REPORT FROM

OFFICE OF PUBLIC ACCOUNTABILITY

Date: April 9, 2018 Council File No. 17-0930 –S2

To: Honorable Nury Martinez, Councilmember
Chairperson, Energy, Climate Change and Environmental Justice Committee
Honorable Paul Koretz, Councilmember, Vice-Chairperson
Honorable Paul Krekorian, Councilmember
Honorable Gilbert A. Cedillo, Councilmember
Honorable Mitch O'Farrell Councilmember

From: Frederick H. Pickel, Ph.D., Executive Director/Ratepayer Advocate
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Subject: California WaterFix Stage 1 Cost to City Ratepayers

SUMMARY

The WaterFix Stage 1 upgrade with one tunnel to the Sacramento Delta water export system is estimated to cost a median single family resident household an average of $1.90 per month. The current City median single family resident household water bill is approximately $66 per month. This upgrade has reasonable rate impacts for City of Los Angeles, under a wide array of cost and water demand possibilities. This analysis also finds that long-term City policies to expand local water supplies, while maintaining access to imported water purchased from the Metropolitan Water District of Southern California (MWD), will minimize the WaterFix costs to Los Angeles ratepayers. Cost risks for City of Los Angeles households can be better managed if MWD allocations of fixed revenues can be constrained or lowered, alternatives like potable water reuse can be expedited, the value of surplus water sales from WaterFix can reflect the long-term costs, and the City adjusts or funds the low income/lifeline water credits for inflation as soon as practicable.

ISSUES NOT ADDRESSED

This report does not attempt to place a value on the reliability-based benefits of the WaterFix project to the City, or its cost effectiveness. This report does not analyze the financial differences between imported water purchases and local water supply costs. MWD imports water from both the MWD-owned Colorado River Aqueduct (CRA) and the State Water Project (SWP), but CRA costs are not included in calculations.

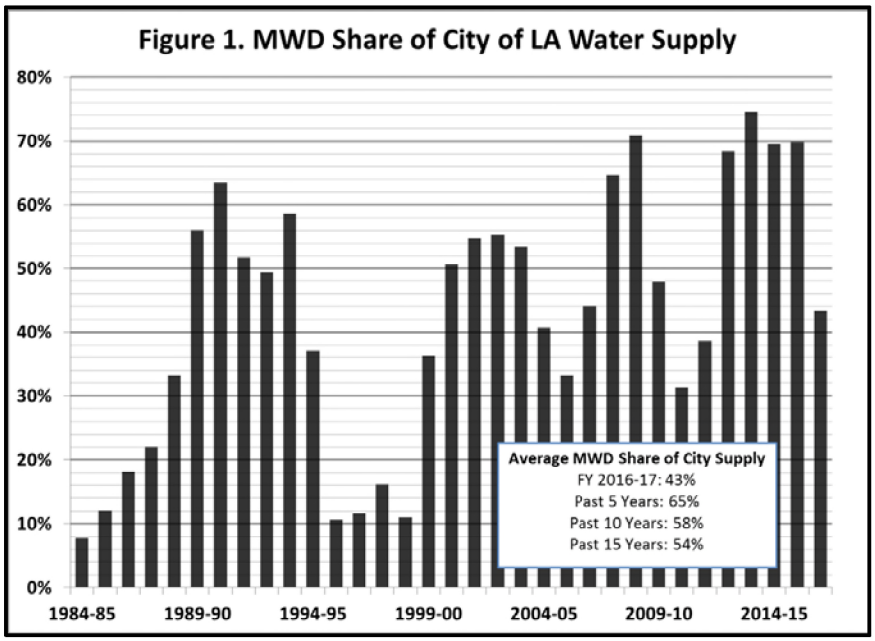
BACKGROUND

This report by the City of Los Angeles Office of Public Accountability/Ratepayer Advocate (OPA) responds to an analysis requested by Council motion on February 27, 2018 in Council File 17-0930-S2. The report also updates prior OPA reports.

The WaterFix Stage 1 is the first stage of an upgrade to the Sacramento Delta water export facilities operated by the State Department of Water Resources (DWR). The full upgrade consists of three new water intakes on the Sacramento River north of the Delta, each with a capacity of 3,000 cubic feet per second (CFS) connecting to twin Main Tunnels running south to the Clifton Court Forebay. The proposed Stage 1 of the project consists of two of the three water intakes, representing 6,000 of the planned 9,000 CFS capacity, connected to an initial Main Tunnel. Stage 2 will occur at a later but unspecified date when participants currently unwilling to commit to project financing are identified. Specifically, 87% of the flow allocation-weighted contractors in the State Water Project (SWP), including MWD, currently are prepared to fund a share of capacity in the proposed facility, and no funding support is forthcoming from the federally-owned California Valley Project (CVP) contractors. This limited support is described on the OPA's August 24, 2017 report, and is tabulated in Appendix Table A-8.

CITY SUPPLIES FROM MWD

MWD imported water is from the Sacramento Delta via the SWP and the Colorado River via the MWD-owned Colorado River Aqueduct (CRA). As illustrated in Figure 1, in past years MWD has cycled significantly from a minor to major portion of the City's diversified water supplies, which include not only purchased imported water from MWD, but also City-owned imported water using the Los Angeles Aqueduct (LAA) and local sources such as recycled water and stormwater capture. However, the City's Department of Water and Power (DWP) has projected that its historical reliance on MWD supplies will

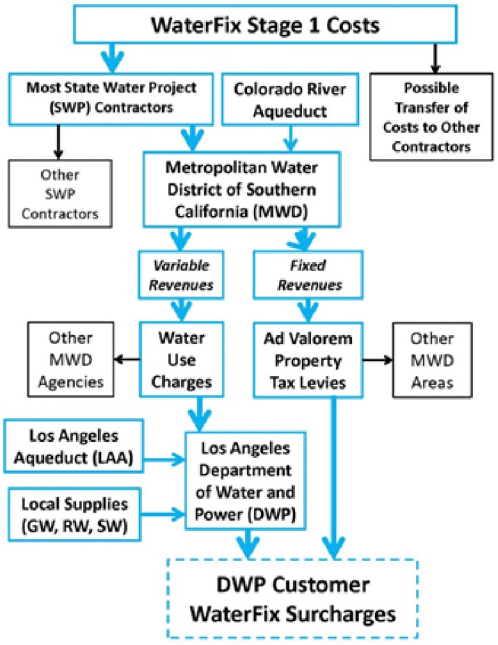


diminish significantly as it aggressively expands local supply project funding, and water demand efficiencies result in additional conservation. DWP projects that by 2035, purchases from MWD will average only 13% of the City's total sources. Based on this information, OPA projects that in the "Baseline" year only 1.5% of City supplies will come from the proposed WaterFix Stage 1 facilities. However, OPA also projects that if local supplies and LAA deliveries are significantly less due to persistently dry climate conditions or a severe multi-year drought, then City supplies from MWD could be as high as 61%.

ANALYSIS

OPA has defined a "surcharge" to DWP water customers as the local funding source in the City for the WaterFix facilities. The surcharge consists of potential MWD fixed property tax levies and certain DWP variable water service charges, and is modelled in the attached appendix. WaterFix Stage 1 project costs in 2017 dollars could range from $9 to $13 billion, including OPA-defined contingency cost factors from 8% to 75%. The Citywide annual surcharges for WaterFix Stage 1 could be as little as $16 million and as high as $74 million in 2018 dollars, depending on eight independent variables analyzed by OPA, including climate, project costs, bonded debt interest rates, local water supplies and the portion of WaterFix costs MWD collects from Ad Valorem property taxes. The water service and tax levy surcharges are illustrated in Figure 2.

