Preliminary Analysis Assumptions used to Model Retail Demands, Local and Imported Supplies for Scenarios A, B, C & D

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
POPULATION				
General Assumption	• Lower population growth driving lower retail demands	• Higher population growth driving higher retail demand	• Lower population growth driving lower retail demands	• Higher population growth driving higher retail demand
Assumption Details	• Adjusted SCAG-SANDAG forecast to resemble the low growth rate observed during 2018 and 2019	• More net in-migration due to various reasons. For example, an influx of “climate migrants” and people seeking job opportunities	• Adjusted SCAG-SANDAG forecast to resemble the low growth rate observed during 2018 and 2019	• More net in-migration due to various reasons. For example, an influx of “climate migrants” and people seeking job opportunities
Outcome	• Reduction of 8 percent (- ~45K people per year) as compared to SCAG-SANDAG forecast. • 20.4 M people vs. 22.0 M people (SCAG-SANDAG 2045 forecast)	• Increase of 9 percent (+ ~180K people per year) as compared to SCAG-SANDAG forecast • 24.1 M people vs. 22.0 M people (SCAG-SANDAG 2045 forecast)	• Reduction of 8 percent (- ~45K people per year) as compared to SCAG-SANDAG forecast. • 20.4 M people vs. 22.0 M people (SCAG-SANDAG 2045 forecast)	• Increase of 9 percent (+ ~180K people per year) as compared to SCAG-SANDAG forecast • 24.1 M people vs. 22.0 M people (SCAG-SANDAG 2045 forecast)
Evidence/ Rationale	Initial Estimate (Under refinement)	Initial Estimate (Under refinement)	Initial Estimate (Under refinement)	Initial Estimate (Under refinement)
	• MWD service area observed an historic low growth rate in 2018-2019 which is consistent with the low demand framed in this scenario CA Department of Finance, December 20, 2019 press release linking to data source and citing 2018 and 2019 as the two lowest recorded growth rates in state population since 1900: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-2/documents/PressReleaseJuly2019.pdf	• Initial evidence supporting higher growth: *Journal of the Association of Environmental and Resource Economists, “Climate Change, Migration and Regional Economic Impacts in the United States”* link	• MWD service area observed an historic low growth rate in 2018-2019 which is consistent with the low demand framed in this scenario CA Department of Finance, December 20, 2019 press release linking to data source and citing 2018 and 2019 as the two lowest recorded growth rates in state population since 1900: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-2/documents/PressReleaseJuly2019.pdf	• Initial evidence supporting higher growth: *Journal of the Association of Environmental and Resource Economists, “Climate Change, Migration and Regional Economic Impacts in the United States”* link
Data Link	***FOLDER PATH: Scenario A > Demographics > Member Agency > Total Population***	***FOLDER PATH: Scenario B > Demographics > Member Agency > Total Population***	***FOLDER PATH: Scenario C > Demographics > Member Agency > Total Population***	***FOLDER PATH: Scenario D > Demographics >Member Agency > Total Population***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
HOUSEHOLDS				
General Assumption	• Lower household growth driving lower retail demands	• Higher household growth driving higher retail demand	• Lower household growth driving lower retail demands	• Higher household growth driving higher retail demand
Assumption Details	• Adjusted SCAG-SANDAG forecast to reflect lower population and considered spatial distribution of housing mix • No loss of existing housing stock • New homes are weighted toward affordable multifamily dwellings along mass transit lines within urban centers • Coastal and middle subregions will have single-family households peak at 2025, with all further growth in subregions consisting entirely of new multifamily homes. • Inland subregions continue to have growth mix including some SF homes after 2025 but at a slower rate than in SCAG-SANDAG forecasts.	• Adjusted SCAG-SANDAG forecast to reflect higher population and considered spatial distribution of housing mix • Total households calculated by taking regionwide annual persons per household ratio for 2045 (given by SCAG and SANDAG forecasts) and multiplying ratio by increased population. • New households distributed proportionately among member agencies based on original SCAG/SANDAG forecasted shares within their respective service areas.	• Adjusted SCAG-SANDAG forecast to reflect lower population and considered spatial distribution of housing mix • No loss of existing housing stock • New homes are weighted toward affordable multifamily dwellings along mass transit lines within urban centers • Coastal and middle subregions will have single-family households peak at 2025, with all further growth in subregions consisting entirely of new multifamily homes. • Inland subregions continue to have growth mix including some SF homes after 2025 but at a slower rate than in SCAG-SANDAG forecasts.	• Adjusted SCAG-SANDAG forecast to reflect higher population and considered spatial distribution of housing mix • Total households calculated by taking regionwide annual persons per household ratio for 2045 (given by SCAG and SANDAG forecasts) and multiplying ratio by increased population. • New households distributed proportionately among member agencies based on original SCAG/SANDAG forecasted shares within their respective service areas.
Outcome	• Fewer homes built over the next 25 years vs. SCAG-SANDAG forecast • People per household remains constant with SCAG-SANDAG • 7.0 M households vs. 7.6 M households (SCAG-SANDAG 2045 forecast)	• Increase in single family homes compared to SCAG-SANDAG forecast • People per household remains constant with SCAG-SANDAG • 8.3 M households vs. 7.6 M households (SCAG-SANDAG 2045 forecast)	• Fewer homes built over the next 25 years vs. SCAG-SANDAG forecast • People per household remains constant with SCAG-SANDAG • 7.0 M households vs. 7.6 M households (SCAG-SANDAG 2045 forecast)	• Increase in single family homes compared to SCAG-SANDAG forecast • People per household remains constant with SCAG-SANDAG • 8.3 M households vs. 7.6 M households (SCAG-SANDAG 2045 forecast)
Evidence/ Rationale	Initial Estimate (Under refinement)	Initial Estimate (Under refinement)	Initial Estimate (Under refinement)	Initial Estimate (Under refinement)
Data Link	***FOLDER PATH: Scenario A > Demographics > Member Agency > Total Occupied Housing Units***	***FOLDER PATH: Scenario B > Demographics > Member Agency > Total Occupied Housing Units***	***FOLDER PATH: Scenario C > Demographics > Member Agency > Total Occupied Housing Units***	***FOLDER PATH: Scenario D > Demographics > Member Agency > Total Occupied Housing Units***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
EMPLOYMENT				
