WIT-25

MAUI ISLAND WATER USE & DEVELOPMENT PLAN UPDATE

PART III: Central and Ko`olau Aquifer Sectors

Council of the County of Maui

Water, Infrastructure and Transportation Committee

January 22, 2020

County of Maui Department of Water Supply

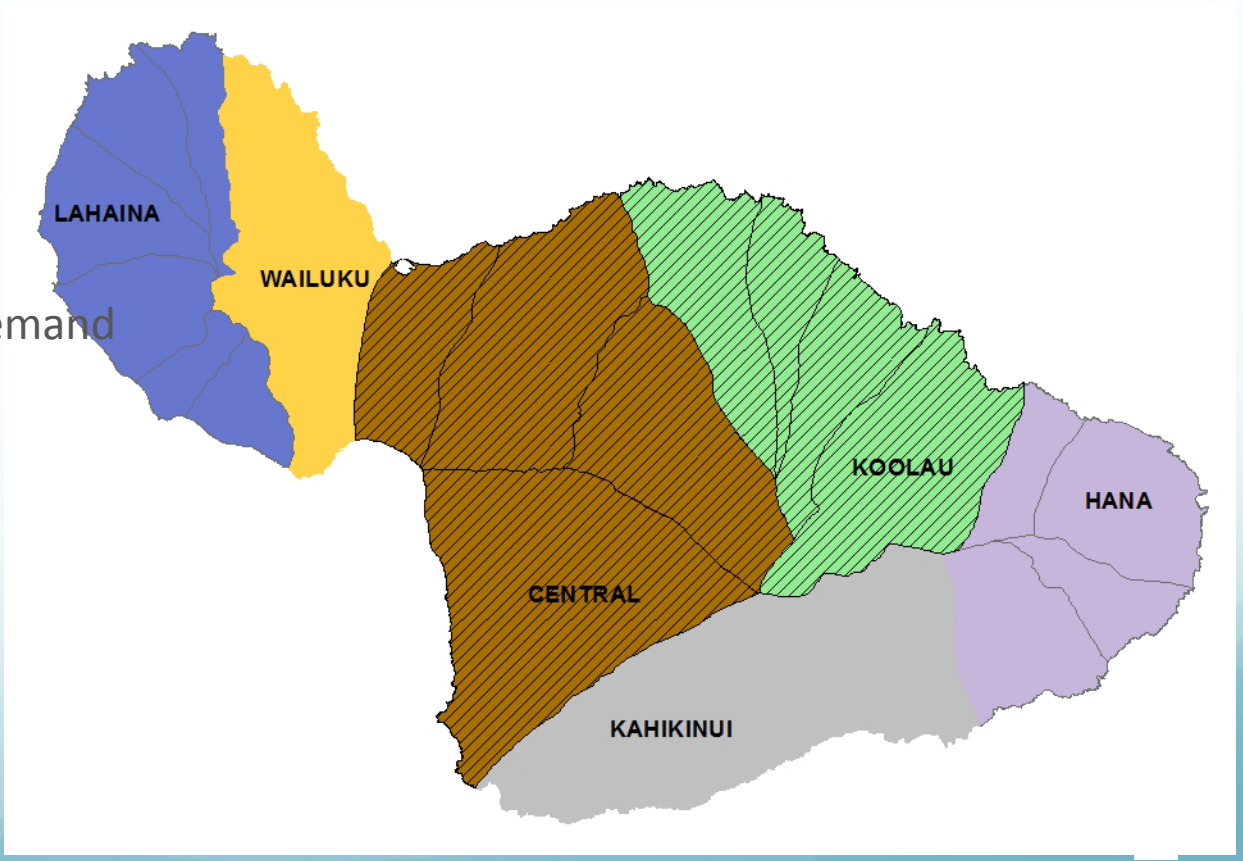
Presentation Outline

Part I: Introduction and Technical Approach

Part II: Water Resource Adequacy, Island Wide Strategies and Recommendations

Part III: Regional Sector Reports: **Central and Ko`olau Aquifer Sectors**

- Key Issues
- Water Resources
- Projected Growth and Demand
- Strategies



KEY ISSUES

Adequate long term resource supply to meet projected demand while maintaining watershed, stream and aquifer sustainability and replenishment