Figure 2. WaterFix Costs & DWP Customers



By the year 2040, the OPA projects that long-term persistent average Delta exports are between 3.4 and 4.8 million acre-feet per year (MAFY), based on climate change and future operating permits for Delta exports. Exports are allocated between the SWP and CVP, with MWD projected to receive an average of 1.3 MAFY from the SWP.

CVP contractors may not choose to participate in WaterFix Stage 1, while SWP contractors including MWD will export Delta supplies through WaterFix facilities, in addition to their existing SWP contractor rights. Consistent with the Mayor's Executive Directive No. 5 and DWP's Urban Water Management Plan, by 2040 the City will require water supplies of 565,600 AFY (0.57 MAFY). MWD will provide 66,000 to 345,000 AFY (12% to 61%) of City supplies, depending on the availability of water from the Los Angeles Aqueduct (LAA) and local supplies.

FINDINGS

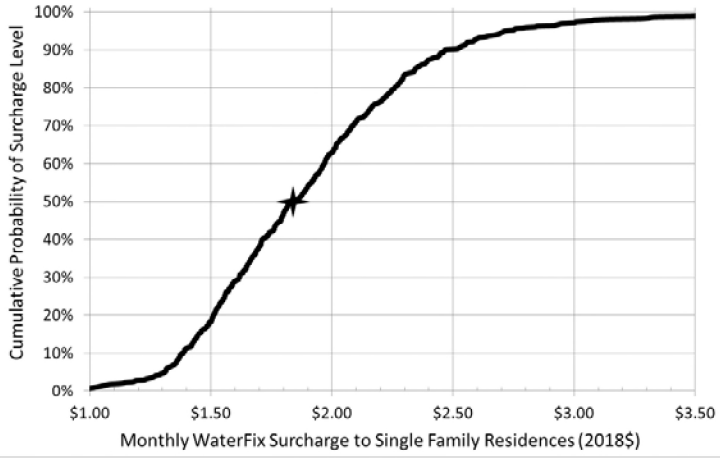
Table 1. WaterFix Stage 1 Financial Impact on City Single Family Residence Households

Description	Surcharges in 2018 Dollars				
	Lowest	Baseline	Median	Average	Highest
DWP Water Surcharge ($/month)	$0.16	$0.27	$0.80	$0.89	$2.32
MWD Property Tax ($/month-SFR)	$0.80	$1.00	$1.01	$1.01	$1.30
Total Monthly Surcharge	$0.96	$1.27	$1.81	$1.90	$3.62
Standard Deviation (+/-)				$0.42	

The surcharge is based on a house with median assessed value and a median monthly water use of 10 HCF. Surcharges are in 2018 dollars. Analysis variables are randomized in 600 modeling runs to develop the probabilistic median, average and standard deviation values.

As shown in the Table 1, OPA expects that the average WaterFix surcharge to a Los Angeles household is $1.90 per month, in 2018 dollars. However, due to the variables associated with the large, long-term water project, it is possible that the actual surcharge will range from as little as $0.96 to as much as $3.62 per month, as illustrated in Figure 3. Much of the WaterFix surcharge to LA water customers will be from MWD property taxes; OPA projects that by the year 2040, MWD will collect 20% of its taxes from Los Angeles properties but only 4% of its water charges. Note that MWD may choose to recover WaterFix costs using a combination of variable water sale revenues and a Readiness to Serve (RTS) charge. The RTS charge recovers a portion of debt service on bonds funding certain capital improvements. This variable RTS is currently based on a ten year rolling average of each MWD member agency's actual demand; in FY 2014/15 Los Angeles' RTS charge was $27 million. DWP's future RTS fees would be a function of the City's long-term persistent MWD purchases. Were OPA's property tax replaced with a RTS fee, the estimated $1.27 Baseline monthly surcharge could drop to a total of $0.37 per month.

Figure 3. Cumulative Probability for City of Los Angeles WaterFix Stage 1 Surcharges



COST OF TWIN TUNNELS ALTERNATIVE

MWD considered independently funding the construction of an additional 3,000 CFS of Stage 2 WaterFix capacity with the second WaterFix Main Tunnel with third water intake facility. The result of this investment would be an increase in MWD's member agency's capacity rights and costs, without an assurance of demand for the additional capacity. This additional capacity

would increase the average WaterFix surcharge for Los Angeles households from $1.90 to $2.52 per month, in 2018 dollars, assuming MWD was able to transfer approximately two-thirds of the additional 3,000 CFS capacity at full cost.

Just as OPA has calculated a range of WaterFix Stage 1 costs from a best case $0.96 per month to a worst case of $3.62, adding the WaterFix Stage 2 Twin Tunnel costs changes the range of costs from $0.95 per month (when all extra water is transferred to non-MWD contractors), to a much higher $6.78 per month. This higher "worst-case" cost occurs when MWD member agencies alone are supporting the extra tunnel costs, and the City increases MWD's share of supplies to 61% due to dryer regional conditions and lower local supplies.

OPA FINDINGS CONSISTENT WITH PRIOR REPORTS

This updated report is consistent with the OPA reports on May 7, 2014 and August 24, 2017 to the City's Energy, Climate Change and Environmental Justice Committee and its predecessor. The OPA's previous estimated monthly household surcharges were in a range of $0.47 to $3.41 in 2014 dollars, and $0.87 to $4.31 in 2017 dollars, whereas the current analysis based on the most recent available information in this report projects the range of $0.96 to $3.62, in 2018 dollars. In the 2017 OPA report, the average surcharge to the Los Angeles median household was $1.73 per month ($1.78 in 2018$). As shown in Table 2, this updated report finds that the average surcharge has increased by 7% to $1.90 per month, largely because information available at the time of the analysis indicates that 13% of the SWP contractors may not participate in WaterFix Stage 1.

Table 2. OPA Trend in Expected WaterFix Surcharges

Monthly Surcharge per Median Household	August 2017 Full Two Tunnels 2017$	February 2018 Stage 1 with One Tunnel (All SWP Contractors) 2018$	March 2018 Stage 1 with MWD Financing the 2nd Tunnel 2018$	April 2018 Stage 1 with One Tunnel (87% of SWP Contractors) 2018$
Average	$1.73	$1.87	$2.52	$1.90
Range	$0.87 to $4.31	$0.90 to $4.07	$0.95 to $6.78	$0.96 to $3.62

While the OPA has projected that MWD's fixed Ad Valorem property tax will be the biggest part of the WaterFix surcharge to Los Angeles residences and business, MWD has asserted that WaterFix surcharges are more likely to be volumetrically-based. If correct, then the WaterFix surcharges to Los Angeles residences would be significantly lower under the Mayor's Executive Directive No. 5 and other variables used in the Baseline cost projections.

CONCLUSION

In the 2017 OPA report, the average surcharge to the Los Angeles median household was $1.73 per month ($1.78 in 2018$). This updated report finds that the average surcharge for WaterFix Stage 1 with one tunnel has increased by 7% to $1.90 per month. If MWD commits to two tunnels the average cost increases to $2.52 per month, with a range of $0.95 to $6.78. Among other variables, the range of costs depends on how much of the second tunnel water supply is transferred.

