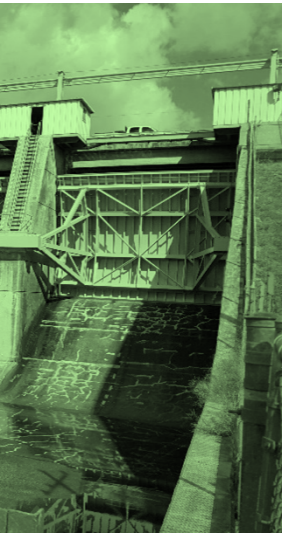
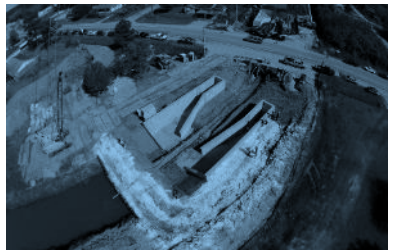


# Raw Water Supply Master Plan Development

## Stakeholder Outreach Meeting

21 June 2016

# Welcome

# Purpose

- Discuss the goals and objectives of the SJRA Raw Water Supply Master Plan (*Plan*)
- Summarize the information developed in the Plan
- Communicate the ongoing efforts and the project schedule
- Gather feedback

# Introductions

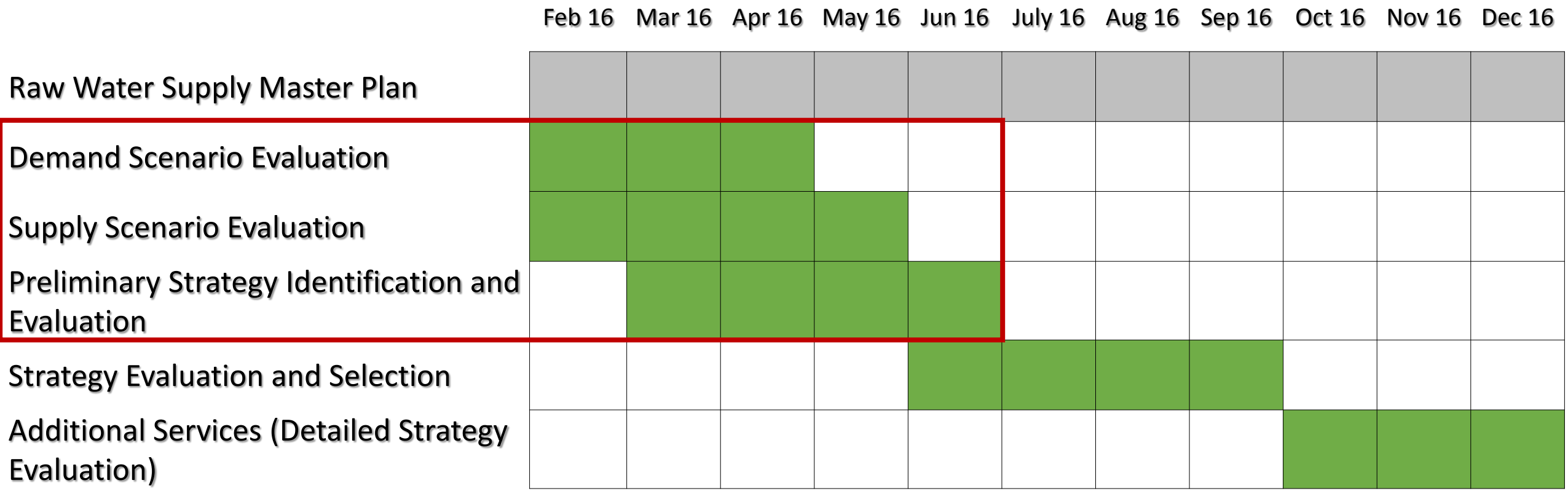
# Master Plan Goals and Objectives

- Refine our standard approach to long-term plan for securing raw water supplies
- Review needs and develop raw water supplies for *Montgomery* and *Highlands* system
- Develop an implementation plan for adding raw water supplies to SJRA portfolio

# Approach


Determine Demand Projections
Assess Reliability of Available Supplies
Identify Needs
Determine Raw Water Strategies
Select Feasible Strategies by Screening
Develop Implementation Plan

# Schedule


Feb 16
Mar 16
Apr 16
May 16
Jun 16
July 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
Raw Water Supply Master Plan
Demand Scenario Evaluation
Supply Scenario Evaluation
Preliminary Strategy Identification and Evaluation
Strategy Evaluation and Selection
Additional Services (Detailed Strategy Evaluation)

# Focus for this Meeting

Approach

Demand Scenario Evaluation

Supply Scenario Evaluation

Needs Identification

# Warnings and Disclaimers

- This kind of planning has been made overly complicated and technical (probably to ensure future work for consultants).

- These types of plans are designed to “sync” with regional water plans (which are also overly complicated and technical).

- This kind of planning is the primary statutory purpose of river authorities (it’s why we were created to begin with).

- These plans are designed to identify projects that ***anyone*** can implement (not so that river authorities can take over the world).

# Preliminary Results Discussion

Demands, supplies, and needs

# Demands

Demand scenario evaluation

# Demand Projections

- Municipal Demands (includes Industrial and Irrigation demands supplied by municipalities)

- Non-Municipal Demands
  - Irrigation (Golf Courses, Agricultural)
  - Industrial
  - Steam Electric Power
  - Mining

# Demand Projections

## Municipal Demands

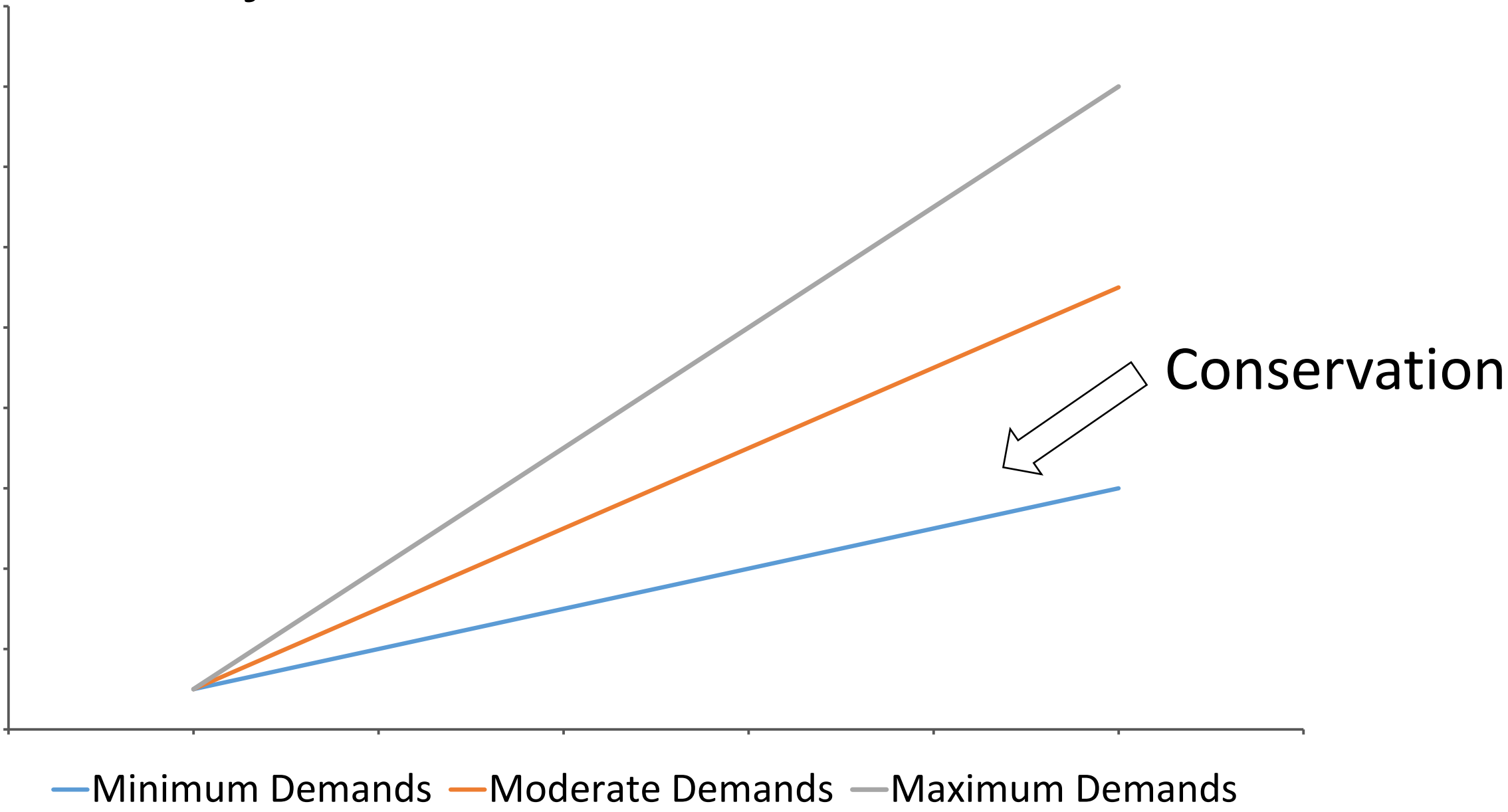

## Non-Municipal Demands

Based on recent trends, growth projections, special studies, and stakeholder recommendations

