



WATER TOMORROW
2020 Integrated Resources Plan

SCENARIO PLANNING

CONSTRUCTING SCENARIOS -
QUALITATIVE-QUANTITATIVE ASSESSMENT

Member Agency Technical Workgroup Meeting

July 17, 2020

Overview


- Drivers of Change survey results
- Qualitative-Quantitative Assessment
 - Examining drivers - Examples
- Opportunities to provide input



DRIVERS OF CHANGE SURVEY RESULTS

3

Drivers of Change Survey



DRAFT V3 Drivers of Change Survey - Member Agency Managers Version
Climate Change

*** 4. Stresses on River Basin Ecosystems**
Continued deterioration of the Bay Delta ecosystem, and potential deterioration of Colorado River riparian systems due to lower flows and rising temperatures could lead to increased invasive species populations on the Colorado and uncertain State Water Project Table A allocations, as endangered species continue to decline.

Not at all important Slightly important Moderately important Very important Extremely important N/A

*** 5. Rising Sea Level**
A changing climate will prompt an unknown level of sea level rise by 2046 that could result in increased saltwater intrusion in coastal groundwater basins and Bay Delta, potential stranded assets under some conditions, and potential impacts on existing wastewater treatment plants.

Not at all important Slightly important Moderately important Very important Extremely important N/A

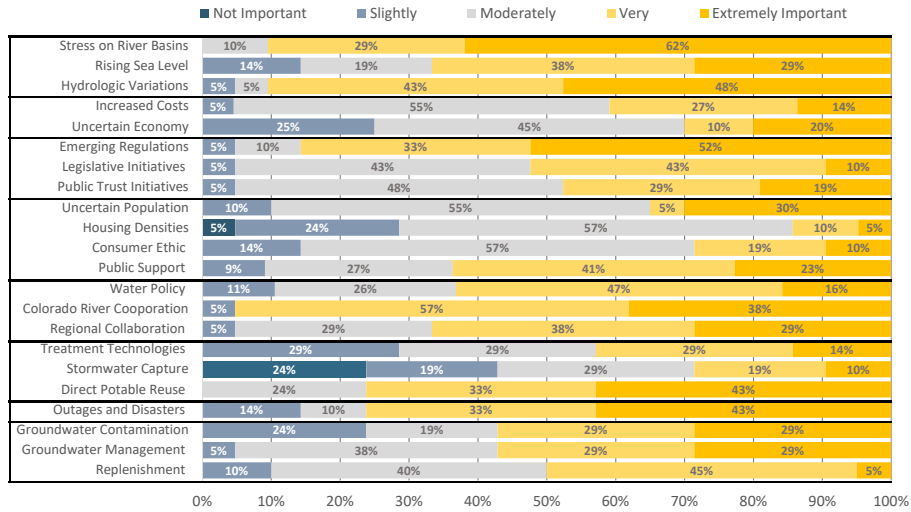
*** 6. Hydrologic Variations and Extremes**
While California has historically had the nation's most variable weather, the future is expected to be even more variable and extreme, with impacts by 2046. The extent of the change may increase Colorado River salinity and agriculture runoff and prolong drought cycles. Existing storage may prove inadequate in wet cycles.

Not at all important Slightly important Moderately important Very important Extremely important N/A