General Assumption	• Lower employment growth driving lower retail demands	Higher employment growth driving higher retail demand	• Lower employment growth driving lower retail demands	• Higher employment growth driving higher retail demand
Assumption Details	• Lower employment growth was calculated by multiplying a modified Working-Age Residential Population (WARP) percentage by reduced residential population • Workforce participation rate percentage in 2045 was reduced from 75% to 70%. • Total employment was calculated by multiplying 70% reduced workforce participation rate with reduced household population.	• Assumes economy will be able to absorb rapidly increasing population without surges of unemployment and overall employment levels remain strong. • Unemployment calculated by multiplying Working-Age Residential Population (WARP) percentage by increased residential population. • Workforce participation rate in 2045 kept at 75% (consistent with SCAG forecast assumptions) • Total employment calculated by multiplying 75% workforce participation rate with increased household population.	• Low-growth employment was calculated by multiplying a modified Working-Age Residential Population (WARP) percentage by reduced residential population. • Workforce participation rate percentage in 2045 was reduced from 75% to 70%. • Total employment was calculated by multiplying 70% reduced workforce participation rate with reduced household population.	• Assumes economy will be able to absorb rapidly increasing population without surges of unemployment and overall employment levels remain strong. • Unemployment calculated by multiplying Working-Age Residential Population (WARP) percentage by increased residential population. • Workforce participation rate in 2045 kept at 75% (consistent with SCAG forecast assumptions) • Total employment calculated by multiplying 75% workforce participation rate with enhanced household population
Outcome	• 8.5 M people employed vs. 10.3 M people employed (SCAG-SANDAG 2045 forecast)	• 11.3 M people employed vs. 10.3 M people employed (SCAG-SANDAG 2045 forecast)	• 8.5 M people employed vs. 10.3 M people employed (SCAG-SANDAG 2045 forecast)	• 11.3 M people employed vs. 10.3 M people employed (SCAG-SANDAG 2045 forecast)
Evidence/ Rationale	Initial Estimate (under refinement)	Initial Estimate (under refinement)	Initial Estimate (under refinement)	Initial Estimate (under refinement)
Data Link	***FOLDER PATH: Scenario A > Demographics > Member Agency > Total Urban Employment***	***FOLDER PATH: Scenario B > Demographics > Member Agency > Total Urban Employment***	***FOLDER PATH: Scenario C > Demographics > Member Agency > Total Urban Employment***	***FOLDER PATH: Scenario D > Demographics > Member Agency > Total Urban Employment***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
WEATHER EFFECT – CLIMATE ADJUSTMENT FACTORS *(Applied to M&I and Ag Demand)*				
General Assumption	• Intra-year impacts due to landscape and irrigation mix along with longer term impacts from climate change can be captured using climate adjustment factors	• Intra-year impacts due to landscape and irrigation mix along with longer term impacts from climate change can be captured using climate adjustment factors	• Intra-year impacts due to landscape and irrigation mix along with longer term impacts from climate change can be captured using climate adjustment factors	• Intra-year impacts due to landscape and irrigation mix along with longer term impacts from climate change can be captured using climate adjustment factors
Assumption Details	• Use observed range of weather variables (precipitation and temperature) on consumptive demands from 1922-2017 • No modification made to the observed relationship between weather variables and demands	• Use observed range of weather variables (precipitation and temperature) on consumptive demands from 1922-2017 • No modification made to the observed relationship between weather variables and demands	• Use observed range of weather variables (precipitation and temperature) on consumptive demands from 1922-2017 • No modification made to the observed relationship between weather variables and demands	• Use observed range of weather variables (precipitation and temperature) on consumptive demands from 1922-2017 • No modification made to the observed relationship between weather variables and demands
Outcome	• The climate adjustment factors raise or lower forecasted demand • Applied to M&I and Ag demands on Metropolitan	• The “climate bumps” raise or lower forecasted demand • Applied to M&I and Ag demands on Metropolitan	• The “climate bumps” raise or lower forecasted demand • Applied to M&I and Ag demands on Metropolitan	• The “climate bumps” raise or lower forecasted demand • Applied to M&I and Ag demands on Metropolitan
Evidence/ Rationale	Initial Estimate (under refinement) • Consistent with modeling protocols in past IRPs	Initial Estimate (under refinement) • Consistent with modeling protocols in past IRPs	Initial Estimate (under refinement) • Consistent with modeling protocols in past IRPs	Initial Estimate (under refinement) • Consistent with modeling protocols in past IRPs
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Climate Effects***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Climate Effects***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Climate Effects***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Climate Effects***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
MUNICIPAL & INDUSTRIAL DEMAND				
General Assumption	• No rebound effect in water use behavior	• Includes rebound effect in water use behavior	• No rebound effect in water use behavior	• Includes rebound effect in water use behavior
Assumption Details	• Assumes water-saving behavior from 2019 will continue	• Assumes rebound effect in water use between 2019 and 2030 to levels observed prior to mandatory drought management measures	• Assumes water-saving behavior from 2019 will continue	• Assumes rebound effect in water use between 2019 and 2030 to levels observed prior to mandatory drought management measures
Outcome	• Very low M&I consumptive retail demands reaching 2.91 MAF by 2045.	• High M&I consumptive retail demands reaching 4.24 MAF by 2045.	• Very low M&I consumptive retail demands reaching 2.91 MAF by 2045.	• High M&I consumptive retail demands reaching 4.24 MAF by 2045.
Evidence/ Rationale	Initial Estimate (under refinement) • Current (2019) water use levels indicate strong water use ethic. Water use since 2015 drought does not indicate a rebound	Initial Estimate (under refinement) • Current water savings are not all linked to structural conservation. Water use behavior can change.	Initial Estimate (under refinement) Current (2019) water use levels indicate strong water use ethic. Water use since 2015 drought does not indicate a rebound	Initial Estimate (under refinement) • Current water savings are not all linked to structural conservation. Water use behavior can change.
