01" average loss per day for 179 days.

Infrastructure	Length (Ft)	Width (Ft)	Surface area (Ft2)	Precipitation AF	Evaporation AF [166]	Spillage AF	Seepage AF	Total (AF)
A-4	14,903	7	104,321					
A-5	3,032	6	18,192					
A-7	9,190	6	55,140					
B Canal	21,220	32	2,122,000		7.62	3,550	~4	
B-1	1,824	5	9,120					
B-2	6,748	5	33,740					
C Canal	58,080	31	5,169,120		17.70	6,372		
C-1				Abandoned				
C-2				Abandoned				
C-3	2,467	5	12,335					
C-4	41,756	30	1,252,680					
C-5	8,029	8	64,232					
C-6	2,828	6	16,968					
C-7	12,838	6	77,028					
D Canal	100,320	~20	2,006,400		6.87	9,312		
D-1	24,435	13	317,655	Pending	Analysis	With	FCA	2022
D-2	1,236	5	16,068	Pending	Analysis	With	FCA	2022
D-3	6,441	8	51,528	Pending	Analysis	With	FCA	2022
D-4				Pending	Analysis	With	FCA	2022
D-5	6,596	6	39,576	Pending	Analysis	With	FCA	2022
D-6				Pending	Analysis	With	FCA	2022
D-7	1,272	5	6,360	Pending	Analysis	With	FCA	2022
D-9	5,221	5	26,105	Pending	Analysis	With	FCA	2022
D-9.5	2,910	5	14,550	Pending	Analysis	With	FCA	2022
D-10	7,199	6	43,194	Pending	Analysis	With	FCA	2022

[166] Assuming a 0.01" average loss per day for 179 days.

Infrastructure	Length (Ft)	Width (Ft)	Surface area (Ft2)	Precipitation AF	Evaporation AF[167]	Spillage AF	Seepage AF	Total (AF)
D-11	3,161	5	15,805	Pending	Analysis	With	FCA	2022
D-12	8,773	13	114,049	Pending	Analysis	With	FCA	2022
D-13				Pending	Analysis	With	FCA	2022
D-14	4,953	8	39,624	Pending	Analysis	With	FCA	2022
D-15	8,221	11	90,431	Pending	Analysis	With	FCA	2022
D-16	6,605	11	72,655	Pending	Analysis	With	FCA	2022
D-17	4,298	8	34,384	Pending	Analysis	With	FCA	2022
D-18	6,575	8	52,600	Pending	Analysis	With	FCA	2022
D-19	7,575	8	60,600	Pending	Analysis	With	FCA	2022
D-20 – 25				Pending	Analysis	With	FCA	2022
E Canal	52,800	15	792,000		2.98	1,543		
E-1	3,400	13	44,200					
F Canal	58,080	20	1,161,600		4.0	2,801		
F-1	26,400	8	211,200		0.73			
F-2								
F-3	9,804	10	98,040					
F-4	7,993	8	63,944					
F-5	6,698	8	53,584					
F-6/7/8	4,380	6	26,280					
G Canal	42,240	80	3,379,000			6,136		
G-1	4,645	11	71,995					
G-2								
G-3	20,406	13	265,278					

[167] Assuming a 0.01" average loss per day for 179 days.

TABLE 5 (AG ONLY)

2019 Crop Name (See Annex's M and N for Crop Reports)	Acres	Crop ET (AF/Ac)[168]	Leaching Requirement (AF/Ac)	Cultural Practices (Frost, pre-irrigation, harvest)	Effective Precipitation (AF/AC)	Appli. Crop Water Use (acre-feet)
Alfalfa	22,518	0.24	UNK		Varies	Irrelevant
Pasture	14,409	0.23	UNK		Varies	Irrelevant
Other Hay	1,417	0.23	UNK		Varies	Irrelevant
Potatoes	6,648	0.22	UNK	Frost Pre-harvest irrigation	Varies	Irrelevant
Beets/Onions	1,200	0.19	UNK	Frost Pre-harvest irrigation	Varies	Irrelevant
Wheat	2,642	0.24	UNK	Post harvest irrigation	Varies	Irrelevant
Other Grains	1,243	0.24	UNK	Post harvest irrigation	Varies	Irrelevant
Garden/Orchard	1,969	0.20	UNK		Varies	Irrelevant
Cover Crop	477	0.20	UNK		Varies	Irrelevant

[168] As per document provided at https://ucanr.edu/sites/irecBETA/files/218740.pdf

TABLE 6 DISTRICT WATER BUDGET

Water Supply	From Table 3		
Riparian ET	Distribution & Drain	Minus	
Groundwater Recharge	Intentional – Pond Injection	Minus	
Seepage	From Table 4	Minus	
Evaporation Precipitation	From Table 4	Minus	
Spillage	From Table 4	Minus	
Transfers out of District		Minus	0
Water Available for Sale to Customers			Klamath ID does not sell water. Water is a property right which Klamath ID provides operations and maintenance of the system to deliver.
Actual Agricultural Water Sales 2019	From District Sales Records		Klamath ID does not sell water. Water is a property right which Klamath ID provides operations and maintenance of the system to deliver.
Private Groundwater	From Table 2	Plus	
Crop Water Needs	From Table 5	Minus	
Drainwater outflow	Tail and Tile, Not Recycled		Unmeasured
Percolation from Agricultural Land	Calculated		
Unaccounted for Water	Calculated		

TABLE 7 (AG ONLY) INFLUENCE ON GROUNDWATER AND SALINE SINK

2019	
Agric Land Depp Perc + Seepage + Recharge - Groundwater Pumping = District Influence on	
Estimated actual change in groundwater storage, including natural recharge	UNK
Irrigated acres (from Table 5) -	53,631
Irrigated acres over a perched water table	UNK
Irrigated acres draining to a saline sink	0
Portion of percolation from agriculture seeping to a perched water table	UNK
Portion of percolation from agriculture seeping to a saline sink	0
Portion of On-Farm Drain water flowing to a perched water table/saline sink	UNK
Portion of Dist. Sys. Seep/leeks/spills to perched water table/saline sink	0
Total (AF) flowing to a perched water table and saline sink	UNK

TABLE 8 ANNUAL WATER QUANTITIES DELIVERED UNDER EACH RIGHT OR CONTRACT

Year	Federal AF Water	Federal Non-Ag Water	State Water (AF) KA 1000 & KA 1004	Local Ground Water (AF) Permit G-16209	Other Water (AF)	Transfers into district	Upslope drain water	Total AF
2001	0	0	52,607		0	0	UNK	52,607
2002	0	0	348,579		0	0	UNK	348,579
2003	0	0	250,529		0	0	UNK	250,529
2004	0	0	307,152		0	0	UNK	307,152
2005	0	0	244,534		0	0	UNK	244,534
2006	0	0	281,677		0	0	UNK	281,677
2007	0.	0	304,836		0	0	UNK	304,836
2008	0	0	290,785		0	0	UNK	290,785
2009	0	0	286,572		0	0	UNK	286,572
2010	0	0	156,578		0	0	UNK	156,578
2011	0	0	252,993		0	0	UNK	252,993
2012	0	0	270,282		0	0	UNK	270,282
2013	0	0	221,210		0	0	UNK	221,210
2014	0	0	191,738		0	0	UNK	191,738
2016	0	0	246,564		0	0	UNK	246,564
2017	0	0	239,870		0	0	UNK	239,870
2018	0	0	169,952		0	0	UNK	169,952
2019	0	0	220,171		0	0	UNK	220,171
2020	0	0	127,781	1,490	0	0	UNK	129,271
2021	0	0	0		0	0	UNK	0

Note: Items highlighted in Yellow indicate years the Federal government curtailed water supplies and redirected stored water for irrigation under KA 294 over 4137 MSL in Upper Klamath Lake to in-stream purposes. This action in 2018, 2020, and 2021 violates Oregon law.

SECTION III: BEST MANAGEMENT PRACTICES (BMPS) FOR AGRICULTURAL CONTRACTORS

A. CRITICAL AGRICULTURAL BMPS

1. Water measurement (OAR 690-086-0240.3)

Measure the volume of water delivered by the District to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to +/-6%.

Number of delivery points (turnouts and connections) 1203

Number of delivery points serving more than one farm 56

Number of measured delivery points (meters and measurement devices) 1203

Percentage of water delivered to the contractor that was measured at a delivery point 100%

Total number of delivery points not billed by quantity Patrons billed O&M only

Delivery point measurement device table Manual turnout slide-table stick measurements with head pressure

Measurement Type	Number	Accuracy (+/-%)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
Orifices	0				
Propeller Meter	0				
Weirs/Checks	398	2%	1	0	6
Flumes	1	5%	1	NA	1
Venturi	0				
Metered Gates	0				
Acoustic doppler	3	8%	1	1	.25
Other – By Hand	1,203	5%	1	1	1
Total	1,605	5%	1	1	1

2. Designate water conservation coordinator

Name: Fritz Frisendahl Title: Klamath ID Water Master and Chief of Logistics

Address: 6640 KID Lane, Klamath Falls, OR 97603

Telephone: 541-882-6661 Email: fritz.frisendahl@klamathid.org

Provide the job description and minimum qualifications:

Klamath Irrigation District

Water Master & Chief of Logistics
Job Description

General Position Summary

This position exercises direct control of water flow, manually, and by computer, in canal systems at major control points and monitors irrigation deliveries and drainage according to District policies. The direct supervisor of the Ditch Rider team during water season and assists in the supervision of the maintenance staff. On-call 24-hours during water deliver season, shares weekend rotation for water delivery duties with management team. This position is non-union and exempt from overtime.

Essential Functions/Major Duties

1. Water Master Responsibilities
   a. Operate and oversee the maintenance of A Canal head works and fish screen facility.
   b. Operate and monitor District SCADA system.
   c. Control operation of and coordinate the maintenance of District pumping plants.
   d. Oversee C-Drop Hydroelectric plant operations.
   e. Addresses customer issues related to water deliveries
   f. Report to outside agencies for routine water tracking requirements
   g. Ensure staff receive position safety training.
   h. Assist with survey and water measuring work.
   i. Prepare evaluations for Ditch Rider team.
   j. Perform GIS mapping activities.
   k. Perform general office assistance when necessary
   l. Responsible for safety of dams program and urban canal safety program
   m. Evaluates and prioritizes infrastructure maintenance requirements
   n. Prepares management weekend duty schedules

2. Chief of Logistics
   a. Coordinate with outside agencies for delivery of resources and equipment
   b. Prepare public announcements for contract bids
   c. Review all contracts for accuracy and fulfillment
   d. Reviews all purchase orders for accuracy and fulfillment

3. Ditch Rider Supervisor
    a. Supervises Ditch Rider team in water season and direct their day to day activities.
    b. Organize rides, schedules and duties of Ditch Rider team during water season
    c. Review time cards of the Ditch Riders for accuracy.
    d. Resolves Ditch Rider team issues

4. Maintenance Supervision
    a. Assist Maintenance Supervisor in direct supervision, organizing, and directing maintenance crew activities.
    b. Assists Manager and Assistant Manager in hiring/firing as well as performance evaluations.
    c. Perform duties as directed by senior management.

Education/Experience

High School diploma or equivalent with over 7 years of ditch riding experience; at least 5 years of management experience. Advanced math and computer skills required. Must be able to pass Bureau of Reclamation security background check. Pass pre-employment and random drug and alcohol testing. First Aid and CPR certification. Must possess a valid Oregon driver's license.

Job Conditions

This position requires a combination of office and fieldwork. Periodic travel for evening meetings, conferences, workshops and training sessions. Physically must be able to sit, stand and lift 50lbs, and walk moderate distances. Fieldwork often requires site visits on landowner properties throughout the Klamath Basin. This may require walking over rough and uneven terrain, sometimes in inclement weather and carrying objects such as measuring tools and supplies.

Work Environment

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. The noise level in the work environment can be moderate to loud. Duties are performed indoors and outdoors.

3. Provide or support the availability of water management services to water users

a. Notices of District Education Programs and Services Available to Customers.

See Attachment H

a1. On-farm evaluations (OAR 690-086-0250.6.e)

	Total in District	#Surveyed Last Year	# Surveyed Current Year	# Projected for Next Year	# Projected for 2nd Year in Future
Irrigated Acres	**53,638**	0	0	0	0
Number of Farms	**5,134 Individual Accounts**	15	2	10	10

Klamath ID has provided on-farm irrigation scheduling assistance from education to contracting private work.

a2. Crop and field water use info to customers

Klamath ID routinely consults with farmers and their needs. We explore options and provide the best information available to address issues, minimize costs, and encourage an conservation culture. Information is provided at our monthly Board of Directors meetings, on our website, and through our newsletters.

b. Normal year and real-time irrigation scheduling and crop ET info

Klamath ID's system for real-time irrigation scheduling is decentralized and managed by our ditch riders. Conflicts are resolved at the ditch rider level or through our Water Master.

Evapotranspiration from crops is not currently measured by Klamath ID.

c. Surface, ground and drainage water quantity and quality data

Klamath ID currently does not monitor this program.

d. Educational programs/materials for farmers, staff, public (attach samples) (OAR 690-086-0250.7.a)

Klamath ID is actively involved in various educational programs and works with other Klamath Project water users, the USBR, the Oregon Institute of Technology, the Klamath Water Users Association, and Klamath Water And Power Association.