To manage the risks in these cost estimates, the City may wish to consider, among other measures:

1. Encouraging MWD to make a greater commitment to conservation by gradually increasing its variable revenues and reducing its fixed revenues, so that all MWD members are investing efficiently in our cheapest water resource.
2. Encouraging the State to provide objective safety criteria for direct potable reuse, as this could remove a significant portion of costs in utilizing this resource.
3. Encouraging the State to act as soon as possible to mitigate risks of long-term holding and reselling surplus water, by declaring it will not re-set market prices reached between willing sellers and buyers.
4. Adjusting or funding the low income/lifeline water credits for inflation as soon as practicable (see Appendix B).

cc: The Honorable Los Angeles City Council

The Honorable Eric Garcetti, Mayor
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Richard H. Llewellyn, City Administrative Officer
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CALIFORNIA WATERFIX STAGE 1 COST TO CITY RATEPAYERS -- TECHNICAL ANALYSIS

TABLE OF CONTENTS **PAGE**

Appendix A

Introduction A-2

Description of Tables A-2

Table A-1. WaterFix Stage 1 Capital Cost Allocations A-6

Table A-2. MWD Water Supplies A-7

Table A-3. DWP Water Supplies A-8

Table A-4. MWD Taxes for WaterFix A-9

Table A-5. WaterFix Annualized Costs A-10

Table A-6. WaterFix Surcharges to City Single Family Resident Households A-11

Table A-7. Variables Affecting Charge and Tax Values A-12

Table A-8. California State Water Project Contractors Table A and WaterFix Shares .. A-13

Appendix B:

Low Income and Lifeline Water Credits B-1

Table B-1. Calculations: Impacts on Average, Low-Income, and Lifeline Ratepayers B-2

References .....

Glossary .....

APPENDIX A

INTRODUCTION

This attachment provides the technical analysis of WaterFix Stage 1 costs to the City of Los Angeles single family resident households. The analysis provides a range of values as an estimate of the WaterFix Stage 1 project cost impacts "surcharges," rather than relying on a single Baseline estimate. The analysis consists of eight tables describing the (1) WaterFix facility costs, (2) the projected water capacities and user demands, and (3) the resulting range of possible surcharges. The 2018 WaterFix Stage 1 has lower capacity and costs, and fewer facility participants, than the full WaterFix facility presented by OPA in 2017. This analysis does not address single year weather volatility effects on regional water supply and demands, which are managed by MWD and DWP water in storage; the values used in this analysis generally represent persistent, stable long-term water deliveries equaling projected average demands, without changes to water in storage.

DESCRIPTIONS OF TABLES

This section provides details regarding the individual tables.

Table A-1. WaterFix Stage 1 Capital Cost Allocations: $9 to $13 Billion. The OPA projected WaterFix Stage 1 project costs range from $8.9 billion to $13.2 billion in 2017 dollars ($11.5 to $16.7 billion in 2024 dollars). The February 12, 2018, Metropolitan Water District of Southern California (MWD) update to the California WaterFix is based on an unloaded $6.3 billion facility and $2 billion in project management costs, in 2017 dollars, plus a facility cost contingency of 36%.These values represent the project "Baseline" in this analysis; the OPA has added to this Baseline a range of contingencies with a lower 8% in Alternative 1 and a higher 75% in Alternative 2. The total WaterFix Stage 1 facility project costs include: construction, contingencies, land, environmental mitigation, engineering and management. As itemized in Table A-1, the "all-in" WaterFix program costs, in 2024 dollars, include 3% per year inflationary escalations from 2017 to 2024 (the year that project spending is midway).

Also included in Table 1 is MWD's 56% share of WaterFix facility costs based on its projected 3,337 cubic feet per second (CFS) share of the Stage 1 capacity of 6,000 CFS. In Alternative 1, MWD's share of the costs and capacity drops to 46% if CVP contractors acquire 1,000 CFS in capacity rights. On this basis, MWD's facility costs range from $5.3 to $9.3 billion, in 2024 dollars. In contrast, OPA's 2017 WaterFix report identified at allocated range from $4.4 to $8.6 billion.

Table A-2. MWD Water Supplies: 26% To 35% of Delta Exports. OPA projects that, with WaterFix Stage 1, by the year 2040 the Delta water exports have a long-term persistent yield of

4.6 million acre-feet per year (MAFY). The State Water Project (SWP) and certain Central Valley Project (CVP) contractors, including those on the Delta-Mendota Canal, have allocations in Sacramento Delta exports. MWD's share of SWP flows is currently 47%. However, certain SWP contractors have elected not to participate in WaterFix Stage 1, so MWD's capacity-based share of WaterFix Stage 1 costs is 56%. OPA projects that by 2040 MWD will receive from 26% to 35% of Delta export flows.

The future Delta exports are difficult to predict. With few or no CVP contractors participating in the additional capacity of WaterFix Stage 1, and challenges in predicting both the climate and the environmental regulations affecting Delta exports, it is difficult to forecast the volume of Delta exports. In Alternative 1 Persistently Wet Climate, OPA has projected that 2040 exports are 4.8 MAFY; in the Baseline projection the exports are 4.6 MAFY; in Alternative 2 Persistently Dry Climate the exports are down to 3.4 MAFY. In essence, these forecasts require assumptions on exports "but for" the construction of the WaterFix facilities. The OPA projects that by 2040 MWD's total Delta supplies with the WaterFix Stage 1 in all alternatives will be approximately 1.3 MAFY, but MWD's total sales including the MWD-owned Colorado River Aqueduct (CRA), will range from 1.7 to 2.5 MAFY, depending on regional climate conditions.

Note several analysis issues: First, the highest dependence on MWD is under Alternative 1 Persistent Dry Climate, when MWD's member agencies have local supply shortages and MWD deliveries are projected at 2.5 MAFY. This higher demand is particularly true for Los Angeles in 2040, when DWP plans to have multiple local sources of supply and LAA imports from the Eastern Sierra Nevada. Conversely, in Alternative 1 Persistently Wet Climate MWD's sales are far lower at 1.7 MAFY. Second, MWD's share of WaterFix Stage 1 costs are a solely a function of the fixed facility capacity right, which differs from the projected levels of water sales.

Table A-3. DWP Water Supplies: 2% To 4% from WaterFix Stage 1. The Department of Water and Power (DWP) prepared a 2015 Urban Water Management Plan (UWMP). It estimates, for the planning year 2040, that a reliable water supply of 0.57 MAFY will serve the City's needs, regardless of future climate conditions. The UWMP supports the Mayor's Executive Directive No. 5 water supply objectives, and is based on a supply portfolio from multiple local water sources, in addition to ongoing conservation and more efficient water use. The multiple City sources of potable water supplies include (1) local water from augmented groundwater (GW), (2) recycled water offsets, (3) Los Angeles Aqueduct (LAA) supplies from the Owens Valley, and (4) purchased water from MWD (imported from the Colorado River and California Delta). The Baseline projection of DWP's water portfolio uses MWD purchases of 75,000 AFY (0.075 MAFY), representing 13% of the total portfolio. However, OPA projects that imported water purchases from MWD can be from 12% to 61% (0.07 to 0.35 MAFY) of DWP's total supply.

Table A-4. MWD Taxes for WaterFix: $0.80 To $1.30 Monthly for City Homeowners. MWD's current property taxing authority is 0.0035% of the assessed valuation of secured properties. In FY 2016-17 the tax generated $90 million, which MWD used for servicing existing debt. The properties within the City of Los Angeles were a 20% share of those taxes, or $18 million. As the SWP bonds will be paid off by 2035, the OPA has assumed that MWD will use its taxing authority in support of new bonds for its share of WaterFix facility costs, at the same 0.0035% rate. However, MWD has asserted that revenues to repay WaterFix bonds are more likely to be volumetrically-based rather than collected from property taxes.

By 2040, MWD taxes should increase to $114 to $186 million per year from a 2% per year growth rate in property values, and OPA presumes that these taxes will, in effect, offset much of the WaterFix volumetric surcharges otherwise billed to MWD member agencies. The year 2018 property tax levy is $1.00 per month equivalent for a median single family residence household in the City. For Alternatives 1 and 2, that current value is adjusted down by 20% and up by 30%.