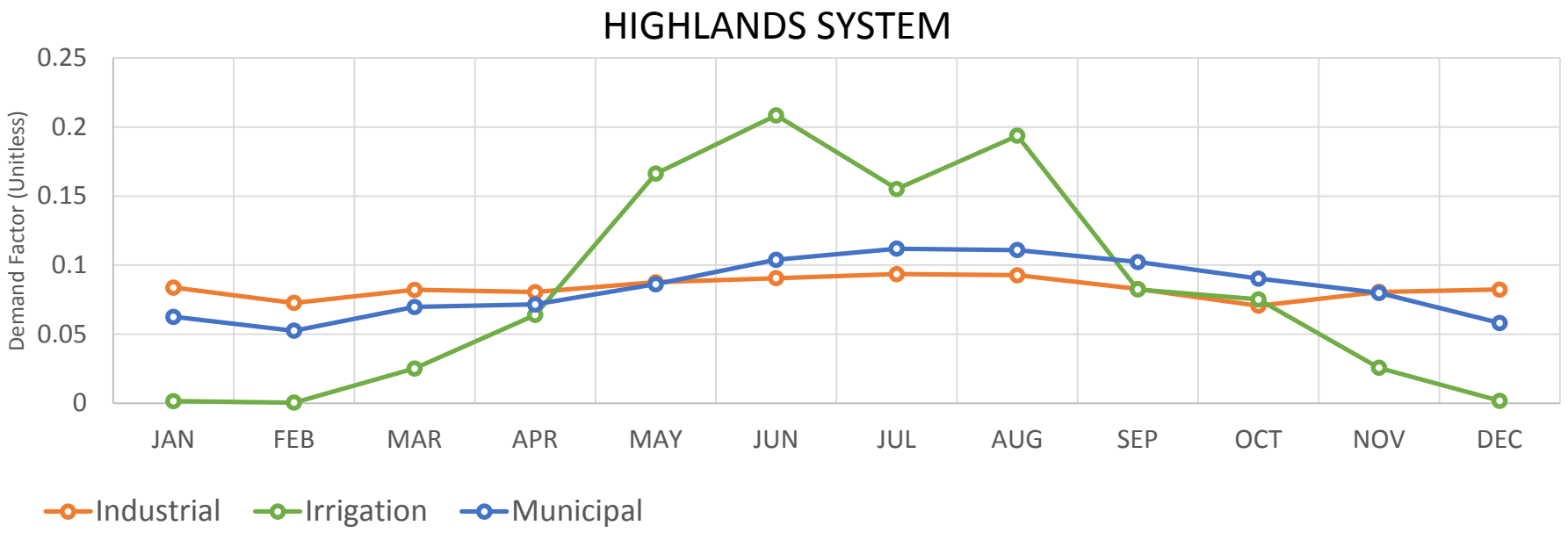
# Demand Projections

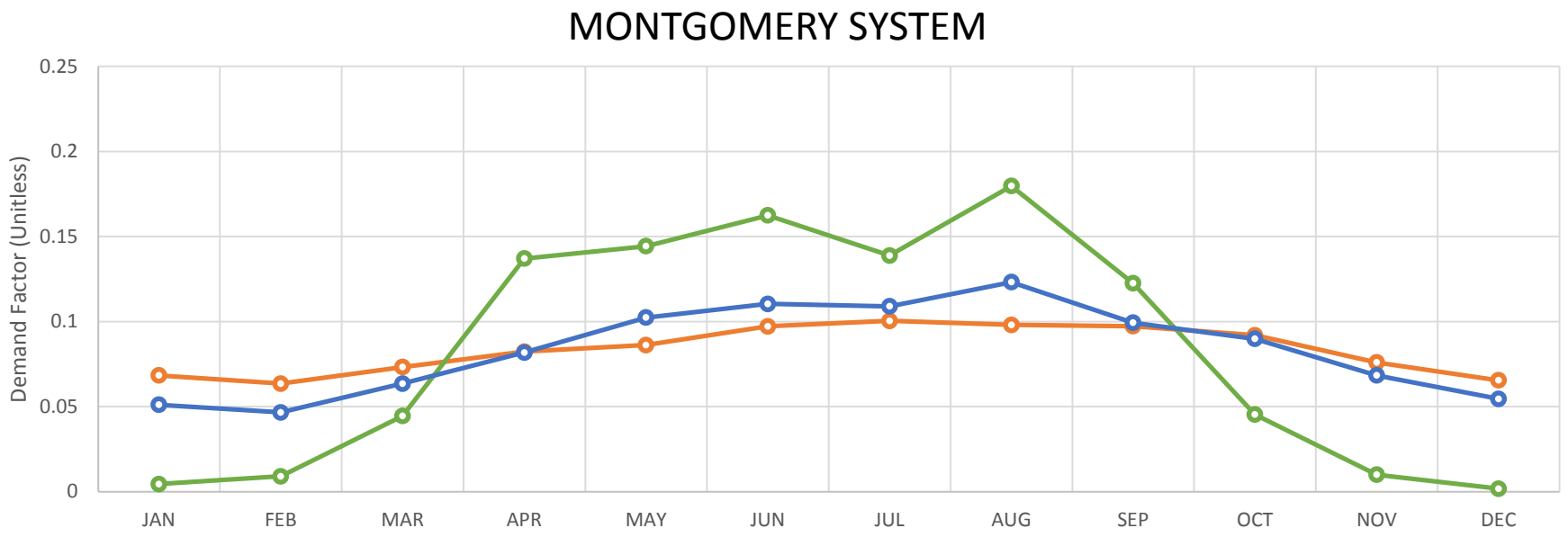
- Determine magnitude of future water demands
- Present a range of alternatives
- Select most likely alternatives
- Focus on average daily demand
- Consider impact of conservation efforts

# Demand Projections Alternatives



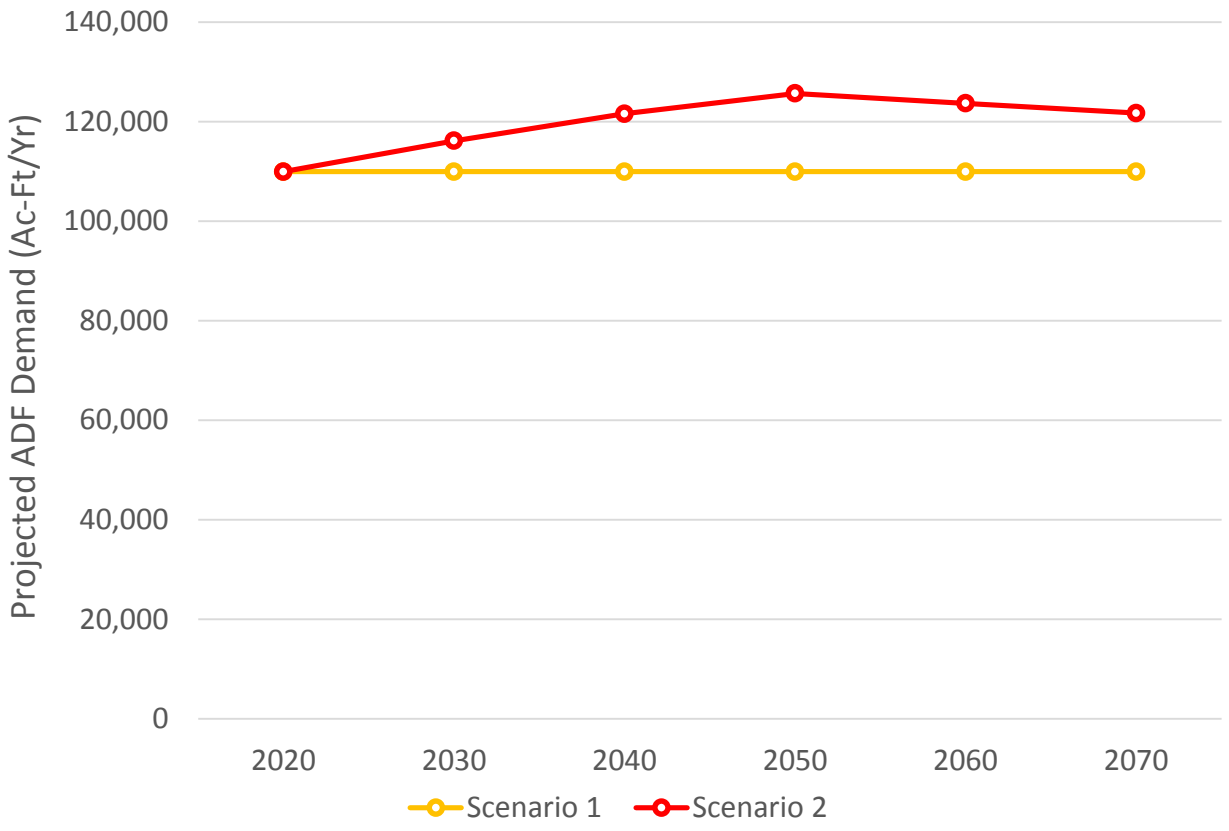
# Demand Patterns



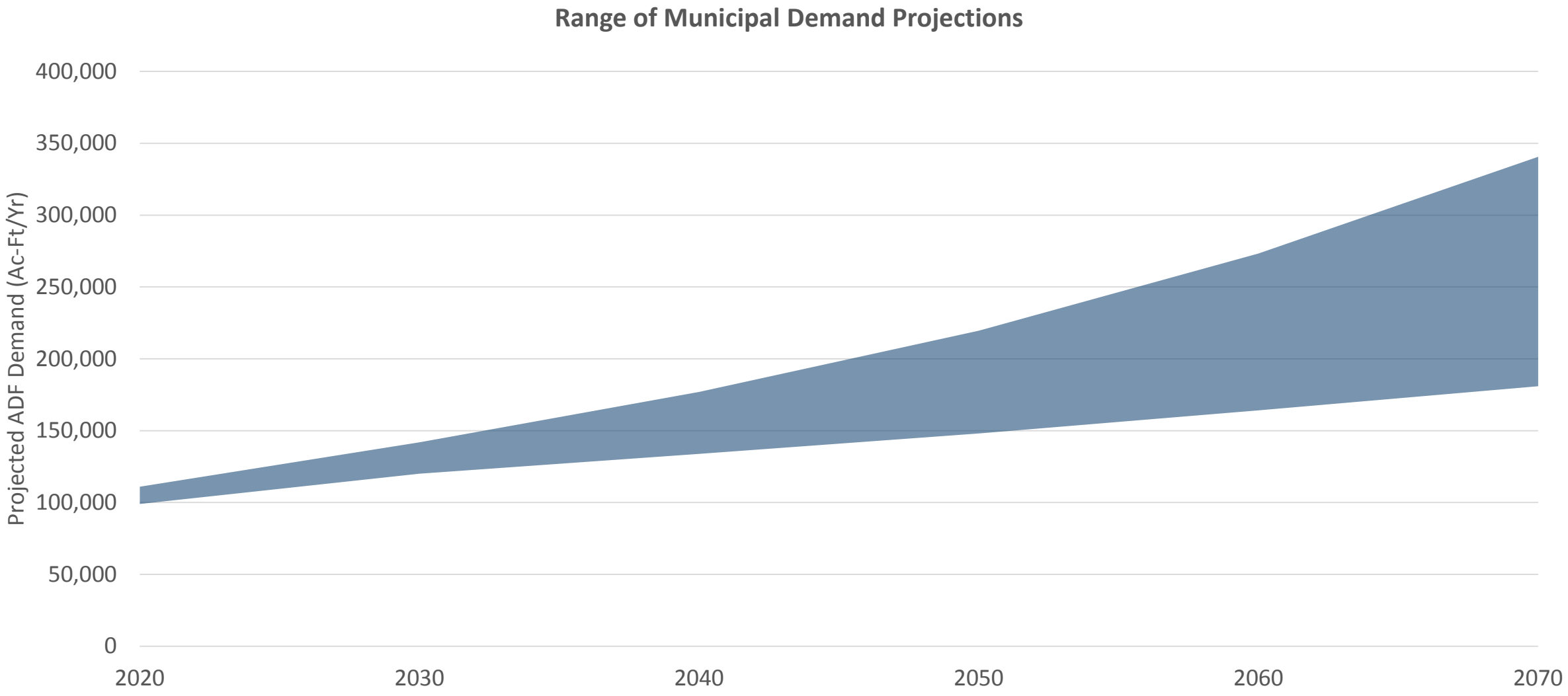



# Results - Highlands Selected Demand Scenarios

| Scenario | Industrial Projection | Irrigation Projection | Municipal Projection |
|---|---|---|---|
| 1 | Expanded Contracts | Current Contracts | Current Contracts |
| 2 | Expanded Contracts + Region H Growth | Current Contracts | Current Contracts + Region H Growth |