During the winter 2000, Tulelake ID arranged for a Canal Operators, Short Course to be presented by the Irrigation Training and Research Center, California Polytechnic State University (ITRC) to the Project water users. This was co-sponsored by the USBR. Klamath ID personnel attended this course. Klamath ID continues to work with various universities to provide continuing education for its staff and customers.

From 2003 – 2008 the USBR contracted with ITRC to provide a preliminary Modernization study and Master Development Plan for the Project. Klamath ID participated in the study and planning, which provided the basis for many of the already accomplished Klamath

ID management and conservation improvements.

Since 2017, Klamath ID provides timely information to its customers through our website. We encourage our users and provide information to participate in energy audits or irrigation efficiency programs. Klamath ID also periodically publishes a newsletter which includes information on water use and conservation.

Since 2019, Klamath ID has relied upon and directed farmers to the Oregon State University Extension and Research Center for various programs.

Continuing Education Programs

Klamath ID invests in continuing education programs to assure Klamath ID employees are well trained to operate the system efficiently with a minimum of loss or risk. Education includes maintenance of the canal and drainage systems and associated structures, weed control, pump rehabilitation, risk management, and safety programs.

Program	Co-Funders (if Any)	Yearly Targets
Information Program	None	--
Safety Program	Various grants	All
Internship Program	Various grants	1-2 Interns

As none of the water legally stored for irrigation from Upper Klamath Lake is being made available to Klamath ID by Reclamation, no other conservation measures are feasible nor appropriate to answer the requirement of OAR 690-086-0250.7.b.

e. Other

(1) Promotion of energy audits offered through local electric utilities for District water users (OAR 690-086-0250.6.a)

Klamath ID partners with Energy Trust through Farmers Conservation Alliance. Energy Trust provides grants and education to District water users. The District promotes energy audits by announcing PacifiCorps program links on our website.

(2) Conversion to metered, pressurized deliveries for parcels of one acre or less (OAR 690-086-0250.6.b)

Due to poor planning for urban development by Klamath County within the District, many parcels no longer have access to the established delivery system as originally designed. Some private land owners have created their own, privately owned, ditches in the urban areas to maintain access to irrigation water from the Project. Many others have suspended their water right as the land developers cut off or eliminated access to the developments.

Klamath IDs parcels for one-acre or less are primarily in the urban expansion areas served primarily by private ditches from one of our original turnouts developed in 1905. There are approximately 1360 lots, scattered along the A Canal laterals; the 1990s piping project, partially funded by Reclamation, did not result in pressurized, nor metered systems.

The Reclamation system, operated by Klamath ID, is not blessed with the topography to create a natural pressurized system. Hundreds of millions of dollars of taxpayer money would

need to be levied to incorporate piping, pumps, and meters. Furthermore, the natural aquatic weeds, algae, and debris create problems for small metered systems. To pursue this path requires a large taxpayer investment of time and resources for a much larger project.

At this time, due to the existing system which delivers to private ditches, placing a pressurized, metered system for all parcels of one acre or less is cost prohibitive for the District without significant outside funding and large scale modernization. We are exploring this option with Farmers Conservation Alliance.

4. Pricing structure

Klamath ID, in accordance with ORS 545, establishes and approves an annual budget to cover costs incurred for the District. This budget provides the basis for the assessment levied per acre of ground within Klamath ID and is linked to various Reclamation contracts.

OAR 690-086-0250.g. As previously explained in this document, OWRD's final order requesting an update on adopting a rate structure is conflicting with ORS 545.381.1 which states, "Annual assessments…determined by the board of directors shall make a computation of the whole amount of money necessary to be raised by the district for the ensuing year…so that each acre of irrigable land in the district shall be assessed and required to pay the same amount." Therefore, OWRD's request for a rate structure is not feasible, nor appropriate.

5. Evaluate and improve efficiencies of the District's pumps

On-going upgrades and modernization of our pumps incorporate a variable frequency drive (VFD) component. VFDs allow the District to more precisely control water management and potentially reduce power costs when installed and operated correctly.

In 2006, the District average pumping costs for recycling water was under $10,000. In 2019 the cost to recycle the same amount of water exceeded $105,000, in 2021, the cost to run the pumps was in excess of $160,000. Reducing power costs is high on the priority list to address with Farmers Conservation Alliance.

	Total in District	# Surveyed Last Year	#Surveyed Current Year	#Projected for Next Year
Wells	1	0	1	0
Lift Pumps	17	3	3	3

B. Exemptible Best Management Practices for Agricultural Contractors

1. Alternative land use

Drainage Characteristic	Acreage	Potential Alternate Uses
High Water Table (<5 ft)	Most	Hay, Alfalfa, Potatoes,
Poor Drainage	UNK	Sump / Reservoir Development
Groundwater Selenium concentration > 50ppb	NA	NA

Poor productivity	UNK	Sump / Reservoir Development

2. Facilitate use of available recycled water (from urban water treatment plant)

Sources of Recycled Urban Waste Water (from water treatment plant)	AF/Y Available	AF/Y Currently Used in District
None	0	0

3. Facilitate the financing of on-farm irrigation systems

Program	Description
NRCS through EQIP	On-Farm evaluations

4. Incentive pricing (OAR 690-086-0250.6.g)

Describe incentive rate structure or other programs and purpose. None; Klamath ID provides a by acre assessment based upon ORS 545; water is the property of the State and is allocated by water rights on property deeds.

5. Infrastructure Improvements

a. Line or pipe ditches and canals (OAR 690-086-0250.6.c)

Canal / Lateral	Types of Improvement	Number of Miles	Estimated Seepage (AF/Y)	Accomplished / Planned Date
C-4-a	Pipe	1.5	45 AF	1 April 2022
F-4	Pipe & Line	1.5	3*25 AF	1 April 2022
Under Analysis by FCA	Pipe	UNK	UNK	UNK

b. Construct/Line regulatory reservoirs (OAR 690-086-0250.6.f)

Reservoir Name	Location	Describe Improved Operations Flexibility and AF Savings
Under analysis by FCA	TBD	

The Lost River system between Harpold Dam and the Tulelake ID J Canal diversion is controlled by Reclamation's Wilson Dam and Tulelake's controlled Anderson Rose Dam creating reregulation reservoirs. The reservoirs behind these dams collect the majority of

Klamath ID operational spills and agricultural return flows for reuse through an extensive drainage system. Klamath ID can also spill to, or pump from these reservoirs from our recapture pumping stations. Tulelake ID uses these recapture reservoirs for their water supply.

Melhase Ryan/Spring Lake also collects Klamath ID operational spills and agricultural return flows through an extensive drainage system. The Melhase Ryan pumping plant pumps water from Spring Lake and can supply water to the Lost River or the C Canal by utilizing the #5 Drain pump.

Previous studies by the MBK Engineering, further examined by the On Project Plan and Reclamation have identified potential sites for regulation reservoirs. To date, the recommendations in these studies have not shown options for controlled gravity reuse.[169] All proposals have required investment in pumping systems and recurring pumping costs. Implementation of these expensive projects have not been further examined by Reclamation, nor Klamath ID due to exorbitant cost, environmental concerns, and/or higher priority maintenance concerns.

6. Increase flexibility in ordering and deliveries (OAR 690-086-0250.6.d)

Klamath ID entered into a contract with WaterVise in November 2020 to develop a modern water ordering system. This system is under development to allow Patrons to order water from electronic devices, provide visibility on all patron water orders, and to automate daily, weekly, monthly, and season reporting. Once implemented and operational, in combination with a modernized SCADA system, increased flexibility may be achieved.

7. Spill and tailwater recovery systems (distribution and drainage)

As previously outlined a substantial quantity of water used by Klamath ID comes from the extensive drainage system developed and maintained by Klamath ID. All return flows are recaptured by Klamath ID or other Districts through re-use pumps or spill into other District canal systems. Ultimately, any water which reaches the Tulelake Sump is then available for use in the Lower Klamath National Wildlife Refuge.

Distribution System Lateral	Annual Spill (AF/Y)	Quantity Recovered and Reused (AF/Y)
C Canal	UNK	100% Tulelake ID & Wildlife Refuge
D Canal	UNK	100% - Tulelake ID

Drainage System	Annual Drainage Outflow (AF/Y)	Quantity Recovered and Reused (AF/Y)
#1 Drain	UNK	92% (Klamath ID, Tulelake

[169] MBK Master Plan. 2008.

		ID, Wildlife Refuge)
#5 Drain	UNK	92% (Klamath ID and Tulelake ID)
#10 Drain	UNK	90% - Tulelake ID

8. Plan to measure outflow

Total # of outflow (surface) locations:	5
Total # of outflow (subsurface) locations:	0
Total # of measured outflow points:	0
Percentage of total outflow (volume) measured during report year:	0

Identify locations, prioritize, determine best measurement method/cost, submit funding proposal.

Location and Priority	Estimated Cost				
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
D Canal Spill. Priority 1	65,000	5,000	3,000	2,000	1,000
C Canal Spill. Priority 2	25,000	5,000	3,000	2,000	1,000
#1 Drain. Priority 3	45,000	10,000	5,000	3,000	2,000
#5 Drain. Priority 4		25,000	3,000	2,000	1,000
#10 Drain. Priority 5		8,000	2,000	1,000	1,000

Klamath ID has submitted for a WaterSMART grant to upgrade and expand the existing SCADA system which includes request for funding for sensors on these points.

9. Optimize conjunctive use

Expand authority and authorized points of diversion for KBID wells.

10. Automate canal structures

Under analysis by Farmers Conservation Alliance. Attempts to automate parts of the system have failed. Current automation which is working is rapidly degrading.

11. Facilitate or promote customer pump testing and evaluation

This option is being explored by Klamath Drought Response Agency.

12. Mapping

GIS Maps	Estimated Cost				
	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Layer 1 – Distribution System	35,000	16,000	8,000	5,000	4,000
Layer 2 – Drainage System	2,500	2,000	2,000	2,000	2,000
Layer 3 – Groundwater Information			15,000	10,000	5,000
Layer 4 – Soils Map			400,000	50,000	25,000
Layer 5 – Natural and Cultural Resources					
Layer 6 – Problem Areas	1,800	1,800	1,800	1,800	1,900

13. Program to evaluate effectiveness of conservation measures (OAR 690-086-0250.8)

Klamath ID is working with Sierra Controls and Farmers Conservation Alliance to improve our ability to evaluate the effectiveness of conservation efforts. Our focus for the period of this plan over the next five years is to upgrade our SCADA system, expand our partnership

with Oregon Institute of Technology's Water Assessment for Drought Resilience & Sustainability (WADRS) and Electrical Engineering Programs.

Due to the extensive drainage system, reuse of operational spills, agricultural return flows, ground water recharging, and interdependence of other Districts, it is difficult to evaluate the effectiveness of one particular conservation effort. Any conservation effort may gain localized conservation for Klamath ID, while having a negative impact on other District activities. Overall Project conservation is also difficult to measure as yearly weather conditions change, demands are altered, cropping patterns for areas change, and political policies have a direct and lasting impact on operations. Conservation trends may only be able to be calculated by analyzing changes across decades or similar weather patterns in relation to political policies.

C. Provide a 5Year Budget Best Management Practices

1. Amount actually spent in 2019.

2019	BMP Name	Budget Expenditure (not including staff time)	Staff Hours
A1	Measurement	$17,800	3,600
A2	Conservation Staff	$0	312
A3	On-Farm Evaluation/Water Delivery Info. Irrigation Scheduling Water Quality Agricultural Education Program	$4,186	7,200
A4	Quantity Pricing	0	0
A5	Contractor's Pumps	0	0
B1	Alternative Land Use	0	0
B2	Urban Recycled Water Use	0	0
B3	Financing of on-farm improvements	0	0
B4	Incentive Pricing	0	0
B5	Line or Pipe Canals/Install Reservoirs	$96,992	8,640
B6	Increase Delivery Flexibility	0	120
B7	District Spill/Tailwater Recovery Systems	$218,519	360
B8	Measure Outflow	0	240
B9	Optimize Conjunctive Use	0	0
B10	Automate Canal Structures	$40,667	480
B11	Customer Pump Testing	0	0
B12	Mapping	$15,442	520
	Total	$393,606	21,472

2.Projected budget summary for 2020

In 2019, Klamath ID has submitted three WaterSmart grants for piping/lining and measurement improvements totaling $725,867 in matching funds; Klamath ID is also in partnership with Farmers Conservation Alliance, and Oregon Institute of Technology and has contracts with Adkins Engineering, Sierra Controls, and Stacey & Dennis IT Solutions; these budget items are accounted for below assuming approval of the grants.