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Retail M&I Demand***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Retail M&I Demand***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Retail M&I Demand***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Retail M&I Demand***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
AGRICULTURAL DEMAND				
General Assumption	• No new assumptions made - Used placeholder information	• No new assumptions made - Used placeholder information	• No new assumptions made - Used placeholder information	• No new assumptions made - Used placeholder information
Assumption Details	• Reflects member agencies' 2015 UWMP and discussions with member agencies from 2017	• Reflects member agencies' 2015 UWMP and discussions with member agencies from 2017	Reflects member agencies' 2015 UWMP and discussions with member agencies from 2017	Reflects member agencies' 2015 UWMP and discussions with member agencies from 2017
Outcome	• 178 TAF by 2045 (higher than 2015 IRP and observed 2019 ag demand)	• 178 TAF by 2045 (higher than 2015 IRP and observed 2019 ag demand)	• 178 TAF by 2045 (higher than 2015 IRP and observed 2019 ag demand)	• 178 TAF by 2045 (higher than 2015 IRP and observed 2019 ag demand)
Evidence/ Rationale	• Initial Estimate (under refinement)	• Initial Estimate (under refinement)	• Initial Estimate (under refinement)	• Initial Estimate (under refinement)
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Retail Ag Demand***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Retail Ag Demand***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Retail Ag Demand***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Retail Ag Demand***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
SEAWATER BARRIER DEMAND				
General Assumption	• No change to current seawater barrier demand	• Higher seawater barrier demand	• No change to current seawater barrier demand	• Lower seawater barrier demand
Assumption Details	• Reflects member agencies' 2015 UWMP and discussions with member agencies from 2019 • Includes Alamitos Gap, Dominguez Gap, Talbert Gap, and West Coast Gap barriers	• Reflects member agencies' 2015 UWMP and discussions with member agencies from 2019 modified to reflect recycled water availability (see recycled water supply assumption) • Includes Alamitos Gap, Dominguez Gap, Talbert Gap, and West Coast Gap barriers	• Reflects member agencies' 2015 UWMP and discussions with member agencies from 2019 • Includes Alamitos Gap, Dominguez Gap, Talbert Gap, and West Coast Gap barriers	• Reflects member agencies' 2015 UWMP and discussions with member agencies from 2019 modified to reflect recycled water availability (see recycled water supply assumption) • Includes Alamitos Gap, Dominguez Gap, Talbert Gap, and West Coast Gap barriers
Outcome	• 63 TAF by 2045 (lower than 2015 IRP and higher than observed 2019 seawater barrier demand)	• 68 TAF by 2045 (lower than 2015 IRP and higher than observed 2019 seawater barrier demand)	• 63 TAF by 2045 (lower than 2015 IRP and higher than observed 2019 seawater barrier demand)	• 60 TAF by 2045 (lower than 2015 IRP and higher than observed 2019 seawater demand)
Evidence/ Rationale	• Initial Estimate (under refinement) • Consistent with low demand framed by this scenario	• Initial Estimate (under refinement) • Consistent with high demand framed by this scenario	• Initial Estimate (under refinement) • Consistent with low demand framed by this scenario	• Initial Estimate (under refinement) • Consistent with more severe climate impacts framed by this scenario
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Seawater Barrier Demand***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Seawater Barrier Demand***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Seawater Barrier Demand***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Seawater Barrier Demand***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
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GROUNDWATER REPLENISHMENT DEMAND				
General Assumption	• Plentiful natural and artificial recharge and low production from basins	• Plentiful natural and artificial recharge and high production from basins	• Limited natural and artificial replenishment with low production from basins	• Limited natural and artificial replenishment with high risk of basin over drafting
Assumption Details	• Natural recharge assumed to be average recharge levels observed from 2010-2012. • Reflects recycled water availability for replenishment demands (see recycled water assumption) • Replenishment water purchases from MWD is based on past discussions with member agencies	• Natural recharge assumed to be average recharge levels observed from 2010-2012. • Reflects higher recycled water availability for replenishment demands (see recycled water assumption) • Replenishment water purchases from MWD is based on past discussions with member agencies	• Natural recharge assumed to be average recharge levels observed from 2014-2016. • Reflects recycled water availability for replenishment demands (see recycled water assumption) • Replenishment water purchases from MWD based on past discussions with member agencies and were reduced	• Natural recharge assumed to be average recharge levels observed from 2014-2016. • Reflects lower recycled water availability for replenishment demands (see recycled water assumption) • Replenishment water purchases from MWD based on past discussions with member agencies and were reduced
Outcome	• 310 TAF by 2045	• 338 TAF by 2045	• 248 TAF by 2045	• 208 TAF by 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • 2010-2012 observed high natural replenishment consistent with less severe climate impacts • Basins are healthy, production low due to lower demands	• Initial Estimate (under refinement) • 2010-2012 observed high natural replenishment consistent with less severe climate impacts • Basins are healthy, production is maximized due to higher demands	• Initial Estimate (under refinement) • 2014-2016 observed low natural replenishment consistent with more severe climate impacts • Basins impaired, production is primarily limited due to low demands • Limited imported supply available	• Initial Estimate (under refinement) • 2014-2016 observed low natural replenishment consistent with more severe climate impacts • Basins impaired, production is primarily limited due low basin availability • Limited imported supply available
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Replenishment Demand***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Replenishment Demand***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Replenishment Demand***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Replenishment Demand***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
