

KINNELOA IRRIGATION DISTRICT

Special Meeting – Board of Directors
1999 Kinclair Drive, Pasadena, CA 91107
Tuesday, January 23, 2024
2:00 P.M.

AGENDA

This meeting will be conducted at the District office in accordance with the Brown Act and AB 2449. Public comment may be made in person or submitted via email to kinneloa@outlook.com prior to the meeting, any information submitted will become part of the official record. The public may participate at the office or via computer or telephone using the following information: <https://us02web.zoom.us/j/85061795151?pwd=QRaWGV5Lzg3dmEvcGx1Ujl6akRHdz09>

Meeting ID: 850 6179 5151

Passcode: 156331

Telephone: 669 900 9128

1. CALL TO ORDER – 2:00 P.M.

- a. Declaration of a quorum
- b. Review of agenda

2. PUBLIC COMMENT – Comments from the Public regarding items on the Agenda or other items within the jurisdiction of the District

In compliance with the Brown Act, the Board cannot discuss or act on items not on the Agenda. However, Board Members or District Staff may acknowledge Public comments, briefly respond to statements or questions posed by the Public, ask a question for clarification, or request Staff to place item on a future Agenda (Government Code section §54954.2)

3. KINNELOA IRRIGATION DISTRICT MASTER PLAN – General Manager and Board to review draft demand calculations and storage analysis and discuss the District’s water storage requirements.

Recommended Action: General Manager to respond to questions and receive input from the Board regarding preparation of master plan documents

4. DIRECTOR REPORTS AND/OR COMMENTS –

In accordance with Government Code §54954.2 Directors may make brief announcements or brief reports on their own activities. Directors may ask a question for clarification, provide a reference to staff or other resources for information, request staff to report back to the Directors at a subsequent meeting, or act to direct staff to place a matter of business on a future agenda.

5. CALENDAR – Upcoming regular meetings: January 23, 2024; February 20, 2024; March 19, 2024

6. ADJOURNMENT

In compliance with the Americans with Disabilities Act, if you are a disabled person and need a disability-related modification or accommodation to participate in this meeting, please contact the District office 48 hours prior to the meeting at 626-797-6295. Each item on the agenda, no matter how described, shall be deemed to include any appropriate motion, whether to adopt a minute motion, resolution, payment of any bill, approval of any matter or action, or any other action. Material related to an item on this agenda submitted after distribution of the agenda packet is available for public review at the District office or online at the District’s website <https://kinneloirrigationdistrict.info>.



Memo

Date: January 23, 2023
To: Board of Directors
From: Tom Majich, General Manager
Subject: Demand Analysis and Storage Requirements

As a kickoff to the Master Plan 2025 effort the first step is to determinate water system needs via a Demand and Storage Capacity Analysis.

Demand Analysis considers Average Day Demand (ADD), Maximum Day Demand (MDD) and Peak Hour Demand (PHD) with respect to adequacy of reservoir storage. Periodically, the District has delivered excess water to the City of Pasadena; however, all wholesale water deliveries have been excluded from any demand calculations for purposes of this exercise. To estimate usage by zone a percentage allocation to each zone has been calculated based on consumption in August 2021 which is the maximum month of consumption from January 2014 through December 2023.

The State of California and the County of Los Angeles have differing requirements for storage capacity and different methodologies for calculating MDD. The following is an analysis of each methodology as well as a recommended methodology and storage capacity policy. Once storage capacity requirements are established by the Board an analysis of pipeline and pumping capacity can be performed.

California Waterworks Standards (California Code of Regulations, Title 22, Division 4, Chapter 16) require a water system to estimate MDD for the system as a whole and for each pressure zone within the system, *excluding fire flow*. To calculate MDD the system must identify the month with the highest water usage during at least the most recent ten years of operation, divide the total water usage during the maximum month by the number of days in that month and to calculate MDD multiply the average daily usage by a peaking factor that is a minimum of 1.5. The District reviewed monthly usage data as reported on the Small Water Systems Annual Report from January 2014 through December 2023. The month with the highest average daily flow identified was August 2021 with average daily flow of 866,667 gallons. The calculated MDD for compliance with California Waterworks Standards is 1,300,000 gallons. The following table which shows that the system as a whole, and in each individual pressure zone, complies with California Waterworks Standards for storage capacity.

