CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX A

DWR STANDARDIZED TABLES

Submittal Table 2-1 Retail: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
Add additional rows as needed			
CA1910239	City of Lakewood	20,041	6,720
	Total	20,041	6,720

DWR NOTES:

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

NOTES: Total volume of water supplied to City (6,720 AF) includes potable water (6,297 AF) and non-potable (423 AF) supplies, which includes recycled water and groundwater from Well 6 for agricultural purposes.

Submittal Table 2-2: Plan Identification		
Select One	**Type of Plan**	**Name of Regional Alliance or RUWMP** (Drop Down List)
☑	**Individual UWMP**	
	If Water Supplier is also a member of a SB X7-7 Regional Alliance, select name from the drop-down.	
☐	**Regional Urban Water Management Plan (RUWMP)**	
	If Supplier selected RUWMP, select name from the drop-down.	
NOTES:		

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesale supplier
☑	Supplier is a retail supplier
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
01/01	
Units of measure used in UWMP (Select from the drop down list).	
Unit	AF
DWR NOTES: **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Submittal Table 2-3.	
NOTES:	

Submittal Table 2-4 Retail: Water Supplier Information Exchange Water Code Section 10631(h)
The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Add additional rows as needed
Central Basin Municipal Water District
NOTES:

Submittal Table 3-1 Retail: Population - Current and Projected Water Code Section 10631(a)						
Population Served	2025	2030	2035	2040	2045	2050(opt)
	60,019	63,781	64,397	64,512	64,628	64,781
NOTES:						

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual
Water Code Section 10631(d)(1)

Use Type	Additional Description (as needed)	2025 Actual Water Use	
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUEdata online submittal tool		**Potable or Non-Potable** (OPTIONAL) Drop down list	Volume (AF)
Add additional rows as needed			
Single Family		Potable	4,820
Multi-Family		Potable	240
Commercial	Includes institutional	Potable	855
Landscape		Potable	329
Landscape	Recycled Water	Non-Potable	364
Agricultural		Non-Potable	59
Other (optional)	Non-Residential	Potable	1
Distribution System Water Loss		Potable	52
		Subtotal Potable	6297
		Subtotal Non-Potable	423
		Total	6,720

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

NOTES:

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected
Water Code Section 10631(d)(1)

Use Type	Additional Description (as needed)	Projected Water Use (Report To the Extent that Records are Available)					
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		**Potable or Non-Potable** (OPTIONAL) Drop down list	**2030 (AF)**	**2035 (AF)**	**2040 (AF)**	**2045 (AF)**	**2050 opt (AF)**
Add additional rows as needed.							
Single Family		Potable	5,340	5,392	5,401	5,411	5,424
Multi-Family		Potable	299	302	302	303	303
Commercial	Includes institutional	Potable	1,033	1,043	1,045	1,047	1,050
Landscape		Potable	136	137	137	138	138
Landscape	Recycled water	Non-Potable	430	430	430	430	430
Agricultural		Non-Potable	55	55	55	55	55
Other (optional)	Non-Residential	Potable	3	3	3	3	3
Distribution System Water Loss		Potable	262	264	265	265	266
		Subtotal Potable	7,073	7,141	7,153	7,167	7,184
		Subtotal Non-Potable	485	485	485	485	485
		Total	7,558	7,626	7,638	7,652	7,669

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

NOTES:

Submittal Table 4-3 Retail: Inclusion in Water Use Projections Water Code Section 10631 (a), 10631 (d)(4)(A), and 10631 (d)(4)(B)	
Are Future Water Savings Included in Projections? **Drop down list (y/n)**	Yes
If "Yes" to above, **state the section or page number**, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found. ***Optional*** Suppliers may complete Optional Submittal Table 4-4 R to quantify the expected savings.	Section 4.2.5 and Chapter 8
Are Lower Income Residential Demands Included In Projections? **Drop down list (y/n)**	Yes
Optional If the method for accounting Lower Income Residential Demands has been included, provide page number where this accounting can be found.	
DWR NOTES: Additional guidance is provided in Appendix K.	
NOTES:	

Submittal Table 4-5 Retail: Water Loss Audit Reporting Water Code Section 10631(d)(3)(A)		
Public Water System ID # Reported in Table 2-1 R	Reporting Period	Submitted to DWR Water Loss Audit Program (yes/no)
Report submittal status for all five years for each Public Water System as available. Add rows as needed		
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes
	2025	Yes
DWR NOTES: Suppliers will provide a link to the WUEdata submittals of their Water Loss Audit Reports.		
NOTES:		