WEATHER EFFECT *(Applied to Surface Water, Seawater Desalination and Replenishment Demand)*				
General Assumption	• Observed precipitation patterns continue into the future	• Observed precipitation patterns continue into the future •	• Certain local supplies are influenced by weather separate from longer term climate change impacts	• Certain local supplies are influenced by weather separate from longer term climate change impacts
Assumption Details	• Updated LA and San Diego annual precipitation history to include 1922 to 2017 • Defined a "wet" year to be greater than 25% of observed average. • Defined a "dry" year to be less than 25% of observed average • Defined a "normal" year to be within 25% of observed average. • Local "wet", "dry", and "normal" years have impacts on certain local supplies. Details found in each respective local supply	• Updated LA and San Diego annual precipitation history to include 1922 to 2017 • Defined a "wet" year to be greater than 25% of observed average. • Defined a "dry" year to be less than 25% of observed average • Defined a "normal" year to be within 25% of observed average. • Local "wet", "dry", and "normal" years have impacts on certain local supplies. Details found in each respective local supply	• Updated LA and San Diego annual precipitation history to include 1922 to 2017 • Defined a "wet" year to be greater than 25% of observed average. • Defined a "dry" year to be less than 25% of observed average • Defined a "normal" year to be within 25% of observed average. • Local "wet", "dry", and "normal" years have impacts on certain local supplies. Details found in each respective local supply • Modified precipitation history (1922-2017) ○ Years lower than the median are made drier by up to 10% and years above the median are made wetter by up to 20%	• Updated LA and San Diego annual precipitation history to include 1922 to 2017 • Defined a "wet" year to be greater than 25% of observed average. • Defined a "dry" year to be less than 25% of observed average • Defined a "normal" year to be within 25% of observed average. • Local "wet", "dry", and "normal" years have impacts on certain local supplies. Details found in each respective local supply • Modified precipitation history (1922-2017) ○ Years lower than the median are made drier by up to 10% and years above the median are made wetter by up to 20%
Outcome	• Maintains observed frequency of "wet" and "dry" year designations	• Maintains observed frequency of "wet" and "dry" year designations	• Increases frequency of "wet" and "dry" year designations	• Increases frequency of "wet" and "dry" year designations
Evidence/ Rationale	Initial Estimate (under refinement) • Past is reflective of a future with minimal climate impacts • Certain local supplies have different production assumptions based on normal, dry, or wet precipitation year type	Initial Estimate (under refinement) • Past is reflective of a future with minimal climate impacts • Certain local supplies have different production assumptions based on normal, dry, or wet precipitation year type	Initial Estimate (under refinement) • Assumption based on studies regarding increasing precipitation volatility (Swain, D. L., Langenbrunner, B., Neelin, J. D., & Hall, A. (2018). Increasing Precipitation Volatility in Twenty-First-Century California. Nature Climate Change, 8, 427-433. https://doi.org/10.1038/s41558-018-0140-y)	Initial Estimate (under refinement) • Assumption based on studies regarding increasing precipitation volatility (Swain, D. L., Langenbrunner, B., Neelin, J. D., & Hall, A. (2018). Increasing Precipitation Volatility in Twenty-First-Century California. Nature Climate Change, 8, 427-433. https://doi.org/10.1038/s41558-018-0140-y)
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > PrecipLA and PrecipSD***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > PrecipLA and PrecipSD***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > PrecipLA and PrecipSD***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > PrecipLA and PrecipSD***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
SURFACE WATER SUPPLY				
General Assumption	• Higher production levels and less climate impacts	• Higher production levels and less climate impacts	• Lower production levels due to more climate impacts	• Lower production levels due to more climate impacts
Assumption Details	• San Diego County Water Authority ○ Used 51,180 AFY. This reflects a weather effect (1922-2017) adjustment to the long-term average reported in SDCWA's 2015 UWMP. • Inland Empire Utilities Agency ○ Normal year: 32,800 AF ○ Dry year: 20,000 AF ○ Wet Year: 49,900 AF • All other ○ 2010-2012 production average	• San Diego County Water Authority ○ Used 51,180 AFY. This reflects a weather effect (1922-2017) adjustment to the long-term average reported in SDCWA's 2015 UWMP. • Inland Empire Utilities Agency ○ Normal year: 32,800 AF ○ Dry year: 20,000 AF ○ Wet Year: 49,900 AF • All other ○ 2010-2012 production average	• San Diego County Water Authority ○ Used 43,928 AFY. This reflects a weather effect (1922-2017) adjustment and a 15% reduction due to climate change impacts to the long-term average reported in SDCWA's 2015 UWMP. • Inland Empire Utilities Agency ○ Normal year: 27,880 AF (15% reduced from 32,800 AF) ○ Dry year: 17,000 AF (15% reduced from 20,000 AF) ○ Wet Year: 42,415 AF (15% reduced from 49,900 AF) • All other ○ 2015-2019 production average	• San Diego County Water Authority ○ Used 43,928 AFY. This reflects a weather effect (1922-2017) adjustment and a 15% reduction due to climate change impacts to the long-term average reported in SDCWA's 2015 UWMP. • Inland Empire Utilities Agency ○ Normal year: 27,880 AF (15% reduced from 32,800 AF) ○ Dry year: 17,000 AF (15% reduced from 20,000 AF) ○ Wet Year: 42,415 AF (15% reduced from 49,900 AF) • All other • 2015-2019 production average
Outcome	• 124 TAF by 2045	• 124 TAF by 2045	• 94 TAF by 2045	• 94 TAF by 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • 2010-2012 represents wet years • Past is reflective of a future with minimal climate impacts	• Initial Estimate (under refinement) • 2010-2012 represents wet years • Past is reflective of a future with minimal climate impacts	• Initial Estimate (under refinement) • 2015-2019 represents dry years	• Initial Estimate (under refinement) • 2015-2019 represents dry years
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Surface Production***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Surface Production***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Surface Production***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Surface Production***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
GROUNDWATER SUPPLY				
General Assumption	• High production levels	• Higher production levels	• Lower production levels	• Low production levels