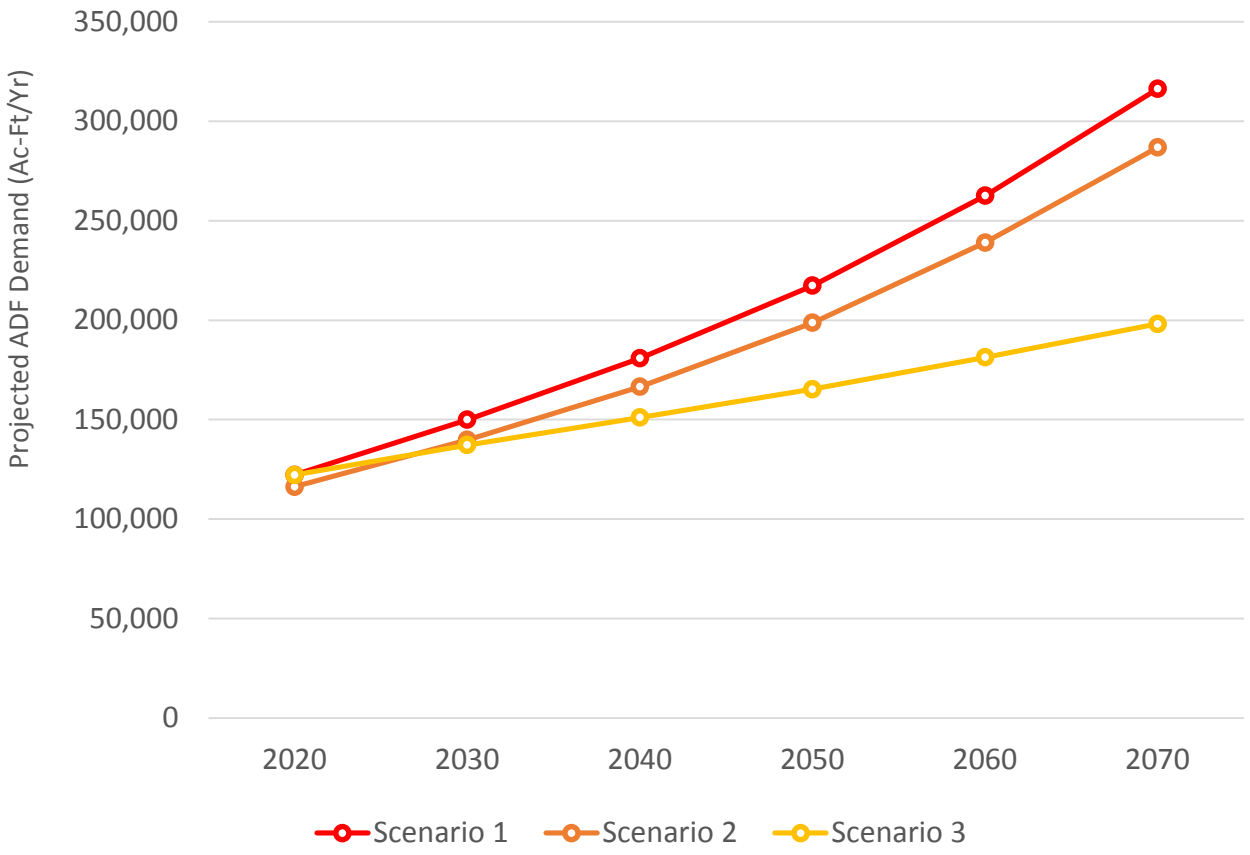


# Montgomery County Municipal Demands

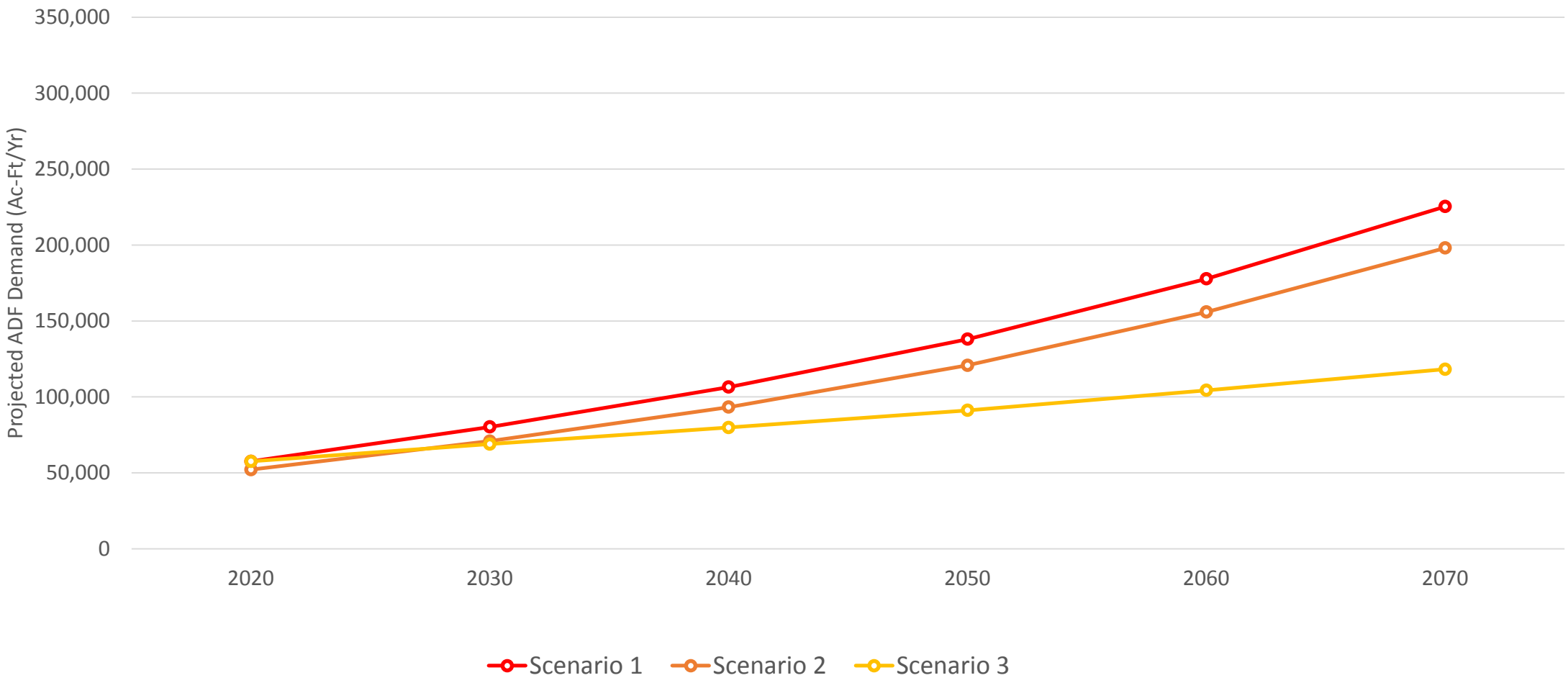


# Results - Montgomery County Selected Demand Scenarios

| Scenario | Industrial Projection | Irrigation Projection | Municipal Projection |
|---|---|---|---|
| 1 | Expanded Contracts | Current Contracts | RGUP Pop + Region H GPCD + Region H Manufacturing |
| 2 | Expanded Contracts | Current Contracts | RGUP Pop + Region H GPCD + Region H Manufacturing + Baseline Conservation |
| 3 | Expanded Contracts | Current Contracts | RGUP Pop + Region H GPCD + Region H Manufacturing + SJRA Conservation |



# Results - Montgomery County SJRA Demand Scenarios



# Demand Scenarios Summary

- Two demand alternatives selected for Highlands System
- Three demand alternatives selected for Montgomery County System

# Supplies

Supply scenario evaluation

# Supply Evaluation

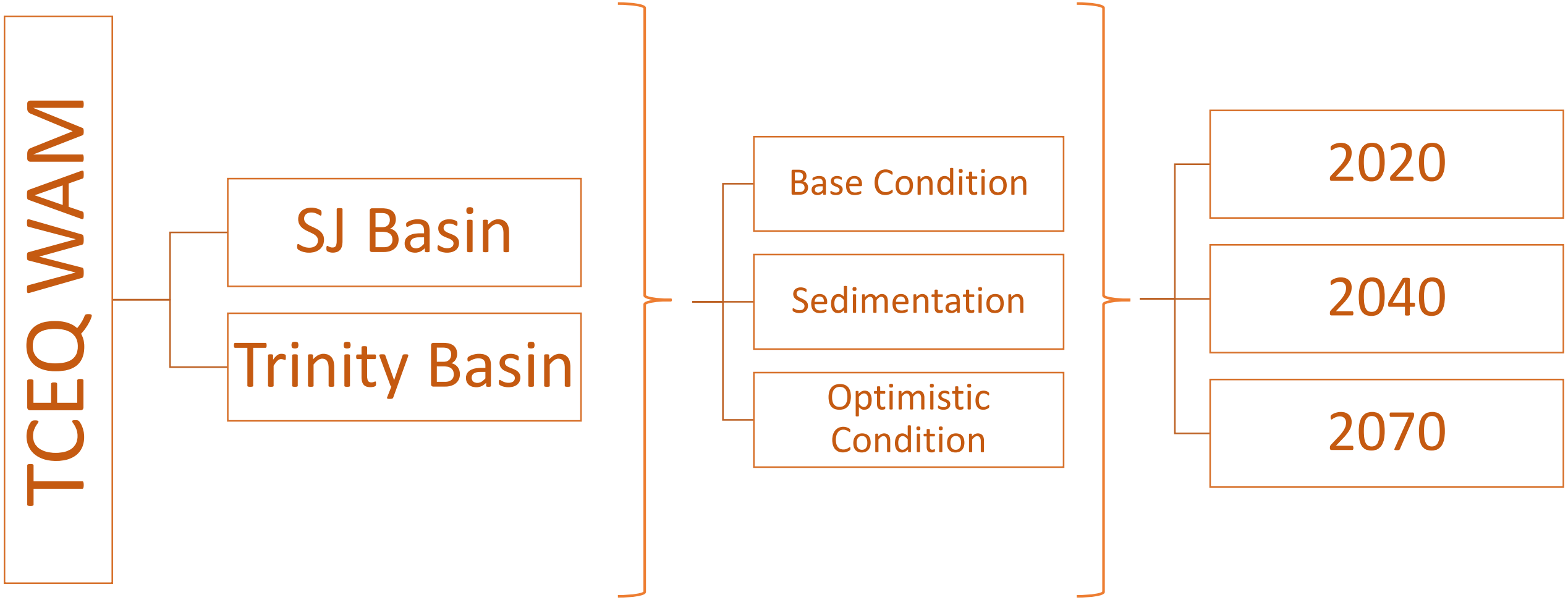
- *Existing* supplies based on SJRA permits
- *Reliability* of supplies is maximum amount produced during a repeat of drought of record
- *Availability* of supplies determined using TCEQ Water Availability Models (WAMs)