4

Survey Response Statistics by Driver

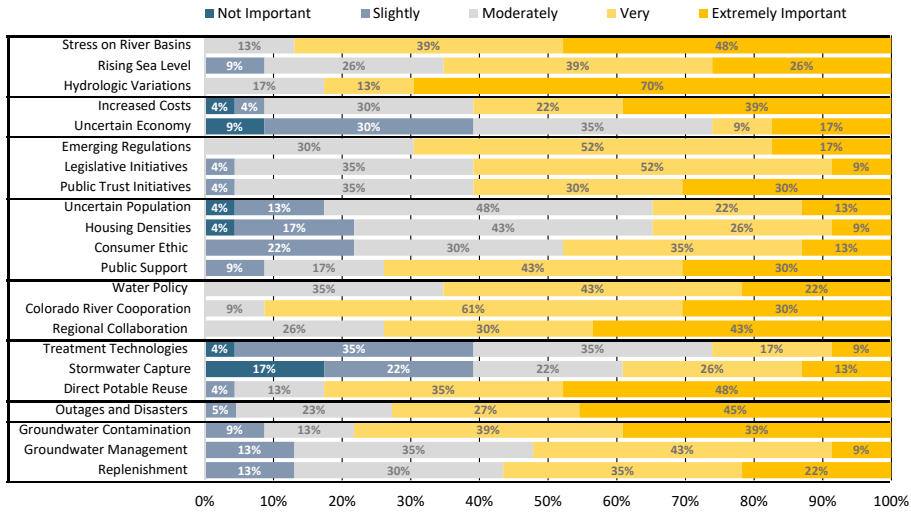
Board Members – 25 Responses (70%); 13% NA



5

Survey Response Statistics by Driver

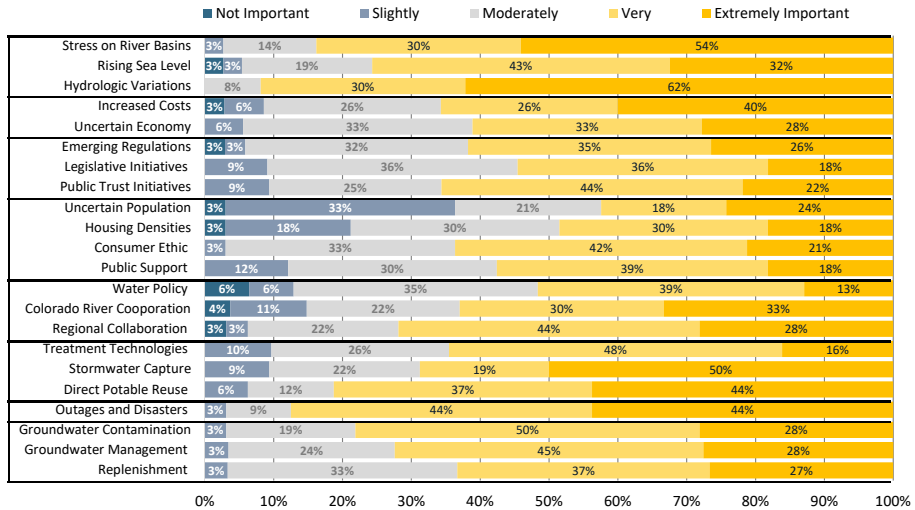
Member Agency– 23 Responses (89%); <1% NA