Table A-5. WaterFix Annualized Cost to MWD: $294 to $933 Million per Year. The OPA estimates that the total WaterFix Stage 1 annual unit cost to MWD member agencies is in a range of $177 to $376 per acre-foot (AF), with a Baseline of $230 per AF, in 2040 dollars. The equivalent rate in 2018 dollars is $120 per AF, before offsetting MWD property tax revenues. The Baseline WaterFix costs represent a 17% increase in average MWD costs.

Table A-6. WaterFix Stage 1 Surcharges to City Single Family Resident Households: $0.96 to $3.62 per Month, in 2018 dollars. The surcharges are based on the assumptions and calculations in the prior tables including the fixed 0.0035% MWD ad valorem property tax levy, combined with the variable DWP water service surcharge. The 2018 median DWP water service bill to single family residents is $66 per month, based on a water demand of 10 HCF billing units per month for median City single family residence customers. Thus, the WaterFix Stage 1 surcharge to Los Angeles water customers is $0.96 to $3.62 per month, representing a 1.4% to 5.5% increase.

Table A-7. Variables Affecting Charge and Tax Values. The range of WaterFix costs are bracketed by extremely low and high surcharges possibilities of Alternatives 1 and 2. To determine a likely (average and median) surcharge, possible values are estimated from the range of possible values for each of seven key independent variables, as well as their probabilities. A randomized mix of variables is used to evaluate the probabilities within that extreme range. The independent variables are: WaterFix Stage 1 project costs, Delta climate (affecting Delta exports and MWD sales volumes), CVP participation in Alternative 1, LAA water supplies, DWP local supplies, MWD assessed valuation (AV) tax revenues, and bond debt

interest rates. A constant inflation/discount rate of 3% per year is used in all alternatives. Most of the variables have uniform distributions, while others have discrete probabilities. Using 600 iterations of randomly generated numbers within the boundaries identified in the two alternatives, the OPA developed the median, average and standard deviation of the possible WaterFix surcharges, as well as the cumulative probability curve.

Table A-8. California State Water Project Contractors Table A and WaterFix Shares. The SWP water contractors have water supply contracts with the DWR that define annual water supply entitlements. The SWP Table A Summary in Table A-8 lists the current annual entitlements of all contracts. Typically, actual yearly water supply deliveries are 65% of the Table A values. Ninety seven percent of the SWP contractors receive water from the California Aqueduct; 87% of these California Aqueduct contractors, plus certain CVP contractors in Alternative 1, are funding the WaterFix Stage 1 costs. Table A-8 also identifies the shared WaterFix capacities among participating SWP contractors. As shown, MWD has a 47% entitlement to the California Aqueduct deliveries, 3,337 CFS (56%) of the 6,000 CFS of the WaterFix Stage 1 facility capacity in the Baseline projection and Alternative 2, and 2,781 CFS (46%) of the capacity in Alternative 1, where 1,000 CFS is presumed to be purchased by CVP contractors. Note that whereas the SWP Table A represents the contractor entitlements solely to existing Delta export facilities allocated to the SWP (versus the CVP), the WaterFix Stage 1 capacities are solely for water agencies purchasing shares of the new facilities.

Table A-1. WaterFix Stage 1 Capital Cost Allocations

WaterFix Stage 1 Facility Project Elements	Alt 1 Cost with Lowest Contingency	Baseline Cost with 36% Contingency	Alt 2 Cost with Highest Contingency
Base Construction & Engring Cost (2017$ M, a)	$6,300	$6,300	$6,300
Contingency (% of Base Costs, b)	**8%**	**36%**	**75%**
Contingency/Risk Costs	$504	$2,268	$4,725
Project & Const. Mgmt./Engineering	$2,000	$2,000	$2,000
Land (with 20% contingency)	$140	$140	$140
Subtotal Project Costs (2017$)	**$8,944**	**$10,708**	**$13,165**
Delta Environmental Mitigation (2017$)	$377	$377	$377
Inflation of 2017$ Costs to 2024$ (c)	$2,146	$2,552	$3,118
Total Cost of Project Alternatives (2024$)	$11,467	$13,637	$16,660
Proposed WaterFix Stage 1 Capacity Rights (d)		**No CVP Participation**	
MWD Share of WaterFix Stage 1	2,781	3,337	3,337
Other Participating SWP Contractors	2,219	2,663	2,663
Subtotal	5,000	6,000	6,000
CVP Contractors	1,000	0	0
Total WaterFix Stage 1 Capacity	6,000	6,000	6,000
WaterFix Stage 1 Cost allocations		**No CVP Participation**	
MWD Share of WaterFix Stage 1 Costs	46%	56%	56%
Other Participating SWP Contractors	37%	44%	44%
Subtotal	83%	100%	100%
CVP Contractors	17%	0%	0%
Total	100%	100%	100%
WaterFix Stage 1 Cost allocations from Capacity Rights (2024$)			
MWD Share of WaterFix Stage 1 Costs	**$5,315**	**$7,585**	**$9,266**
Other Participating SWP Contractors	$4,241	$6,052	$7,394
Subtotal	$9,556	$13,637	$16,660
CVP Contractor Participation	$1,911	$0	$0
Total	$11,467	$13,637	$16,660

Values may not foot due to rounding. All values are in million dollars.

(a) Source: February 12, 2018, MWDSC Update on the California WaterFix, Water Planning and Stewardship Committee Item 6a.

(b) The lowest and highest alternatives are used in the probabilistic analysis based on facility cost possibilities under differing scenarios identified by MWD.

(c) Inflation is estimated at 3% per year using annual compounding. The midpoint of construction expenditures is in 7 years (2024). The WaterFix Project is projected to be online in 2033.

(d) The variations in allocations of the WaterFix facility costs are independent of the volume of Delta exports.

Table A-2. MWD Water Supplies

Persistent Delta Exports in 2040 with WaterFix Stage 1 (AFY)	Alt 1 Persistently Wet Climate	Baseline Project	Alt 2 Persistently Dry Climate
Delta Supply to MWD (net of storage, a)	**1,258,108**	**1,262,972**	**1,181,342**
Delta Supply to Other SWP Contractors	676,234	696,916	909,360
Subtotal Participating SWP Contractors	1,934,342	1,959,888	2,090,703
ST Non-participating SWP Contractor	595,658	565,112	273,697
Total SWP Contractors	2,530,000	2,525,000	2,364,400
Subtotal Participating CVP Contractors (b)	691,250	508,750	246,400
Subtotal Non-participating CVP Contractor	1,608,750	1,526,250	739,200
Total CVP Contractors (c)	2,300,000	2,035,000	985,600
Total Delta Exports	**4,830,000**	**4,560,000**	**3,350,000**
Exports in 2040 without WaterFix	3,900,000	3,700,000	2,560,000
Increase in Exports with WaterFix Stage 1 (d)	930,000	860,000	790,000
Total Contractor Flows with WaterFix Capacity	2,625,592	2,468,638	2,337,103
WaterFix Participating Flows vs Delta Exports	54%	54%	70%
MWD Share of SWP Flow	50%	50%	50%
MWD Share of WaterFix related Flows	46%	56%	56%
MWD Share of Delta Exports	**26%**	**28%**	**35%**
MWD Sources of Supply, Net of Storage (AFY)	Lower Demands		Higher Demands
SWP Supplies (a)	1,258,108	1,262,972	1,181,342
Colorado River Supplies (CRA, e)	400,892	837,028	1,296,658
Total MWD Annual Persistent Sales (2040, f, g)	1,659,000	2,100,000	2,478,000
MWD Sources of Supply, Net of Storage			
SWP Supplies (b)	76%	60%	48%
Colorado River Supplies (CRA, e)	24%	40%	52%
Total MWD Annual Persistent Sales	100%	100%	100%
MWD Sales in SoCal versus Baseline Sales (2040, g)	79%	100%	118%

Values may not foot due to rounding. "Participating" contractor values refers to flows associated with purchase of WaterFix capacity. The values herein are net of water to/from storage, and represent persistent, stable long-term reliability targets supporting projected demands. MWD's SWP flows depend on both climate CVP usage. Short term drought conditions are not modeled.