2020	BMP Name	Budget Expenditure (not including staff time)	Staff Hours
A1	Measurement	$581,027	4,400
A2	Conservation Staff	$0	312
A3	On-Farm Evaluation/Water Delivery Info. Irrigation Scheduling Water Quality Agricultural Education Program	$4,300	7,200
A4	Quantity Pricing	0	0
A5	Contractor's Pumps	$100,000	0
B1	Alternative Land Use	0	0
B2	Urban Recycled Water Use	0	0
B3	Financing of on-farm improvements	0	0
B4	Incentive Pricing	0	0
B5	Line or Pipe Canals/Install Reservoirs	$700,000	9,000
B6	Increase Delivery Flexibility	$45,000	240
B7	District Spill/Tailwater Recovery Systems	$190,000	360
B8	Measure Outflow	$105,000	240
B9	Optimize Conjunctive Use	$15,000	120
B10	Automate Canal Structures	$65,000	480
B11	Customer Pump Testing	0	0
B12	Mapping	$45,000	520
	Total	$1,809,827	22,872

SECTION IV: BEST MANAGEMENT PRACTICES FOR URBAN CONTRACTORS (NOT APPLICABLE)

ATTACHMENT A - DISTRICT MAPS

Reclamation Service – 1905. Topographic and irrigation map of the upper and lower Klamath projects

Map available for download at https://people.wou.edu/~taylors/g473/klamath_historical_map.jpg

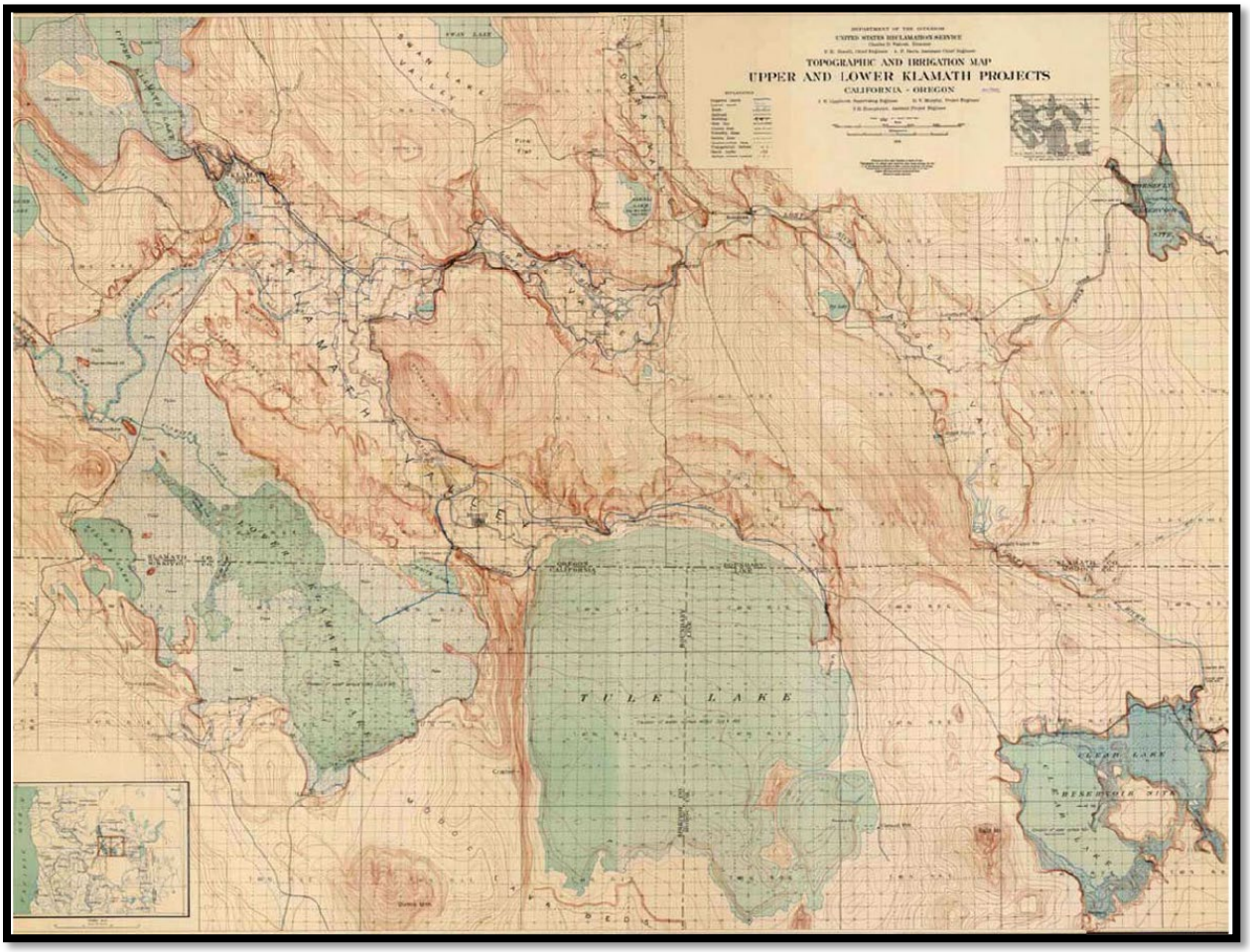


Figure 55 Topographic and Irrigation Map of the Upper and Lower Klamath Projects 1906[170]

[170] Reclamation. 1906. Map provided in the On-Project-Plan Summary. This 1906 map is on-file with Reclamation's Klamath Basin Area Office and MBK Engineers.

Reclamation service – 1917. Klamath Project Irrigation Map

Map available for download at
https://fedora.digitalcommonwealth.org/fedora/objects/commonwealth:4m90fd15n/datastreams/access800/content

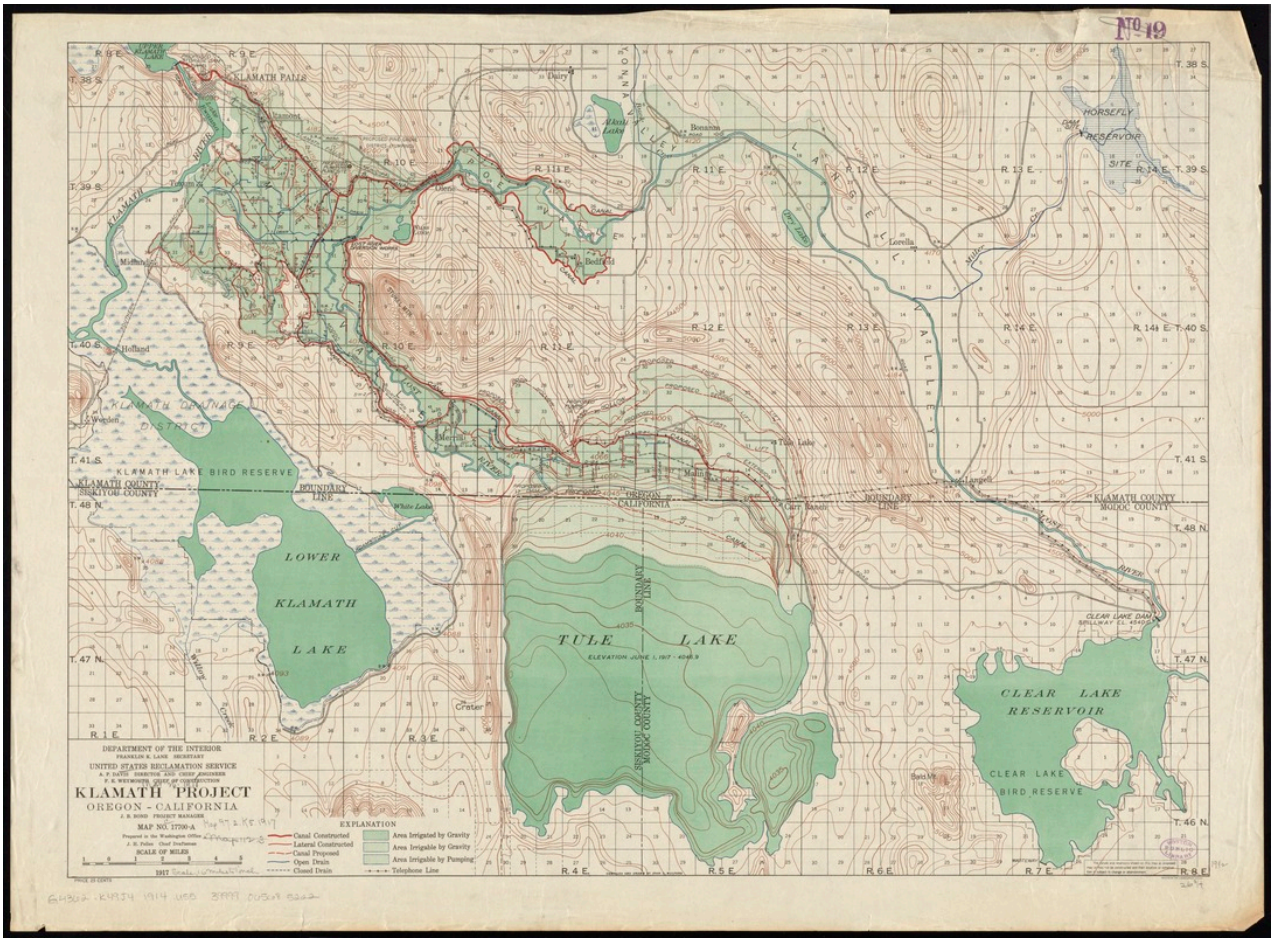


Figure 56 Topographic and Irrigation Map of the Klamath Project 1917 - Klamath ID Canals in Red.[171]

[171] Reclamation. 1917. Klamath Project.
https://fedora.digitalcommonwealth.org/fedora/objects/commonwealth:4m90fd15n/datastreams/access800/content

Bureau of Reclamation – 2019. Klamath Project Highlighting Klamath ID

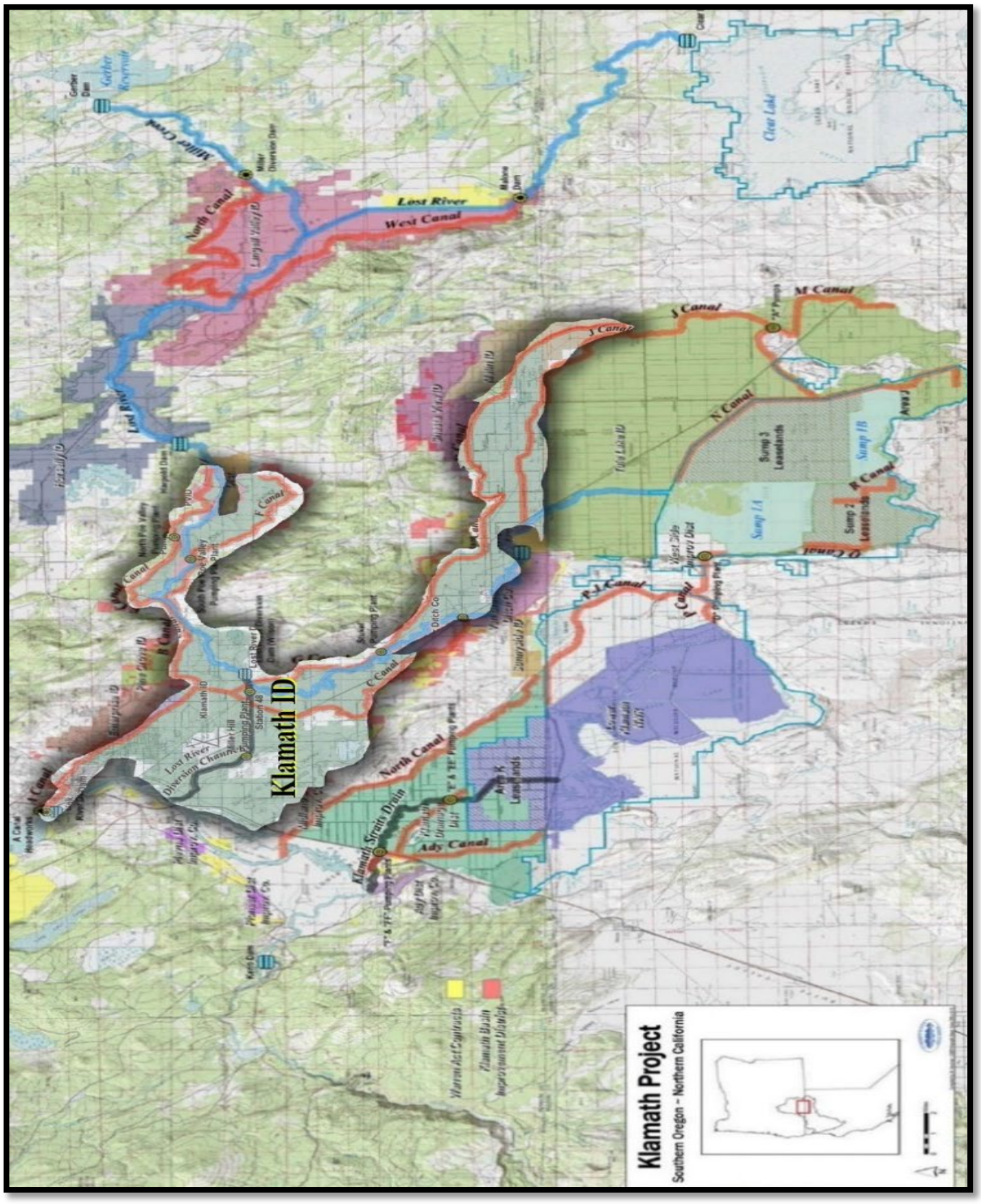


Figure 57 Klamath Project with Districts. Klamath ID Highlighted[172]