# Supply Evaluation

- **WAM availability** estimation
  - *Annual output*
  - *Monthly output*

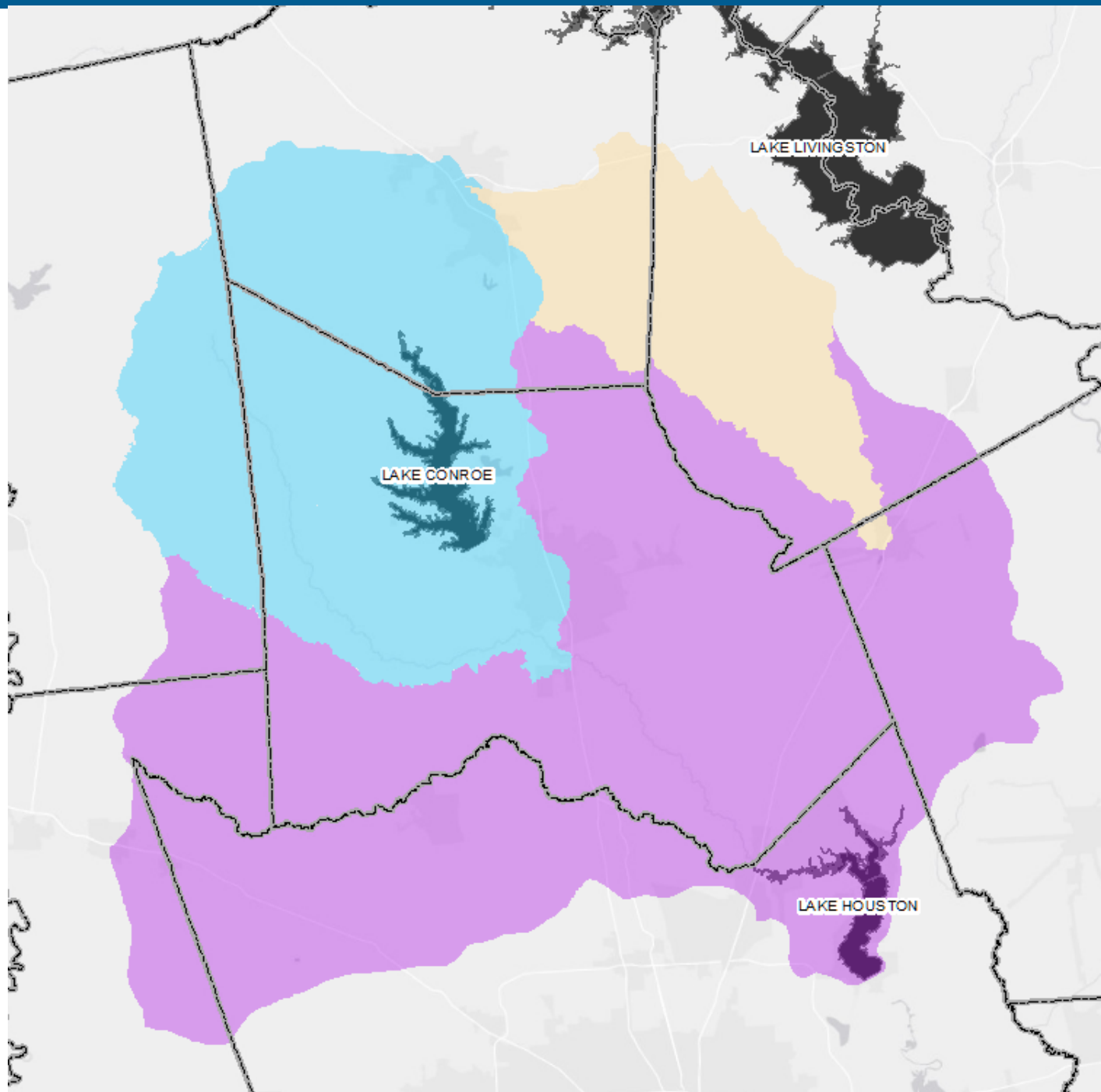
- **Monthly needs** analysis using operations model
  - *Determine needs based on operational and infrastructure constraints*

# Annual Availability



# Return Flows

| Sub-Area | Potential Return Flow Supply (ac-ft) | | |
|---|---|---|---|
| | 2020 | 2040 | 2070 |
| West Fork (Lake Conroe & Lower) | 2,535 | 5,681 | 14,855 |
| Lake Houston | 60,008 | 88,100 | 136,567 |
| East Fork | 40 | 42 | 45 |
| **TOTAL** | **62,583** | **93,823** | **151,466** |



# SJRA Permits

**LAKE CONROE**

- 4963 (100,000 Ac-ft) – Lake Conroe Permit

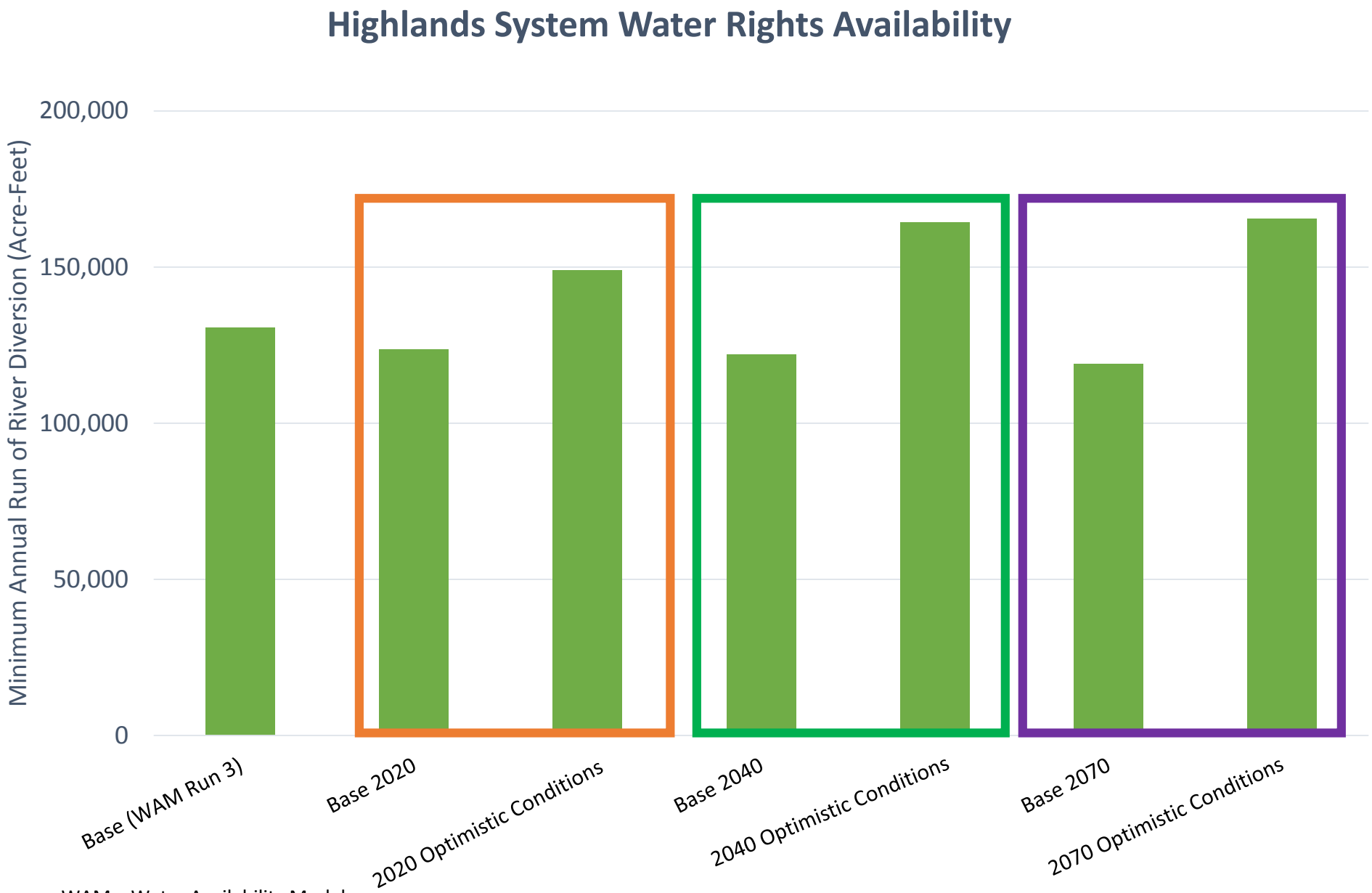
**LAKE HOUSTON HIGHLANDS**

- 4964 (55,000 Ac-ft) – SJRA Highlands Permit (Backup)
- 5807 (14,100 Ac-ft) – Lake Houston Additional Authorization (SJRA)
- 5808 (40,000 Ac-ft) – Excess Flow Permit
- 5809 (14,944 Ac-ft) – Reuse Permit