- ✓ Water Management and Transport
- ✓ Streamflow Protection and Native Hawaiian Rights and Uses
- ✓ Department of Hawaiian Homelands Needs
- ✓ Impact of HC&S transition
- ✓ Resource Protection and Restoration
- ✓ Alternative Water Sources and Conservation
- ✓ Water Availability and the Upcountry Priority List

MAJOR CONSTRAINTS:

East Maui contested case/HC&S to Mahi Pono transition

- June 2018 IIFS incorporated
- HC&S diversified ag plan and alternative ag use scenarios evaluated
- Affect water use demand

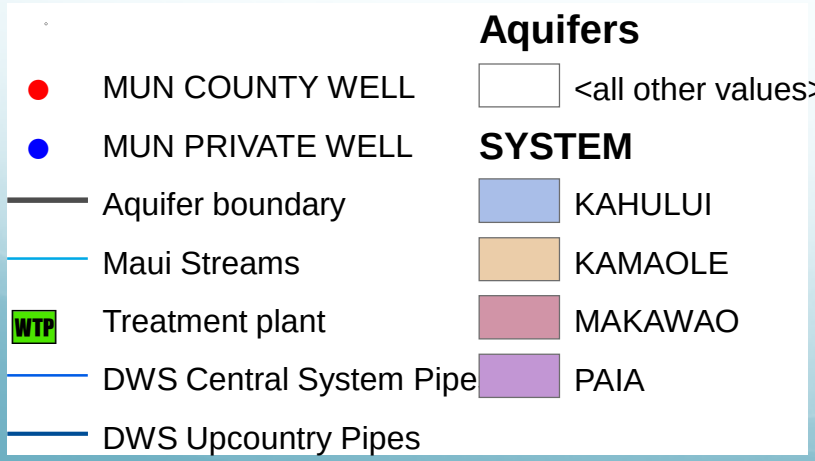
Sustainable Yield Revisions 2019:

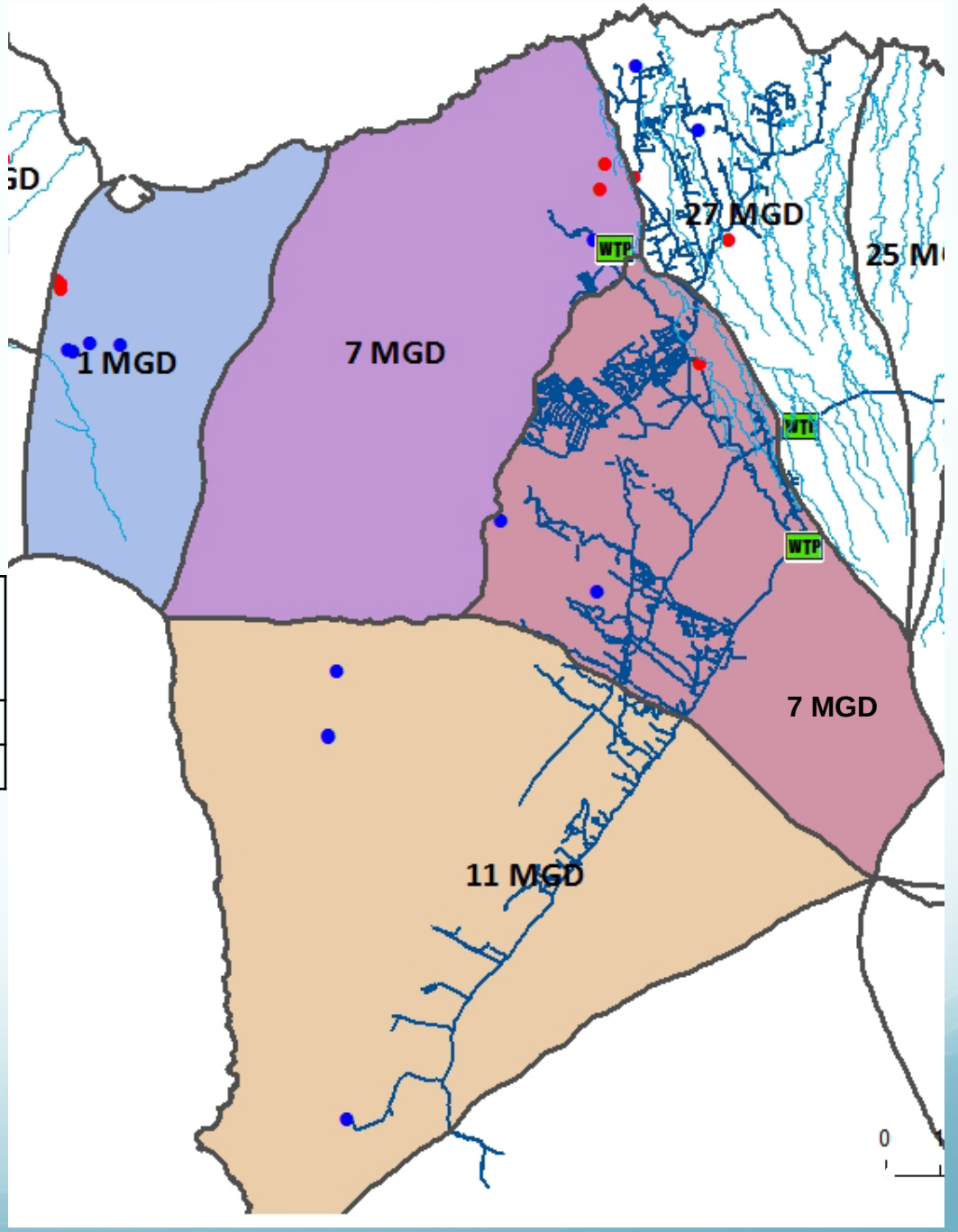
- Do not affect strategies

Central Water Resources

- ✓ No perennial streams
- ✓ Groundwater Sustainable Yield = 26 MGD
- ✓ Decreased irrigation return flow to aquifers
- ✓ Climate change impacts: decreased groundwater recharge