[172] A version of this map is available digitally at https://www.usbr.gov/projects/index.php?id=470

Klamath Irrigation District Boundary Map – 2003 MBK

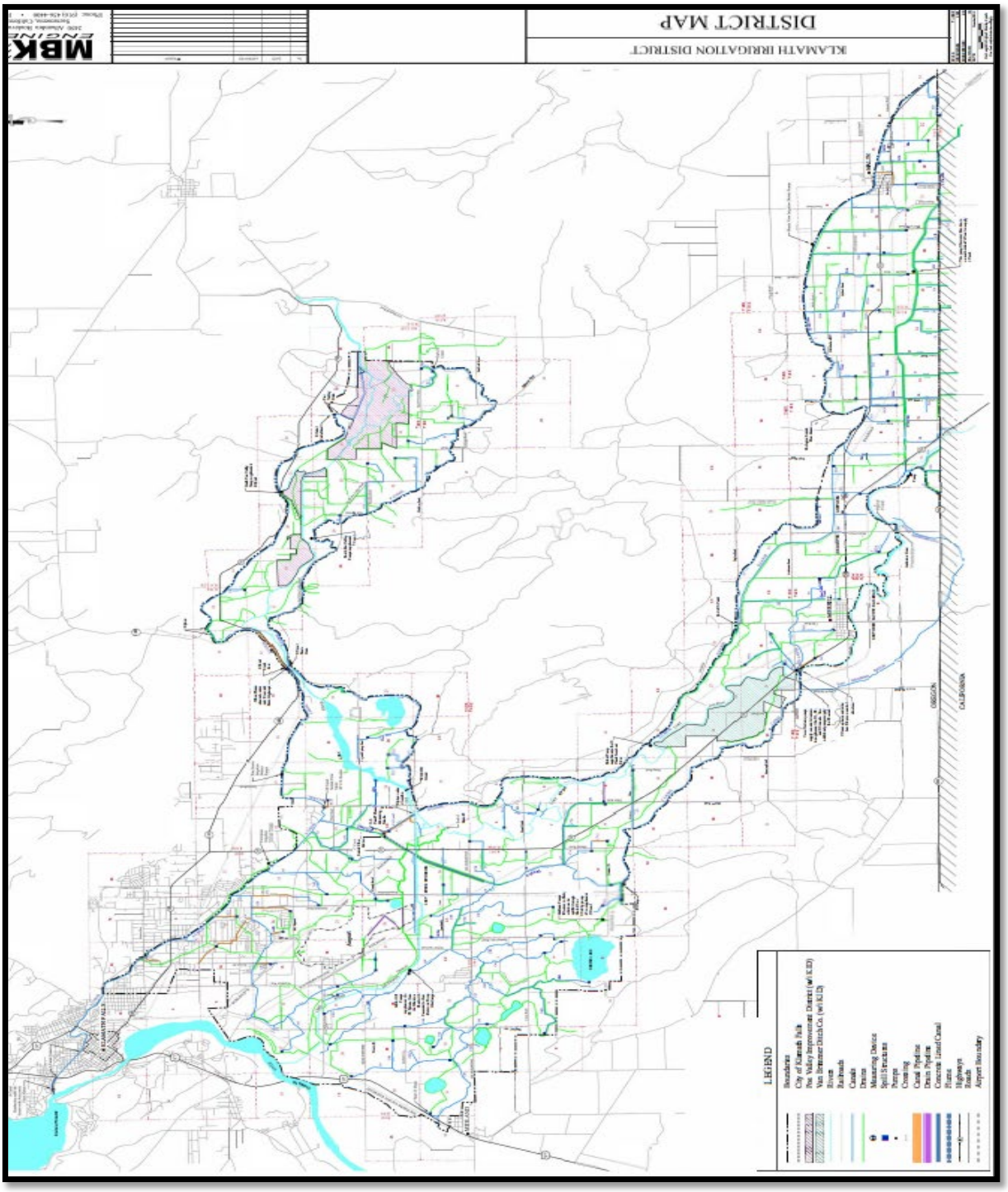


Figure 58 Klamath Irrigation District Boundaries without California D Lands[173]

[173] MBK Engineering Survey Map 2003. Previously provided in hardcopy to OWRD with the 2003, 2008, and 2011 WMCPs.

Klamath Project Schematic Map 12-209-3

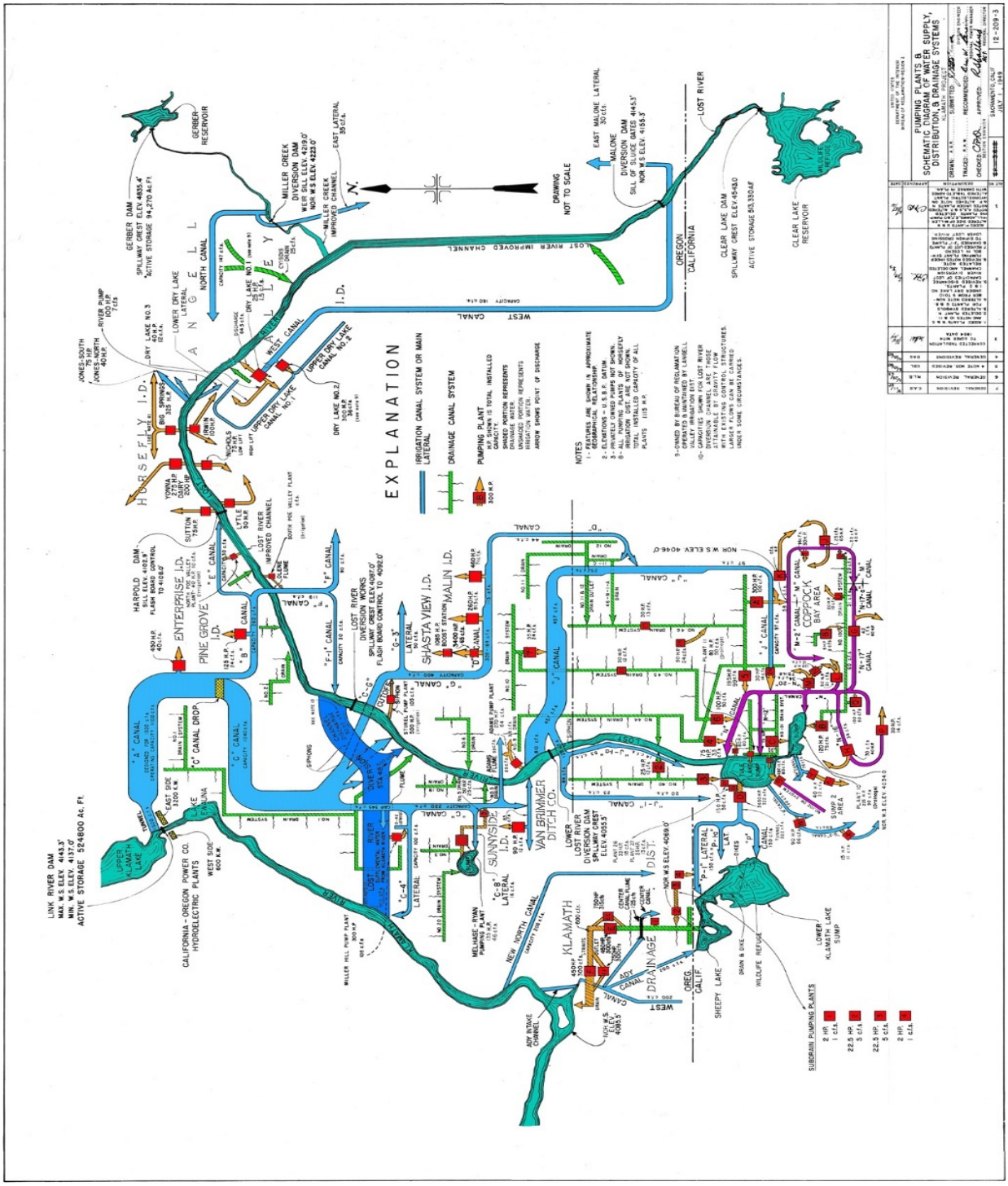


Figure 59 Klamath Project Infrastructure and Schematic[174]

[174] Reclamation. 1 July 1949. Pumping Plants and Schematic Diagram of Water Supply, Distribution, & Drainage Systems Klamath Project. Map 12-209-3. Sacramento California.

ATTACHMENT B - DISTRICT RULES AND REGULATIONS

Klamath ID Rules and Regulations are available at http://kid.stacygroup.com/wp-content/uploads/2019/10/KID-Patron-Water-Management-Policy_2019.pdf

ATTACHMENT C - MEASUREMENT DEVICE DOCUMENTATION

Figure 60 A Canal Headworks

A Canal Headworks and Fish Screen is managed by the "Lookout" program provided by National Instruments and programed under the direction of Reclamation. **All programing documentation is on file with Reclamation's Klamath Basin Area Office.**

Client: United States Bureau of Reclamation

Project: Klamath Irrigation District, A Canal Fish Screen

Engineer: Montgomery Watson Harza (MWH)

2353 - 130th Avenue N.E.

Suite 200

Bellevue, WA 98005

phone (425) 881-1100

fascimile (425) 881-8937

Project Manager: Dennis E. Dorratcague, P.E.

Author: John C. Deerkop, P.E.

Data from the headwords Acoustic Sensor is delivered through the A Canal Headworks PLC to the Lookout program, transmitted via radio through a RUGD system to the Klamath ID HQ, and processed on an outdated SCADA computer running "Wonderware".

C-Drop-Hydro Measurements – Hand Recorded Measurements

C-DROP HYDRO PLANT – DAILY LOG WHEN RUNNING

DATE	TIME	BLADE POSITION	WICKET GATE %	BYPASS GATE %	A CANAL LEVEL	INTAKE LEVEL	POWER OUT (KW)	FLOW (CFS)	H2O (PSI)	VIBRATION	NDE (LEFT)	DE (RIGHT)	AIR TEMP (F°)	BAT 1 OK	BAT 2 OK	OIL SIGHT GLASS	SIGN INITIALS
5/4/19	10:00	[illegible]	90	0	2.90	2.88	561	389	18	0	22.5	21.3	76	✓	✓	✓	[illegible]
5/5/19	9:05	+2.5	94	0	2.88	2.89	605	389	18	0	25.0	23.1	76	—	—	—	EE
5/6/19	2:00	+4.0	77	0	2.98	2.75	625	429	18	0	25.8	24.5	84	—	—	—	EE
5-7	2:00	0	84	0	2.88	2		489									
5-8	11:3	0	94	0	2.89	2.53	773	494	18	0	25.8	23.2	86	—	—	—	RS
5-9			94	0	2.88		773	494	18	0	25.4	23.6	86				EE
5-10	11:00	+4.5	78	0	2.68	2.66	695	514	18	0	25.8	24.4	86	—	—	—	EE
5-11	10:05	+4.5	80.6	0	2.87	2.75	690	529	18	0	26.1	24.2	80	—	—	—	SK
5-12	1345	+4.5	75.3	0	2.88	2.46	606	505	16	0	22.8	26.0	86	—	—	—	SC
5/13/19	8:00	+4.5	76.0	0	2.88	2.35	607	505	18	0	22.1	25.1	78	—	—	—	EE
5/14	11:35	+4.5	78.0	0	2.88	2.33	607	505	18	0	26.2	24.8	79	—	—	—	EE
5/15	2:30	+4.5	68.3	0	2.88	2.46	462	445	18	0	25.2	24.0	80				EE
5/16	7:50	+4.5	67.5	0.2	2.90	2.59	498		18	0	23.2	22.3	80				CS
5/18	20:30	+4.5	78.2	0.2	2.84	2.36	631		18	0	33.1	22.1	78				GM
5/18	20:50	+4.5	80.9	0.2	2.77	2.30	700		18	0	23.2	22.1	78				
5/19	7:17	+4.6↓	59.8	0.2	2.72	2.41	355		17	0.03	22.3	22.0	78				
5/19	10:12	10↑	57.1	0.2	2.81	2.74	427	328	18	0.00	21.8	20.6	70				
5/20	10:35	-10	94	0	2.88	2.77	525	388	18	0	23.5	21.9	22				
5/21	3:25	-10	94.8	0.2	2.88	2.75	525	366	18	0	23.4	21.9	76				
5/22	2:00	-10	76.0	0	2.79	2.	520	351	18	0	23.4	21.8	76				
5/24	1:30	-10	73.5	0.2	2.88	2.77	512	351	17	0	23.9	22.0	78				RTS
5/25	11:15	-10	75.9	0.2	2.89	2.77	511	351	17	0	23.8	22.0	77				RTS
5/26	12:30	-10	76.4	0.2	2.89	2.77	512	351	17	0	23.7	21.9	77				RTS
5/27	12:00	-10	55.0	0.2	2.88	2.78	400	286	18	0	23.3	22.0	75				RTS
5/28	12:00	-10	55.0	0	2.88	2.75	350	266	18	0	23.5	22.3	75				
5/29	3:30	-10	59.0	0	2.88	2.75	348	251	18	0	23.3	23.8	78				
5/30	9:35	-10	61.3	0	2.88	2.75	364	241	18	0	24.8	23.2	77				