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard
Water Code Section 10631(d)(3)(C)

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System? (y/n) If no, Supplier will not complete this row.	Real Water Loss					Apparent Water Loss				
		State Water Board Standard		Most Recent AWWA Water Loss Audit			State Water Board Standard		Most Recent AWWA Water Loss Audit		
		2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Drop down list	Number of Units (Connections or Miles corresponding with units selected)	Volume of Total Real Loss (from AWWA Water Loss Audit) (AF)	Real Water Loss Per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit) (AF)	Apparent Water Loss Per Unit per Day
Add additional rows as needed.											
CA1910239	Yes	9.5	Gallons per Service Connection per Day (GPSCD)	20,108	55.785	2.5	2.2	Gallons per Service Connection per Day (GPSCD)	20,108	46.885	2.1
								Gallons per Service Connection per Day (GPSCD)			
								Gallons per Service Connection per Day (GPSCD)			

Water Board's Calculated Water Loss Standards

DWR NOTES: Units of measure (AF, CCF, MG) for Water Loss **MUST** remain consistent with units reported in Submittal Table 2-3. The units reported in Submittal Table 2-3 are used in this table's calculations.

NOTES:

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress
Water Code Section 10608.40

☐	**Check the box if the Supplier was not an Urban Water Supplier during or before the 2020 UWMP reporting cycle. Proceed to the next table.**					
Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target? Drop down list	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	**Only for suppliers that did not meet the Target in 2020 See DWR NOTES below.** Actual 2025 GPCD (From SB X7-7 Compliance Form)	Did Supplier meet the 2020 Target in 2025?
No	Individual Target	99	106	No	94	Yes

DWR NOTES:
Suppliers calculating a 2025 GPCD will need to complete and submit SB X 7-7 Compliance Tables to verify the use of SB X7-7 Methodologies.
Suppliers that were part of a merger or consolidation since 2020 see Chapter 5 and Appendix P for guidance.
NA=Not Applicable

NOTES: The City reported a 2020 GPCD of 106 in the City's 2020 Plan which was greater than the 2020 Target on 99 GPCD. Based upon properly recalculating the City's 2020 population in the 2025 Plan, it was determined that the City had a 2020 GPCD of 99 which would have been in compliance. Nonetheless, the City also met the 2020 Target in 2025. The updated SB X7-7 2025 compliance tables are provided in Appendix F.

Submittal Table 6-1 Retail: Groundwater Volume Pumped
Water Code Section 10631(4) and 10631(4)(c)

☐	Check the box if the Supplier does not pump groundwater. Proceed to the next table.
☐	Check the box if all or part of the groundwater described below is desalinated. (OPTIONAL)

Groundwater Type **Drop Down List** May use each category multiple times	Potable or Non-Potable (OPTIONAL) **Drop down list**	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Add additional rows as needed							
Alluvial Basin	Potable	Central Basin	7190	6851	6948	6273	6298
Alluvial Basin	Non-Potable	Central Basin	52	55	50	59	59
		Total	7,242	6,906	6,998	6,332	6,357

DWR NOTES:

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

NOTES

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area
Water Code Section 10633(a)

☐	Check the box if there is no wastewater collection system. Proceed to the next table.
	Percentage of 2025 service area served by wastewater collection system (OPTIONAL)
	Percentage of 2025 service area population served by wastewater collection system (OPTIONAL)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? OPTIONAL **Drop Down List**	Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Name of Wastewater Treatment Plant (WWTP) and Place ID Number **Drop down list**	Is WWTP Located Within UWMP Area? **Drop Down List**
Add additional rows as needed				
LACSD	Estimated	4,365	A.K. Warren Water Resource Facility, Place ID 234156	No
LACSD	Estimated	273	Long Beach WRP, Place ID 238562	No
Total Wastewater Received from UWMP Service Area in 2025:		4,638		

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.
Additional Guidance: See Appendix M, Section M.21 for detailed guidance on this table.

NOTES:

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area
Water Code Section 10633(b)

☑	**Check the box if no wastewater is treated or disposed of within the UWMP service area.** Proceed to the next table.

