BEFORE THE OREGON WATER RESOURCES DEPARTMENT

IN THE MATTER OF AN INVESTIGATION IN AID OF DISTRIBUTION PURSUANT TO ORS 540.210	)	**DETERMINATION ON STATUS OF RELEASES OF WATER STORED UNDER DETERMINED CLAIM KA 294**
Klamath Irrigation District *Petitioner*,	)	
Bureau of Reclamation *Reservoir Owner*.	)	

To: Staff of the Oregon Water Resources Department

I. BACKGROUND

Pursuant to the order of the Marion County Circuit Court dated October 13, 2020P0F[1]P ((*Klamath Irrigation District v. Water Resources Department* (20CV15606) the Oregon Water Resources Department (Department) determines whether water that is passing through the Link River Dam as of the date of this Determination is water stored pursuant to Determined Claim KA 294.

The Department will continue to provide updates as to the status of water released from UKL whenever circumstances change materially and at least monthly throughout 2021. Determination #1 was issued on January 22, 2021 and Determination #2 on February 23, 2021. This is the third determination for 2021 (Determination #3).

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[1] The October 13, 2020 order directed the watermaster to:

> "* * * immediately stop the distribution, use and/or release of Stored Water from the UKL [Upper Klamath Lake] without determining that the distribution, use and/or release is for a permitted purpose by users with existing water rights of record or determined claims to use the Stored Water in UKL.
>
> The term "existing water rights of record" has the meaning provided in ORS 540.045(4). The term "determined claim" has the meaning provided in Section 1, chapter 445, Oregon Laws 2015 (which is published in the Oregon Revised Statutes as a note following ORS 539.170).

II. REGULATION OF DETERMINED CLAIMS

ORS 540.145 authorizes the Water Resources Commission to adopt rules to "secure the equal and fair distribution of water in accordance with the rights of the various users" which rules "shall apply to all water rights that have been established * * * "[u]nder an order of the commission or the Water Resources Director in proceedings for the determination of relative rights to the use of water * * *." The rules of the Commission authorizing the distribution of Determined Claims in the ACFFOD[2] to secure the equal and fair distribution of water in accordance with the rights of the various users are provided in Oregon Administrative Rules (OAR) Chapter 690 Division 250.

A "reservoir" includes a modified natural lake such as Upper Klamath Lake (UKL), in which water is collected for beneficial use or purpose.[3] "Legally stored water" means any "water impounded in a reservoir under the provisions of an established right to store water."[4] Use of legally stored water is governed by the water rights that may call on that source of water and is limited to that amount of water that may be put to beneficial use without waste.[5] Any legally stored water that is in excess of the needs of the water rights calling on that stored water is considered "natural flow" which may be diverted according to the next water right in priority or is once again public water subject to appropriation.[6]

III. FINDINGS OF FACT

A. KA 294 and KA 1000

1. The Bureau's Klamath Project (Project) was established in accord with federal legislation and state legislation in 1902 and 1905, respectively. The Bureau built and owns the facilities, known

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[2] The term "ACFFOD" refers to the Amended and Corrected Findings of Fact and Order of Determination. The ACFFOD is the Director's order of determination regarding claims filed in the Klamath Adjudication and is currently under review in the Klamath County Circuit Court. Pursuant to ORS 539.170 while the ACFFOD is pending before the circuit court, the "division of water from the stream involved in the appeal shall be made in accordance with the order of the director."

[3] OAR 690-250-0010(13); Modifications of the outlet of UKL along with the construction of the Link River Dam around 1916 allow the UKL to be operated and managed as a reservoir between the elevations of 4136 and 4143.3.

[4] OAR 690-250-0010(10).

[5] OAR 690-250-0010(3); *Bennett v. City of Salem*, 192 Or 531, 543 (1951)(An appropriator is never entitled to divert more water than is actually put to beneficial use, reasonable transmission losses excepted); *In re Water Rights of Deschutes River and Tributaries*, 134 Or 623, 644 (1930)("The right of a prior appropriator is paramount, and the right is limited to such an amount of water as is reasonably necessary for such use and project as may be fairly within contemplation at the time the appropriation is made); *Tudor v. Jaca*, 178 Or 126, 143 (1945) *citing Bolter v. Garrett*, 44 Or 204 (1904) for the proposition that the use of water appropriated "must not only be beneficial to the lands of the appropriator, but it must also be reasonable in relation to the reasonable requirements of subsequent appropriators."