TOTAL RESERVOIR STORAGE ANALYSIS per California Waterworks Standards

24 HOURS	MAX DAY DEMAND	Total	Max Day	Max Day	Existing	Surplus or	Fire Flow	Storage Goal	Surplus or
	EXCL FIRE FLOW	Services	Average	Customer	Capacity	Shortfall	Demand	incl Fire-Flow	(Shortfall)
			Demand	Demand			EXCLUDED		
			GPM	Gallons	Gallons	Gallons	gallons	gallons	gallons
7.25%	Eucalyptus Zone	61	1.07	94,248	180,000	85,752	-	94,248	85,752
11.93%	Brown/Glen Zone	69	1.56	155,126	250,000	94,874	-	155,126	94,874
26.33%	Vosburg Zone	196	1.21	342,282	1,250,000	907,718	-	342,282	907,718
30.57%	Holly/Sage Zone	194	1.42	397,441	525,000	127,559	-	397,441	127,559
23.92%	East/West Tank Zone	78	2.77	310,903	650,000	339,097	-	310,903	339,097
	SUBTOTALS	598	1.51	1,300,000	2,855,000	1,555,000	-	1,300,000	1,555,000

Los Angeles County Standards (Los Angeles County Code, Title 40 Utilities) require total storage capacity to meet fire-flow requirements and twice the average daily water flow (the MDD). The County code does not specify a time horizon for calculation average daily water flow. The average daily water flow for the period of January 2014 through December 2023 is 538,371 gallons. Twice that amount is 1,076,742 gallons. This figure will be represented as MDD for purposes of compliance with Los Angeles County storage standards.

Fire-Flow requirements are per Los Angeles County Code, Title 32 Fire Code. Appendix B “Fire-Flow Requirements for Buildings” includes tables B105.1(1) “Required Fire Flow for one-, and two-family dwellings, Group R-3 and R-4 Buildings and Townhouses” as well as reference Table B105.1(2). The minimum fire-flow for one- and two-family dwellings, and Group R-3 buildings located in a fire hazard zone shall not be less than 1,250 gallons per minute for a 1-hour duration at 20 psi. This minimum fire-flow requires 75,000 gallons of storage.

KID fire flow policy will be to establish this baseline 1,250 gpm for 1-hour in the Eucalyptus Zone given that most of the zone is outside the fire hazard zone which requires even less fire-flow capacity. There are only 4 customers in the Eucalyptus Zone that are in the high fire hazard zone, the City of Pasadena maintains fire hydrants on their system in this vicinity at Eaton Canyon Drive and Kinneloa Canyon Drive which are available for use in addition to KID hydrants.

All other pressure zones shall be required to meet a standard of 1,500 gpm for 2-hours which requires 180,000 gallons of fire-flow storage in the pressure zone. Per Table B105.1(2) this allows for up to a 3,600 sf dwelling of Type V-B construction to be built without fire sprinklers. At that same fire-flow standard a dwelling that includes fire sprinklers could be constructed up to 11,300 square feet in Type V-B construction. Type V-B construction is construction of any allowable material, including wood construction with no fire-resistant construction, typically light-frame wood or metal stud and joist framing. Changing construction type to a fire resistant classification would allow a dwelling to be constructed at a greater scale at the same fire-flow capacity.

The following table which shows that the system as a whole meets Los Angeles County standards for storage capacity and each zone, except for the Brown/Glen Zone, is individually in compliance.

TOTAL RESERVOIR STORAGE ANALYSIS - MDD is 2x ADD per LA County Utility Standards

24 HOURS	MAX DAY DEMAND	Total	Max Day	Max Day	Existing	Surplus or	Fire Flow	Storage Goal	Surplus or
	PLUS FIRE FLOW	Services	Average	Customer	Capacity	Shortfall	Demand	incl Fire-Flow	(Shortfall)
			Demand	Demand		no FFD			
			GPM	gallons	gallons	gallons	gallons	gallons	gallons
7.25%	Eucalyptus Zone	61	0.89	78,062	180,000	101,938	75,000	153,062	26,938
11.93%	Brown/Glen Zone	69	1.29	128,485	250,000	121,515	180,000	308,485	(58,485)
26.33%	Vosburg Zone	196	1.00	283,500	1,250,000	966,500	180,000	463,500	786,500
30.57%	Holly/Sage Zone	194	1.18	329,186	525,000	195,814	180,000	509,186	15,814
23.92%	East/West Tank Zone	78	2.29	257,509	650,000	392,491	180,000	437,509	212,491
	SUBTOTALS	598	1.25	1,076,743	2,855,000	1,778,257	795,000	1,871,743	983,257

Kinneloa Irrigation District Standards for purposes of master plan development will use an average day demand of 528,371 gallons and a maximum day demand of 1,076,742 gallons consisted with Los Angeles County methodology. Peak Hour Demand (PHD) will be calculated at 5 times ADD (or 2.5 times MDD). California Waterworks Standards require that PHD be at least 2.25 times ADD. The District has reported a maximum day for each year since 2014, the reported maximum day has ranged from 862,444 to 1,071,774 gallons.