Wastewater Treatment Plant Name and Place ID Number **Drop down list**	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (OPTIONAL) **Drop down list**	2025 Volume of Wastewater Received from UWMP Service Area (As Reported in Submittal Table 6-2 R) (AF)	Total 2025 Volume of Water Treated (AF)	**2025 Outcomes of Treated Wastewater**										
				Water Recycled Within UWMP Service Area (enter data as applicable)		**Water Recycled Outside of UWMP Service Area** (enter data as applicable)		**Effluent Discharge that is not a Permitted Recycled Water Use** (enter data as applicable)		**Required Discharge for Instream Flow** (enter data as applicable)		**Delivered to Another Entity for Additional Treatment** (enter data as applicable)		
				Treatment Level **Drop down list**	Volume (AF)	Treatment Level **Drop down list**	Volume (AF)	Treatment Level **Drop down list**	Volume (AF)	Treatment Level **Drop down list**	Volume (AF)	Treatment Level **Drop down list**	Volume (AF)	Name of other entity
Add additional rows as needed														
Total		0	-		0		0		0		0		0	

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.
IPR: Indirect Potable Reuse would have the treatment level of its end use requirement in the Level of Treatment drop-down.
Additional Guidance: See Appendix M, Section M.21 for detailed guidance on this table.

NOTES:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area
Water Code Section 10633 (c),(d),(e)

☐	Check box if recycled water is not used and is not planned for use within the service area of the supplier. The supplier will only complete the column on "Potential Recycled Water Use" and submit an accompanying narrative on the feasibility of that potential recycled water use.

Name(s) of Facility/ies Producing (Treating) the Recycled Water (OPTIONAL) :	
Name of Supplier Operating the Recycled Water Distribution System (OPTIONAL) :	
Volume of Supplemental Water Added in 2025 (OPTIONAL) :	
Source of 2025 Supplemental Water (OPTIONAL) :	

Use Type **Drop down list**	**Potable or Non-Potable** (after treatment if treated) (OPTIONAL) Drop down list	Additional Information (as needed)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	**Potential Recycled Water Use**	
									Volume	Narrative page number (OPTIONAL)
Add additional rows as needed										
Landscape irrigation (exc golf courses)	Non-Potable	Parks and medians	364	430	430	430	430	430		
Subtotal Potable			0	0	0	0	0	0	0	
Subtotal Non-Potable			364	430	430	430	430	430	0	
Total			364	430	430	430	430	430	0	0

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.
Additional Guidance: See Appendix M, Section M.21 for detailed guidance on this table.
Potential recycled water use: a description of the feasibility of these uses must be included in the narrative.
Multiple Producers: If you have multiple recycled water producers, submit a separate table for each.

NOTES:

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual
Water Code Section 10633(e)

☐ Check the box if recycled water was not used in 2025 nor previously projected for use in 2020.
Proceed to the next table.

Use Type Drop Down list	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Add additional rows as needed		
Landscape irrigation (exc golf courses)	450	364
Total	450	364

DWR NOTES:

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3

Additional Guidance: See Appendix M, Section M.21 for detailed guidance on this table.

NOTES:

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use
Water Code Section 10633(f)

☑	Check the box if the Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
Section 6.2.5.5	Provide page location of narrative in the UWMP

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
Add additional rows as needed			
		Total (AF)	0
		Unit Conversion to AF	0

DWR NOTES:
Units of measure (AF, CCF, MG) MUST remain consistent with units reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.
The unit conversion to Acre Feet addresses the Water Code's requirement that this value be provided in acre-feet.

NOTES:

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs
Water Code Section 10631(f)

☐	Check the box if there are no expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Proceed to the next table.
☑	Check the box if some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.
Section 6.2.10	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other suppliers?		Additional Description (as needed)	**Potable or Non-Potable** (after treatment if treated) (OPTIONAL) Drop Down list	Planned Implementation Year	Planned for Use in Year Type **Drop Down List**	Expected Increase in Water Supply to Supplier (This may be a range) (AF)
	Drop Down List (yes/no)	If Yes, Supplier Name					
Add additional rows as needed							

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3.

NOTES:

Submittal Table 6-8 Retail: Water Supplies — Actual
Water Code Section 10631(b)

Water Supply		2025		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	**Potable or Non-Potable** (after treatment if treated) (OPTIONAL) Drop Down list	Actual Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)
Add additional rows as needed				
Groundwater (not desalinated)	Central Basin	Potable	6,297	
Groundwater (not desalinated)	Central Basin	Non-Potable	59	
Recycled Water		Non-Potable	364	
		Subtotal Potable	6,297	0
		Subtotal Non-Potable	423	0
		Total	6,720	0

DWR NOTES:

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

Total Entitlement: e.g. Water Right, Groundwater Allocation, Contracted Amount.