(a) 2015 MWD UWMP 2015 pgs. A.3-46 1.2 MAF persistent long term post 2030 Delta Source of Supply Solution. The State Water Project Final Delivery Capability Report Jul 2015 Table 5-1 lists SoCal area SWP contractor max Table A delivery at 2.6 MAFY, and MWD median deliveries at 65% of Table A volumes. MWD 2015 UWMP Table A.3-7 (pg. A.3-57) identifies the 2040 multiple dry years California Aqueduct supply as 0.79 MAFY, including the WaterFix; the persistent deliveries in the dry climate will exceed this multi-year shortage condition. Per Bay-Delta Initiatives Manager, MWD, 23 Feb 2017, current SWP contractor deliveries are stable at 46% to MWD, 3% to SWP contractors taking water above the Delta and 50% for other SWP contractors using Delta exports.

(b) In Alternative 1, certain CVP contractors participate in the additional WaterFix Stage 1 capacity rights.

(c) By 2040, CVP contractors are projected to annually sell 18% of their current supply allocations to SWP contractors. In Alternative 2, a persistently dry climate results in the CVP contractors selling an additional 30% of their supplies.

(d) MWD estimates that WaterFix Stage 1 protects 860,000 acre-feet of water per year from future reductions due to seasonal environmental constraints or earthquakes.

(e) MWD 2015 UWMP - Year 2040 average year supplies from the Colorado River Aqueduct (CRA) are ~0.9 MAFY. Minimum water supply under Metropolitan's Priority 4 senior rights apportionment of Colorado River water (0.55 MAFY) has been continuously delivered since 1939. MWD's CRA supplies are a function of it's Delta exports. CRA supply cost is not included in those calculations.

(f) The total MWD Annual Persistent Sales are projected to grow from 1.7 MAFY in 2015 to 1.85 MAFY by 2025, per Page 2 of Attachment 2 to the Ten-Year Financial Forecast of the 2016/17 and 2017/18 Biannual Budget. This analysis projects that MWD Baseline total sales is 1.9 MAFY by 2033 and 2.1 MAFY in 2040.

(g) In the wetter SoCal climate, demand for imported MWD supplies is lower than the Baseline, while in a dry climate the demands are higher.

Table A-3. DWP Water Supplies

DWP Long-term Persistent Annual Source of Supplies in 2040	Alt. 1 Minimum MWD Reliance	Baseline	Alt. 2 Maximum MWD Reliance
Imported Water Purchases (a)	**12%**	**13%**	**61%**
LA Aqueduct (LAA, b)	52%	51%	8.9%
Local GW, RW & Transfers (b)	36%	36%	30%
Total DWP Supplies and Sales (c)	100%	100%	100%
New WaterFix Facilities Exports	930,000	860,000	790,000
MWD total Sales	1,659,000	2,100,000	2,478,000
Imported Water Purchases (AFY, a)	**66,000**	**74,930**	**345,000**
LA Aqueduct	295,130	286,200	50,600
Local GW, RW & Transfers	204,470	204,470	170,000
Total DWP Supplies and Sales	**565,600**	**565,600**	**565,600**
DWP Portion of WaterFix Facilities	**2%**	**1%**	**4%**
DWP Portion of MWD's Sales (d)	4%	4%	14%

Values may not foot due to rounding. The sources of supply are net of water to/from storage, as supply herein represents persistent, stable long-term demands.

a. All DWP imported water purchases are from MWD. Certain City areas have access only to MWD water at an average demand of 66,000 AFY. Per the 2015 DWP UWMP 2040 Exhibit 11F, the MWD supplies of 310,530 AFY for single dry years is increased to represent a long-term dryer California climate with more City dependence on MWD supplies.

b. Wet and Baseline cases presume successful development of all future local supplies. The dryer case alternative presumes a shortfall in local supply development and lower LAA supplies.

c. Source: 2015 DWP UWMP 2040 demands (Exhibit 11F & H)

d. DWP's "share" MWD purchases originating from Delta supplies. Note that MWD deliveries and bills do not distinguish among the sources of supply.

Table A-4. MWD Taxes for WaterFix

Description	Assessed Valuation ($ billion)	MWD Ad Valorem Tax Rate (b)	Taxes to MWD ($ million)
City Area (FY 2016-17, a)	$521	0.0035%	$18
Other Areas in the MWD Service Area	$2,062	0.0035%	$72
Total MWD Service Area (FY 2016-17, a)	$2,583	0.0035%	$90
City to Total MWD Service Area Ratio	20%		20%

DWP's Share of MWD's Total Member Agency Water Deliveries (2040)	Ratio of Supply
Alt. 1 Wet Climate - Less MWD Reliance	4%
Baseline	4%
Alt. 2 Dry Climate - More MWD Reliance	14%

MWD Property Tax Revenues in FY 2016-17 ($ million/year)		$90
MWD Reported Annualized Growth in AV Revenues 2016 to 2026 (a, b)	2.0%	
Equivalent Growth in AV Revenues from FY 2016-17 to 2040		158%
MWD Property Tax Revenues in 2040 ($ million/year, Baseline)		**$143**

MWD Property Tax Revenues in 2040	Alt. 1 Lower Ad Valorem Property Taxes	Baseline	Alt. 2 Higher Ad Valorem Property Taxes
Range of Tax Levy Revenues for Alternatives	80%	100%	130%
Projected Property Tax Revenues (2040$, $ million/year)	**$114**	**$143**	**$186**

Surcharges Collected Using MWD's Assessed Valuation Taxing Authority	Median Value House in City
One SFR Household Property Taxable Assessed Valuation (2016, c)	$323,400
Projected Annualized Inflation in Property Assessed Value (d)	3.0%
One SFR Household Property Taxable Assessed Valuation (2018$)	$343,124
MWD Ad Valorem Tax Rate (b)	0.0035%
Monthly Equivalent Tax Levy on City SFR in 2018$ ($/month-SFR house)	$1.00

MWD Property Tax Levies to City of Los Angeles SFR Houses for WaterFix Bonded Debt Service	Alt. 1 Lower MWD AV Tax Levy	Baseline Median MWD AV Tax Levy	Alt. 2 Higher MWD AV Tax Levy
Range of Assessed Valuation Levies (% of median City SFR)	80%	100%	130%
Annual Tax Levy on SFR in 2040$ ($/month-SFR house equivalent)	$1.54	$1.92	$2.50
Monthly Levy on SFRs in 2018$ ($/month-SFR house equivalent, d)	**$0.80**	**$1.00**	**$1.30**

Values may not foot due to rounding. The high/low range of MWD tax revenues and SFD assessment is projected by OPA.

a. July 17, 2017, City Council File No. 17-0654 - Metropolitan Water District of Southern California Rate Setting Practices and Approaches. The current tax levies include $15 million for MWD bonds and $75 million for State Water Project bonds. Source: Ad Valorem (AV) Growth rate of 2% is from 2016 to 2025 per the MWD 2016/17 and 2017/18 Biennial Budget, Attachment 2. This annual growth rate is used for 2017 to 2040. The projected SFR AV growth in the City is estimated at 1 percent per year above the total MWD service area. Per California Municipal Statistics, Inc., in FY 2016-17 SFR AV in the City was 53% of the AV of all properties.

b. The April 2016 MWD Board Letter 8-1 proposed ten-year forecast and adopted a resolution finding that continuing an ad valorem tax rate of 0.0035% for fiscal year 2015/16 is essential to MWD's fiscal integrity. This rate is projected by OPA to be unchanged for the WaterFix bond financing period.

c. 7/9/2017 HdL Companies, for 589,991 single family residences in 2016 Los Angeles; values are net of exemptions and for secured properties only. The avg. sale price of City SFRs in FY 2015-16 was $550,000.

d. Values in 2018 dollars use a 3% per year inflation rate.