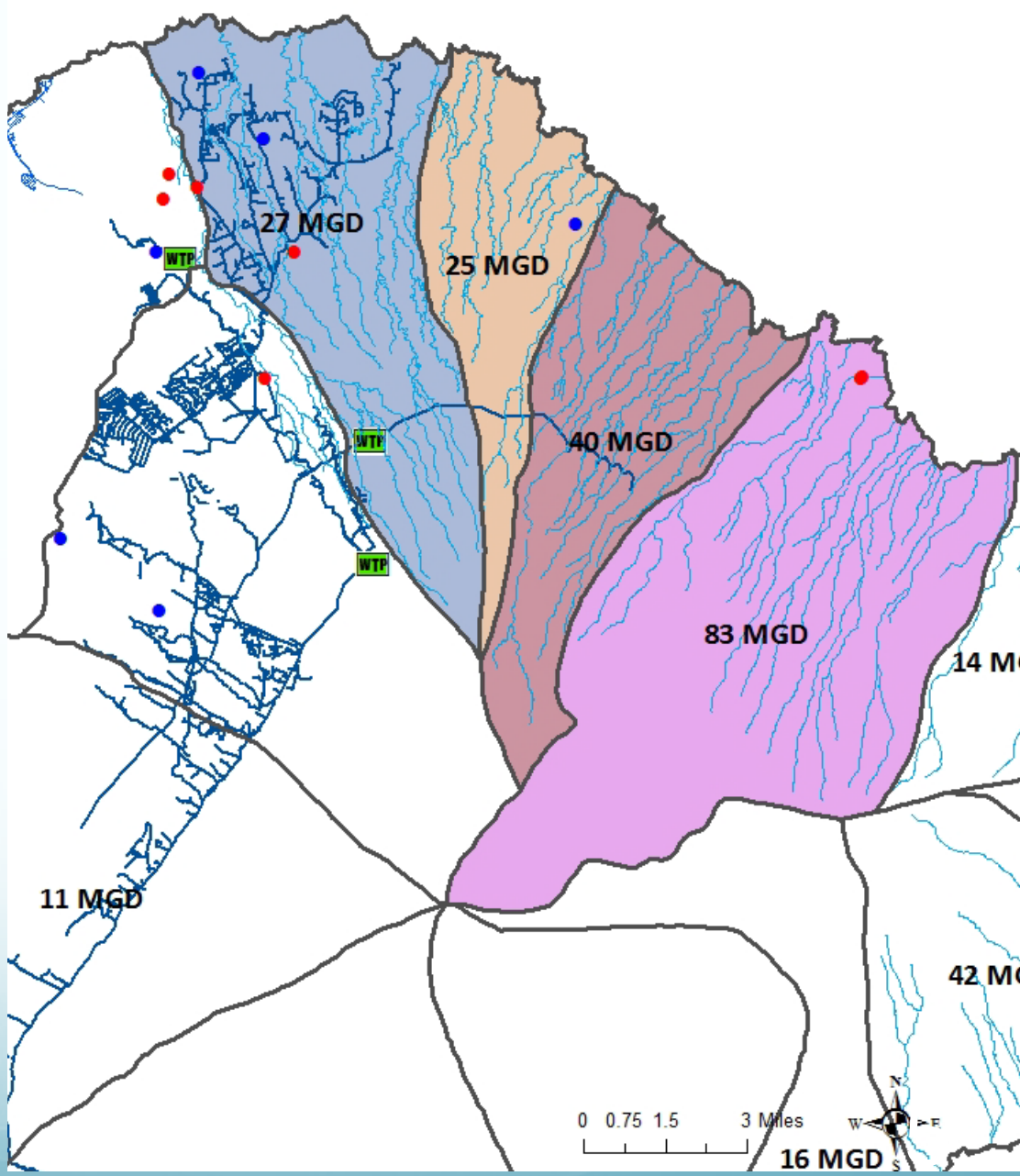
Aquifer	SY	Ag Pumpage 2014	Total Pumpage 2014	Total Pumpage 2017
Kahului	1	28.22	29.99	53.18
Pā`ia	7	29.09	29.50	0.41