**TRINITY BASIN**

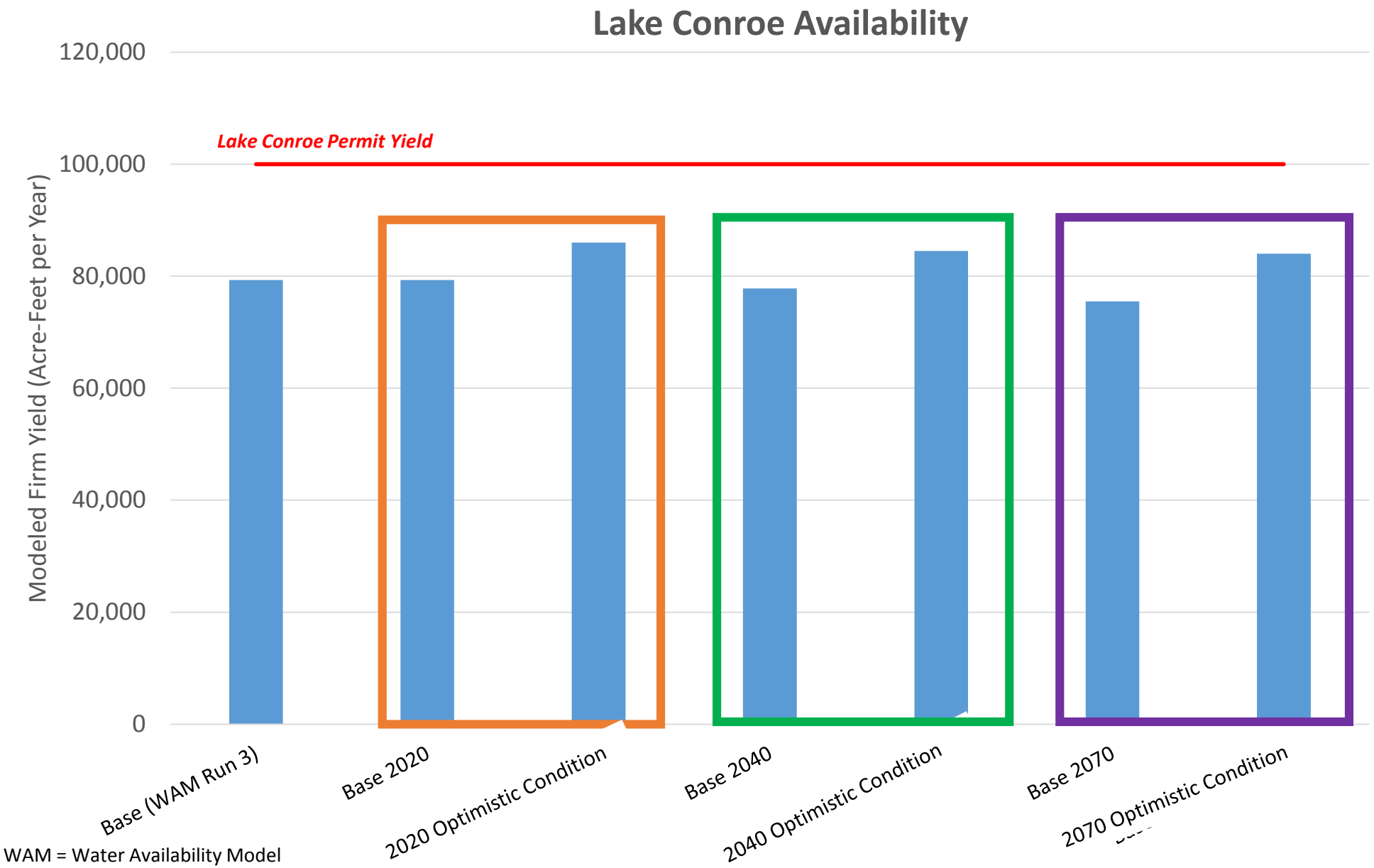
- 5271 (56,000 Ac-ft) – Devers
- 4279A (30,000 Ac-ft) – CLCND

# Results - Highlands




WAM = Water Availability Model

# Results – Montgomery County




WAM = Water Availability Model

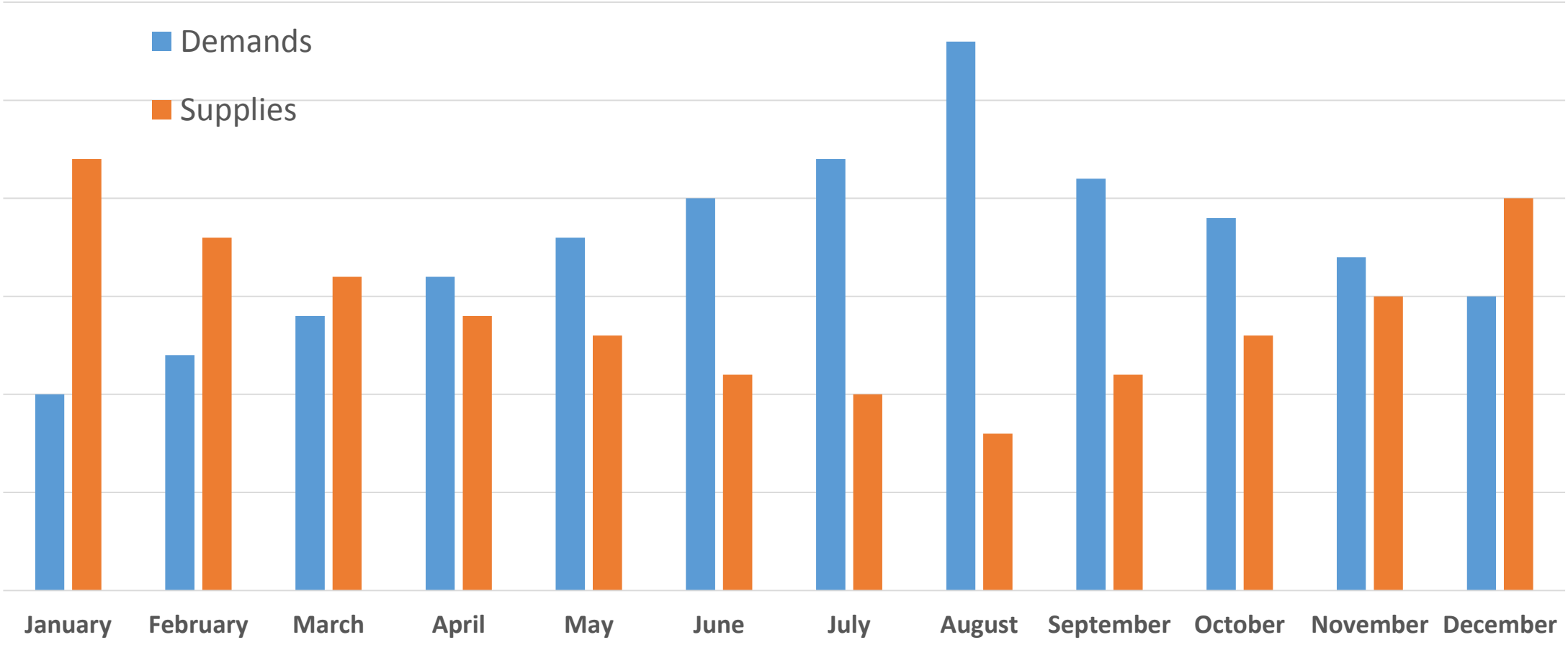
# Needs Identification

Needs evaluation

# Needs Analysis

## REGIONAL PLANNING APPROACH

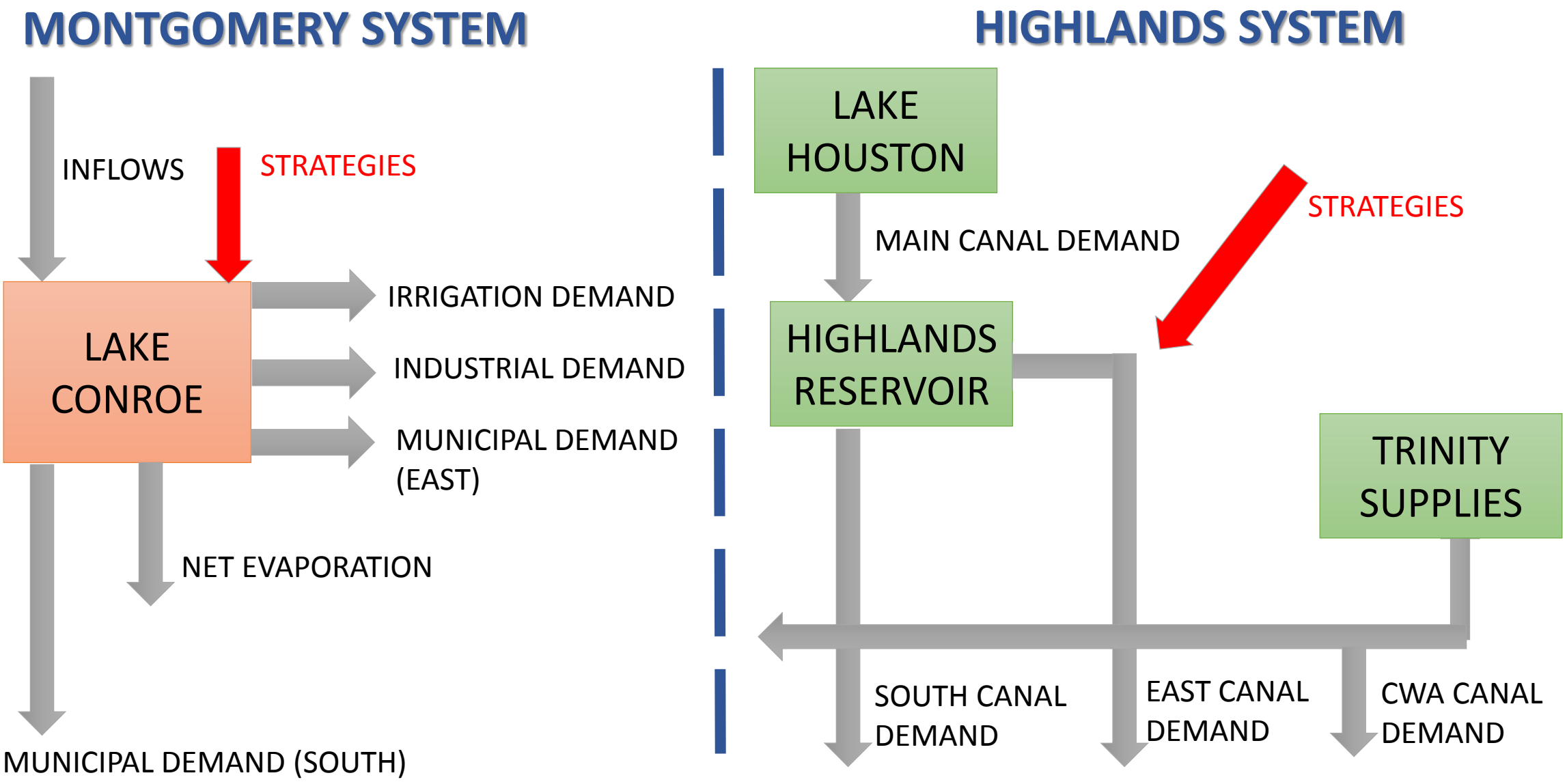
# Supply and Demand Trends



# Detailed Needs Analysis – Why?

## OPERATIONS MODEL

# Operations Model - Features



# Needs Analysis Scenarios

## SUPPLIES

BASE (SEDIMENTATION)