NOTES:

Submittal Table 6-9 Retail: Water Supplies — Projected
Water Code Section 10631 (b)

Water Supply			Projected Water Supply (Report to the Extent Practicable)									
			2030		2035		2040		2045		2050 (opt)	
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	**Potable or Non-Potable** (after treatment if treated) (OPTIONAL) Drop Down list	Reasonably Available Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)	Reasonably Available Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)	Reasonably Available Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)	Reasonably Available Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)	Reasonably Available Volume (AF)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (AF)
Add additional rows as needed												
Groundwater (not desalinated)	Central Basin	Potable	7,073		7,141		7,153		7,167		7,184	
Groundwater (not desalinated)	Central Basin	Non-Potable	55		55		55		55		55	
Recycled Water		Non-Potable	430		430		430		430		430	
		Subtotal Potable	7,073	0	7,141	0	7,153	0	7,167	0	7,184	0
		Subtotal Non-Potable	485	0	485	0	485	0	485	0	485	0
		Total	7,558	0	7,626	0	7,638	0	7,652	0	7,669	0

DWR NOTES:

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.

Total Entitlement: e.g. Water Right, Groundwater Allocation, Contracted Amount.

NOTES:

Optional Submittal Table O-1B: Recommended Energy Reporting - SINGLE DELIVERY PRODUCT - TOTAL UTILITY APPROACH

Water Delivery Product drop down list (If delivering more than one type of product recommend using Table O-1C)	Retail Potable Deliveries	**Only for Water Delivery Products Under the Urban Water Supplier's Operational Control**		
Start Date of Reporting Period	1/1/2025	**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
End Date of Reporting Period	12/31/2025			
Is upstream embedded energy in the values reported?	No			
Units of Measure for Water	AF	**Total Utility** See DWR NOTES	**Hydropower**	**Net Utility**
Volume of Water Entering Process		6,297		6,297
Energy Consumed (kWh)		3,937,989		3,937,989
Energy Intensity (kWh/vol. converted to MG)		1,919	-	1,919

DWR NOTES:

Total Utility: The volume of water entered in the "Total Utility" column should equal the volume of water entering the distribution system (excluding recycled water); in most cases, this is the total volume calculated in UWMP Table 4-1: 2025 Actual Total Uses for Potable and Non-Potable Water. Note if recycled water is included in your Submittal Table 4-1, you must exclude it from your volume in this table.

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)

Combination of Estimates and Metered Data

Data Quality Narrative:

The total energy consumed was identified based on Southern California Edison (SCE) billing records. Although the total energy consumed includes electricity usage for general administration (which is not an identified water management process), general administration energy use is considered to be negligible compared to overall water system use and has not been netted out.

Narrative:

The total energy consumption includes energy associated with operating groundwater production wells and booster pumps to deliver water in the distribution system. Energy consumption is associated with operating groundwater water treatment. Energy consumption is also associated with plant lighting and air conditioning, and operating the Supervisory Control and Data Acquisition (SCADA) system and chlorination injection pumps.

NOTES:

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2024-2025, use 2025	Available Supplies if Year Type Repeats	
		☐	Check the box if quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. **Location:** [insert location from UWMP]
		Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available (AF)	**% of Average Supply**
Average Year	2018	7662	100%
Single-Dry Year	2017	7531	98.3%
Consecutive Dry Years 1st Year	2012	8598	112.2%
Consecutive Dry Years 2nd Year	2013	8893	116.1%
Consecutive Dry Years 3rd Year	2014	8364	109.2%
Consecutive Dry Years 4th Year	2015	7053	92.1%
Consecutive Dry Years 5th Year	2016	7284	95.1%

DWR NOTES: Supplier may use multiple versions of Submittal Table 7-1 R if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Submittal Table 7-1 R, in the "Note" section of each submittal table, state that multiple versions of Submittal Table 7-1 R are being used and identify the particular water source that is being reported in each submittal table. **Units of measure (AF, CCF, MG**) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table reports the units of measure reported in Submittal Table 2-3.

NOTES:

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison Water Code Section 10635 (a)					
	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals (autofill from Submittal Table 6-9 R)	7,558	7,626	7,638	7,652	7,669
Use totals (autofill from Submittal Table 4-2 R)	7,558	7,626	7,638	7,652	7,669
Surplus/(shortfall)	0	0	0	0	0
OPTIONAL Planned WSCP Actions					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.					
NOTES:					

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison Water Code Section 10635(a)					
	2030 (AF)	**2035 (AF)**	**2040 (AF)**	**2045 (AF)**	**2050 (AF)**
Supply totals	7,429	7,495	7,507	7,521	7,538
Use totals	7,429	7,495	7,507	7,521	7,538
Surplus/(shortfall)	0	0	0	0	0
OPTIONAL Planned WSCP Actions					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.					
NOTES See Section 7.2.2 for an explanation of supply fluctuations by year.					