Assumption Details	• Orange County Basin
	  ○ Assume 75% BPP
	• All other basins
	  ○ 2010-2012 average production by 2045.
	  ○ Agencies pump to full adjudication (when information is available)
	  ○ PFAS impacts up to 2025
		• Orange County Basin
		  ○ Assume 75% BPP
		• All other basins
		  ○ Production based on 2010-2012 average.
		  ○ Agencies pump to full adjudication (when information is available)
		  ○ PFAS impacts up to 2025
			• Orange County Basin
			  ○ Assume 75% BPP initially, degrades to 65% by 2045
			• All other basins
			  ○ 2014-2016 average production by 2045.
				• Orange County Basin
				  ○ Assume 75% BPP initially, degrades to 65% by 2045
				• All other basins
				  ○ 2014-2016 average production by 2045.

Outcome	• 1.17 MAF in 2045	• 1.34 MAF in 2045	• 1.03 MAF in 2045	• 1.14 MAF in 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • 2010-2012 represents wet years	• Initial Estimate (under refinement) • 2010-2012 represents wet years	• Initial Estimate (under refinement) • 2014-2016 represents dry years	• Initial Estimate (under refinement) • 2014-2016 represents dry years
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Groundwater Production***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Groundwater Production***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Groundwater Production***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Groundwater Production***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
GROUNDWATER RECOVERY SUPPLY				
General Assumption	• Lower production	• Higher production	• Lower production	• High production limited by climate and regulatory impacts
Assumption Details	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Only included projects currently producing water and future projects already under construction or that have signed a Local Resources Program agreement. Did not include future projects still in planning phases.	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Included full inventory of local projects, reduced ultimate yield of future projects (under construction, CEQA, and Conceptual only) by 20% reflecting successful development of local projects.	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Only included projects currently producing water and future projects already under construction or that have signed a Local Resources Program agreement. Did not include future projects still in planning phases.	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Included full inventory of local projects, reduced ultimate yield by 20% and reduced projection by an additional 20% reflecting severe climate and regulatory setbacks to local project development and operation.
Outcome	• 171 TAF in 2045	• 249 TAF in 2045	• 171 TAF in 2045	• 222 TAF in 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • Limited development of additional future projects due to slow economic growth	• Initial Estimate (under refinement) • Successful development of identified new projects due to strong economic growth and minimal climate and regulatory impacts	• Initial Estimate (under refinement) • Limited development of additional future projects due to slow economic growth	• Initial Estimate (under refinement) • Development of identified new projects due to strong economic growth with limited production due to climate and regulatory impacts
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Groundwater Recovery***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Groundwater Recovery***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Groundwater Recovery***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Groundwater Recovery***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
RECYCLED WATER SUPPLY				
General Assumption	• Lower project development	• High project development with high production	• Lower project development	• High project development with production limited by climate and regulatory impacts
Assumption Details	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Only included projects currently producing water and future projects already under construction or that have signed a Local Resources Program agreement. Did not include future projects still in planning phases.	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Included full inventory of local projects, reduced ultimate yield of future projects (under construction, CEQA, and Conceptual only) by 20% reflecting successful development of local projects.	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Only included projects currently producing water and future projects already under construction or that have signed a Local Resources Program agreement. Did not include future projects still in planning phases.	• Used 2020 Local Supply Survey updated inventory • Projected using local projects projections model • Included full inventory of local projects, reduced ultimate yield by 20% and reduced projection by an additional 20% reflecting severe climate and regulatory setbacks to local project development and operation.
Outcome	• 550 TAF in 2045	• 690 TAF in 2045	• 550 TAF in 2045	• 520 TAF in 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • Limited development of additional future projects due to slow economic growth	• Initial Estimate (under refinement) • Successful development of identified new projects due to strong economic growth and minimal climate and regulatory impacts	• Initial Estimate (under refinement) • Limited development of additional future projects due to slow economic growth	• Initial Estimate (under refinement) • Development of identified new projects due to strong economic growth with limited production due to climate and regulatory impacts
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Total Recycling***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Total Recycling***	***FOLDER PATH: Scenario C > Demand and Supply > > Member Agency > Total Recycling***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Total Recycling***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
SEAWATER DESALINATION SUPPLY				
General Assumption	• Lower project development	• High project development with high production	• Lower project development	• High project development with production limited by climate and regulatory impacts
Assumption Details	• Included only one existing/under construction project (Claude "Bud" Lewis) • Assumed facility to operate at 85% of capacity in normal and wet years, and full capacity during dry years.	• Included full inventory of seawater desalination projects reported in 2020 Local Supply Survey, reduced ultimate yield of future projects (under construction, CEQA, and Conceptual only) by 20% reflecting successful development of local projects. • Assumed all facilities would operate at the reduced ultimate yield in all years.	• Included only one existing/under construction project (Claude "Bud" Lewis) • Assumed facility to operate at 85% of capacity in normal and wet years, and full capacity during dry years.	• Included full inventory of seawater desalination projects reported in 2020 Local Supply Survey, reduced ultimate yield by 20% and reduced by projection by an additional 20% reflecting severe climate and regulatory setbacks to local project development and operation. • Assumed all facilities would operate at the reduced ultimate yield in all years.
Outcome	• 51 TAF in 2045	• 142 TAF in 2045	• 51 TAF in 2045	• 105 TAF in 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • Limited development of additional future projects due to slow economic growth • Assume maximum production in dry years	• Initial Estimate (under refinement) • Successful development of identified new projects due to strong economic growth and minimal climate and regulatory impacts • Maximum production in all years due to high demand	• Initial Estimate (under refinement) • Limited development of additional future projects due to slow economic growth • Assume maximum production in dry years	• Initial Estimate (under refinement) • Development of identified new projects due to strong economic growth with limited production due to climate and regulatory impacts • Maximum production in all years due to high demand
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Seawater Desalination***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Seawater Desalination***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Seawater Desalination***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Seawater Desalination***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
LOS ANGELES AQUEDUCT SUPPLY				
General Assumption	• Current deliveries continue into the future	• Current deliveries continue into the future	• More extreme precipitation patterns increasing deliveries	• More extreme precipitation patterns increasing deliveries
Assumption Details	• Used forecast provided by LADWP in August 2020. Includes 96 hydrologies (1922-2017).	• Used forecast provided by LADWP in August 2020. Includes 96 hydrologies (1922-2017).	• Modified the forecast provided by LADWP in August 2020. Includes 96 hydrologies (1922-2017). • Adjusted values below median to be up to 10% lower • Adjusted values above median to be up to 20% higher	• Modified the forecast provided by LADWP in August 2020. Includes 96 hydrologies (1922-2017). • Adjusted values below median to be up to 10% lower • Adjusted values above median to be up to 20% higher.
Outcome	• 258 TAF on average in 2045	• 258 TAF on average in 2045	• 272 TAF on average in 2045	• 272 TAF on average in 2045
Evidence/ Rationale	• Initial Estimate (under refinement) • Past is reflective of a future with minimal climate impacts	• Initial Estimate (under refinement) • Observed hydrologic patterns show potential range of future conditions	• Initial Estimate (under refinement) • Assumption based on studies regarding increasing precipitation volatility (Swain, D. L., Langenbrunner, B., Neelin, J. D., & Hall, A. (2018). Increasing Precipitation Volatility in Twenty-First-Century California. Nature Climate Change, 8, 427-433. https://doi.org/10.1038/s41558-018-0140-y)	• Initial Estimate (under refinement) Assumption based on studies regarding increasing precipitation volatility (Swain, D. L., Langenbrunner, B., Neelin, J. D., & Hall, A. (2018). Increasing Precipitation Volatility in Twenty-First-Century California. Nature Climate Change, 8, 427-433. https://doi.org/10.1038/s41558-018-0140-y)
Data Link	***FOLDER PATH: Scenario A > Demand and Supply > Member Agency > Los Angeles Aqueduct***	***FOLDER PATH: Scenario B> Demand and Supply > Member Agency > Los Angeles Aqueduct***	***FOLDER PATH: Scenario C > Demand and Supply > Member Agency > Los Angeles Aqueduct***	***FOLDER PATH: Scenario D > Demand and Supply > Member Agency > Los Angeles Aqueduct***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
STATE WATER PROJECT SUPPLY				
General Assumption	• Current DWR delivery projections	• Current DWR delivery projections	• Climate change and more restrictive regulatory requirements impacting current delivery projections	• Climate change and more restrictive regulatory requirements impacting current delivery projections