Figure 61 C-Drop-Hydro Daily Manual Recording of Daily Flows

Figure 62 C-Drop-Hydro Power Measurements provided through C-D-H PLC Developed by Sorenson Engineering

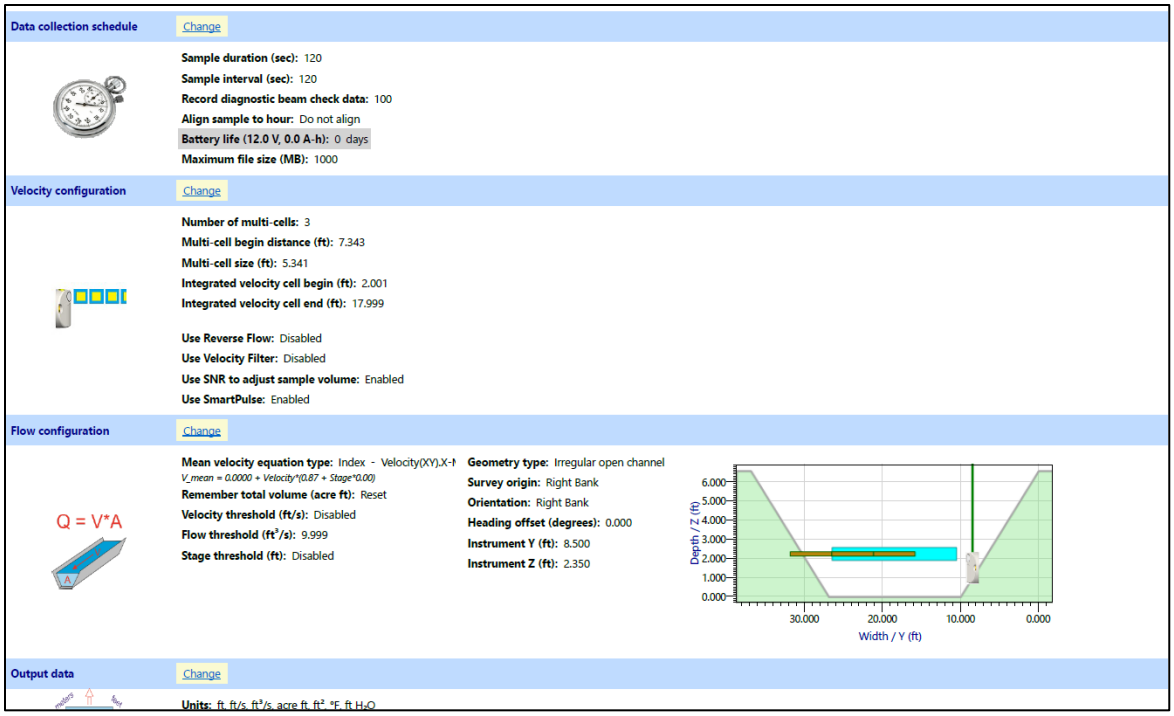


Figure 63 B Canal SonTek Configuration

Figure 64 B Canal Automated Gate – Attempts to fully Automate this Gate since 2011 have failed.

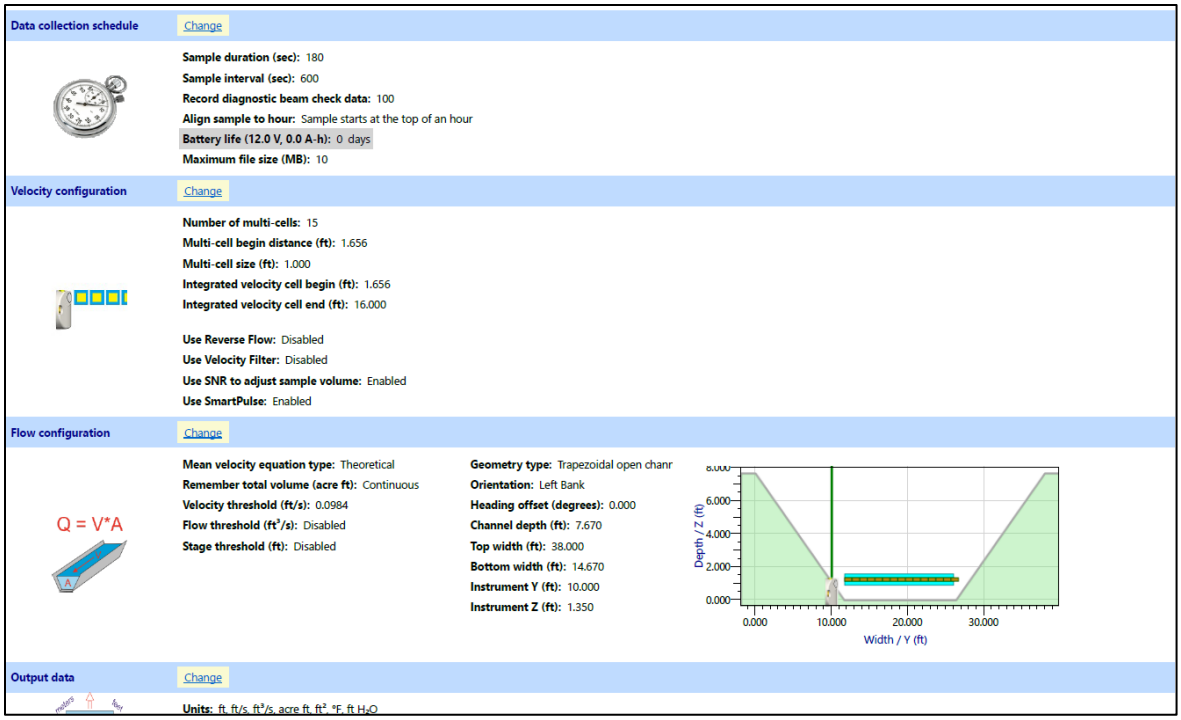


Figure 65 C Canal SonTek Configuration

Figure 66 Upper C Canal SonTek Measurement Station

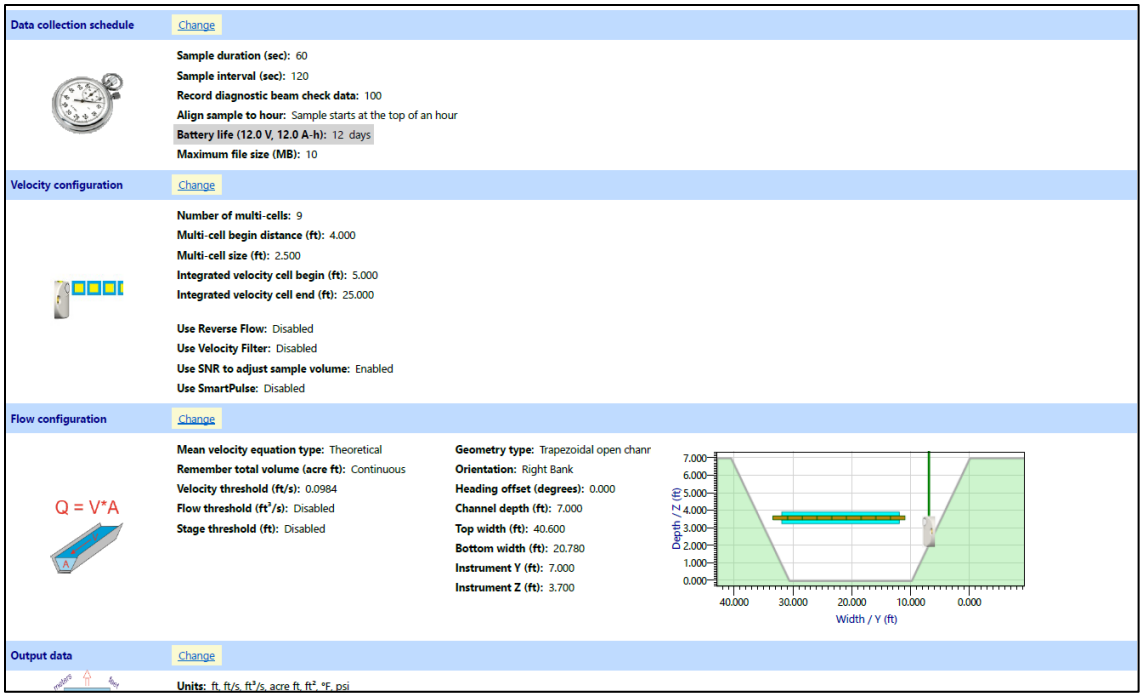


Figure 67 D Canal at Covington Station SonTek Configuration

Figure 68 D Canal Weir at Covington Station

Figure 69 Miller Hill Pumping Station

Miller Hill Pump 1

Frequency Hz	Flow Cfs	Current amps
30		
32		
34	4.00	74.90
36	6.75	75.00
38	8.50	76.90
40	14.00	78.40
42	17.00	84.80
44	20.00	88.50
46	22.50	92.00
48	24.50	95.00
50	27.00	98.40
52	28.50	101.40
54	30.00	104.70
56	31.50	108.00
58	33.50	112.00
60	35.25	117.00

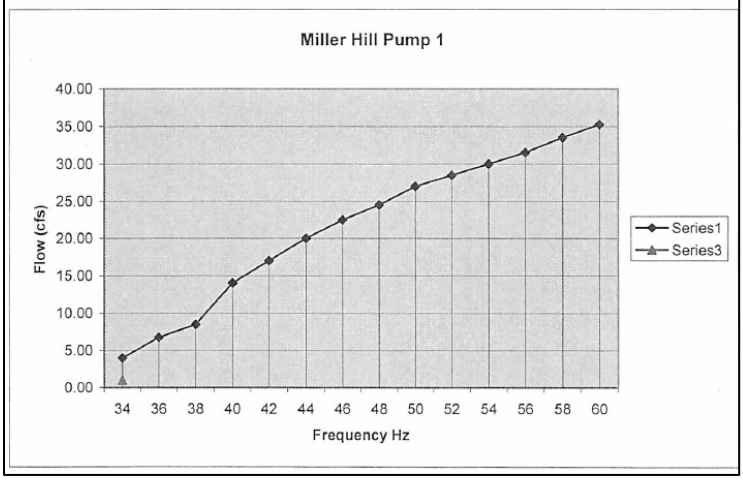


Figure 70 Miller Hill VFD Pump Chart

Acct.# 2954

Klamath Irrigation District

Daily Water Use Report

Ride # 3

Month June

Lateral A Canal

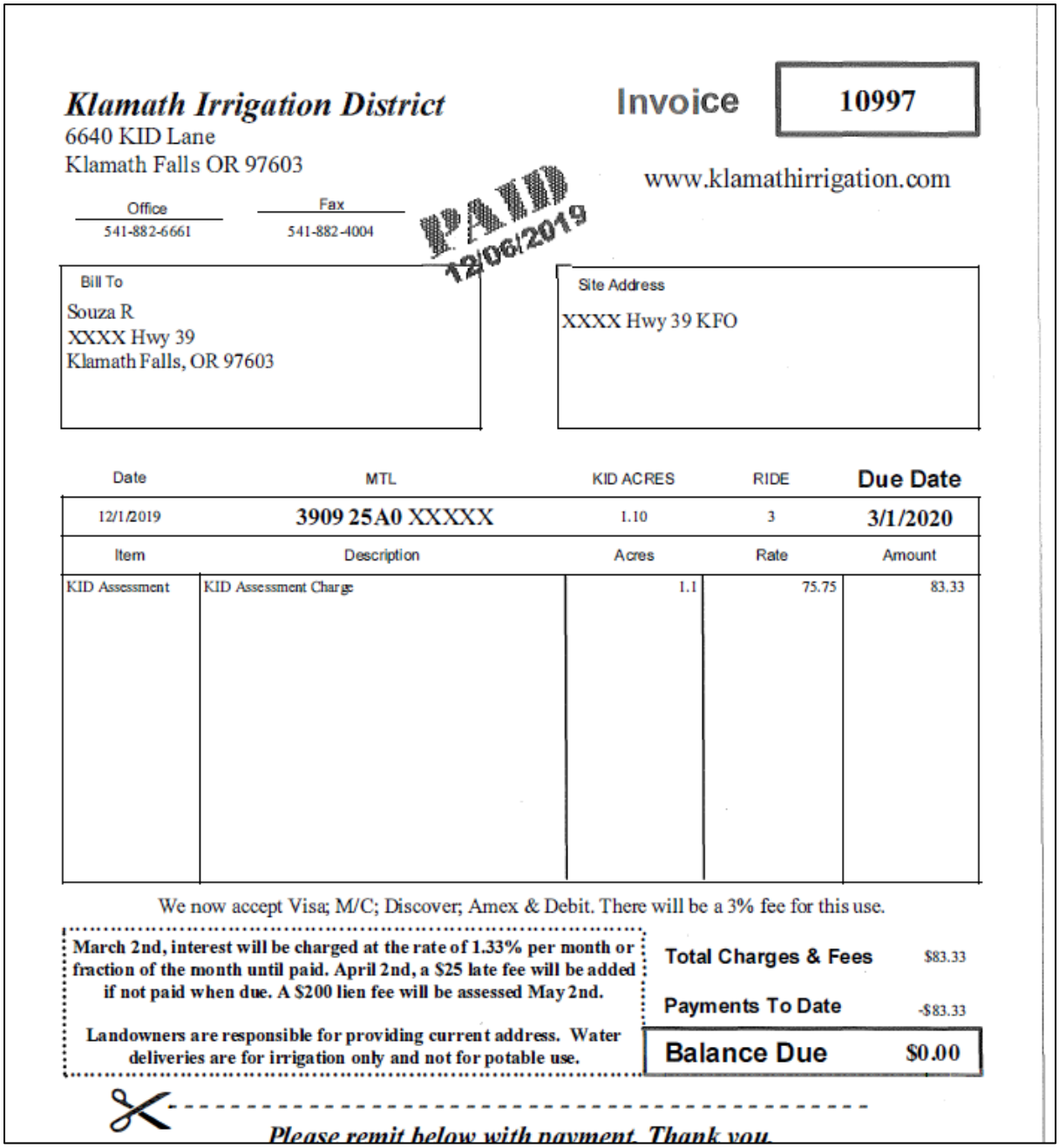
Owner: D. McFarland **User:** _____ **Structure#** T337