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison
Water Code Section 10635(a)

		2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	8,482	8,558	8,572	8,587	8,606
	Use totals	8,482	8,558	8,572	8,587	8,606
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Second year	Supply totals	8,773	8,852	8,866	8,882	8,902
	Use totals	8,773	8,852	8,866	8,882	8,902
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Third year	Supply totals	8,250	8,324	8,338	8,353	8,371
	Use totals	8,250	8,324	8,338	8,353	8,371
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Fourth year	Supply totals	6,957	7,020	7,031	7,044	7,060
	Use totals	6,957	7,020	7,031	7,044	7,060
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Fifth year	Supply totals	7,185	7,250	7,261	7,275	7,291
	Use totals	7,185	7,250	7,261	7,275	7,291
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.

NOTES:

See Section 7.2.2 for an explanation of supply fluctuations by year.

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment Water Code Section 10635(b)(3)	
2026	**Total**
Total Water Use (AF)	7,730
Total Supplies (AF)	8,598
Surplus/Shortfall w/o WSCP Action	868
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
2027	**Total**
Total Water Use (AF)	8,189
Total Supplies (AF)	8,893
Surplus/Shortfall w/o WSCP Action	704
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
2028	**Total**
Total Water Use (AF)	7,884
Total Supplies (AF)	8,364
Surplus/Shortfall w/o WSCP Action	480
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
2029	**Total**
Total Water Use (AF)	6,803
Total Supplies (AF)	7,053
Surplus/Shortfall w/o WSCP Action	250
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
2030	**Total**
Total Water Use (AF)	7,185
Total Supplies (AF)	7,284
Surplus/Shortfall w/o WSCP Action	99
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (AF)	
WSCP - use reduction savings benefit (AF)	
Revised Surplus/(shortfall)	
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.	
NOTES:	

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels Water Code Section 10632(a)(3)(B)			
☐	Check the box if the Supplier uses the Standard six levels of water shortage. Proceed to the next table.		
Standard Shortage Levels	**Percent Shortage Range**	**Suppliers Shortage Levels**	**Percent Shortage Range**
1	Up to 10%	1	Up to 10%
2	Up to 20%	2	Up to 20%
3	Up to 30%	3	Up to 30%
4	Up to 40%	4	Up to 40%
5	Up to 50%	5	Up to 50%
6	>50%	5	50%
NOTES:			

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions
Water Code Section 10632(a)(4)(A),(C) and (E)

Yes	Is the Supplier completing this table using the standard six levels? (yes/no)			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier **Drop down list** These are the only categories that will be accepted by the WUEdata online submittal tool	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (AF)	
Add additional rows as needed				
1	Transfers	Volume	0	Not applicable (see Notes)
2	Transfers	Volume	0	Not applicable (see Notes)
3	Transfers	Volume	0	Not applicable (see Notes)
4	Transfers	Volume	0	Not applicable (see Notes)
5	Transfers	Volume	0	Not applicable (see Notes)
6	Transfers	Volume	0	Not applicable (see Notes)

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.

NOTES: The City will consider increased production from the Central Basin using existing facilities to address increased demands. As noted on Table 8-3, the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions
Water Code Section 10632(a)(4)(B),(D), and (E)

Yes	Is the Supplier completing this table using the standard six levels? (yes/no)				
Shortage Level	Demand Reduction Actions **Drop down list** These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)	Penalty, Charge, or Other Enforcement? **For Retail Suppliers Only** Drop Down List
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (AF)		
Add additional rows as needed					
1	Other - Prohibit use of potable water for washing hard surfaces	Volume	Collective reduction from all Shortage Level 1 actions is up to 390 AFY		Yes
1	Other - Require automatic shut of hoses	Volume	Collective reduction from all Shortage Level 1 actions is up to 390 AFY		Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 1 actions is up to 390 AFY	Repair within five days	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Volume	Collective reduction from all Shortage Level 1 actions is up to 390 AFY		Yes
2	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 2 actions is up to 780 AFY	Prohibited between 9:00am and 5:00pm	Yes
2	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 2 actions is up to 780 AFY	No more than three times per week during June-September. No more than two times per week the rest of the year.	Yes
2	Other - Require automatic shut of hoses	Volume	Collective reduction from all Shortage Level 2 actions is up to 780 AFY		Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 2 actions is up to 780 AFY	Repair within four days	Yes