6

Survey Response Statistics by Driver

Stakeholders– 43 Responses (10%); 4.6% NA



7

Top 5 Survey Rankings by Cohort

Based on Percentage of Responses that Were Extremely or Very Important

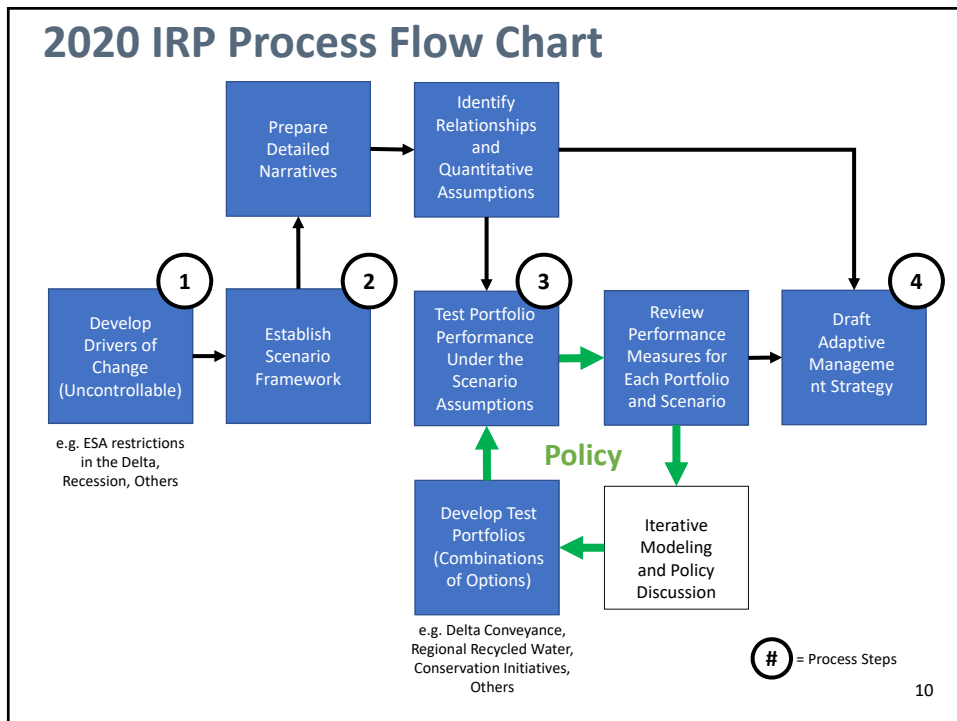
Board Members	%	Member Agencies	%	Stakeholders	%
Colorado River Cooperation	95%	Colorado River Cooperation	91%	Hydrologic Variations	92%
Hydrologic Variations	90%	Stress on River Basins	87%	Outages and Disasters	87%
Stress on River Basins	90%	Direct Potable Reuse	83%	Stress of River Basins	84%
Emerging Regulations	86%	Hydrologic Variations	83%	Direct Potable Reuse	81%
Direct Potable Reuse	76%	Groundwater Contamination	78%	Groundwater Contamination	78%
Outages & Disasters	76%				

8



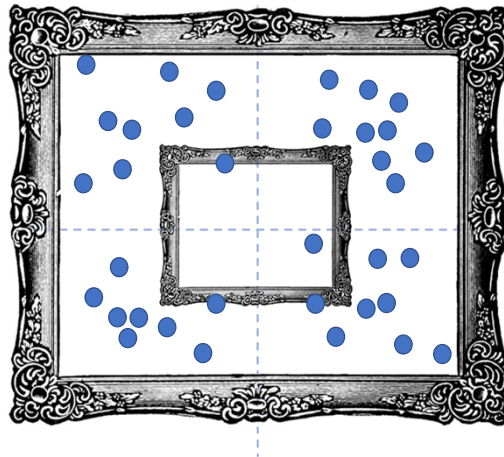
CONSTRUCTING SCENARIOS - RECAP OF PROCESS

9



The Scenario Framework Bounds our View of the Future

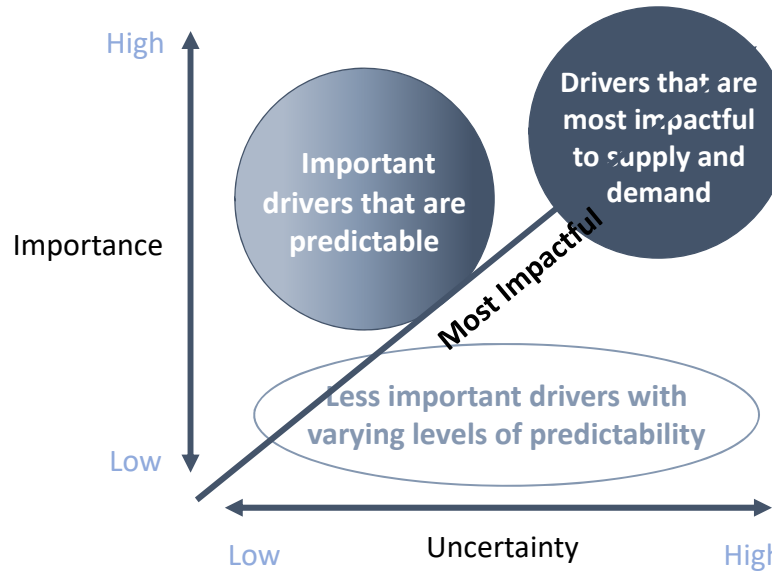
A Broad View Will Better Prepare us for the Future