Assumption Details	• Use 2019 Delivery Capability Report model output
	• No Conveyance Project
		• Use 2019 Delivery Capability Report model output
		• No Conveyance Project
			• Use 2019 Delivery Capability Report model output adjusted for
			  ○ Additional climate change impacts
			  ○ More restrictive South Delta requirements
			  ○ Increased Delta outflow requirements
			• No Conveyance Project
				• Use 2019 Delivery Capability Report model output adjusted for
				  ○ Additional climate change impacts
				  ○ More restrictive South Delta requirements
				  ○ Increased Delta outflow requirements
				• No Conveyance Project

Outcome	• 57% long-term average Table A	• 57% long-term average Table A	• 43% long-term average Table A	• 43% long-term average Table A
Evidence/ Rationale	• Initial Estimate (under refinement)	• Initial Estimate (under refinement)	• Initial Estimate (under refinement)	• Initial Estimate (under refinement)
Data Link	***FOLDER PATH: Scenario A > Imported Supply > Imported Supply_Sce A > SWP***	***FOLDER PATH: Scenario B > Imported Supply > Imported Supply_Sce B > SWP***	***FOLDER PATH: Scenario C > Imported Supply > Imported Supply_Sce C > SWP***	***FOLDER PATH: Scenario D > Imported Supply > Imported Supply_Sce D > SWP***

	Scenario A (Low Demands, Stable Imports)	**Scenario B** (High Demands, Stable Imports)	**Scenario C** (Low Demands, Reduced Imports)	**Scenario D** (High Demands, Reduced Imports)
Scenario Description	*This scenario is driven by a combination of plentiful regional and local supplies, a struggling economy, low population growth, and a continuing water use ethic across the state.*	*This scenario reflects increasing retail demands across the region resulting from population growth and a strong economy. Fortunately, climate change impacts have been manageable and imported supplies have remained stable. Increased reliance on Metropolitan resulting from groundwater contamination has also driven up demands for imported water.*	*This scenario combines slow population growth and a weak economy with successful efforts among member agencies to manage water use behavior and drought-proof their local supplies. It couples a struggling economy with the rapid onset of climate change impacts that have affected imported supplies more drastically than less-vulnerable local system.*	*This scenario is driven by severe climate change impacts to both imported and local supplies during a period of population and economic growth. Demands on Metropolitan are increasing due to rapidly increasing demands and diminishing yield from local supplies. Efforts to develop new local supplies to mitigate losses underperform. Losses of regional imported supplies are equally dramatic.*
COLORADO RIVER AQUEDUCT SUPPLY				
General Assumption	• Most recent USBR modeling(August 2020) using long-term historic hydrologic conditions	• Most recent USBR modeling(August 2020) using long-term historic hydrologic conditions	• Most recent USBR modeling(August 2020) adjusted to reflect drier hydrologic conditions	• Most recent USBR modeling(August 2020) adjusted to reflect drier hydrologic conditions

Assumption Details	• August 2020 CRSS Modeling Run
	  ○ Full Hydrology (1906-2018)
	• Upper Basin Drought Operations plan in place through planning horizon
		• August 2020 CRSS Modeling Run
		  ○ Full Hydrology (1906-2018)
		• Upper Basin Drought Operations plan in place through planning horizon
			• August 2020 CRSS Modeling Run
			  ○ Stress Test Hydrology (1988-2018)
			• Upper Basin Drought Operations plan in place through planning horizon
				• August 2020 CRSS Modeling Run
				  ○ Stress Test Hydrology (1988-2018)
				• Upper Basin Drought Operations plan in place through planning horizon