3	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 3 actions is up to 1,171 AFY	Residential and commercial. No more than two times per week during June-September. No more than once per week the rest of the year.	Yes
3	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 3 actions is up to 1,171 AFY	Commercial nursuries and parks. No more than three times per week.	Yes
3	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 3 actions is up to 1,171 AFY	Residential and commercial. Prohibited between 8:00am and 8:00pm per week during June-September. Prohibited between 9:00am and 5:00pm the rest of the year.	Yes
3	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 3 actions is up to 1,171 AFY	Commercial nursuries and parks. Prohibited between 9:00am and 4:00pm.	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 3 actions is up to 1,171 AFY	Repair within three days	Yes
4	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 4 actions is up to 1,561 AFY	Residential and commercial. No more than once per week during June-September. No more than once per two weeks the rest of the year.	Yes
4	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 4 actions is up to 1,561 AFY	Commercial nursuries and parks. No more than two times per week.	Yes
4	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 4 actions is up to 1,561 AFY	Residential and commercial. Prohibited between 8:00am and 8:00pm per week during June-September. Prohibited between 9:00am and 5:00pm the rest of the year.	Yes
4	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 4 actions is up to 1,561 AFY	Commercial nursuries and parks. Prohibited between 9:00am and 4:00pm.	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 4 actions is up to 1,561 AFY	Repair within two days	Yes
5	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Residential and commercial. Water permanent trees and shrubs only. No more than once per week during June-September. No more than once per two weeks the rest of the year.	Yes
5	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Commercial nursuries. No more than once per week.	Yes
5	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Parks. No more than two times per week.	Yes

5	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Residential and commercial. commercial. Water permanent trees and shrubs only. Prohibited between 8:00am and 8:00pm per week during June-September. Prohibited between 9:00am and 5:00pm the rest of the year.	Yes
5	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Commercial nursuries. Prohibited between 9:00am and 6:00pm.	Yes
5	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Parks. Prohibited between 9:00am and 4:00pm.	Yes
5	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 5 actions is up to 1,951 AFY	Repair within 24 hours	Yes
6	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Residential and commercial. Water permanent trees and shrubs only. No more than once per week during June-September. No more than once per two weeks the rest of the year.	Yes
6	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Commercial nursuries. No more than once per week.	Yes
6	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Parks. No more than two times per week.	Yes
6	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Residential and commercial. commercial. Water permanent trees and shrubs only. Prohibited between 8:00am and 8:00pm per week during June-September. Prohibited between 9:00am and 5:00pm the rest of the year.	Yes
6	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Commercial nursuries. Prohibited between 9:00am and 6:00pm.	Yes
6	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Parks. Prohibited between 9:00am and 4:00pm.	Yes
6	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 1,951 AFY	Repair within 24 hours	Yes

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.

NOTES:

Submittal Table 10-1 Retail: Notification to Cities and Counties Water Code Section 10621(b) and 10642		
City Name	60 Day Notice **Drop Down (yes/no)**	Notice of Public Hearing **Drop Down (yes/no)**
Add additional rows as needed		
City of Cerritos	Yes	Yes
City of Long Beach	Yes	Yes
City of Signal Hill	Yes	Yes
County Name **Drop Down List**	60 Day Notice **Drop Down (yes/no)**	Notice of Public Hearing **Drop Down (yes/no)**
Add additional rows as needed		
Los Angeles County	Yes	Yes
NOTES:		

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX B

COMPLETED PLAN CHECKLIST

Retail (x = required)	Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Chapter 1 Lay Description
x	x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Beginning of each Chapter
x	x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Section 2.1
x	n/a	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Sections 2.1 and 2.5
x	x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Sections 2.2 and 2.5
x	x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Sections 2.3 and 2.5
x	x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Section 2.4
x	x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Section 2.4.2
x	n/a	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Sections 2.4.1 and 2.5
n/a	x	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Section 3.1 and 3.2
x	x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Section 3.3
x	x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Sections 3.4 and 3.6
x	x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Section 3.4.2
x	x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Section 3.5
x	Optional	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Sections 4.2 and 4.4
x	Optional	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Sections 4.3 and 4.4
x	n/a	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Sections 4.3 and 4.4
x	n/a	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Sections 4.2.5.5 and 4.4
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Section 4.2.5.3
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Sections 4.2.5.3 and 9.1
x	n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Section 4.2.5.3 and 4.2.5.4
x	x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Section 4.2.5.6
n/a	x	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	n/a	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Sections 5.2 and 5.3
x	x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Sections 6.1 and 6.2
x	x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Sections 6.1, 6.2, 7.1, and 7.2
x	x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Sections 6.2.2 and 6.4
x	x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Section 6.2.2
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Section 6.2.2
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Section 6.2.2
x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Section 6.2.2