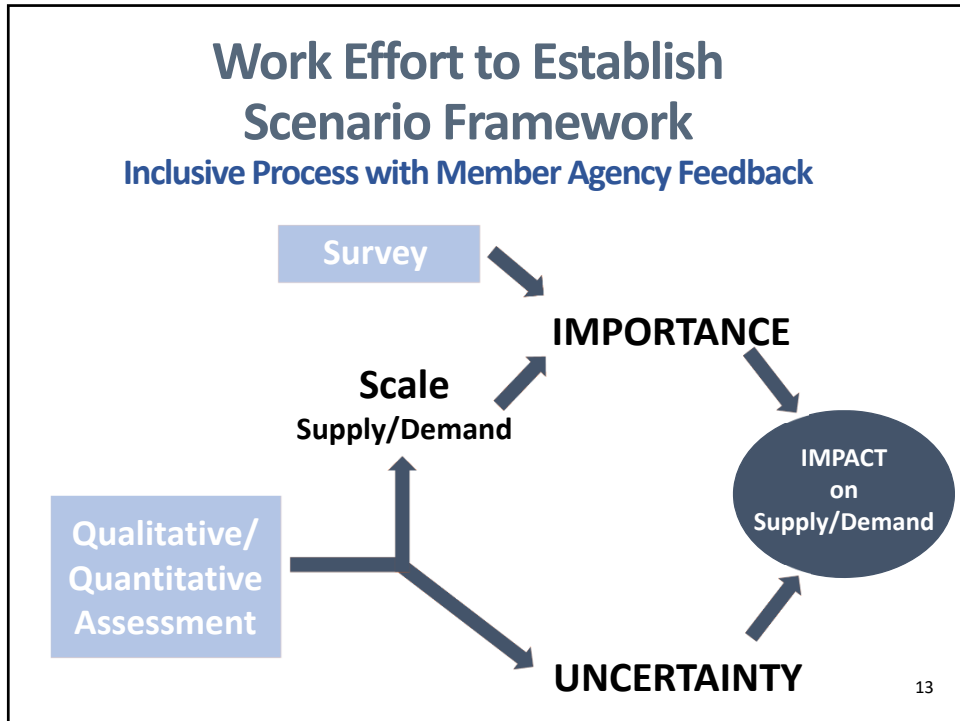
11

Establishing the Scenario Framework

Identify, Prioritize, and Manage Key Drivers



12



CONSTRUCTING SCENARIOS - QUALITATIVE/QUANTITATIVE ASSESSMENT



The slide features a globe icon with the letters 'WWD' on it. To the right of the globe is the title 'CONSTRUCTING SCENARIOS - QUALITATIVE/QUANTITATIVE ASSESSMENT'. Below the title is a short horizontal line with segments of blue, yellow, and green. The number 14 is in the bottom right corner.