Diversion Type:

Day	Time	Person Ordering	Order +/-	CFS	Time on	Time off	Stem Inches	Comments
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11	9:25	Con	+2.0					
12				2.0	8:00			
13				2.0				
14				2.0				
15	11:???	Con	-2.0	2.0				
16				0		8:00		
17								
18								
19	5:00	Con	+1.5					
20				1.5	8:00			
21				1.5				
22				1.5				
23				1.5				
24				1.5				
25	8:15	Con	-1.5	0		8:00		
26	7:58	Con	+2.0					
27				2.0	8:00			
28	5:58	Con	-2.0	2.0				
29				0		8:00		
30								
31								

Figure 71 Sample Ditch rider Daily Water Use Report

ATTACHMENT D - DISTRICT SAMPLE BILLS



Klamath Irrigation District
6640 KID Lane
Klamath Falls OR 97603

Office 541-882-6661
Fax 541-882-4004

Invoice **10997**

www.klamathirrigation.com

PAID 12/06/2019

Bill To
Souza R
XXXX Hwy 39
Klamath Falls, OR 97603

Site Address
XXXX Hwy 39 KFO

Date	MTL	KID ACRES	RIDE	Due Date
12/1/2019	3909 25A0 XXXXX	1.10	3	3/1/2020

Item	Description	Acres	Rate	Amount
KID Assessment	KID Assessment Charge	1.1	75.75	83.33

We now accept Visa; M/C; Discover; Amex & Debit. There will be a 3% fee for this use.

March 2nd, interest will be charged at the rate of 1.33% per month or fraction of the month until paid. April 2nd, a $25 late fee will be added if not paid when due. A $200 lien fee will be assessed May 2nd.

Landowners are responsible for providing current address. Water deliveries are for irrigation only and not for potable use.

Total Charges & Fees	$83.33
Payments To Date	-$83.33
Balance Due	**$0.00**

Please remit below with payment. Thank you

ATTACHMENT E - DISTRICT WATER SHORTAGE PLAN

Water shortages for Klamath ID are primarily caused by political climate change.

Klamath ID is required to follow Reclamation guidance to fulfill Reclamation contracts. Current Reclamation plans are available at https://www.usbr.gov/mp/kbao/programs/ops-planning.html.

ATTACHMENT F - GROUNDWATER MANAGEMENT PLAN (IF APPLICABLE)

Not Applicable

ATTACHMENT G - GROUNDWATER BANKING PLAN (IF APPLICABLE)

Within the borders of Klamath ID, groundwater recharge is accomplished through the standard irrigation practices, seepage, and drainage in operating the irrigation system.

The chalk rock (Yonna Formation) prohibits most water from reaching the large aquifer in the basalt base. Most surface water drains across the top of the chalk rock and ultimately ends in the Tule Lake Sump.

ATTACHMENT H - ANNUAL POTABLE WATER QUALITY REPORT – URBAN

Not Applicable

ATTACHMENT I - NOTICES OF DISTRICT EDUCATION PROGRAMS AVAILABLE TO CUSTOMERS

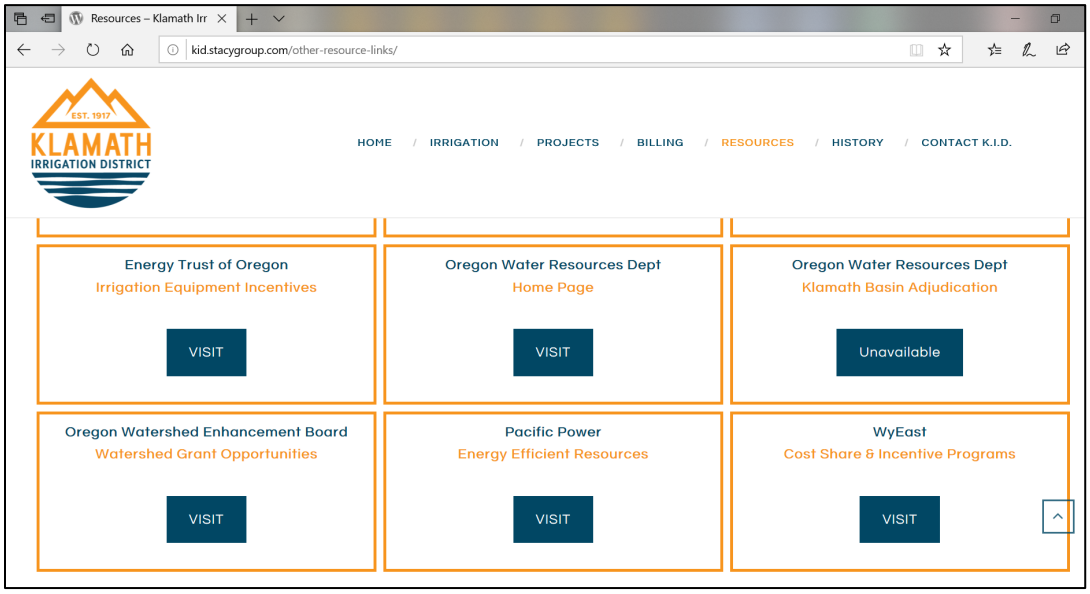
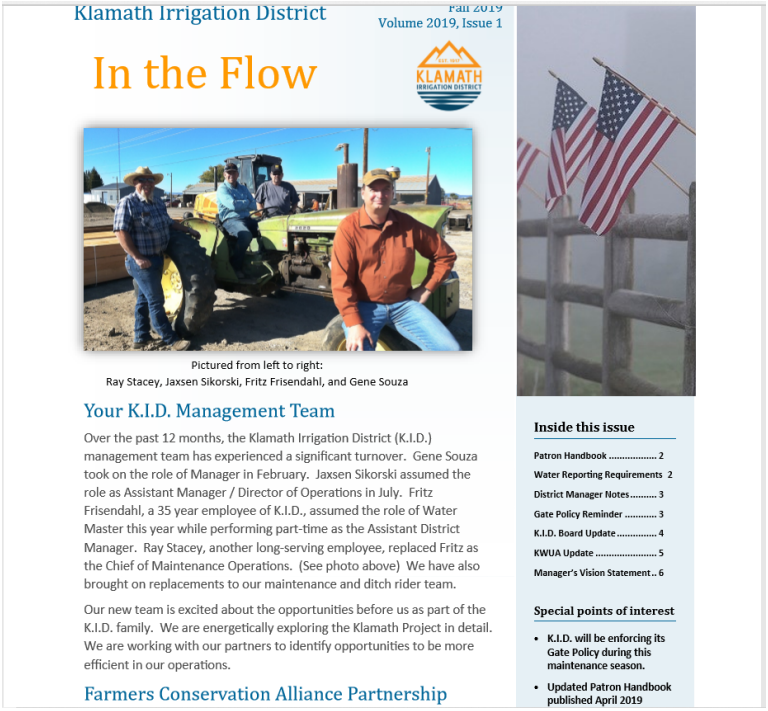


Figure 72 Information provided on Klamath ID Website


Klamath Irrigation District

Fall 2019
Volume 2019, Issue 1

In the Flow

Pictured from left to right:
Ray Stacey, Jaxsen Sikorski, Fritz Frisendahl, and Gene Souza

Your K.I.D. Management Team

Over the past 12 months, the Klamath Irrigation District (K.I.D.) management team has experienced a significant turnover. Gene Souza took on the role of Manager in February. Jaxsen Sikorski assumed the role as Assistant Manager / Director of Operations in July. Fritz Frisendahl, a 35 year employee of K.I.D., assumed the role of Water Master this year while performing part-time as the Assistant District Manager. Ray Stacey, another long-serving employee, replaced Fritz as the Chief of Maintenance Operations. (See photo above) We have also brought on replacements to our maintenance and ditch rider team.

Our new team is excited about the opportunities before us as part of the K.I.D. family. We are energetically exploring the Klamath Project in detail. We are working with our partners to identify opportunities to be more efficient in our operations.

Farmers Conservation Alliance Partnership

Inside this issue

Patron Handbook 2
Water Reporting Requirements 2
District Manager Notes 3
Gate Policy Reminder 3
K.I.D. Board Update 4
KWUA Update 5
Manager's Vision Statement .. 6

Special points of interest

- K.I.D. will be enforcing its Gate Policy during this maintenance season.
- Updated Patron Handbook published April 2019

Figure 73 Klamath ID Newsletters provided to Patrons[175]

[175] http://kid.stacygroup.com/wp-content/uploads/2019/10/KID-Newsletter-2019-Fall.pdf

ATTACHMENT J - DISTRICT AGRICULTURAL WATER ORDER FORM (IF APPLICABLE)

Currently Not Applicable. Orders are taken via phone.

On-going work under contract with WaterVise is anticipated to automate this process.

ATTACHMENT K - DRAINAGE PROBLEM AREA REPORT (IF APPLICABLE)

Not Applicable

ATTACHMENT L - FARMERS CONSERVATION ALLIANCE KLAMATH IRRIGATION DISTRICT MODERNIZATION BRIEF

KLAMATH IRRIGATION DISTRICT DISTRICT MODERNIZATION BRIEF

Background

Klamath Irrigation District (Klamath ID or the District) is located in southern Oregon, south and east of Klamath Falls, just north of the California border. Klamath Irrigation District was officially formed in 1917.[176] However, the District's infrastructure dates back to 1906 when construction began on the A Canal.[177] Construction of the District's canals, laterals, and drainage system continued through 1917.[176] Klamath ID is a Bureau of Reclamation (Reclamation) District and is part of the Klamath Project, which provides water to 240,000 acres of cropland.[177] The District's water supply is from the Klamath River, Upper Klamath Lake, and Lake Ewauna.

In 1918, Klamath ID entered into a contract with Reclamation for repayment of the costs of certain project works.[176] In 1954, the District entered into another contract with Reclamation to assume operation and maintenance of the A, B, C, D, E, F, and G Canals; the C-G cutoff; and all the related distribution, drainage, and pumping plants.[176] Under this contract, Klamath ID is also required to serve water users both within and outside of its boundaries, including Klamath Basin Improvement District and individual Warren Act Contracts.[176] Since the District delivers water to eight other districts or companies, it does not keep records of the number of acres irrigated annually; however, approximately 74,996 acres are irrigated from the Klamath ID system.

Klamath ID has over 2,500 patrons and irrigates 53,638 acres of cropland through 200 miles of canals and laterals.[178] Although urbanization has occurred throughout the District, especially close to Klamath Falls, the District only delivers water for irrigation and stock water; no water is delivered for domestic or municipal purposes. The District has one major diversion, from Upper

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[176] Klamath Irrigation District. (2019). *District Website*. Retrieved from: http://www.klamathirrigation.com/page11.html

[177] Bureau of Reclamation. (2019). *Klamath Project*. Retrieved from: https://www.usbr.gov/projects/index.php?id=470

[178] Klamath Irrigation District *Water Management and Conservation Plan*. (2011).

Klamath Lake into the A Canal, with a capacity of 1,150 cfs. The diversion is screened through a vertical-plate, V-shaped fish screen before passing through a 3,300-foot-long tunnel beneath the City of Klamath Falls, then is discharged into the A Canal. The A Canal flows southeast for about 9 miles where it terminates and delivers water into the B Canal and the C Canal. The B Canal flows east about 4 miles where it terminates and delivers water into the E and F canals. The C Canal flows south about 1 mile to the C-G Cutoff, continues southwest about 2 miles to C-4 Lateral, and flows to the west. Below the C-G Cutoff, the G Canal flows southeast about 8 miles to discharge into the D Canal. Approximately, 21,460 feet of the District's laterals in urban areas have been piped, but the vast majority of the system is open and unlined.