x	x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Section 6.2.2
x	x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Sections 6.2.2 and 6.4
x	x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Sections 6.2.2 and 6.4
x	x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Section 6.4
x	x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Section 6.2.7
x	n/a	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Sections 6.2.5 and 6.4
x	x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Section 6.2.6
x	x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Sections 6.2.10 and 6.4
x	x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Section 6.3
x		7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Section 7.1
x	x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Sections 7.2
x	x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Section 7.2.3
x	x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Section 7.3
x	x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Section 7.3
x	x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Section 7.3
x	x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Section 7.3
x	x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Section 7.3
x	x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Chapter 8
x	x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Chapter 8
x	x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Section 8.2
x	x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Section 8.2
x	x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Section 8.3
x	x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Sections 8.3 and 8.14
x	x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Sections 8.4.1 and 8.14
x	x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Sections 8.4.2 and 8.14
x	x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Section 8.4.3
x	x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Section 8.4.4
x	x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Sections 8.4.7 and 8.14
x	x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Section 8.4.6
x	x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Section 8.5

x	x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Section 8.5
x	n/a	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Section 8.6
x	x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Section 8.7
x	x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3, *Water Shortage Emergencies* .	Water shortage contingency planning	n/a	Section 8.7
x	x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Section 8.7
x	x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Section 8.8
x	x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Section 8.8
x	n/a	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought* .	Water shortage contingency planning	n/a	Section 8.8
x	n/a	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Section 8.9
x	x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Section 8.10
x	n/a	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Section 8.11
x	x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Sections 8.12 and 10.6
x	n/a	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Section 9.1.1
n/a	x	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	n/a	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Sections 10.3 and 10.4
x	x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Section 10.2
x	x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Section 10.5
x	x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Sections 10.2, 10.3, and 10.4
x	x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Section 10.3
x	x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Sections 10.4 and 10.9
x	x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Section 10.5.3
x	x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Section 10.5.4
x	x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Sections 10.5 and 10.9
x	x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Section 10.9
x	x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Section 10.6
x	x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Section 10.6
x	x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Section 10.7

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX C

DEMONSTRATION OF REDUCED IMPORTED WATER RELIANCE

DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN FOR PARTICIPANTS IN COVERED ACTIONS (CY 2015 THROUGH CY 2050)

CITY OF LAKEWOOD

Introduction

Pursuant to the California Department of Water Resources (DWR), an urban water supplier that anticipates participating in or receiving water from a proposed project (or "covered action") such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015, 2020, and 2025 Urban Water Management Plans (UWMPs) for use in demonstrating consistency with Delta Plan Policy WR P1, "*Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance"*. In addition, pursuant to California Code of Regulations, Title 23, § 5003:

> *(c)(1) Water suppliers that have done all of the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*
>
> > *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
> >
> > *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*
> >
> > *(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The City of Lakewood (the City) is sub-agency of the Central Basin Municipal Water District, which in turn is a member agency of the Metropolitan Water District of Southern California (MWD). As noted in MWD's 2025 Regional UWMP, Appendix 10 (provided as Attachment 1 below), "... Metropolitan and its members as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used."

In addition, MWD's 2025 Regional UWMP indicates "...in accordance with UMWP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta…While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed…For water suppliers that make investments in regional projects or programs it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta." Nonetheless, the City has taken proactive measures to help reduce regional reliance on imported water supplies and is discussed in the following sections.

Reduced Reliance Calculation Tables

Pursuant to DWR guidance, Tables C-1 through C-4 were prepared to show the potential reduction of reliance on imported supply for the City. The City has used these tables to demonstrate its reduced regional reliance on imported water supplies, but not specifically Delta Watershed supplies. For each of the tables, a "Baseline year" was selected. Water demands during subsequent years (from 2015 through 2050 in five-year increments) were compared to water demands during the Baseline year. Table C-1 considers the population and service area water demands, and a demand in gallons per capita per day (GPCD) water use rate was calculated for each of the years following the Baseline year. The calculated reduction in GPCD from the Baseline year was then translated to an estimated amount of water saved as a result of water conservation measures. Table C-2 references the estimated amount of water saved from Table C-1 and shows the City's water demand without water use efficiency in effect.