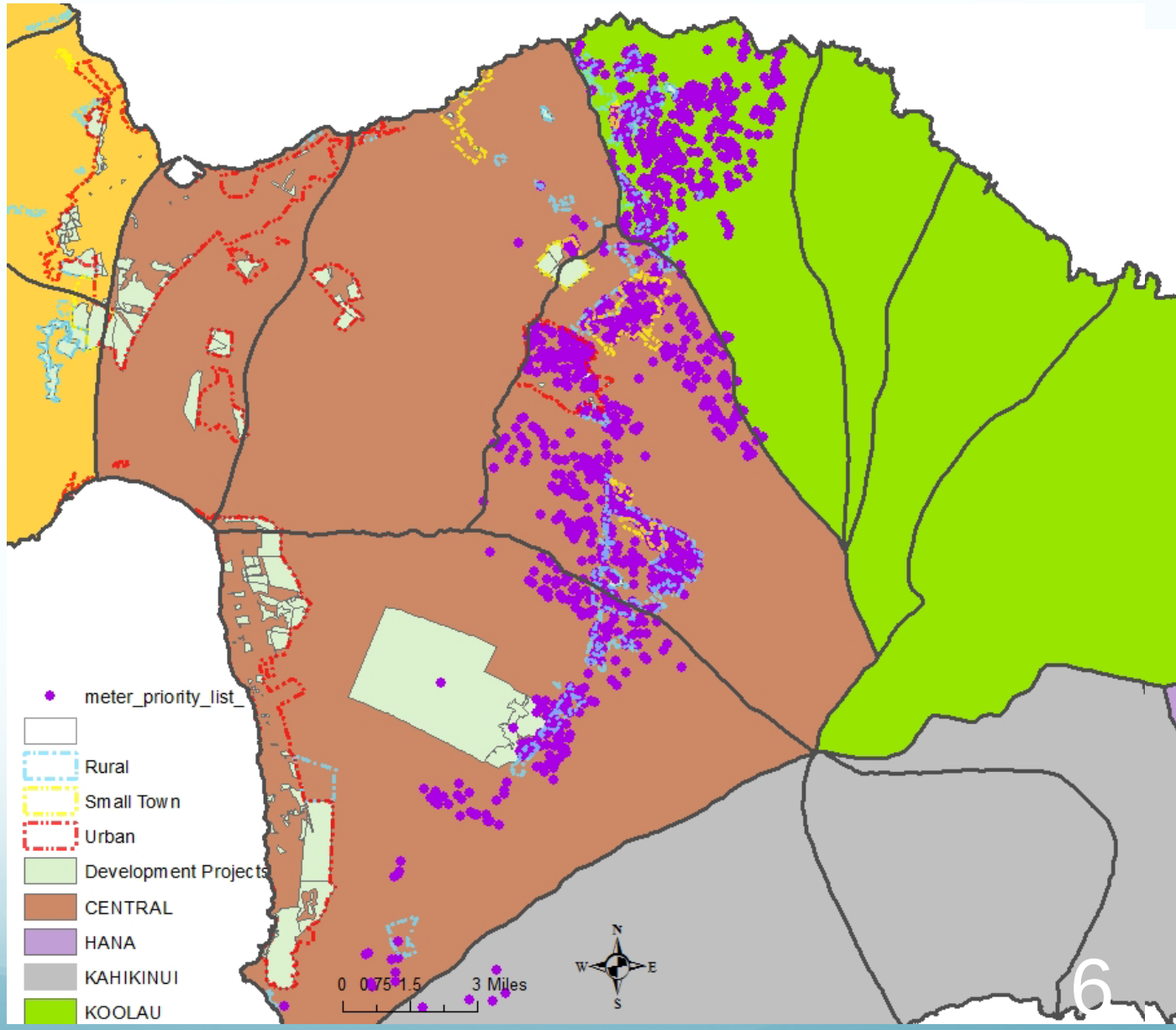
Ko`olau Water Resources

- ✓ **Groundwater Sustainable Yield = 175 mgd (2019 revised to 152 mgd)**
- ✓ **Interim Instream Flow Standards established June 2018:**
- IIFS Baseflow 73.26 mgd
- Median Baseflow (BF) available to divert: 20.35 mgd
- Drought BF available to divert: 2.21 mgd
- *Estimated* median Total Flow (TF) available to divert (petitioned and non petitioned streams): 83 mgd
- ✓ **Climate change impacts: generally increased groundwater recharge, stream flow variable and unstable (flashy)**