Qualitative-Quantitative Assessment Objectives

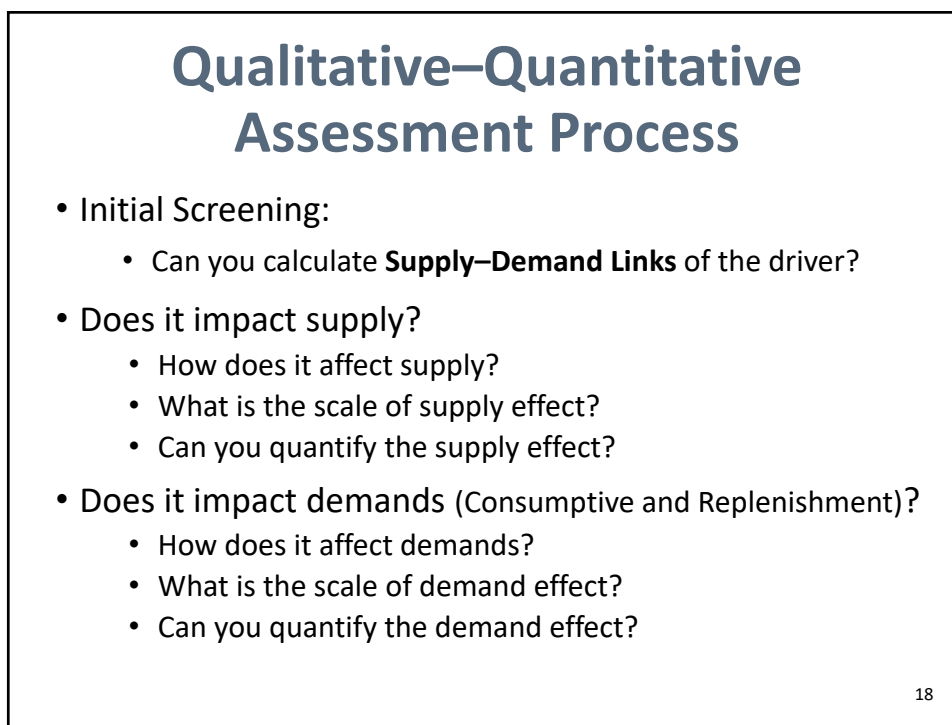
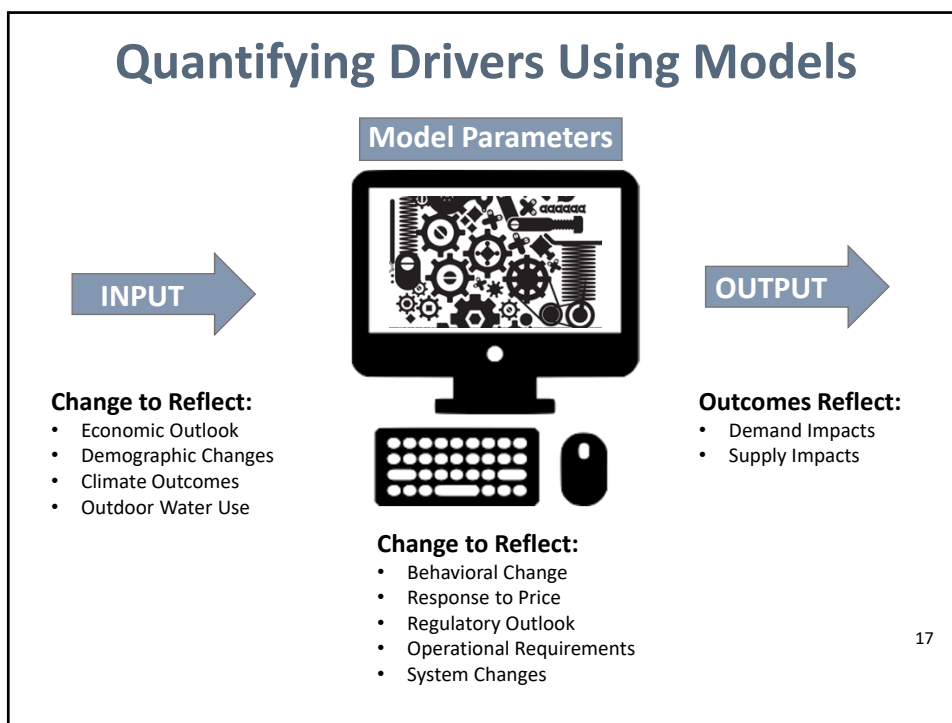
- Examine and organize the drivers
- Determine supply and demand links to the drivers
- Identify quantification methods and tools
 - available and/or needed
- Identify data and input needs
- Open and iterative process