[6] OAR 690-250-0150(4); *Jones v. Warmsprings*, 162 Or 186, 195 (1939) (Water discharged to the natural stream with no intent to recapture it becomes part of the natural stream and is subject to reappropriation).

as the works in the Project area. UKL is a modified natural lake and is one of the three reservoirs in the Project which also comprises eight dams, five major pumping plants, 19 canals, and other works.

2. The Bureau is the sole owner of Determined Claim KA 294. KA 294 provisionally authorizes the Bureau to store a maximum annual volume of 486,828 acre feet (AF) of water in UKL between elevations 4136 feet and 4143.3 feet, relative to the Bureau's Klamath Basin Datum.

3. The volume of water stored in UKL above elevation 4136 is estimated based on an elevation capacity curve, or rating, provided by the Bureau, and using the weighted mean lake level as reported by the United States Geological Survey (USGS). The most recent rating provided by the Bureau indicates the maximum storage volume for KA 294 (486,828 AF) is met when the lake elevation is at 4142.48 feet.[7]

4. The KID and 20 other Klamath Project Water Users (together the KPWU) and the Bureau are co-owners of Determined Claim KA 1000. KA 1000 provisionally authorizes the diversion of natural flow from UKL and water stored in UKL pursuant to KA 294 for beneficial use by the KPWU both upstream and downstream of the Link River Dam.[8] KA 1000 does not specify what amount of water must be taken from natural flow as opposed to stored water and does not prohibit the taking of water from both sources simultaneously.

5. Pursuant to KA 1000, KID may divert up to 1,150 cfs through the A Canal for irrigation during the irrigation season March 1 through October 31, with a priority date of May 19, 1905.

6. The Link River Dam is a federally owned dam located on the Link River. The storage and release of water pursuant to KA 294 from UKL is through the Link River Dam.

7. Downstream of the Link River Dam, and pursuant to KA 1000, there are 34 authorized points of diversion from the Klamath River. Many of these diversions have an authorized season of use from March 1 to October 31 and two irrigation districts also maintain an additional season of use from November 1 to February 28. These 34 points of diversion have a total authorized instantaneous maximum diversion rate of 1,572.51 cfs.

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[7] The weighted mean lake level of UKL is monitored and reported by the USGS. Four separate lake stage gages are operated and maintained by the USGS, and the data from each gage are entered into an equation to calculate the weighted mean lake elevation. The provisional lake elevation data are available at the website: https://waterdata.usgs.gov/or/nwis/uv/?site_no=11507001&agency_cd=USGS

[8] KA 1000 erroneously refers to KA 293, but this is a typographical error.

B. Determining Water Stored in UKL Pursuant to KA 294

1. Calculating Storage Release

8. The equation the Department is using to calculate stored water releases is:

{eqn 1} Storage Release = Link River Flow – (UKL Inflows - UKL DiversionsR_{KA1000} R***)***

with the storage release in excess of water rights then calculated as:

{eqn 2} Excessive Storage Release = Storage Release – Downstream DiversionR_{KA1000}R

If either equation results in a zero or negative value, then no storage release unrelated to water rights is occurring.

Description of the variables used in the equation:

Link River flow data are available from a USGS stream gage (USGS 11507500) operated on the river.

UKL inflows represent the total amount of *natural flow* coming into the lake from surface water, groundwater, and precipitation. Some of these inflows are measured directly (e.g., Wood and Williamson River stream gages) while others must be estimated (e.g., groundwater inflows) as explained below.

UKL DiversionsR_{KA1000}R **:** The largest UKL Diversion, the A Canal, is monitored by a gage accessible at this link:
https://www.usbr.gov/pn-bin/wyreport.pl?site=acho&parameter=qj&head=yes
There are 12 authorized points of diversion from UKL above the Link River Dam included in KA 1000. Additionally, there are 10 state certificated water rights and 8 non-KA 1000 determined claims each exceeding 1 cfs for the use of natural flow from UKL. These 18 non-KA 1000 water rights and determined claims have a combined total of 23 authorized points of diversion from UKL. Because many of these points of diversion do not have measuring devices installed, their diversion rates are estimated using the authorized diversion rate on the determined claim or water right.[9]

[9] Efforts are underway to develop a more sophisticated mechanism of estimating these numerous smaller users that divert water directly from UKL, including inventorying each POD and working with the landowner to install measuring devices.

Downstream DiversionsR_{KA1000} R: Gages monitor three of the KA 1000 diversions below UKL; the Lost River Diversion Channel (LRDC), the North Canal, and the Ady Canal. There are 34 authorized points of diversions identified under the KA 1000 below the Link River Dam and approximately 61 other diversions from the Klamath River downstream of the Link River Dam not associated with KA 1000. The ungaged diversions and individual pump diversions are currently estimated (see footnote 4). As of March 23, 2021, there are no indications of any active water diversion occurring below Link River Dam .