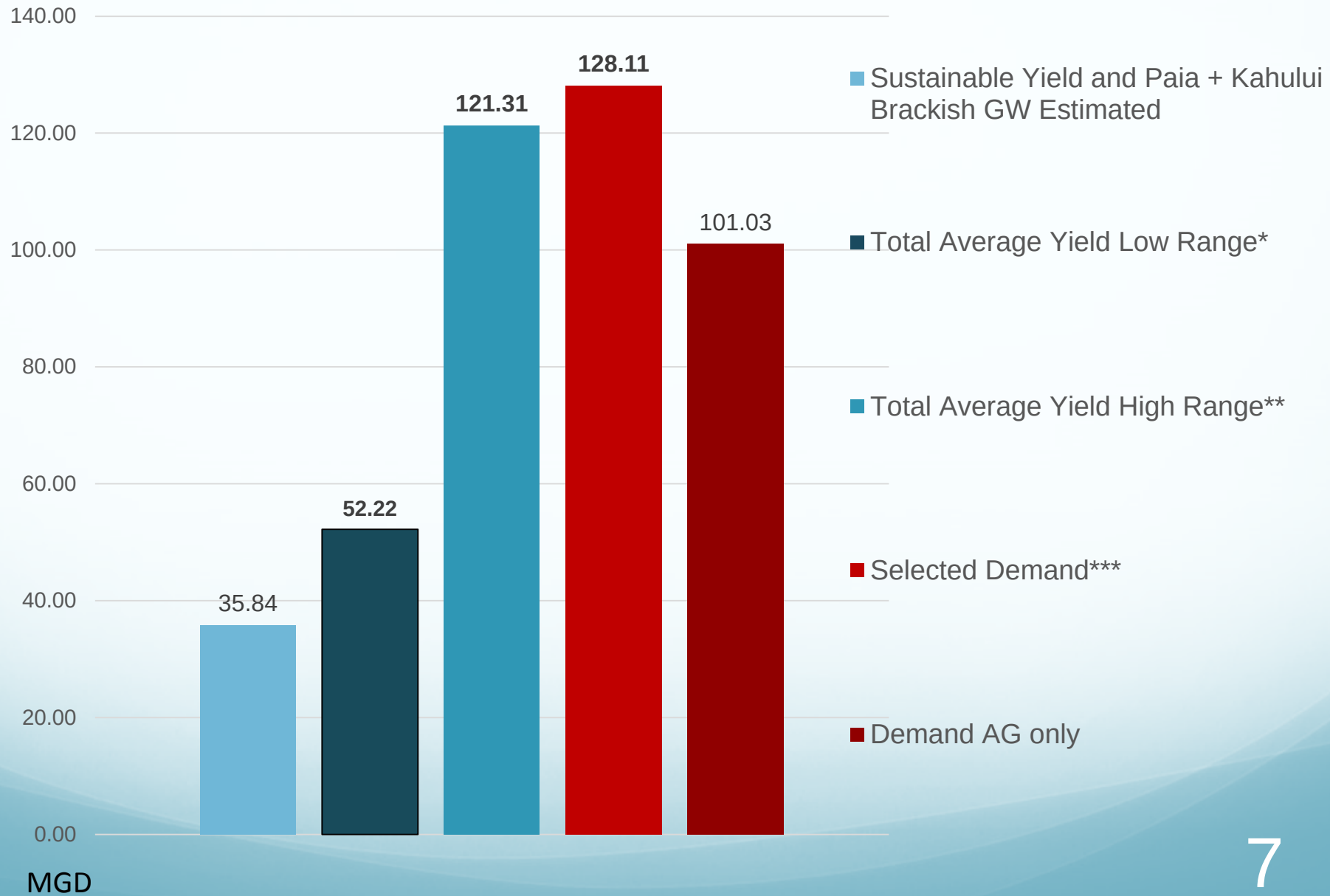


Central & Ko`olau Projected Growth and Demand

2035 Demand MGD	Low	High
DWS Upcountry	7.0	9.0
DWS Upcountry + Meter List	9.9	13.5
A&B (Mahi Pono) lands	23.2	89.23



Central Projected Growth and Demand



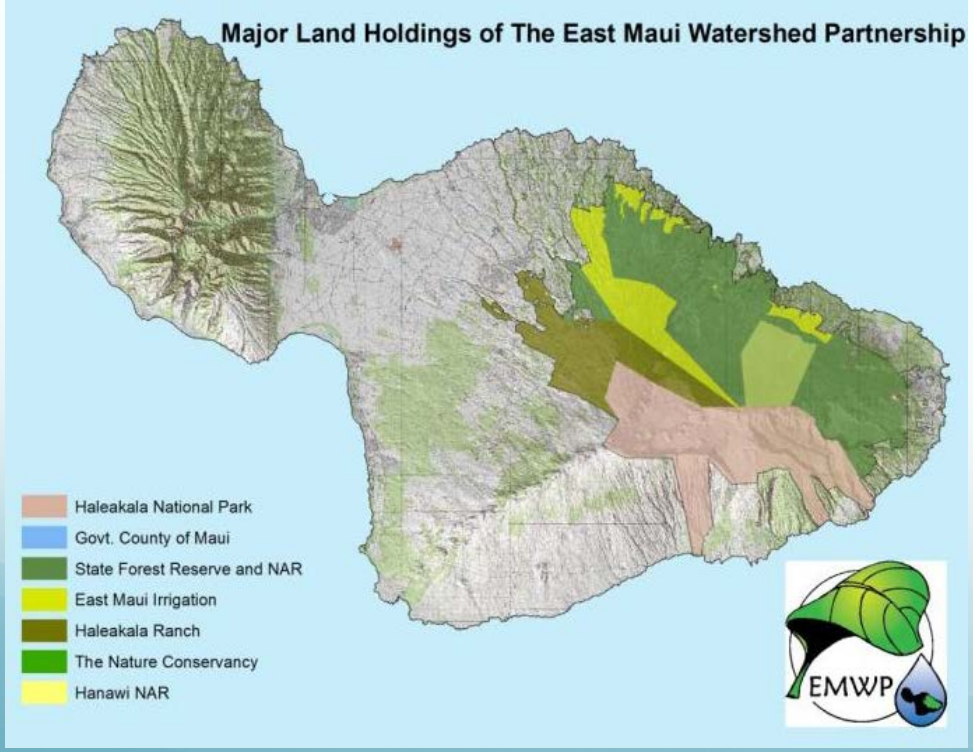
Selected Demand and Supply Strategies: Central Aquifer Sector and DWS Upcountry System

DEMAND (MGD)	2035
MDWS Potable (Upcountry excl. Priority List)	8.53
Upcountry Meter Priority List	7.30
Municipal Private Potable	0.35
DHHL Potable Kahului Aquifer	1.73
DHHL Potable Kama`ole Aquifer	0.81
TOTAL POTABLE DEMAND	18.73
Irrigation Non-potable	5.59
Agriculture, Non-potable	101.03
Industrial, Non-potable	0.31
DHHL, Non-potable	2.43
TOTAL NON-POTABLE DEMAND	109.37
TOTAL DEMAND	128.10

SUPPLY (MGD)	2035
Potable Groundwater Kama`ole Aquifer	1.50
Potable Groundwater Pā`ia Aquifer*[3]	1.50
Potable Groundwater Makawao Aquifer	3.00
Potable Groundwater Ha`ikū Aquifer	1.40
Potable Surface Water Ko`olau ASEA	11.70
Conservation (8% per capita)	2.67
TOTAL POTABLE SUPPLY	**21.77**
Non-potable Groundwater Kahului Aquifer	10.77
Non-potable Groundwater Pā`ia Aquifer	9.08
Non-potable Groundwater Kama`ole Aquifer	4.73
Non-potable Groundwater Makawao Aquifer	0.22
Non-potable Surface Water Ko`olau ASEA *[4]	28.50
Recycled Water (South Maui WWTF) Offset MDWS Central System*	2.28
Recycled Water Kahului WWTF)*[5]	3.00
Recycled Water Upcountry	0.19
TOTAL NON-POTABLE SUPPLY	53.50
Unmet Non-potable Demand	-55.87
TOTAL SUPPLY	**75.27**

Central & Ko`olau Strategies: Resource Management & Conservation

Seek dedicated, long term and broad based core funding for maintaining and expanding watershed protection areas and providing for watershed maintenance in East Maui watersheds for habitat protection and water security.