OPTIMISTIC CONDITIONS

DROUGHT CONTINGENCY OPERATIONS

−

## DEMANDS

HIGHLANDS

•Two Demand Projections

MONTGOMERY

Three Demand Projections

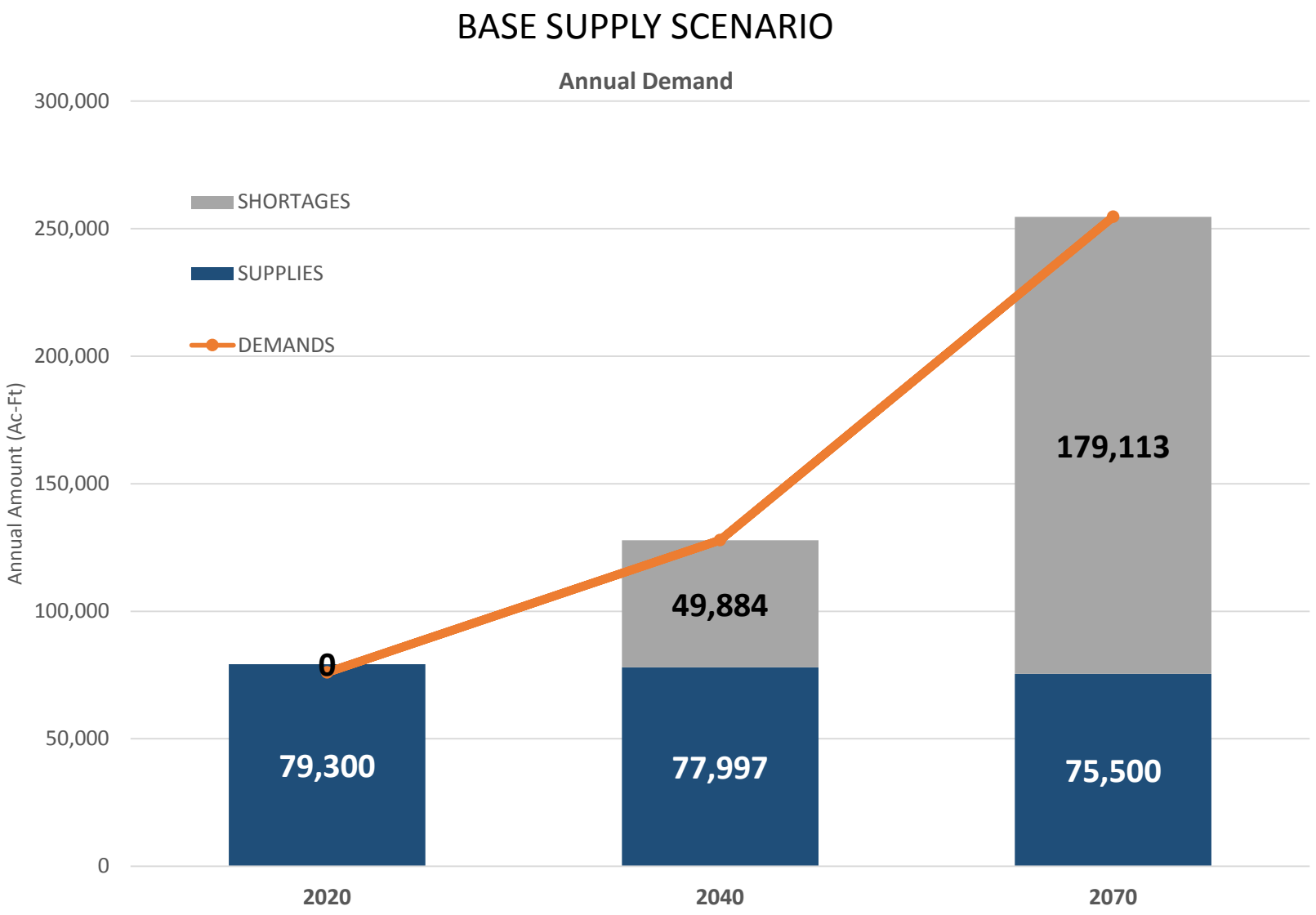
=

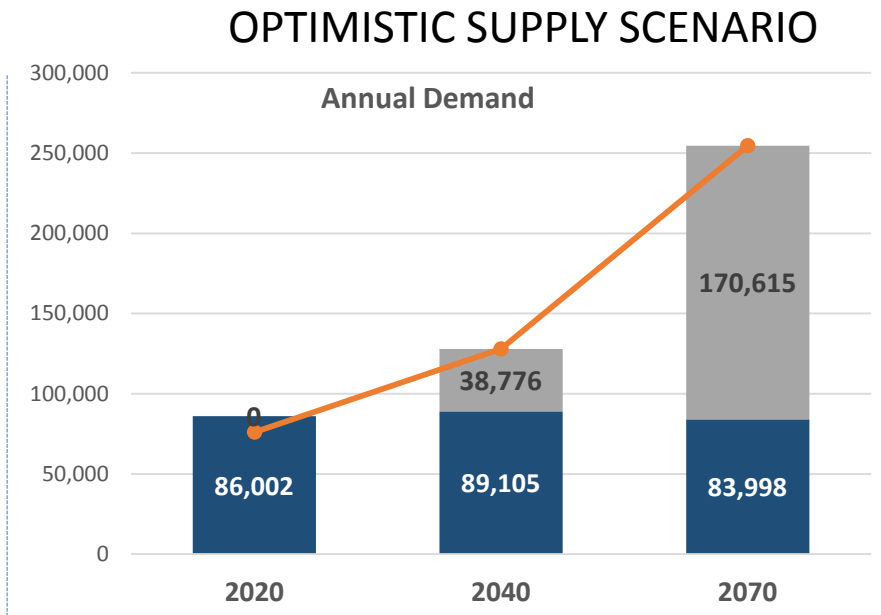
## SURPLUS/NEEDS

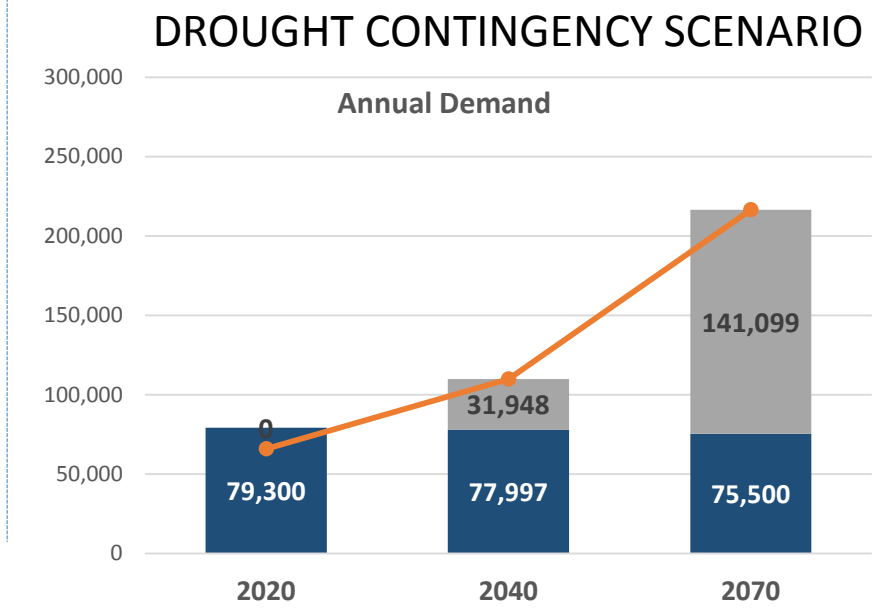
HIGHLANDS

MONTGOMERY

# Results - Montgomery County Needs

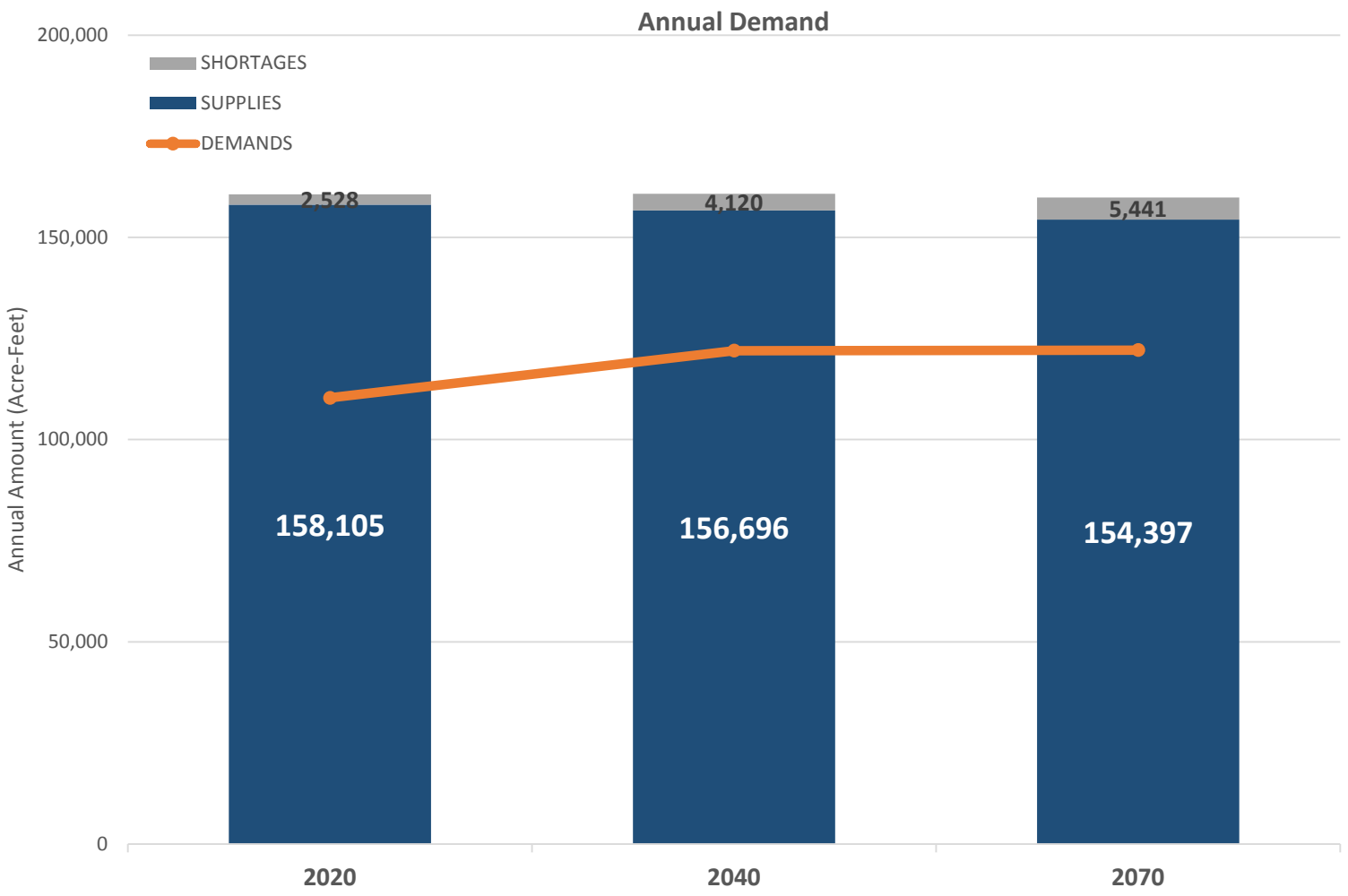


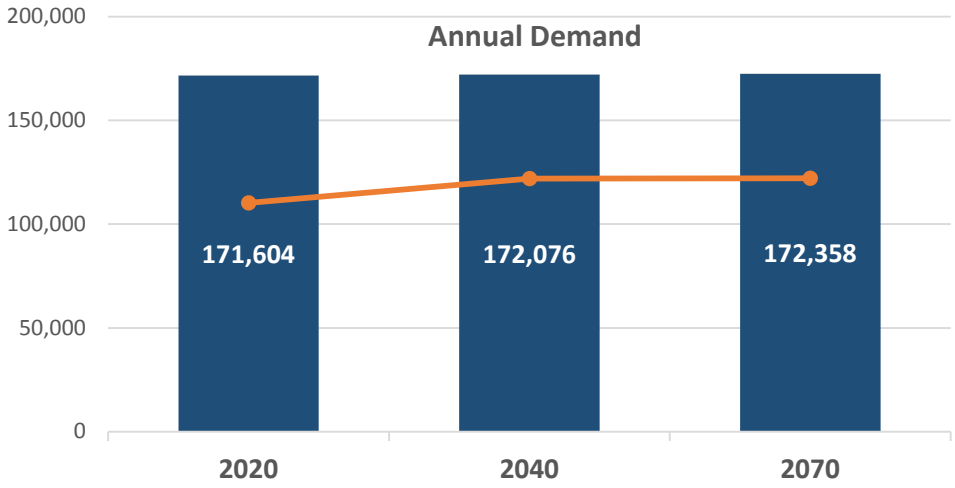



# Results - Highlands System Needs

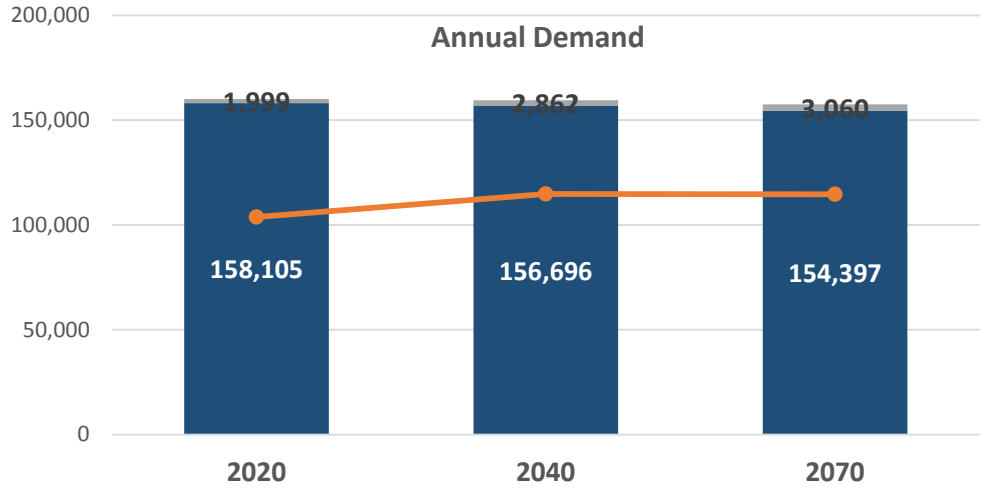
## BASE SUPPLY SCENARIO




## OPTIMISTIC SUPPLY SCENARIO

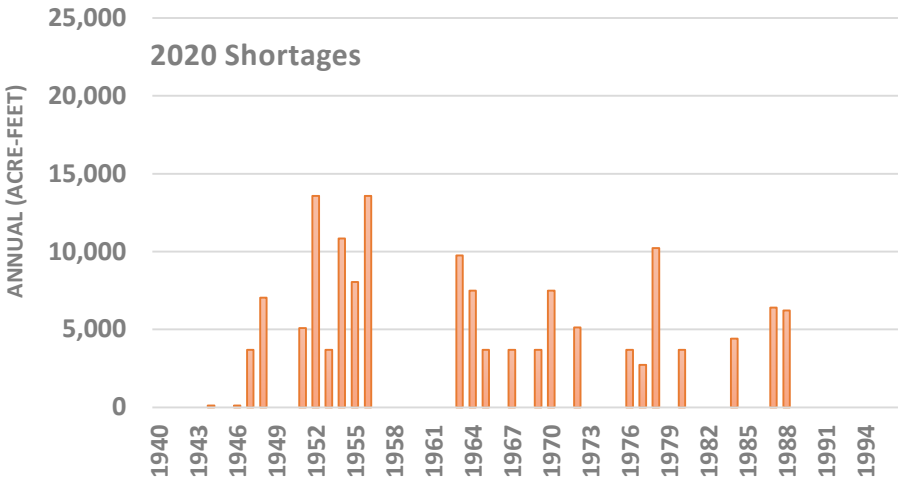


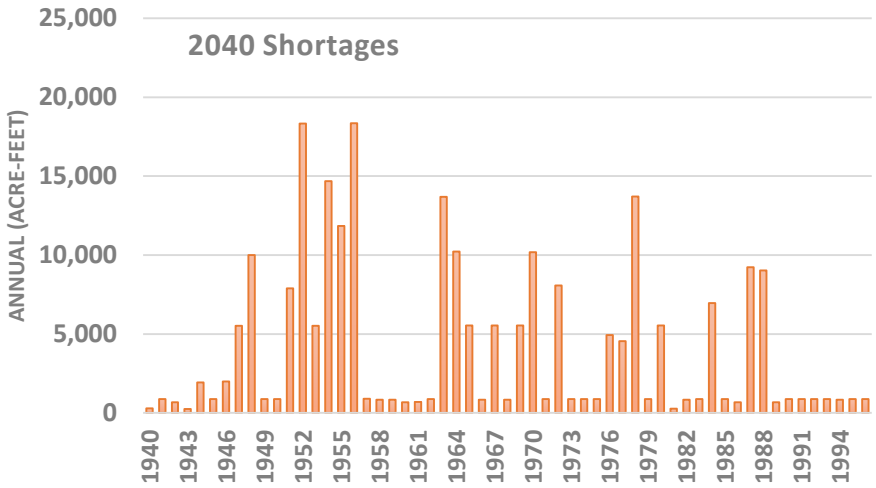

## DROUGHT CONTINGENCY SCENARIO

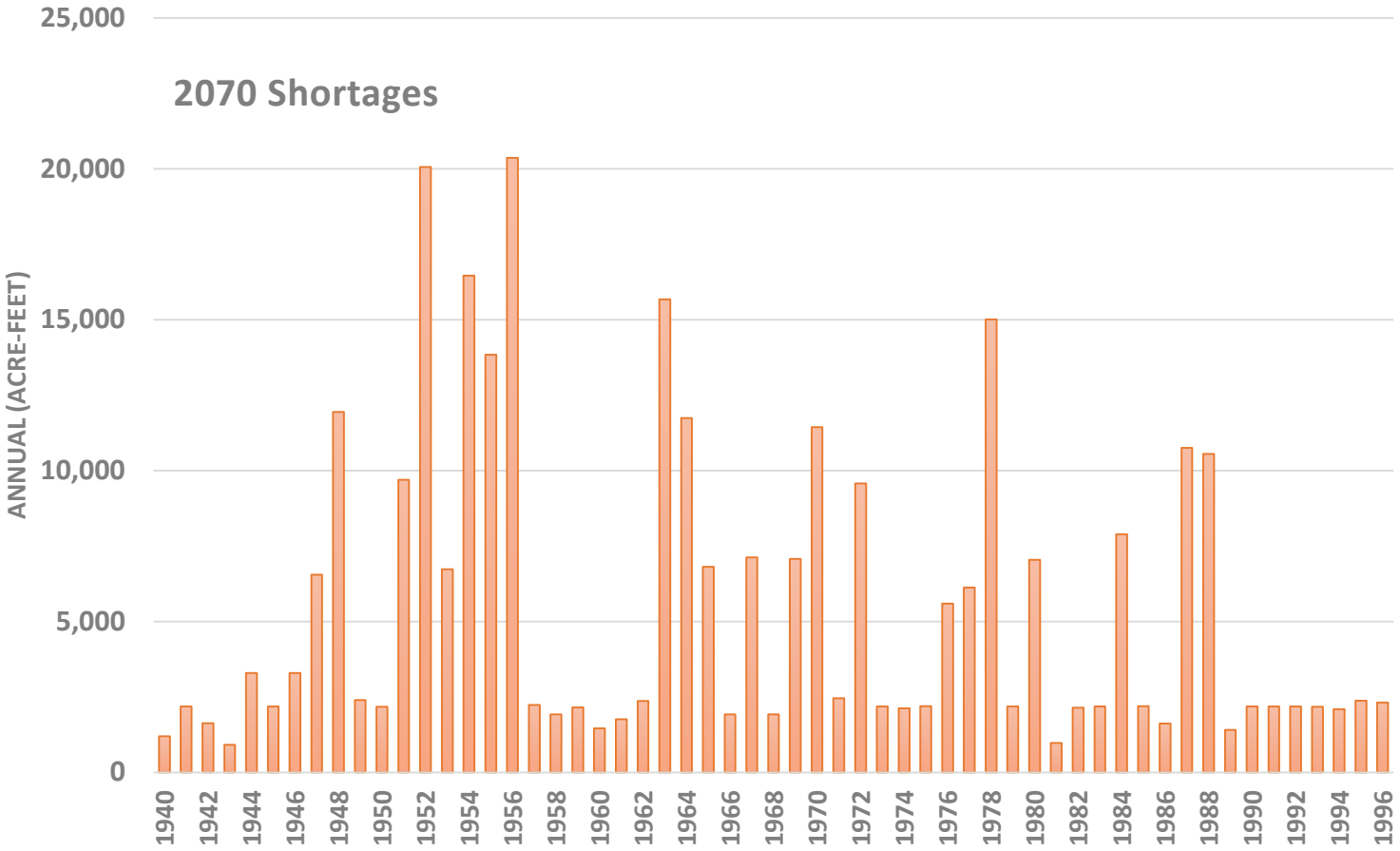


# Results - Highlands System Needs

BASE SCENARIO
Annual Demand



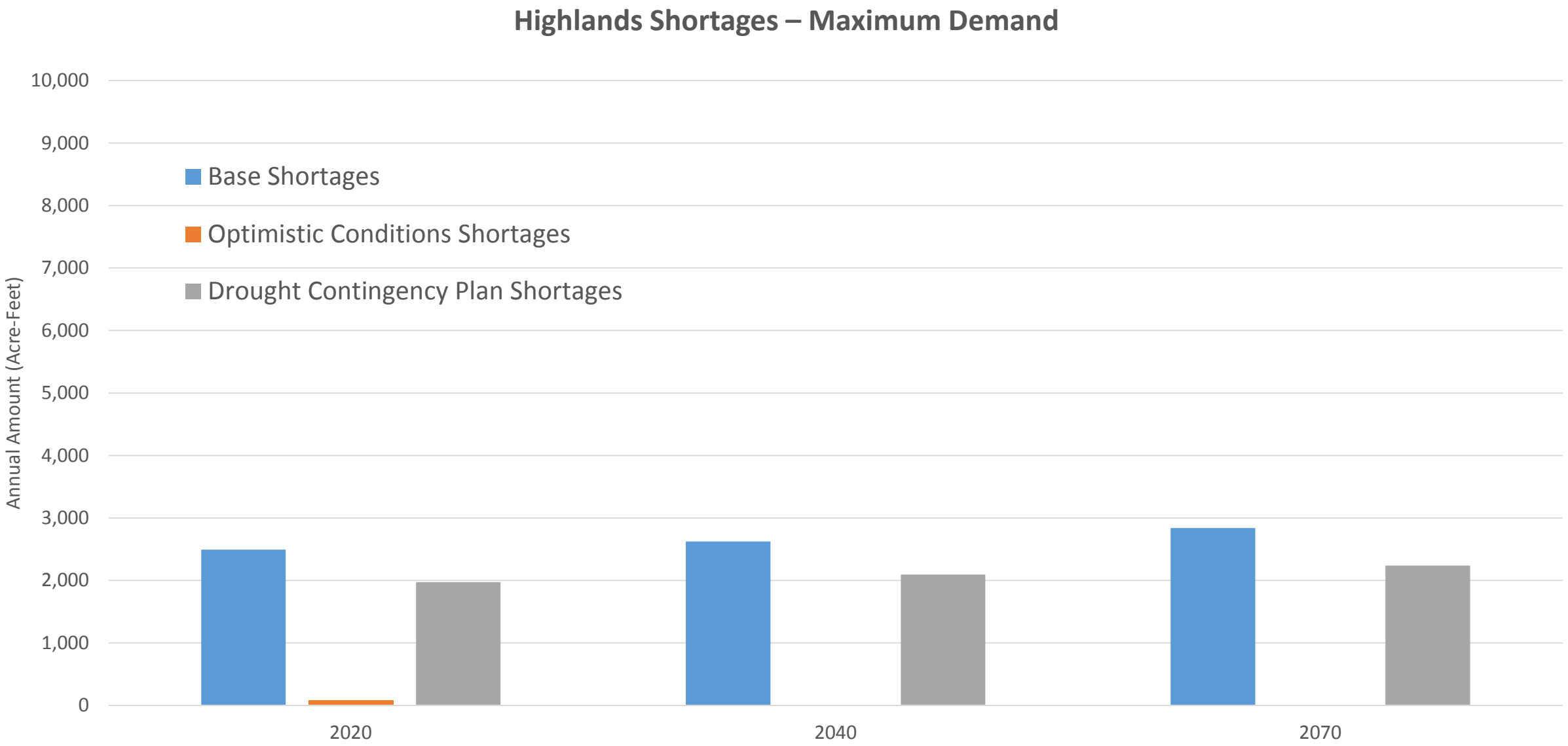