It shall be the Policy of the KID to meet State and County requirements for system, and individual pressure zone, storage capacity. Additionally, the KID desires to have total system capacity to meet maximum day demand, daily fire-flow demand, an operational reserve equal to 30% of maximum day demand and an emergency reserve equal to average day demand.

The following table shows storage capacity in the aggregated system meets the KID proposed policy; however, the Eucalyptus, Brown/Glen and Holly/Sage zones are deficient. The Master Plan will include proposed projects that can rectify the deficiencies in these zones.

KID TOTAL STORAGE CAPACITY REQUIRED

24 HOURS	MAX DAY DEMAND	Total	Maximum Day	Reserve	Reserve	Demand	Storage Goal	Existing	Surplus or
	PLUS FIRE FLOW	Services	Demand	Operational	Emergency	Fire-Flow	incl Fire-Flow	Capacity	(Shortfall)
			MDD	30% of MDD	1x ADD		and reserves		
			gallons	gallons	gallons	gallons	gallons	gallons	gallons
7.25%	Eucalyptus Zone	61	79,634	23,890	39,031	75,000	217,555	180,000	(37,555)
11.93%	Brown/Glen Zone	69	131,072	39,321	64,242	180,000	414,635	250,000	(164,635)
26.33%	Vosburg Zone	196	289,208	86,762	141,750	180,000	697,720	1,250,000	552,280
30.57%	Holly/Sage Zone	194	335,814	100,744	164,593	180,000	781,151	525,000	(256,151)
23.92%	East/West Tank Zone	78	262,694	78,808	128,755	180,000	650,256	650,000	(256)
	SUBTOTALS	598	1,076,743	329,526	538,371	795,000	2,761,317	2,855,000	93,683

Future Demand Projections

The District is nearly fully built-out and has been since the completion of the Kinclair Ridge Tract. Expected future demand may come from construction of ADU's on existing lots, densification of existing households and limited new construction on infill lots that have previously contained residences served by the District. The following table projects future demand assuming that new ADU's are constructed on 50% of single family lots in the District. ADU's are limited to 800 sf per County standards and demand was assumed at 4 CCF/Month which is consistent with average demand of the Dove Creek Townhomes and smaller homes in the District. For purposes of household densification, the Junior ADU standard was applied. This assumes that each home in the District adds 2 adults to the household full time with separate cooking and cleaning facilities. Gallons per capita per day (GPCD) is assumed at the California indoor water use standard for 2030 of 42 GPCD. With respect to new construction of homes on previously occupied lots currently served by the District an informal survey was completed and a 750 GPD demand factor was applied.

Existing Accounts	Pressure Zone	NEW ADU's (50%)			NEW JADU's (100%)			POTENTIAL SFR's			TOTAL GPD
		QTY	Unit Demand GPD	Subtotal ADU GPD	QTY	Unit Demand GPD	Subtotal JADU GPD	QTY	Unit Demand GPD	Subtotal SFR GPD	
			<i>4 CCF/MO</i>								
61	Eucalyptus Zone	2	99.73	199	2	84.00	168	-	150.00	-	367
69	Brown/Glen Zone	35	99.73	3,441	69	84.00	5,796	2	750.00	1,500	10,737
196	Vosburg Zone	98	99.73	9,774	196	84.00	16,464	2	750.00	1,500	27,738
194	Holly/Sage Zone	97	99.73	9,674	194	84.00	16,296	8	750.00	6,000	31,970
78	East/West Tank Zone	39	99.73	3,890	78	84.00	6,552	10	750.00	7,500	17,942
598	SUBTOTALS	271	99.73	26,978	539	84.00	45,276	22	750.00	16,500	88,754
										AF/YEAR	99.42