2. Calculating Inflows

9. To manage the water rights and determined claims and distinguish between natural flow and stored water, the Department must quantify gross inflows to UKL. Table 1 contains measured inflows between February 22, 2021 and March 28, 2021.

10. Stream tributaries constitute one component of inflow that contributes to UKL. Tributary inflows include the Williamson River, Wood River, Sevenmile Creek, Crystal Creek, Thomason Creek, and Fourmile Creek. These streams and their tributaries are listed as sources on KA 294.[10]

11. Groundwater contributions and direct precipitation are also estimated inflow contributions that contribute to UKL. Table 1 includes estimates groundwater inflow[11] and direct precipitation into the UKL.[12]

[10] Gaged inflow streams include the Williamson and Wood Rivers, and Sevenmile Creek. On November 5, 2020, the Department issued a FINAL ORDER MEASURING DEVICES to the Bureau requiring installation of measuring devices on Sevenmile Creek, Thomason Creek, Fourmile Creek, and Crystal Creek. On December 30, 2020, the Bureau requested reconsideration of this order, and on February 23, 2021, the Department notified the Bureau that it is reconsidering its order. At the time of the issuance of this order, the Department is working with the Bureau to evaluate the viability of installing gages on Crystal Creek and Fourmile Creek.

[11] Groundwater contributions are based on USGS estimates and adjusted for current hydro-climate conditions.

[12] Groundwater contributions and precipitation estimates are based on the previous month's lake water balance, which is subsequently adjusted based on reconciliation with the current monitoring period UKL water balance.

Upper Klamath Lake Inflows (CFS)									
DATE	USGS Gage 11504115 Wood River	USGS Gage 11504290 Sevenmile at Dike Rd	USGS Gage 11502500 Williamson	GW Inflow Estimate	Fourmile, Crystal Creek & Other Ungaged Tributaries	Gaged Inflows to UKL	UnGaged Inflows to UKL	Precipitation	Total Inflow to UKL
2/22/2021	364	101	576	224	24	1041	248	5	1290
2/23/2021	370	129	573	224	24	1072	248	0	1320
2/24/2021	366	134	566	224	24	1066	248	0	1310
2/25/2021	337	122	568	224	24	1027	248	0	1270
2/26/2021	326	87	566	224	24	979	248	19	1230
2/27/2021	334	101	554	224	24	989	248	29	1240
2/28/2021	337	106	556	224	24	999	248	15	1250
3/1/2021	340	102	561	224	24	1003	248	5	1250
3/2/2021	345	107	558	224	24	1010	248	0	1260
3/3/2021	341	103	558	224	24	1002	248	0	1250
3/4/2021	319	56	560	224	24	935	248	10	1180
3/5/2021	354	133	561	224	24	1048	248	15	1300
3/6/2021	348	97	562	224	24	1007	248	93	1250
3/7/2021	354	120	564	224	24	1038	248	93	1290
3/8/2021	341	73	576	224	24	990	248	39	1240
3/9/2021	361	98	584	224	24	1043	248	49	1290
3/10/2021	370	109	580	224	24	1059	248	176	1310
3/11/2021	365	109	579	224	24	1053	248	166	1300
3/12/2021	359	90	571	224	24	1020	248	10	1270
3/13/2021	361	93	566	224	24	1020	248	5	1270
3/14/2021	356	85	563	224	24	1004	248	68	1250
3/15/2021	373	95	565	224	24	1033	248	127	1280
3/16/2021	356	92	562	224	24	1010	248	63	1260
3/17/2021	346	72	572	224	24	990	248	0	1240
3/18/2021	360	89	567	224	24	1016	248	15	1260
3/19/2021	375	91	560	224	24	1026	248	34	1270
3/20/2021	359	81	557	224	24	997	248	10	1240
3/21/2021	357	94	569	224	24	1020	248	0	1270
3/22/2021	358	85	578	224	24	1021	248	24	1270
3/23/2021	359	102	573	224	24	1034	248	20	1280
3/24/2021	352	83	574	224	24	1009	248	15	1260
3/25/2021	364	82	580	224	24	1026	248	10	1270
3/26/2021	356	81	571	224	24	1008	248	10	1260
3/27/2021	369	80	570	224	24	1019	248	5	1270
3/28/2021	369	80	566	224	24	1015	248	0	1260

Table 1 ***Note: OWRD gages were located and installed to monitor instream determined claims**.*

3. Calculating Inflows in Relation to Outflows

12. The total UKL inflow estimate is reconciled against the change in UKL contents and the outflows based on a water balance of the lake performed periodically, expressed as the following equation:

{eqn 2} Reconciled UKL Inflows = Change in UKL Contents + UKL outflows

Adjustments to the estimated ungaged inflow components are made based on this reconciliation to ensure the UKL water balance is satisfied (Table 2).