15

Connecting Drivers to the Analysis: *Supply – Demand Links*

- Makes explicit how the drivers affect supply/demand
- Identifies what needs to be quantified
- Identifies how we will quantify
 - Calculate using existing model approaches
 - Approximate where models do not exist or are not flexible
- Relates with geographic location

16



The image shows a screenshot of a large spreadsheet with multiple columns and rows. The columns are color-coded: blue for the first few columns, green for the next few, and yellow for the remaining columns. Several rows are highlighted with red boxes, indicating specific data points of interest. The spreadsheet appears to be a detailed data table with various categories and sub-categories.

Example 1:

Category:
Demographic Changes

Driver:
Uncertainty Regarding Population Projections

SCREENING

Can you calculate Supply-Demand Links given the driver?
YES, utilizing expert demographer input

Example 1: Summary of Changes

BEFORE:

Category	Driver
Demographic Changes	Uncertainty Regarding Population Projections

AFTER:

Category	Driver
Demographic Changes	Uncertainty Regarding Population Projections

Identified Supply-Demand Link: Growth rate of population - MWD Service Area

21

Example 1:

Category:
Demographic Changes

Driver:
Uncertainty Regarding Population Projections

Supply – Demand Link:
Growth Rate of Population

Location:
MWD Service Area

22

Example 1:

Demographic Changes

Uncertainty Regarding Population Projections
Growth Rate of Population
MWD Service Area

SUPPLY

- Does this driver affect supply? **NO**
- What is the scale of effect? **N/A**
- Can you quantify the supply effect? **N/A**

23

Example 1:

Demographic Changes

Uncertainty Regarding Population Projections
Growth Rate of Population
MWD Service Area

CONSUMPTIVE DEMAND

- Does this driver affect demand? **YES**
- Can you quantify the demand effect? **YES**

How does it affect demand?	What is the Scale Effect?	How can you quantify the demand effect?
Increase in retail demand	Large	MWD-EDM - population Input
Changes in household size	Large	MWD-EDM - population Input
Changes in employment	Large	MWD-EDM - employment Input

24

Example 1:**Demographic Changes**

Uncertainty Regarding Population Projections

*Growth Rate of Population**MWD Service Area*REPLENISHMENT DEMAND

- Does this driver affect demand? **NO**
- What is the scale of effect? **N/A**
- Can you quantify the demand effect? **N/A**

25

Example 2:

Category:
Climate Change

Driver:
Hydrologic Variations and Extremes

SCREENING

Can you calculate Supply-Demand Links given the driver?
YES, using Global Climate Model and hydrology models

26

Example 2: Summary of Changes

BEFORE:

Category	Driver
Climate Change	Hydrologic Variations and Extremes

Expanded



AFTER:

Category	Driver
Climate Change	Warming Temperatures
Climate Change	Changing Precipitation
Climate Change	Atmospheric River

- Identified several Supply-Demand Links
 - i.e., Changing Runoff Quantity - SWP Watershed

27

Example 2:

Category:
Climate Change

Driver:
Changing Precipitation

Supply–Demand Link:
Changing Runoff Quantity

Location:
SWP Watershed

28

Example 2:**Climate Change****Changing Precipitation***Changing Runoff Quantity
SWP Watershed***SUPPLY**

- Does this driver affect supply? **YES**
- Can you quantify the supply effect? **YES**

How does it affect supply?	What is the Scale Effect?	How can you quantify the supply effect?
Changes in Delta inflow	Large	CalSIM input hydrology
Changes in regulatory needs	Small	CalSIM input hydrology