The District has seven reuse pumping stations (Miller Hill, Stukel, Adams, South Poe Valley, North Poe Valley, Melhase Ryan, and the #5 Pump) with a total of 16 pumps; ten major drains; and 2,000 turnouts. According to District staff, the South Poe Valley and Miller Hill stations are used most frequently, along with the Stukel station, which is used to correct water deliveries. The Miller Hill station's three pumps operate at 100 HP each and nearly always pump approximately 17 to 20 cfs between the Lost River Diversion Channel and the C-4 Canal. The A, B, C, D, and G Canals, and the Miller Hill Pumping Plant have SCADA.[179] Some measuring points use weirs and flumes, and others use differential pressure flow measurement meters. The District would like to install SCADA at the C and D drops and C Syphon Gate. The District has flow measurements for water discharging back to the Lost River and to Tulelake Irrigation District. Tulelake Irrigation District measures flows at the Anderson Rose Diversion Dam and Station 48 but does not typically share those measurements with Klamath Irrigation District staff.

The District maintains and operates one hydroelectric power facility located at the C Drop, though the facility is owned by Ted Sorenson. It has a vertical Kaplan turbine and a capacity of 1.1 MW. The power that is generated is sold to Pacific Power. The District receives royalties on power production, which are approximately $200,000 to $250,000 per year. Though, there is no drought contingency plan in the contract, so in a low water year the District could be subject to paying Pacific Power if the facility does not produce the agreed-upon amount of power. According to the District's water rights, the 700 cfs-capacity facility provides an average annual generation of 2,900 megawatt-hours (MWh). The turbine operates at a theoretical horsepower (HP) of 1,790.

Approximately 40,000 acres within the District are irrigated with sprinklers (i.e., wheel lines, solid set, and, more frequently, pivots), and approximately 13,000 acres are flood irrigated. The primary crops grown in Klamath ID are alfalfa, pasture, potatoes, and cereal grains; however, row crops, orchards, strawberries, and landscape plants are also irrigated from the District's

[179] Freeman, B., Hicks, J., & Burt, C. (2005). *Leveraging SCADA to Modernize Operations in the Klamath Irrigation Project*. SCADA and Related Technologies. Retrieved from: https://mountainscholar.org/bitstream/handle/10217/46525/121_Proceedings%202005%20USCID%20Vancouver%20Freeman.pdf?sequence=20&isAllowed=y

system.

Existing water loss data for the District indicate that between 1991 and 2000, approximately 20 percent of diverted water is lost in end spills, 14 percent is lost to lateral seepage, 1 percent is required for filling and draining the system, and the remaining 65 percent reaches patrons.[178] However, overall, the Klamath Project re-uses and recycles between 90 and 95 percent of the diverted water, according to a 1998 draft report entitled "Klamath Project Historical Water Use Analysis" by Davids Engineering.[178]

Goals and Objectives

- Modernization Goal: The District's main goal for modernization is to optimize its water resources by improving the flexibility and resiliency of its system.
- Key Modernization Objectives:
    - Improve water tracking from diversion to drain
        - Possible actions: water loss assessment; identify irrecoverable losses; mass balance study; improve measurement devices
            - The vast majority of the water loss in the District's system is reused by other Klamath Project water users; actions that impact recoverable losses could impact and reduce the overall Project efficiency.
    - Maximize efficiency and flexibility of water deliveries
        - Possible actions: reduce irrecoverable losses through piping; water transactions/marketing
    - Bring people together
        - Possible actions: build/strengthen partnerships to collaboratively manage water resources in the basin
    - Update failing infrastructure
        - There is a lots of failing infrastructure in the District. The A Canal between the diversion and the tunnel needs to be replaced, which is about ¼ mile.
    - Economic benefits: The District noted that it's tough to make things work financially for the District and the patrons, with power costs, market prices, water accessibility, etc.
        - Reduce power costs through piping
        - Reduce weed control through piping

Opportunities/Data Gaps

- Strengthen partnerships with local governments and other stakeholders
- Potential for low-head hydro in the District, with about 85 feet of drop across the existing system
- Potential for other power-generating activities, like solar

- The District has GIS data for its main canals and laterals but not for its smaller ones. The District is working on completing a GIS data set (which is 80-90% complete as of early May) that will include all the turnouts and the associated acreage.
- Updated water loss assessments, District- and project-wide, would inform the development of a System Improvement Plan and Modernization Strategy. Given the extensive reuse of water in the Klamath Project, an updated mass-balance study would also inform modernization efforts.
- Better information/data regarding stormwater inflow into the system from the City of Klamath Falls
- Mapping/GIS development of unmapped laterals and/or delivery points to District patrons, particularly in the southern part of the District
- Water rights mapping—need to get PDFs from District office
- Engineering designs—need to get PDF copies from District office

Challenges

- Water supply certainty is a challenge: Water deliveries are predicated on the current biological opinion, as well as the annual water availability. The BOR releases an Annual Operations Plan, which dictates that quantity of water available to Project water users. Hence, from year to year, there is no certainly, regarding Project water supply.
- There is a lot of competition between stakeholders for limited water supply and disagreement on how the limited water supply should be used.
- Because there is extensive water reuse within the Project, any piping or lining of canals and laterals requires careful review and analysis to not adversely affect downstream water supplies
- Effective coordination with local jurisdictions about stormwater management is a challenge.

Recent Successes/Projects

- C Siphon – replaced a failing flume, paid for by the District
- C-G Drop – replaced a structure that failed in 2016, concrete lining
- Stasney Check – replaced a failing structure

Pending Grants

- None known

Questions/Topics to Focus On

- Clarity on the District's major goals/objectives

Main Partnerships

- Through its contract with Reclamation, Klamath ID delivers water to:
  - Enterprise Irrigation District
  - Pine Grove Irrigation District
  - Van Brimmer Ditch Co.
  - Shasta View Irrigation District
  - Malin Irrigation District
  - Klamath Basin Improvement District
  - Sunnyside Irrigation District
  - Poe Valley Improvement District
  - Tulelake Irrigation District
  - individual Warren Act contractors
  - miscellaneous annual flat rate and temporary annual contracts
- The District works closely with the other Klamath Project water users. It is a member of the Klamath Water Users Association.

FCA Contact Information

- Lead Contact: Scott McCaulou; scott.mccaulou@fcasolutions.org; (503) 318-7116

ATTACHMENT M: KLAMATH IRRIGATION DISTRICT 2019 CROP REPORT

FORM 7-2045

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
Crop and Water Data Year 2019

OMB Approval No. 1006-0001

SECTION I - DISTRICT INFORMATION

a. Region	b. IDCON	c. Cong. Dist.	d. Project	e. Division
Mid-Pacific	203480	2nd	Klamath	Main
f. Unit	g. Water District		h. State	i. County
Main and Group E	Klamath Irrigation District		Oregon	Klamath
j. Contract Acres[1]	k. Irrigable Acres	l. Contact Person	m. 10-Digit Phone	n. Email
37,953	41,297	Fritz Frisendhal	(541) 882-6661	Ffrisendhal@klamathirrigation.com

SECTION II - DISTRICT LANDS IN AN IRRIGATION ROTATION

a. Agricultural Acres[3]	b. Non-ag Acres[4]	c. Seasonal Wetlands	d. Permanent Wetlands
39,274	850		

e. Acres irrigated by			f. Acres irrigated but not harvested	g. Acres not irrigated (dry crop, fallow, WUMP)
	Sprinkler:	27,203	951	2,022
	Drip:			

SECTION III - CROP PRODUCTION

a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL
CEREALS									
50 Barley (malt)		Bu		0	54 Rice		Cwt		0
51 Barley (feed)	98	Bu		0	56 Sorghums		Bu		0
52 Corn		Bu		0	57 Wheat	1,485	Bu		0
53 Oats	119	Bu		0	58 Other Cereals (specify) Other Grains	1,068	Bu		0
FORAGE									
61 Alfalfa hay	16,375	Ton		0	63 Irrigated pasture	11,115	AUM		0
62 Other hay	957	Ton		0	65 Silage or ensilage		Ton		0
					70 Other forage (specify) Cover crop	370	Ton		0
MISCELLANEOUS FIELD CROPS									
81 Beans, dry and edible		Cwt		0	86 Hops		Ton		0
82 Cotton: Lint (Upland)		Bale		0	87 Mint		Lb		0
83 Cotton: Seed (Upland)[6]		Ton		0	89 Sugar beets		Ton		0
84 Cotton: Lint (American-Pima)		Bale		0	90 Soybeans		Bu		0
85 Cotton: Seed (American-Pima)[6]		Ton		0	91 Other field crops (specify) Rye grass	85			0
VEGETABLES									
101 Asparagus		Cwt		0	119 Peas, green (processing)		Ton		0
102 Beans (processing)		Ton		0	120 Peas, green (fresh market)		Cwt		0
103 Beans (fresh market)		Cwt		0	121 Peppers (all kinds)		Cwt		0
104 Broccoli		Cwt		0	122 Potatoes, early		Cwt		0
105 Cabbage		Cwt		0	123 Potatoes, late	5,322	Cwt		0
106 Carrots		Cwt		0	124 Squash		Cwt		0
107 Cauliflower		Cwt		0	100 Sweet Potatoes		Cwt		0
108 Celery		Cwt		0	125 Tomatoes (canning)		Ton		0
109 Corn, sweet (processing)		Cwt		0	126 Tomatoes (fresh market)		Cwt		0
110 Corn, sweet (fresh market)		Ton		0	114 Cantaloupe		Cwt		0
111 Cucumbers		Cwt		0	116 Watermelon		Cwt		0
112 Greens (kale, spinach, etc.)		Cwt		0	115 Honey Ball, Honeydew, etc.		Cwt		0
113 Lettuce	50	Cwt		0	127 Other vegetables (specify) Spinach	50	Cwt		0
117 Onions, dry	1,004	Cwt		0					
118 Onions, green		Cwt		0					

CROP PRODUCTION CONTINUED									
a. CROPS	b. ACRES	c. UNIT	d. YIELDs PER AC	d. YIELDs TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDs PER AC	d. YIELDs TOTAL
NURSERY									
137 Strawberry Plants				0					0
SEED CROPS									
141 Alfalfa		Cwt		0	146 Onion		Cwt		0
142 Clover		Cwt		0	147 Pea		Cwt		0
143 Corn		Cwt		0	148 Potato		Cwt		0
144 Grass		Cwt		0	149 Sugar beet		Cwt		0
145 Lettuce		Cwt		0	150 Other seeds (specify)		Cwt		0
FRUITS									
161 Apples		Ton		0	165 Grapefruit				0
162 Apricots		Ton		0	166 Lemons and Limes		Cwt		0
158 Avocados		Ton		0	171 Olives		Cwt		0
163 Berries, except Strawberries		Cwt		0	167 Oranges and Tangerines		Ton		0
164 Cherries		Ton		0	172 Peaches		Cwt		0
168 Dates		Ton		0	173 Pears		Ton		0
159 Figs		Cwt		0	174 Prunes and Plums		Ton		0
169 Grapes, table		Ton		0	160 Strawberries		Ton		0
176 Grapes, raisin		Ton		0	175 Other fruits (specify)	226	Ton		0
177 Grapes, wine		Ton		0	Misc garden and trees				
170 Grapes, other		Ton		0					
NUTS									
181 Almonds		Ton		0	183 Walnuts		Ton		0
182 Pecans		Cwt		0	184 Other nuts (specify)		Ton		0
180 Pistachios		Ton		0					

FORM 7-2045	UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation Crop and Water Data Year 2019	OMB Approval No. 1006-0001

SECTION I - DISTRICT INFORMATION

a. Region	b. IDCON	c. Cong. Dist.	d. Project	e. Division
Mid-Pacific	203480	2nd	Klamath	Pumping
f. Unit	g. Water District		h. State	i. County
Warren Act Contracts	Klamath Irrigation District		Oregon	Klamath

j. Contract Acres[1]	k. Irrigable Acres	l. Contact Person	m. 10-Digit Phone	n. Email
4,341	5,106	Fritz Frisendhal	(541) 882-6661	ffrisendhal@klamathirrigation.com

SECTION II - DISTRICT LANDS IN AN IRRIGATION ROTATION

a. Agricultural Acres[3]	b. Non-ag Acres[4]	c. Seasonal Wetlands	d. Permanent Wetlands
4,716	104		

e. Acres irrigated by			f. Acres irrigated but not harvested	g. Acres not irrigated (dry crop, fallow, WUMP)
	Sprinkler:	4,101	95	390
	Drip:			