Description of the variables used in the equation:

The **change in UKL contents** is based on contents derived from the USBR elevation capacity table using the average UKL elevation from four USGS lake level gages.

UKL outflows consist of lake evaporation, outflows through the Link River and A- Canal, and 23 other authorized diversions greater than 1 cfs directly from the UKL. Lake evaporation is currently estimated using weather station data from two nearby AgriMet sites.[13] Flow through the Link River and A- Canal are measured with gages. The other diversions from the UKL are currently estimated.

Water Balance Summary Table		
Start Date		2/22/2021
End Date		3/28/2021
Number of Days in Reporting Period		35
	AC-FT	*Equivalent CFS*
Change in Storage (+ = storage)	31,217	*450*
Gaged Inflows	70669	*1018*
Ungaged Inflows [1]	1,648	*24*
Groundwater Inflow[2]	15550	*224*
Precipitation Inflow	2234	*32*
Total Inflow	90101	*1298*
Evaporation	-16285	*-235*
Link River Outflow	-42599	*-614*
A Canal Diversions	0	*0*
Adjacent UKL Land Diversions	0	*0*
Total Outflow	-58884	*-848*
UKL Water Balance	0	0
[1] Adjusted to close water balance		
[2] Updated from Hubbard using Spring Cr&Fall R as hydro-climate index		

Table 2: Water balance table in reconciliation process.

[13] The Department estimates evaporation by a Penman-Monteith equation that uses weather data from two USBR AgriMet weather stations just north and south of UKL. Evaporation estimates are adjusted for local lake conditions based on comparisons of the Penman-Montieth derived estimates with concurrent evaporation data on UKL from a study completed by USBR in 2015.

13. The evaporation estimate is charged against the storage account, thus increasing the accounting of what has been stored since the beginning of the year, and decreasing the amount remaining to be stored under the 486,828 acre-foot storage limit in KA 294.

14. Table 3 represents the Department's calculations of inflows into UKL versus lake outflows for the time period between February 21, 2021 and March 28, 2021.

Table 3.