29

Example 2:**Climate Change****Changing Precipitation***Changing Runoff Quantity
SWP Watershed***CONSUMPTIVE DEMAND**

- Does this driver affect demand? **NO**
- What is the scale of effect? **N/A**
- Can you quantify the demand effect? **N/A**

REPLENISHMENT DEMAND

- Does this driver affect demand? **NO**
- What is the scale of effect? **N/A**
- Can you quantify the demand effect? **N/A**

30

Example 3:

Category:
Groundwater Impacts

Drivers:
Groundwater Availability Due to Contaminations, Impacts of Mandatory Groundwater Management, Impacts on Replenishment

SCREENING

Can you calculate Supply-Demand Links given the drivers?

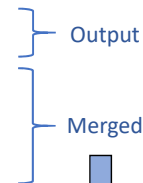
NO

31

Example 3: Summary of Changes

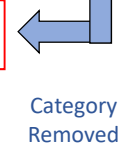
BEFORE:

Category	Driver
Groundwater Impacts	Impacts on Replenishment
Groundwater Impacts	Impacts of Mandatory Groundwater Management
Groundwater Impacts	Groundwater Availability Due to Contaminants



AFTER:

Category	Driver
Legislative and Regulatory	Emerging Regulatory Requirements
Groundwater Impacts	



- Identified several Supply-Demand Links
 - i.e., Emerging Contaminant Regulations in MWD Service area

32

Example 3:

Category:
Legislative and Regulatory

Driver:
Emerging Regulatory Requirements

Supply–Demand Link:
Emerging Contaminants Regulations

Location:
MWD Service Area

33

Example 3:

Legislative and Regulatory

Emerging Regulatory Requirements
Emerging Contaminant Regulations
MWD Service Area

SUPPLY

- Does this driver affect supply? **YES**
- Can you quantify the supply effect? **YES**

How does it affect supply?	What is the Scale Effect?	How can you quantify the supply effect?
Loss of groundwater production without additional treatment	Large	Estimate by monitoring data

34

Example 3:

Legislative and Regulatory

Emerging Regulatory Requirements
 Emerging Contaminant Regulations
 MWD Service Area

CONSUMPTIVE DEMAND

- Does this driver affect demand? **NO**
- What is the scale of effect? **N/A**
- Can you quantify the demand effect? **N/A**

35

Example 3:

Legislative and Regulatory

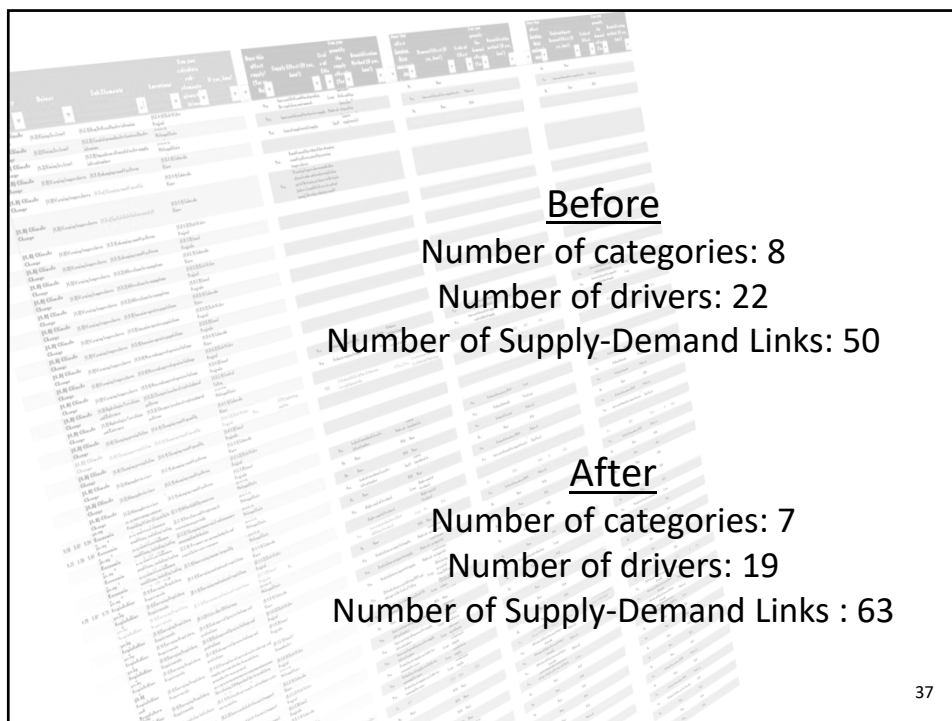
Emerging Regulatory Requirements
 Emerging Contaminant Regulations
 MWD Service Area