Table A-5. WaterFix Annualized Costs

Description	Alt. 1 Least Cost	Baseline	Alt. 2 Highest Cost
Project Costs Mid-construction ($ million, 2024$)	$11,467	$13,637	$16,660
Bonded Debt Interest Rates (True Interest Cost)	3.0%	4.0%	8.0%
Annual Bonded Debt Service from 2023 to 2062 (a)	$537	$772	$1,579
Annual O&M Costs (2040$, b)	$98	$98	$98
Annual WaterFix Stage 1 Cost ($M/year, 2023$ to 2062$)	$634	$870	$1,677
MWD Share of WaterFix Stage 1 Costs (%)	46%	56%	56%
MWD Share of Costs ($ M/year 2023$ to 2062$ - 2040$ mid-point)	**$294**	**$484**	**$933**
MWD Share of Costs ($ Million/year 2018$)	$153	$252	$486
Unit Cost Statistics for Information Only			
WaterFix Stage 1 Annual Cost ($ Million/year)	*$634*	*$870*	*$1,677*
Average Participating Contractor Flows (AFY)	*2,625,592*	*2,468,638*	*2,337,103*
WaterFix Unit Cost ($/AF, 2033$ to 2062$)	*$242*	*$352*	*$718*
MWD Share of Stage 1 Costs ($ Million/year 2040$)	*$294*	*$484*	*$933*
MWD Member Agency Demands (AFY in Year 2040, Avg Est)	*1,659,000*	*2,100,000*	*2,478,000*
MWD WaterFix unit costs per Acre Foot ($/AF, 2040$)	***$177***	***$230***	***$376***
MWD WaterFix unit costs per Acre Foot ($/AF, 2018$, c)	*$92*	*$120*	*$196*
MWD Tier 1 Full Service Untreated Cost ($/AF, 2018$)	*$695*	*$695*	*$695*
MWD Cost Increase for WaterFix Stage 1 Costs in 2018$	***13%***	***17%***	***28%***
MWD Annual Costs for WaterFix ($ million/year, 2040$)	*$294*	*$484*	*$933*
70% of costs allocated to residents per MWD	*$206*	*$339*	*$653*
Estimated Households Served by MWD (2040, d)	*7,332,000*	*7,332,000*	*7,332,000*
Avg. MWD WaterFix Charge per Household ($/month-HH, 2040$)	*$2.34*	*$3.85*	*$7.42*
Avg. MWD WaterFix Charge per Household ($/month-HH, 2018$)	*$1.22*	*$2.01*	*$3.87*
City of Los Angeles Annual Costs for WaterFix ($ million/year)			
DWP Share of MWD Net WaterFix Costs (2040$)	*$7*	*$12*	*$104*
AV Taxes to LA Properties (20% of MWD Total AV Taxes)	*$23*	*$29*	*$37*
Total ($ million/year, 2040$)	*$30*	*$41*	*$141*
Total ($ million/year, 2018$)	*$16*	*$21*	*$74*

Values may not foot due to rounding. The highest, lowest and Baseline costs are shown herein. However, an average WaterFix unit cost, based on proper inclusion of all quantifiable variables, represents a more probable WaterFix cost.

(a) SCWC 2012 Bay Delta Conservation Plan with Conservation Benefits and Financial Strategies, by PFM Group. The bonds have 40 year terms from 2023 to 2062, a cost of issuance (COI) of $8M and capitalized interest for two years. The COI and cap interest costs add 8%, 12% and 13% to the project. Maximum debt service starts in 2033 per Modernizing the System: California WaterFix Finance & Cost Allocation, Attachment 1.

(b) Source: California WaterFix Economic Analysis Fact Sheet, Page 3, February 2018. Annual O&M Costs after construction are $49.5 million per year in 2017$, plus 3%/year inflation from 2017.

(c) The 2033 dollars are adjusted to 2018 using a 3% per year inflation rate.

(d) Estimated households based on California Dept. of Finance Statewide population projections and MWD service area.

Table A-6. WaterFix Surcharges to City Single Family Resident Households

Description	Alt. 1 Lowest Cost	Baseline	Alt. 2 Highest Cost
Total Annual MWD Cost for WaterFix ($ million/year, 2033$ to 2072$)	$294	$484	$933
Less MWD AV taxes for WaterFix Debt Payments ($million/year)	($114)	($143)	($186)
Net Annual MWD Variable Cost for WaterFix ($ million/year, 2040$)	$180	$341	$747
MWD Member Agency Projected Demand (AFY, 2040 Average)	1,659,000	2,100,000	2,478,000
MWD Variable Surcharge to MWD Agencies ($ per AF, 2040$)	$108	$162	$302
DWP Volumetric Surcharges for WaterFix Costs			
MWD Variable Cost to All Member Agencies ($ per AF, 2040$)	$108	$162	$302
DWP Purchases of MWD Water (AFY, 2040)	66,000	74,930	345,000
DWP Cost based on Use of MWD Supplies ($ Million per year)	$7.2	$12.2	$104
DWP Projected Water Sales (MHCF per year, 2040, a)	234	234	234
Unit DWP Cost for WaterFix ($/HCF, 2040$)	$0.031	$0.052	$0.444
Unit DWP Surcharge for WaterFix ($/HCF, 2018$, b)	$0.016	$0.027	$0.232
Current DWP Tier 1 Water Rate ($/HCF, Winter 2018)	$6.203	$6.203	$6.203
WaterFix Stage 1 DWP Tier 1 Unit Surcharge	0.3%	0.4%	3.7%
Total WaterFix Charge to City SFR Households (2040$)			
Unit DWP Cost for WaterFix ($/HCF, 2040$)	$0.031	$0.052	$0.444
Median Water Use for City Single Residence (HCF/month-house)	10	10	10
DWP WaterFix Variable Cost per SFR ($/month, 2040$)	$0.31	$0.52	$4.44
MWD Taxes to SFR for WaterFix Costs ($/month, Table 5, 2040$)	$1.54	$1.92	$2.50
Total Monthly WaterFix Charge in 2040 Dollars ($/month -SFR)	$1.84	$2.44	$6.94
Total Monthly WaterFix Surcharge to Median City Single Family Residence ($/month, 2018$, b)			
DWP WaterFix Variable Cost per SFR ($/month)	$0.16	$0.27	$2.32
MWD Direct AV Taxes to City SFR for WaterFix Costs ($/month)	$0.80	$1.00	$1.30
Total Monthly WaterFix Surcharge ($/month-SFR)	**$0.96**	**$1.27**	**$3.62**
Current DWP 10 HCF Water Bill ($/month-SFR Winter 2018, including 2 HCF of Tier 2 water at $8.358/HCF)	$66.34	$66.34	$66.34
Increase to LA Household (MWD AV Taxes & DWP Bills)	1.4%	1.9%	5.5%
Increase in DWP Water Bills (including Tiers 1 & 2)	0.2%	0.4%	3.5%

Values may not foot due to rounding. The median City household characteristics include 10 HCF/month of water demand, and a 2016 property assessment (not sales value) of $323,400.

(a) Non-revenue water is estimated at 5% of supplies for calculating unit rates.
(b) The 2040 dollars are converted to 2018 dollars using a 3% per year inflation rate. The projected median water usage is 10 HCF per month.