DATE	Lake Elevations (FT) and Storage (AC-FT)					Lake Inflows (CFS)			Lake Outflows (CFS)					Flow Distribution Calculation						
	UKL Lake Elevation (USBRKB Datum)	UKL Elevation > 4136 FT (USBRKB datum)	UKL Storage	Stored since Jan 1, 2021	KLA 294 Remaining to Store (Max 486,828 AF)	Gaged Inflows into UKL	Ungaged Inflows into UKL	Precip	Evap	Link River Flow	A- Canal Diversion	KA 1000 Diversions from Adjacent UKL Lands	Non KA 1000 Diversions from Adjacent UKL Lands	Live Flow Available to Pass Link R Dam	Stored Water Released from Link R Dam	Gaged KA 1000 below LRD	Ungaged KA 1000 below LRD	Non KA 1000 Diversions below LRD	KA 1000 Storage Deliveries blw LRD	Stored Release in Excess of WRs
2/22/2021	4140.44	4.44	309,783	94,344	170,602	1041	248	5	124	450	0			1294	0	20			0	0
2/23/2021	4140.46	4.46	311,366	96,234	168,712	1072	248	0	155	488	0			1320	0	18			0	0
2/24/2021	4140.48	4.48	312,959	98,073	166,873	1066	248	0	124	453	0			1314	0	25			0	0
2/25/2021	4140.47	4.47	312,162	97,568	167,378	1027	248	0	147	453	0			1275	0	12			0	0
2/26/2021	4140.49	4.49	313,755	99,407	165,539	979	248	19	124	490	0			1246	0	9			0	0
2/27/2021	4140.55	4.55	318,534	104,494	160,452	989	248	29	155	486	0			1266	0	10			0	0
2/28/2021	4140.54	4.54	317,738	103,944	161,002	999	248	15	124	479	0			1261	0	24			0	0
3/1/2021	4140.56	4.56	319,331	106,044	158,902	1003	248	5	256	479	0			1256	0	18			0	0
3/2/2021	4140.58	4.58	320,952	108,084	156,862	1010	248	0	212	480	0			1258	0	11			0	0
3/3/2021	4140.59	4.59	321,763	109,359	155,587	1002	248	0	234	489	0			1250	0	9			0	0
3/4/2021	4140.58	4.58	320,952	109,232	155,714	935	248	10	345	642	0			1192	0	13			0	0
3/5/2021	4140.55	4.55	318,534	107,674	157,272	1048	248	15	434	720	0			1310	0	16			0	0
3/6/2021	4140.61	4.61	323,385	112,967	151,979	1007	248	93	223	701	0			1347	0	1			0	0
3/7/2021	4140.62	4.62	324,195	114,285	150,661	1038	248	93	256	626	0			1378	0	3			0	0
3/8/2021	4140.63	4.63	325,006	115,559	149,387	990	248	39	234	610	0			1277	0	5			0	0
3/9/2021	4140.63	4.63	325,006	115,913	149,033	1043	248	49	178	614	0			1339	0	9			0	0
3/10/2021	4140.66	4.66	327,438	118,565	146,381	1059	248	176	111	625	0			1482	0	4			0	0
3/11/2021	4140.69	4.69	329,903	121,472	143,474	1053	248	166	223	629	0			1467	0	2			0	0
3/12/2021	4140.69	4.69	329,903	121,980	142,966	1020	248	10	256	681	0			1277	0	2			0	0
3/13/2021	4140.70	4.7	330,725	123,310	141,636	1020	248	5	256	792	0			1273	0	8			0	0
3/14/2021	4140.70	4.7	330,725	123,641	141,305	1004	248	68	167	731	0			1320	0	2			0	0
3/15/2021	4140.76	4.76	335,655	128,990	135,956	1033	248	127	212	701	0			1408	0	0			0	0
3/16/2021	4140.73	4.73	333,190	126,945	138,001	1010	248	63	212	615	0			1321	0	2			0	0
3/17/2021	4140.73	4.73	333,190	127,431	137,515	990	248	0	245	613	0			1238	0	4			0	0
3/18/2021	4140.71	4.71	331,547	126,428	138,518	1016	248	15	323	696	0			1278	0	7			0	0
3/19/2021	4140.75	4.75	334,834	130,223	134,723	1026	248	34	256	818	0			1308	0	1			0	0
3/20/2021	4140.76	4.76	335,655	131,463	133,483	997	248	10	212	810	0			1254	0	1			0	0
3/21/2021	4140.75	4.75	334,834	131,172	133,774	1020	248	0	267	653	0			1268	0	4			0	0
3/22/2021	4140.78	4.78	337,321	134,035	130,911	1021	248	24	189	513	0			1293	0	1			0	0
3/23/2021	4140.80	4.8	338,987	136,407	128,539	1034	248	20	356	466	0			1301	0	4			0	0
3/24/2021	4140.79	4.79	338,154	135,972	128,974	1009	248	15	200	570	0			1271	0	4			0	0
3/25/2021	4140.81	4.81	339,820	138,190	126,756	1026	248	10	278	746	0			1283	0	0			0	0
3/26/2021	4140.81	4.81	339,820	138,808	126,138	1008	248	10	312	747	0			1265	0	2			0	0
3/27/2021	4140.82	4.82	340,653	140,325	124,621	1019	248	5	345	645	0			1272	0	5			0	0
3/28/2021	4140.81	4.81	339,820	140,420	124,526	1015	248	0	468	766	0			1263	0	3			0	0

15. Currently, the total gaged inflows plus the estimated groundwater inflow to UKL exceeds the amount of water passing through the Link River Dam. Therefore, the water passing through Link River Dam is natural flow as opposed to Legally Stored Water (Table 3.)

IV. ULTIMATES FINDING OF FACT

1. As of the date of this determination, water passing through the Link River Dam constitutes natural flow as opposed to water legally stored pursuant to KA 294.

V. CONCLUSIONS

1. No Legally Stored Water is presently passing through the Link River Dam.

VI. DETERMINATION

As of the date of this Determination #3, water passing through the Link River dam is natural flow. The Department and the Watermaster District 17 will continue to monitor conditions in the UKL throughout 2021 and will issue a status determination on a monthly basis or as conditions change. When the Department determines that Legally Stored Water in excess of the needs of KA 1000 is passing or may pass through the Link River Dam, it will issue an order directed to the Bureau as required by the order of the Marion County Circuit Court.

DATED this 30th day of March 2021.

DANETTE WATSON,
Watermaster, District 17
Oregon Water Resources Department