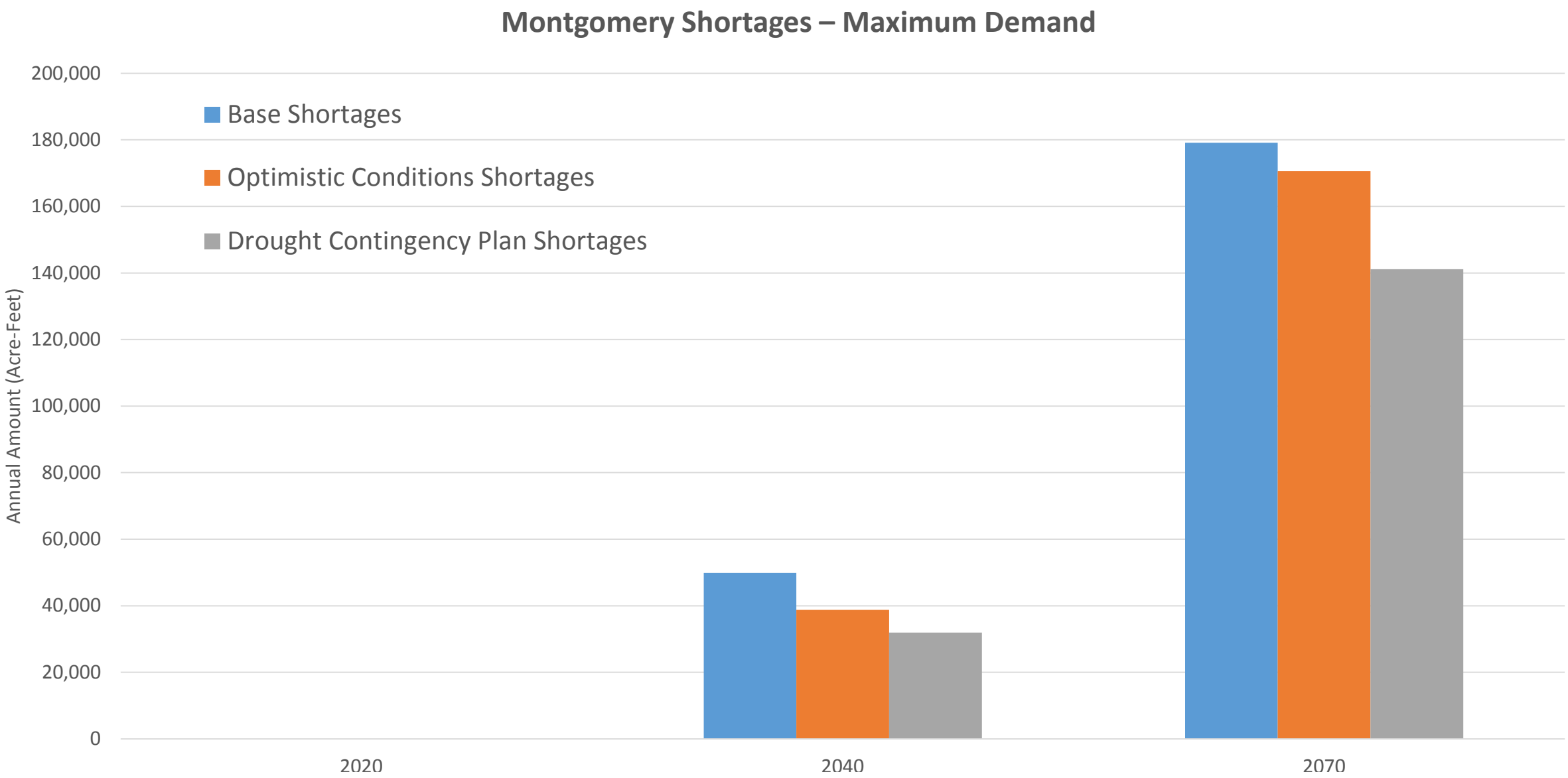
# Needs - Summary

- Both systems’ needs important
- Impacts of Optimistic and Drought Contingency scenarios
- Timing of shortages

# Needs - Summary



# Needs - Summary



# Water Supply Strategies

Preliminary strategy evaluation

# Strategies - Approach

- Detailed strategy analyses are costly

- High-level screening of universe of potential strategies

# Identified Strategies

| Name | Details |
|---|---|
| **Additional CWA Canal Capacity** | |
| **Aquifer Storage and Recovery** | Developed by SJRA Customers |
| | Developed by SJRA (GRP Treated) |
| | Developed by SJRA (Mildly Treated) |
| **Bedias Reservoir** | |
| **Brazos River Supplies** | |
| **Catahoula Aquifer Supplies** | Developed by SJRA Customers (Treated) |
| | Developed by SJRA Customers (Blended) |
| | Developed by SJRA (Lake Conroe) |
| | Developed by SJRA (Treated) |
| | Developed by SJRA (Blended) |
| **COH Water Swap** | |
| **Conservation** | TWDB Baseline |
| | SJRA Recommendations |
| **Direct Reuse** | GRP Participants |
| | Woodlands |
| **East Texas Water Transfer** | Neches Basin |
| | Sabine Basin |

| Name | Details |
|---|---|
| **Lake Creek Reservoir** | |
| **Lake Creek Scalping** | Run-of-River Diversion |
| | Storage in Lake Conroe |
| | Dedicated Storage |
| **Lake Livingston Transfer** | Livingston to Conroe |
| | Livingston to Highlands |
| **Purchase Groundwater** | Purchase from Eastern Basins |
| | Purchase from Western Basins |
| **Purchase Surface Water** | TRA |
| | CLCND |
| | COH |
| **Regional Return Flows** | Lake Conroe |
| | Lake Houston |
| | Lake Houston w/ South Plant |
| **Seawater Desalination** | |
| **Trinity Return Flows** | |

# Next Stakeholder Meeting

# Questions??