Table A-7. Variables Affecting Charge and Tax Values

Alternatives: Calculation Variables	Alt. 1	Baseline	Alt. 2	Independent Variable	Random Variable Calculation: Result	Random Variable Calculation: Selection of Random Variable
WaterFix Stage 1 Total Capital Cost ($M)	$11,467	$13,637	$16,660	Yes	$12,169	Uniform Distribution
Delta Climate (Wet/Base/Dry)	Wet	Baseline	Dry	Yes	Dry	Discrete Probability
CVP Buys 1,000 CFS of WaterFix Stage 1 Cap	Yes	No		Yes	Yes	Discrete Probability
DWP LAA Supply from Sierra Nevada (AFY)	295,130	286,200	50,600	Yes	234,665	Uniform Distribution
DWP Supply from Local GW & RW (AFY)	204,470	204,470	170,000	Yes	202,671	Uniform Distribution
MWD AV Tax Rev (Variable from Baseline)	80%	100%	130%	Yes	127%	Uniform Distribution
MWD AV Tax Revenues ($ Million per year)	$114	$143	$186	No	$181	Same as Above
Bond Debt Interest Rates (TIC, a)	3.0%	4.0%	8.0%	Yes	4.8%	Uniform Distribution
Inflation/Discount Rate (% per year)	3.0%	3.0%	3.0%	No	3.0%	Same in All Alts

Probabilities Projected by OPA					Random Probability	
Delta Climate (Wet/Base/Dry)	15%	55%	30%	100%	93%	
CVP Buys Capacity (Yes/No)	40%	60%		100%	38%	

The alternatives are designed to create cost extremes from combining highest costs with lowest deliveries, and lowest costs with highest deliveries. The likely and average outcome is within these two extremes. The average WaterFix unit cost, based on proper inclusion of all quantifiable variables, represents a probable WaterFix cost.

(a) Source: Modernizing the System: California WaterFix Finance & Cost Allocation, Attachment 1, Page 10. A True Interest Cost (TIC) of four percent is identified as Base Case, and eight percent as worst case.

Table A-8. California State Water Project Contractors Table A and WaterFix Shares

Contractor	Maximum as of 1/2016 Volume (AFY)	Share	Served from California Aqueduct	All SWP & CVP Contractors Participate 100% in WaterFix (Not Included in Analysis)		WaterFix Stage 1 Capacities with and without CVP Partial Participation (a, CFS)			
						Excluding Most San Joaquin Valley & All CVP Participation (Baseline & Alternative 2)		Excluding Most San Joaquin Valley but including 1,000 CFS of CVP Participation (Alternative 1 Only)	
Upper Feather River									
County of Butte	27,500	0.7%	no						
Plumas County Water Conservation District	2,700	0.1%	no						
City of Yuba	9,600	0.2%	no						
Subtotal	39,800	1.0%							
North Bay Area									
Napa County Flood District	29,025	0.7%	no						
Solano County Water Agency	47,756	1.1%	no						
Subtotal	76,781	1.8%							
South Bay Area									
Alameda County FC&WC District Zone 7	80,619	1.9%	2.0%	98	1.1%	141	2.3%	117	2.0%
Alameda County Water District	42,000	1.0%	1.0%	51	0.6%	73	1.2%	61	1.0%
Santa Clara Valley Water District	100,000	2.4%	2.5%	122	1.4%	175	2.9%	145	2.4%
Subtotal	222,619	5.3%	5.5%	272	3.0%	389	6.5%	324	5.4%
San Joaquin Valley									
Oak Flat Water District	5,700	0.1%	0.1%	7	0.1%	no		no	
County of Kings	9,305	0.2%	0.2%	11	0.1%	no		no	
Dudley Ridge Water District Participating	22,675	0.5%	0.6%	28	0.3%	40	0.7%	33	0.5%
Dudley Ridge Water District Excluded	22,675	0.5%	0.6%	28	0.3%	no		no	
Empire West Side Irrigation District	3,000	0.1%	0.1%	4	0.0%	no		no	
Kern County WA Participation in WaterFix	491,365	12%	12%	600	6.7%	858	14.3%	715	11.9%
Kern County WA Excluded from WaterFix (a)	491,365	12%	12%	600	6.7%	no		no	
Tulare Lake Basin Water Storage District	87,471	2.1%	2.2%	107	1.2%	no		no	
Subtotal	1,133,556	27%	28%	1,383	15%	897	15%	748	12%
Central Coast (Flood Control & Water Conservation Districts)									
San Luis Obispo County	25,000	0.6%	0.6%	31	0.3%	44	0.7%	36	0.6%
Santa Barbara County	45,486	1.1%	1.1%	56	0.6%	79	1.3%	66	1.1%
Subtotal	70,486	1.7%	1.7%	86	1.0%	123	2.1%	103	1.7%
Southern California									
Antelope Valley-East Kern Water Agency	144,844	3.5%	3.6%	177	2.0%	253	4.2%	211	3.5%
Castaic Lake Water Agency	95,200	2.3%	2.3%	116	1.3%	166	2.8%	139	2.3%
Coachella Valley Water District	138,350	3.3%	3.4%	169	1.9%	242	4.0%	201	3.4%
Crestline-Lake Arrowhead Water Agency	5,800	0.1%	0.1%	7	0.1%	10	0.2%	8	0.1%
Desert Water Agency	55,750	1.3%	1.4%	68	0.8%	97	1.6%	81	1.4%
Littlerock Creek Irrigation District	2,300	0.1%	0.1%	3	0.0%	4	0.1%	3	0.1%
Metropolitan Water District	***1,911,500***	***46%***	***47%***	***2,333***	***26%***	***3,337***	***56%***	***2,781***	***46%***
Mojave Water Agency	85,800	2.1%	2.1%	105	1.2%	150	2.5%	125	2.1%
Palmdale Water District	21,300	0.5%	0.5%	26	0.3%	37	0.6%	31	0.5%
San Bernardino Valley Municipal Water District	102,600	2.5%	2.5%	125	1.4%	179	3.0%	149	2.5%
San Gabriel Valley Municipal Water District	28,800	0.7%	0.7%	35	0.4%	50	0.8%	42	0.7%
San Gorgonio Pass Water Agency	17,300	0.4%	0.4%	21	0.2%	30	0.5%	25	0.4%
Ventura County Watershed Protection District	20,000	0.5%	0.5%	24	0.3%	35	0.6%	29	0.5%
Subtotal	2,629,544	63%	65%	3,209	36%	4,591	77%	3,826	64%
Served from California Aqueduct	4,056,205	97%	100%	**4,950**	55%	**6,000**	100%	**5,000**	83%
Total State Water Project	**4,172,786**	100%	**CVP Capacity**	**4,050**	45%	**CVP Allocation of Stage 1:**		**1,000**	17%
			Total WaterFix Capacity (CFS):	**9,000**		**Total WaterFix Stage 1:**		**6,000**	100%

The SWP water contractors have water supply contracts with the California Department of Water Resources that define annual water supply allocations.

(a) The WaterFix Stage 1 cost is shared among SWP Aqueduct contractors based on Table A, except that Kern County Water Agency takes only half of their Table A.

APPENDIX B: LOW INCOME AND LIFELINE WATER CREDITS

"Affordability" guidelines for water utility projects were first published by the U.S. Environmental Protection Agency (EPA) in the late 1990's. One definition of affordability is for certain drinking water projects in small communities. This approach examines the monthly water bill, and whether a project's rate impacts increase the annual water bills to more than 2.5% of the U.S. median household income. While the rate impacts of WaterFix may be affordable by that measure, the measure has been subject to extensive debate and lacks general acceptance for any non-EPA purposes, as discussed below. To emphasize the nature of the data, an "affordable" project in EPA's opinion does not imply that every household can afford that project's rate impacts. As discussed further below, a partial remedy for WaterFix rate impacts is within the City authority.