Outcome	• Lake Mead falls below elevation 1045 ft. 42% of the time over the planning horizon	Lake Mead falls below elevation 1045 ft. 42% of the time over the planning horizon	• Lake Mead falls below elevation 1045 ft. 59% of the time over the planning horizon	• Lake Mead falls below elevation 1045 ft. 59% of the time over the planning horizon
Evidence/ Rationale	• Initial Estimate (under refinement) • Past is reflective of a future with minimal climate impacts	• Initial Estimate (under refinement) • Past is reflective of a future with minimal climate impacts	• Initial Estimate (under refinement) • More recent hydrologic conditions (drier) reflective of a future with more severe climate impacts	• Initial Estimate (under refinement) • More recent hydrologic conditions (drier) reflective of a future with more severe climate impacts
Data Link	***FOLDER PATH: Scenario A > Imported Supply > Imported Supply_Sce A > SWP***	***FOLDER PATH: Scenario B > Imported Supply > Imported Supply_Sce B > SWP***	***FOLDER PATH: Scenario C > Imported Supply > Imported Supply_Sce C > SWP***	***FOLDER PATH: Scenario D > Imported Supply > Imported Supply_Sce D > SWP***

2045 Demographic Input Comparisons

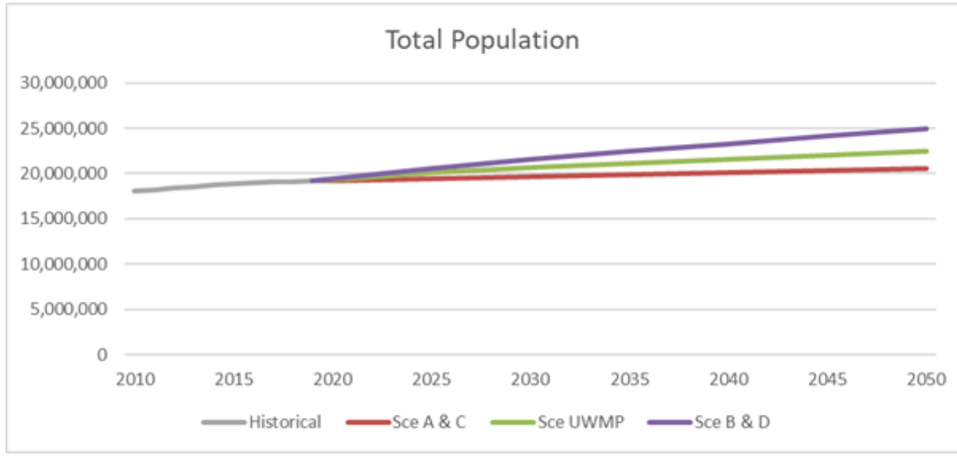
Year 2045 Projections	2019 Actual	SCAG-SANDAG	Scenario A & C	Scenario B & D
Population, Total	19.2 M	22.0 M	20.4 M	24.1 M
Population, Household	18.8 M	21.7 M	20.0	23.7 M
Households, Total	6.2 M	7.6 M	7.0 M	8.3 M
Households, SF	3.7 M	4.1 M	3.8 M	4.4 M
Households, MF	2.6 M	3.4 M	3.3 M	3.9 M
Persons per Household	3.03	2.85	2.85	2.85
Urban Employment, Total	9.2 M	10.3 M	8.5 M	11.3 M

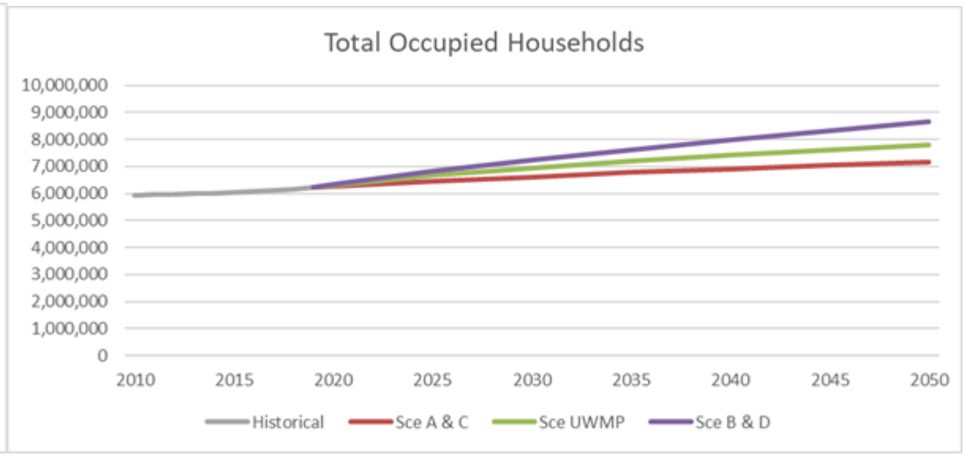
M&I Consumptive Retail Demand Model Output Comparisons (millions of acre-feet)

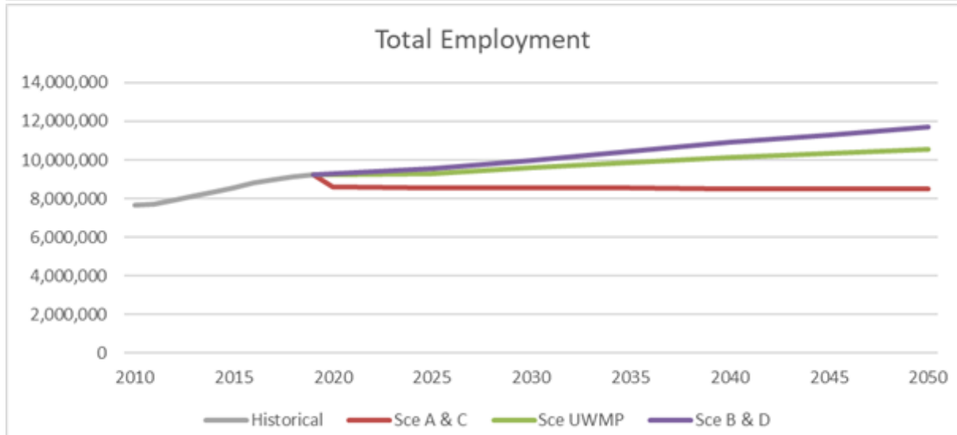
Scenario	2019 actual	2025	2030	2035	2040	2045	Δ% 2019-2045
Scenario A	2.92	2.88	2.89	2.90	2.89	2.90	- 1%
SCAG-SANDAG (UWMP)	2.92	3.02	3.08	3.15	3.19	3.23	+ 11%
Scenario D w/Rebound	2.92	3.43	3.93	4.05	4.15	4.24	+ 45%