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		10 YR AVG
January	27,346	16,380	10,076	6,089	16,219	14,800	13,257	18,538	10,384	7,257		14,035
February	19,531	17,898	13,278	6,262	18,832	7,816	16,358	13,576	22,567	11,990		14,811
March	14,993	21,985	12,520	13,610	13,919	10,430	14,226	19,894	30,288	6,068		15,793
April	28,145	23,800	17,969	20,024	18,685	18,530	10,781	21,305	25,568	12,546		19,735
May	29,732	18,225	16,657	22,410	20,075	15,946	21,204	20,474	24,473	17,038		20,623
June	29,875	26,869	22,757	29,558	25,110	22,405	29,461	32,128	21,736	14,585		25,448
July	36,367	23,521	29,324	27,536	29,242	25,607	27,947	26,976	29,190	23,246		27,896
August	31,023	26,667	28,037	29,209	31,448	26,632	28,500	35,918	27,735	27,085		29,225
September	31,754	27,175	33,730	31,395	33,188	35,025	36,522	27,848	36,221	21,051		31,391
October	32,085	20,555	24,972	27,044	23,942	25,220	27,514	25,678	21,053	20,578		24,864
November	20,372	22,671	22,421	19,133	23,305	23,597	23,016	19,053	15,331	20,136		20,903
December	14,310	19,747	13,481	26,862	13,970	11,011	27,009	19,686	18,101	15,650		17,983
TOTAL CCF	315,533	265,493	245,222	259,132	267,935	237,019	275,795	281,074	282,647	197,230		262,708
TOTAL AF	724.36	609.49	562.95	594.89	615.09	544.12	633.14	645.26	648.87	452.78		603.09

*data taken from SWS Annual Reports, measured in CCF; Total of all sales EXCEPT for Deliveries to City of Pasadena

ADD (ccf)	864.5	727.4	671.8	710.0	734.1	649.4	755.6	770.1	774.4	540.4		719.7
ADD (gal)	646,627	544,078	502,536	531,043	549,083	485,727	565,191	576,009	579,233	404,186		538,371
MAX MONTH	36,367	27,175	33,730	31,395	33,188	35,025	36,522	35,918	36,221	27,085		33,263
gallons	27,202,516	20,327,132	25,230,354	23,483,460	24,824,624	26,198,700	27,318,456	26,866,664	27,093,308	20,259,580		24,880,479
previous read date	6/15/14	8/27/15	8/22/16	8/24/17	8/22/18	8/21/19	8/19/20	7/25/21	8/25/22	7/26/23		
current read date	7/28/14	9/28/15	9/26/16	9/26/17	9/24/18	9/25/19	9/23/20	8/25/21	9/26/22	8/29/23		
billing days	43	32	35	33	33	35	35	31	32	34		
average daily	632,617	635,223	720,867	711,620	752,261	748,534	780,527	866,667	846,666	595,870		
MIN MONTH	14,310	16,380	10,076	6,089	13,919	7,816	10,781	13,576	10,384	6,068		10,940
billing days	30	30	30	30	30	30	30	30	30	30		
average daily	356,796	408,408	251,223	151,819	347,047	194,879	268,806	338,495	258,908	151,295		272,768
Ratio to ADD	0.55	0.75	0.50	0.29	0.63	0.40	0.48	0.59	0.45	0.37		0.50
STATE REGULATIONS												
MDD 1.5x	948,925	952,834	1,081,301	1,067,430	1,128,392	1,122,801	1,170,791	1,300,000	1,269,999	893,805		
PHD 1.5x	59,307.81	59,552.14	67,581.31	66,714.38	70,524.50	70,175.09	73,174.44	81,249.99	79,374.93	55,862.81		
GPM for MDD	658.98	661.69	750.90	741.27	783.61	779.72	813.05	902.78	881.94	620.70		
COUNTY REGULATIONS												
ADD	646,626.53	544,078.21	502,536.26	531,043.11	549,083.23	485,726.61	565,190.85	576,009.18	579,232.76	404,186.41		538,371
MDD (2x ADD)	1,293,253.06	1,088,156.42	1,005,072.52	1,062,086.22	1,098,166.47	971,453.22	1,130,381.70	1,152,018.37	1,158,465.51	808,372.82		1,076,743
GPM for MDD	898.09	755.66	697.97	737.56	762.62	674.62	784.99	800.01	804.49	561.37		
DISTRICT CALCULATIONS												
Max Day on eAR	1,071,884	997,084	902,088	1,029,921	1,060,664	862,444	936,496	1,015,036	899,096	915,350		969,006
Method	Production	Production	Production	Production	Production	Production	Production	Production	Subeca	Subeca		
GPM for MDD	744.36	692.42	626.45	715.22	736.57	598.92	650.34	704.89	624.37	635.66		672.92