Criticism of the EPA measure has been extensive, and includes an issue brief published by the U.S. Council of Mayors, the American Water Works Association, and the Water Environment Federation in 2013. Two types of objections were raised: 1) a more local median household income would measure areas less able to afford a water project than the U.S. median household income, and 2) more factors should be included. To explore rate impacts of WaterFix, OPA evaluated the median household income in the City of Los Angeles, very low income levels in the County of Los Angeles, poverty income levels in the U.S., as well as eight of the lowest median income zip code areas in the City.[1] OPA specifically looked at existing median water charges and consumption in each of these lower income zip codes for low-income and Lifeline customers. While OPA did not evaluate other factors, nothing prevents the City from adopting other objective measures.

A partial and potential remedy, which the City can adopt, is to inflation-adjust the credit given to low-income, Lifeline, and other special-needs customers, although the means of sourcing these funds may need to change. OPA has previously recommended this action by the City, and continues to urge it be done as soon as practicable, and without regard to any specific project like WaterFix. That remedy will be over-inclusive because many low-income and Lifeline customers will keep their water bills below 2.5% of their household's income after WaterFix is built in the early 2030's.

The Department of Water and Power has adopted standards of eligibility for low-income and Lifeline credits on water bills. In California and before Proposition 218, it was considered best practice to inflation-adjust low-income utility rates, so that the same level of assistance is

[1] These were zip codes 90001, 90002, 90011, 90021, 90033, 90037, 90044, and 90059 selected from www.censusreporter.org. DWP sends water bills to 120 zip codes. Note that phasing-in the WaterFix costs will be necessary to avoid an impact over 5% for Lifeline customers, because their bills are materially smaller than low-income or standard ratepayers.

maintained over time. Proposition 218 impedes this practice in municipal utilities only if the inflation-adjustment is funded by other water ratepayers and without a vote of the citizens. OPA is aware of no obstacle to providing an inflation-adjustment with the City's funds or donations. A water inflation-adjustment to the low income credit started now would cost approximately $300,000 in 2018. It would add $4.69 (in 2030$) to $9.74 (in 2040$) to the current $10 per month credit, costing between $5M (in 2030$) and $10M (in 2040$).

Table B-1. Calculations: Impacts on Average, Low-Income, and Lifeline Ratepayers

Description	2017 Water Use (HCF per Month)	DWP Monthly Water Bill (2017 Median)	Most Costly WaterFix Surcharge (Twin Tunnels with MWD financing)	Total Cost with Surcharge
Median City Single Res Household	10	$66	$6.78	$72.78
Citywide Low Income Household	9	$44.66	$6.23	$50.89
Citywide Lifeline Household	7.5	$31.64	$5.41	$37.05
2.5% of Poverty Household Income (a)				$58.94

All water related information are from 2017 DWP billing information. The billed amounts include existing lifeline and low-income discounts.
(a) The 2017 United States H&HS poverty level for a four person household is $28,290.

	Household Incomes (2016)		Median of All Low-Income Households		Median of All for Lifeline Households	
City of Los Angeles Zip Codes	Median Annual Income	2.5% of Monthly Income	Monthly Water Use (HCF)	Monthly Water Bill	Monthly Water Use (HCF)	Monthly Water Bill
90021 (a)	*$12,813*	*$26.69*	*7.5*	*$34.96*	*7.5*	*$30.30*
90037	$27,179	$56.62	9	$43.84	6.5	$27.26
90033	$27,622	$57.55	8	$37.19	6.5	$26.08
90044	$29,206	$60.85	8	$38.19	6	$23.30
90011	$30,251	$63.02	8.5	$41.84	7	$28.85
90002	$30,413	$63.36	8.5	$39.64	5.5	$21.35
90059	$32,506	$67.72	8.5	$40.43	6.5	$24.53
90001	$33,887	$70.60	8.5	$42.66	5	$18.61

All water related information are from 2017 DWP billing information. The billed amounts include existing lifeline and low-income discounts.
(a) Zip Code 90021 has less than 11 lifeline and low-income customers.

REFERENCES

This report was prepared using a variety of supporting documents, including:

- March 27,2018, *California WaterFix,* MWDSC Board Workshop, Presentation
- February 12, 2018, *Update on the California WaterFix*, MWDSC Water Planning and Stewardship Committee Item 6a.
- February 12, 2018, *Economic Analysis of Stage I of the California WaterFix,* California Department of Water Resources, Report
- February 2018, *California WaterFix Economic Analysis Fact Sheet*
- July 10, 2017, *Modernizing the System: California WaterFix Infrastructure White Paper,* Metropolitan Water District of Southern California, Report
- July 20, 2017, *Modernizing the System: California WaterFix Operations White Paper,* Metropolitan Water District of Southern California, Report
- August 10, 2017, *Modernizing the System: California WaterFix Finance and Cost Allocation White Paper,* Metropolitan Water District of Southern California, Report
- April 27, 2016, *Urban Water Management Plan 2015,* Los Angeles DWP, Report
- June 2016, *Urban Water Management Plan, 2015*, MWDSC, Report
- July 17, 2017, *Council File No. 17-0654 - Metropolitan Water District of Southern California Rate Setting Practices and Approaches*, City of Los Angeles, Motion
- February 23, 2017, *MWDSC Senior Staff Discussion,* Telephone
- July 7, 2017, *City of Los Angeles Secured Single Family Residence Parcel Valuation Data*, HdL Companies, Database Summary Request
- July 1, 2015, *State Water Project Delivery Capability,* California Department of Water Resources, Report
- February 25, 2014, *Review Status of BDCP Cost Allocations,* Metropolitan Water District of Southern California Special Committee on Bay-Delta, Presentation
- September 2016, *Why a California Water Fix?,* MWDSC, Brochure
- December 22, 2016, *Bay Delta Conservation Plan/California WaterFix Final Environmental Impact Report/Environmental Impact Statement,* California Department of Water Resources, Federal Bureau of Reclamation, Report
- February 9, 2016, *Ten-Year Financial Forecast,* Metropolitan Water District of Southern California, Board Presentation
- July 2016, *Biannual Budget 2016/17 and 2017/18,* MWDSC, Board Report
- February 2012, *Bay Delta Conservation Plan with Conservation Benefits and Financial Strategies,* Southern California Water Committee, Presentation
- November 2016, *Update on California WaterFix,* Metropolitan Water District of Southern California Special Committee on Bay-Delta, Presentation
- 2013, *Assessing the Affordability of Federal Water Mandates,* United States Conference of Mayors, American Water Works Association, Water Environment Association, Issues Brief

GLOSSARY

2018$: Year 2018 Dollars
AF: Acre-Foot
AFY: Acre-Feet per Year
Alt: Alternative
AV: Ad Valorem
City: City of Los Angeles
CVP: Central Valley Project
CRA: Colorado River Aqueduct
DWP: City of Los Angeles Department of Water and Power
DWR: California State Department of Water Resources
ED: Mayor of Los Angeles Executive Directive
GW: Groundwater
HCF: Hundred Cubic Feet (one DWP billing unit)
MHCF: Million Hundred Cubic Feet
LAA: Los Angeles Aqueduct
MAF: Million Acre-Feet
MAFY: Million Acre-Feet per Year
MWD or MWDSC: Metropolitan Water District of Southern California
No.: Number
O&M: Operations and Maintenance
OPA: Office of Public Accountability/Ratepayer Advocate
RW: Recycled Water
SFR: Single Family Resident (dwelling)
SoCal: Southern California
SW: Stormwater
SWP: State Water Project
TIC: True Interest Cost
UWMP: Urban Water Management Plan
w/: with
YR: Year