SECTION III - CROP PRODUCTION

a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL
CEREALS									
50 Barley (malt)		Bu		0	54 Rice		Cwt		0
51 Barley (feed)		Bu		0	56 Sorghums		Bu		0
52 Corn		Bu		0	57 Wheat	145	Bu		0
53 Oats		Bu		0	58 Other Cereals (specify)	275	Bu		0
					Other Grains				
FORAGE									
61 Alfalfa hay	2,197	Ton		0	63 Irrigated pasture	683	AUM		0
62 Other hay	335	Ton		0	65 Silage or ensilage		Ton		0
					70 Other forage (specify)	103	Ton		0
					Cover crop				
MISCELLANEOUS FIELD CROPS									
81 Beans, dry and edible		Cwt		0	86 Hops		Ton		0
82 Cotton: Lint (Upland)		Bale		0	87 Mint		Lb		0
83 Cotton: Seed (Upland)[6]		Ton		0	89 Sugar beets		Ton		0
84 Cotton: Lint (American-Pima)		Bale		0	90 Soybeans		Bu		0
85 Cotton: Seed (American-Pima)[6]		Ton		0	91 Other field crops (specify)				0
VEGETABLES									
101 Asparagus		Cwt		0	119 Peas, green (processing)		Ton		0
102 Beans (processing)		Ton		0	120 Peas, green (fresh market)		Cwt		0
103 Beans (fresh market)		Cwt		0	121 Peppers (all kinds)		Cwt		0
104 Broccoli		Cwt		0	122 Potatoes, early	762	Cwt		0
105 Cabbage		Cwt		0	123 Potatoes, late		Cwt		0
106 Carrots		Cwt		0	124 Squash		Cwt		0
107 Cauliflower		Cwt		0	100 Sweet Potatoes		Cwt		0
108 Celery		Cwt		0	125 Tomatoes (canning)		Ton		0
109 Corn, sweet (processing)		Cwt		0	126 Tomatoes (fresh market)		Cwt		0
110 Corn, sweet (fresh market)		Ton		0	114 Cantaloupe		Cwt		0
111 Cucumbers		Cwt		0	116 Watermelon		Cwt		0
112 Greens (kale, spinach, etc.)		Cwt		0	115 Honey Ball, Honeydew, etc.		Cwt		0
113 Lettuce		Cwt		0	127 Other vegetables (specify)		Cwt		0
117 Onions, dry	80	Cwt		0					
118 Onions, green		Cwt		0					

CROP PRODUCTION CONTINUED									
a. CROPS	b. ACRES	c. UNIT	d. YIELDS PER AC	d. YIELDS TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS PER AC	d. YIELDS TOTAL
NURSERY									
137 Strawberry Plants				0					0
SEED CROPS									
141 Alfalfa		Cwt		0	146 Onion		Cwt		0
142 Clover		Cwt		0	147 Pea		Cwt		0
143 Corn		Cwt		0	148 Potato		Cwt		0
144 Grass		Cwt		0	149 Sugar beet		Cwt		0
145 Lettuce		Cwt		0	150 Other seeds (specify)		Cwt		0
FRUITS									
161 Apples		Ton		0	165 Grapefruit				0
162 Apricots		Ton		0	166 Lemons and Limes		Cwt		0
158 Avocados		Ton		0	171 Olives		Cwt		0
163 Berries, except Strawberries		Cwt		0	167 Oranges and Tangerines		Ton		0
164 Cherries		Ton		0	172 Peaches		Cwt		0
168 Dates		Ton		0	173 Pears		Ton		0
159 Figs		Cwt		0	174 Prunes and Plums		Ton		0
169 Grapes, table		Ton		0	160 Strawberries		Ton		0
176 Grapes, raisin		Ton		0	175 Other fruits (specify)	42	Ton		0
177 Grapes, wine		Ton		0	Misc Garden				
170 Grapes, other		Ton		0					
NUTS									
181 Almonds		Ton		0	183 Walnuts		Ton		0
182 Pecans		Cwt		0	184 Other nuts (specify)		Ton		0
180 Pistachios		Ton		0					

FORM 7-2045	UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation Crop and Water Data Year 2019	OMB Approval No. 1006-0001

SECTION I - DISTRICT INFORMATION

a. Region	b. IDCON	c. Cong. Dist.	d. Project	e. Division
Mid-Pacific	203330	1st	Klamath	Main
f. Unit	g. Water District		h. State	i. County
D-Lands	Klamath Irrigation District		California	Modoc

j. Contract Acres[1]	k. Irrigable Acres	l. Contact Person	m. 10-Digit Phone	n. Email
1,192	1,519	Fritz Frisendhal	(541) 882-6661	Ffrisendhal@klamathirrigation.com

SECTION II - DISTRICT LANDS IN AN IRRIGATION ROTATION

a. Agricultural Acres[3]	b. Non-ag Acres[4]	c. Seasonal Wetlands	d. Permanent Wetlands
1,475	-327		

e. Acres irrigated by			f. Acres irrigated but not harvested	g. Acres not irrigated (dry crop, fallow, WUMP)
	Sprinkler:	956	38	5
	Drip:			

SECTION III - CROP PRODUCTION

a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL
CEREALS									
50 Barley (malt)		Bu			54 Rice		Cwt		
51 Barley (feed)		Bu			56 Sorghums		Bu		
52 Corn		Bu			57 Wheat		Bu		
53 Oats		Bu			58 Other Cereals (specify)		Bu		
FORAGE									
61 Alfalfa hay	761	Ton			63 Irrigated pasture	444	AUM		
62 Other hay	110	Ton			65 Silage or ensilage		Ton		
					70 Other forage (specify)		Ton		
MISCELLANEOUS FIELD CROPS									
81 Beans, dry and edible		Cwt			86 Hops		Ton		
82 Cotton: Lint (Upland)		Bale			87 Mint		Lb		
83 Cotton: Seed (Upland)[6]		Ton			89 Sugar beets		Ton		
84 Cotton: Lint (American-Pima)		Bale			90 Soybeans		Bu		
85 Cotton: Seed (American-Pima)[6]		Ton			91 Other field crops (specify)				
VEGETABLES									
101 Asparagus		Cwt			119 Peas, green (processing)		Ton		
102 Beans (processing)		Ton			120 Peas, green (fresh market)		Cwt		
103 Beans (fresh market)		Cwt			121 Peppers (all kinds)		Cwt		
104 Broccoli		Cwt			122 Potatoes, early		Cwt		
105 Cabbage		Cwt			123 Potatoes, late	100	Cwt		
106 Carrots		Cwt			124 Squash		Cwt		
107 Cauliflower		Cwt			100 Sweet Potatoes		Cwt		
108 Celery		Cwt			125 Tomatoes (canning)		Ton		
109 Corn, sweet (processing)		Cwt			126 Tomatoes (fresh market)		Cwt		
110 Corn, sweet (fresh market)		Ton			114 Cantaloupe		Cwt		
111 Cucumbers		Cwt			116 Watermelon		Cwt		
112 Greens (kale, spinach, etc.)		Cwt			115 Honey Ball, Honeydew, etc.		Cwt		
113 Lettuce		Cwt			127 Other vegetables (specify)		Cwt		
117 Onions, dry	23	Cwt							
118 Onions, green		Cwt							

CROP PRODUCTION CONTINUED									
a. CROPS	b. ACRES	c. UNIT	d. YIELDS PER AC	d. YIELDS TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS PER AC	d. YIELDS TOTAL
NURSERY									
137 Strawberry Plants									
SEED CROPS									
141 Alfalfa		Cwt			146 Onion		Cwt		
142 Clover		Cwt			147 Pea		Cwt		
143 Corn		Cwt			148 Potato		Cwt		
144 Grass		Cwt			149 Sugar beet		Cwt		
145 Lettuce		Cwt			150 Other seeds (specify)		Cwt		
FRUITS									
161 Apples		Ton			165 Grapefruit				
162 Apricots		Ton			166 Lemons and Limes		Cwt		
158 Avocados		Ton			171 Olives		Cwt		
163 Berries, except Strawberries		Cwt			167 Oranges and Tangerines		Ton		
164 Cherries		Ton			172 Peaches		Cwt		
168 Dates		Ton			173 Pears		Ton		
159 Figs		Cwt			174 Prunes and Plums		Ton		
169 Grapes, table		Ton			160 Strawberries		Ton		
176 Grapes, raisin		Ton			175 Other fruits (specify)		Ton		
177 Grapes, wine		Ton							
170 Grapes, other		Ton							
NUTS									
181 Almonds		Ton			183 Walnuts		Ton		
182 Pecans		Cwt			184 Other nuts (specify)		Ton		
180 Pistachios		Ton							

ATTACHMENT N: KLAMATH BASIN IMPROVEMENT DISTRICT 2019 CROP REPORT

FORM 7-2045

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
Crop and Water Data Year 2019

OMB Approval No. 1006-0001

SECTION I - DISTRICT INFORMATION

a. Region	b. IDCON	c. Cong. Dist.	d. Project	e. Division
Mid-Pacific	203480	2nd	Klamath	Pumping

f. Unit EID, KID, MID SVID,PGID,VBDC	g. Water District	h. State	i. County
	Klamath Basin Improvement District	Oregon	Klamath

j. Contract Acres[1]	k. Irrigable Acres	l. Contact Person	m. 10-Digit Phone	n. Email
10,403	8,098	Fritz Frisendhal	(541) 882-6661	Ffrisendhal@klamathirrigation.com

SECTION II - DISTRICT LANDS IN AN IRRIGATION ROTATION

a. Agricultural Acres[3]	b. Non-ag Acres[4]	c. Seasonal Wetlands	d. Permanent Wetlands
7,780	337		

e. Acres irrigated by		f. Acres irrigated but not harvested	g. Acres not irrigated (dry crop, fallow, WUMP)
	Sprinkler:	137	318
	Drip:		

SECTION III - CROP PRODUCTION

a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS[5] PER AC	d. YIELDS[5] TOTAL
CEREALS									
50 Barley (malt)		Bu		0	54 Rice		Cwt		0
51 Barley (feed)		Bu		0	56 Sorghums		Bu		0
52 Corn		Bu		0	57 Wheat	1,012	Bu		0
53 Oats		Bu		0	58 Other Cereals (specify) Other Grains	666	Bu		0
FORAGE									
61 Alfalfa hay	3,185	Ton		0	63 Irrigated pasture	2,168	AUM		0
62 Other hay	16	Ton		0	65 Silage or ensilage		Ton		0
					70 Other forage (specify)		Ton		0
MISCELLANEOUS FIELD CROPS									
81 Beans, dry and edible		Cwt		0	86 Hops		Ton		0
82 Cotton: Lint (Upland)		Bale		0	87 Mint		Lb		0
83 Cotton: Seed (Upland)[6]		Ton		0	89 Sugar beets		Ton		0
84 Cotton: Lint (American-Pima)		Bale		0	90 Soybeans		Bu		0
85 Cotton: Seed (American-Pima)[6]		Ton		0	91 Other field crops (specify) Cover Crop	4			0
VEGETABLES									
101 Asparagus		Cwt		0	119 Peas, green (processing)		Ton		0
102 Beans (processing)		Ton		0	120 Peas, green (fresh market)		Cwt		0
103 Beans (fresh market)		Cwt		0	121 Peppers (all kinds)		Cwt		0
104 Broccoli		Cwt		0	122 Potatoes, early		Cwt		0
105 Cabbage		Cwt		0	123 Potatoes, late	464	Cwt		0
106 Carrots		Cwt		0	124 Squash		Cwt		0
107 Cauliflower		Cwt		0	100 Sweet Potatoes		Cwt		0
108 Celery		Cwt		0	125 Tomatoes (canning)		Ton		0
109 Corn, sweet (processing)		Cwt		0	126 Tomatoes (fresh market)		Cwt		0
110 Corn, sweet (fresh market)		Ton		0	114 Cantaloupe		Cwt		0
111 Cucumbers		Cwt		0	116 Watermelon		Cwt		0
112 Greens (kale, spinach, etc.)		Cwt		0	115 Honey Ball, Honeydew, etc.		Cwt		0
113 Lettuce		Cwt		0	127 Other vegetables (specify)		Cwt		0
117 Onions, dry	83	Cwt		0					
118 Onions, green		Cwt		0					

CROP PRODUCTION CONTINUED

a. CROPS	b. ACRES	c. UNIT	d. YIELDS PER AC	d. YIELDS TOTAL	a. CROPS	b. ACRES	c. UNIT	d. YIELDS PER AC	d. YIELDS TOTAL
NURSERY									
137 Strawberry Plants				0					0
SEED CROPS									
141 Alfalfa		Cwt		0	146 Onion		Cwt		0
142 Clover		Cwt		0	147 Pea		Cwt		0
143 Corn		Cwt		0	148 Potato		Cwt		0
144 Grass		Cwt		0	149 Sugar beet		Cwt		0
145 Lettuce		Cwt		0	150 Other seeds (specify)		Cwt		0
FRUITS									
161 Apples		Ton		0	165 Grapefruit				0
162 Apricots		Ton		0	166 Lemons and Limes		Cwt		0
158 Avocados		Ton		0	171 Olives		Cwt		0
163 Berries, except Strawberries		Cwt		0	167 Oranges and Tangerines		Ton		0
164 Cherries		Ton		0	172 Peaches		Cwt		0
168 Dates		Ton		0	173 Pears		Ton		0
159 Figs		Cwt		0	174 Prunes and Plums		Ton		0
169 Grapes, table		Ton		0	160 Strawberries		Ton		0
176 Grapes, raisin		Ton		0	175 Other fruits (specify)	45	Ton		0
177 Grapes, wine		Ton		0	Mis Garden and trees				
170 Grapes, other		Ton		0					
NUTS									
181 Almonds		Ton		0	183 Walnuts		Ton		0
182 Pecans		Cwt		0	184 Other nuts (specify)		Ton		0
180 Pistachios		Ton		0					

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