REPLENISHMENT DEMAND

- Does this driver affect demand? **YES**
- Can you quantify the demand effect? **NO**

How does it affect demand?	What is the Scale Effect?	How can you quantify the demand effect?
Changes in replenishment needs/quantity	Small	N/A

36



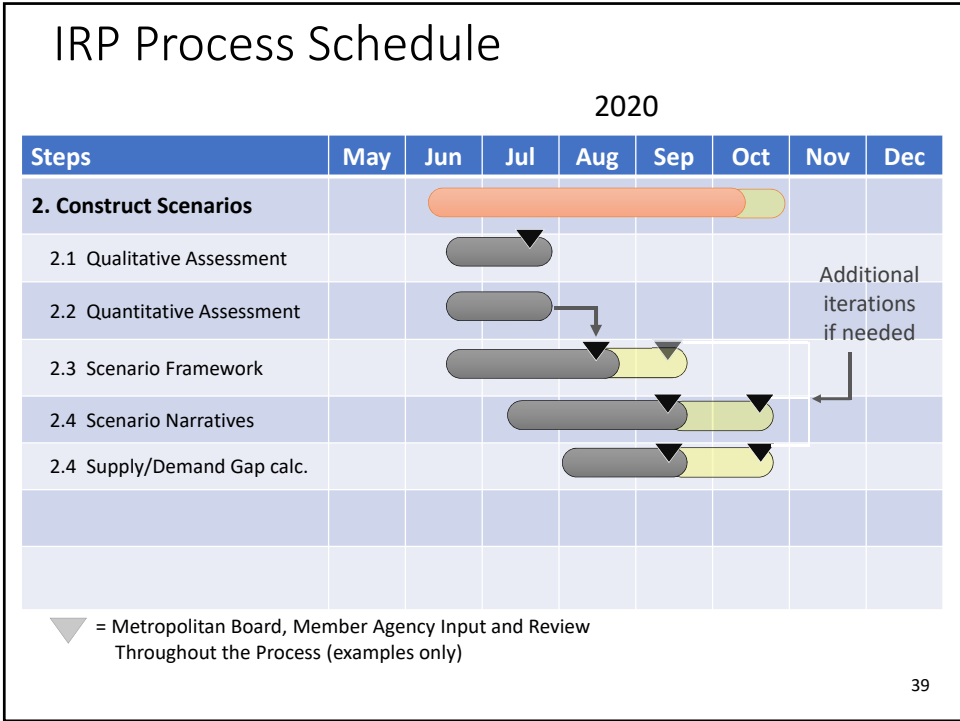
Before
 Number of categories: 8
 Number of drivers: 22
 Number of Supply-Demand Links: 50

After
 Number of categories: 7
 Number of drivers: 19
 Number of Supply-Demand Links : 63

37

Technical Workgroup Partnering

- Review and provide comments on draft qualitative assessment spreadsheet
- Help identify quantification tools
- Help with approximations
- Identify and provide data
- Ensure internal consistency



WHAT'S NEXT

- Continue Qualitative-Quantitative Assessment of Drivers
- Construct Scenarios



40