Source: EMWP

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Resource Management Strategies

Strategy	Estimated Cost	Lead Agency
Support and promote community grassroots initiatives to collaborate with state and land owner partnerships to increase participation in natural resource management and to ensure adequate access and opportunities for traditional uses of the region's natural resources. Use established moku process to consult on resource management.	N/A	Public-private partnerships Aha Moku DLNR
Explore funding and conduct a cost benefit analysis of improvements to the EMI non- potable conveyance system to mitigate losses and preserve existing reservoirs at risk of decommissioning. Priority components and associated costs TBD.	N/A	Maui County, A&B Properties, EMI
Support collaborative hydrogeological studies to inform impact from climate change and future well development on groundwater health for Ha`ikū and Honopou Aquifers.	N/A	CWRM USGS
Convene sector-based drought workshops to assist stakeholders in developing or improving their individual drought/water conservation plans. Focus in the Ko`olau Sector should be on catchment systems and contingency supply to supplement or substitute catchment when necessary.	$50K/year	CWRM NRWA

Conventional Water Source Strategies

Strategy	Estimated Cost	Lead Agency
Assess alternative options to restructure and process the existing Upcountry Meter Priority List to improve processing rate and adequate source development.	N/A	MDWS
Explore new basal well development in the Makawao Aquifer to accommodate growth Upcountry and add reliable new source. Potential yield is up to 3 mgd.	$4.5 – 6.0 /1000 gallons	MDWS, DLNR Public/private partnerships
Explore East Maui well development in combination with Makawao Aquifer basal groundwater to meet projected demand on the MDWS Upcountry System. Initiate a hydrologic study to determine any negative impact on existing ground and surface water sources, stream flow and influences from dikes. Potential yield is > 6 mgd.	$3.71*/1000 gallons	CWRM USGS MDWS
Explore Pā`ia Aquifer for non-potable demand, and potable use with additional treatment as necessary to serve projects included in the Maui Island Plan that cannot feasibly be serviced by MDWS source and infrastructure.	N/A	Maui County
Execute a long-term source agreement for use and maintenance of the Wailoa Ditch that ensures adequate non-potable supply for the Kula Agricultural Park expansion and potable supply for projected MDWS Upcountry System needs over the planning period.	N/A	Maui County MDWS , A&B Properties
Pursue hydrologic studies needed to explore the Ha`ikū Aquifer **and** an updated ditch flow analysis to optimize raw water storage and treatment plant capacity at Kamole Weir in order to expedite the most feasible new source. Contingent on a long- term agreement with A&B Properties allocating adequate surface water for the MDWS Upcountry System.	Surface water $5.15 /1000 gal (20 yr) (construction cost $50M, operational $1.47/1000 gal)	MDWS

Alternative Water Source Strategies

Strategy	Estimated Cost	Lead Agency
Consider alternative sources of irrigation water including wastewater reuse, recycled stormwater runoff, and brackish well water in land use permitting to mitigate low flow stream conditions. Require alternative sources for irrigation when reasonably available in county discretionary land use permitting.	N/A	Maui County DEM HC&S
Expand distribution from the Kahului WWTF and the application for planned energy crops. Potential available recycled water is 4.2 mgd.	$6.7M	MDEM HC&S
MDWS and MDEM collaborate to identify private-public partnerships, state and federal funding sources to maximize utilization of recycled water produced at the Kīhei WWTF and supplemental non-potable sources for seasonal use of R-1 water.	(Transmission South Kīhei to Wailea $21M)	MDEM MDWS

Implementation and Funding

- Recommendations provide guidance for land use and capital improvement program budgeting
- Implementing actions should be developed over the planning period for near term (1 – 5 years) and long-term (5 – 20 years) timeframes
- Conservation programs defer but don't replace costly investments
- Funding shared between state and county agencies, with greatest burden on DWS (water service fees, water system development fees, bond financing and State Revolving Fund loans)