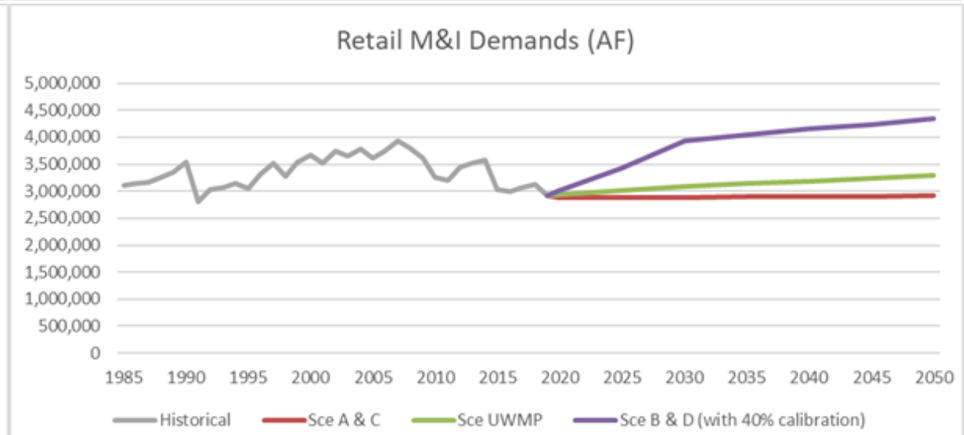
Coastal-Mid-Inland Subregion Designations by Member Agency

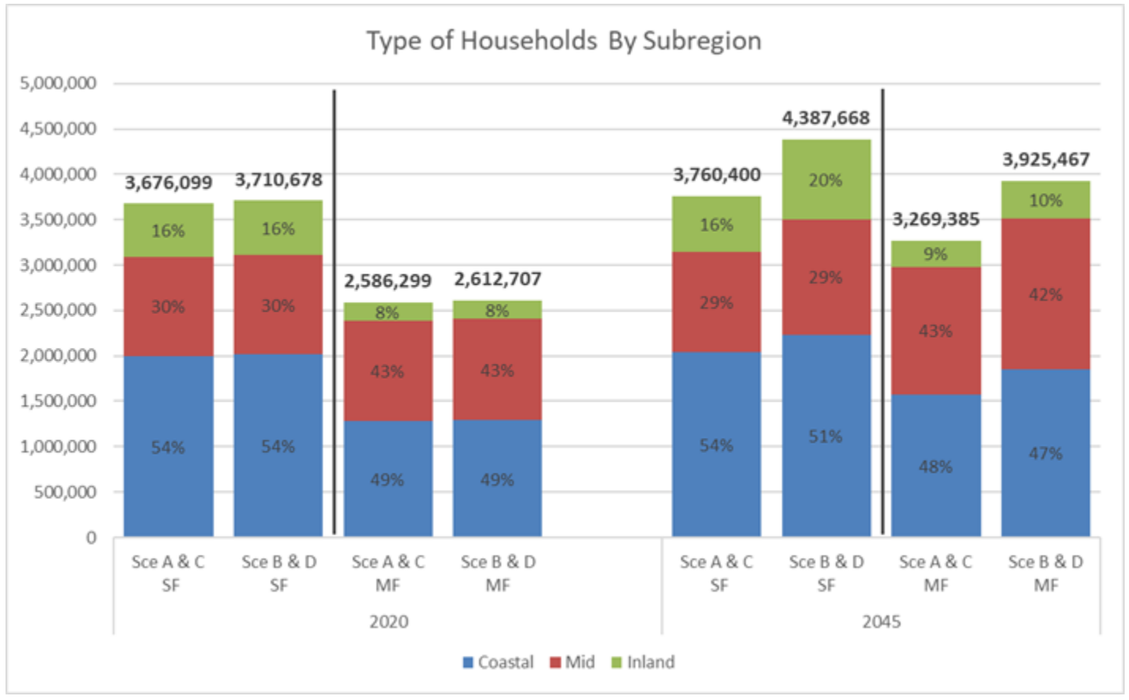
Subregion	Member Agency	Scenario A & C Housing Assumptions	Scenario B & D Housing Assumptions
Coastal	Beverly Hills Calleguas Central Basin Compton Las Virgenes Long Beach MWDOC San Diego Santa Ana Santa Monica Torrance West Basin	SF reduced (peak at 2025) MF reduced, MF rising share	SF and MF increased, MF rising share
Mid	Anaheim Burbank Foothill Fullerton Glendale Los Angeles Pasadena San Marino Three Valleys Upper San Gabriel	SF reduced (peak at 2025) MF reduced, MF rising share	SF and MF increased
Inland	Eastern Inland Empire San Fernando Western	SF reduced; MF reduced SF rising share	SF and MF increased, SF rising share


Total Population
30,000,000
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
2010
2015
2020
2025
2030
2035
2040
2045
2050
Historical
Sce A & C
Sce UWMP
Sce B & D


Total Occupied Households
10,000,000
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
2010
2015
2020
2025
2030
2035
2040
2045
2050
Historical
Sce A & C
Sce UWMP
Sce B & D


Total Employment
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
2010
2015
2020
2025
2030
2035
2040
2045
2050
Historical
Sce A & C
Sce UWMP
Sce B & D


Retail M&I Demands (AF)
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Historical
Sce A & C
Sce UWMP
Sce B & D (with 40% calibration)


Type of Households By Subregion
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
3,676,099
3,710,678
2,586,299
2,612,707
3,760,400
4,387,668
3,269,385
3,925,467
16%
16%
8%
8%
16%
20%
9%
10%
30%
30%
43%
43%
29%
29%
43%
42%
54%
54%
49%
49%
54%
51%
48%
47%
Sce A & C SF
Sce B & D SF
Sce A & C MF
Sce B & D MF
Sce A & C SF
Sce B & D SF
Sce A & C MF
Sce B & D MF
2020
2045
Coastal
Mid
Inland