A method of showing reduced regional reliance on imported water supplies is to show increased regional self-reliance. Table C-3 lists water supply sources that contribute to regional self-reliance, including water use efficiency (from Table C-1 and C-2) and groundwater recharge activities. Regional self-reliance is expressed both in terms of acre feet (AF) and as a percentage.

The calculation of reduced regional reliance on imported water supplies is shown on Table C-4. Table C-4 also shows the percent change in imported water supplies relative to the City's total supply. A negative percent change of imported water supplies indicates the City has reduced regional reliance on imported water supplies.

Since the Baseline year, the City has decreased its reduced regional reliance on imported water supplies in 2015, 2020, 2025, and anticipates doing so through 2050.

The City has reduced its reliance on imported water supply in up to three separate categories, as follows:

- The demand in GPCD for the "Baseline year" was compared to the GPCDs in subsequent years (from 2015 through 2050, in five-year increments). The reduced GPCD multiplied by the population in these subsequent years is indicative of the potential reduced regional reliance on imported water supplies and is included in Table C-1.
- The recycled water use from 2015 through 2050, in five-year increments, also demonstrates reduced regional reliance on imported water supplies and included in Table C-1
- To the extent the Water Replenishment District of Southern California (WRD) has, or plans to, use recycled water to replenish the Central Basin, the City's proportional share (up to the total replenishment water obligation) will be included on Table C-1.

These categories of reduced imported water reliance are discussed below. The sum of the increased regional self-reliance and the sum of the reduced regional reliance imported water demand resulting from these categories is reflected on Table C-3 and Table C-4, respectively, and is reflective of the City's overall reduced reliance.

Reduced GPCD

Section 6.2.2 of the 2025 UWMP describes the management of the Central Basin. The City produces groundwater from the Central Basin, which is adjudicated and managed by the WRD. The City's current Allowed Pumping Allocation in the Central Basin is 4,680.03 AFY. As discussed in Section 6.2.7 of the 2025 UWMP, the City can lease Central Basin water rights on an annual basis to allow for additional production above its Allowed Pumping Allocation. In addition, the City can purchase treated imported water from Central Basin Municipal Water District which is ultimately provided by the Metropolitan Water District of Southern California. The City regularly sells potable water to the City of Long Beach and Golden State Water Company. However, the City has not purchased imported water supplies in over 30 years.

Chapter 9 of the 2025 UWMP describes the Demand Management Measures which the City has implemented to reduce the amount water used by its customers. In addition, Chapter 6 of the 2025 UWMP describes the groundwater basin management measures implemented by WRD. Collectively these actions translate to a reduction in the GPCD usage rate which is described further in Chapter 5 of the 2025 UWMP. These actions directly impact total water demands, and consequently, the quantity of imported water which may be required. Absent the proactive measures taken by the City, it is anticipated there may have been a greater demand on imported water.

Pursuant to DWR guidance, reduced reliance on imported water supplies can be demonstrated by first selecting a “Baseline” water demand, represented by total potable water demands during CY 2010. Table C-1 summarizes the “Baseline” water usage by the City in 2010 (assuming demand reduction efforts had not been implemented); actual water usage in 2015, 2020, and 2025; and projected water usage through 2050 in five-year increments. Table C-2 demonstrates that, but for the water conservation efforts implemented by the City, there may have been a greater reliance on untreated imported water supplies during the Baseline year as compared to subsequent years. The reduction is considered the reduced imported water reliance.

The City’s potable water demand during 2010, along with the corresponding service area population, were used to determine the Baseline GPCD. Subsequently, the actual demands for 2015, 2020, and 2025 were compared to the calculated population to obtain the recent GPCD which includes the water conservations measures which have been implemented (those demand management measures are described in Chapter 9 of the 2025 UWMP). The “Water Supplies Contributing to Regional Self-Reliance" are also provided in Table C-1. The differences between the Baseline GPCD and the 2015, 2020, and 2025 GPCDs are effectively considered a demonstration of the reduced regional reliance on imported water supplies with the understanding that any potential increased demand by the City resulting from increased population could have been required, absent the City’s new water supplies which contribute to self-reliance. A similar methodology is

used for the projected potable water demands (2025 UWMP Table 4-2) and populations (2025 UWMP Table 3-1).

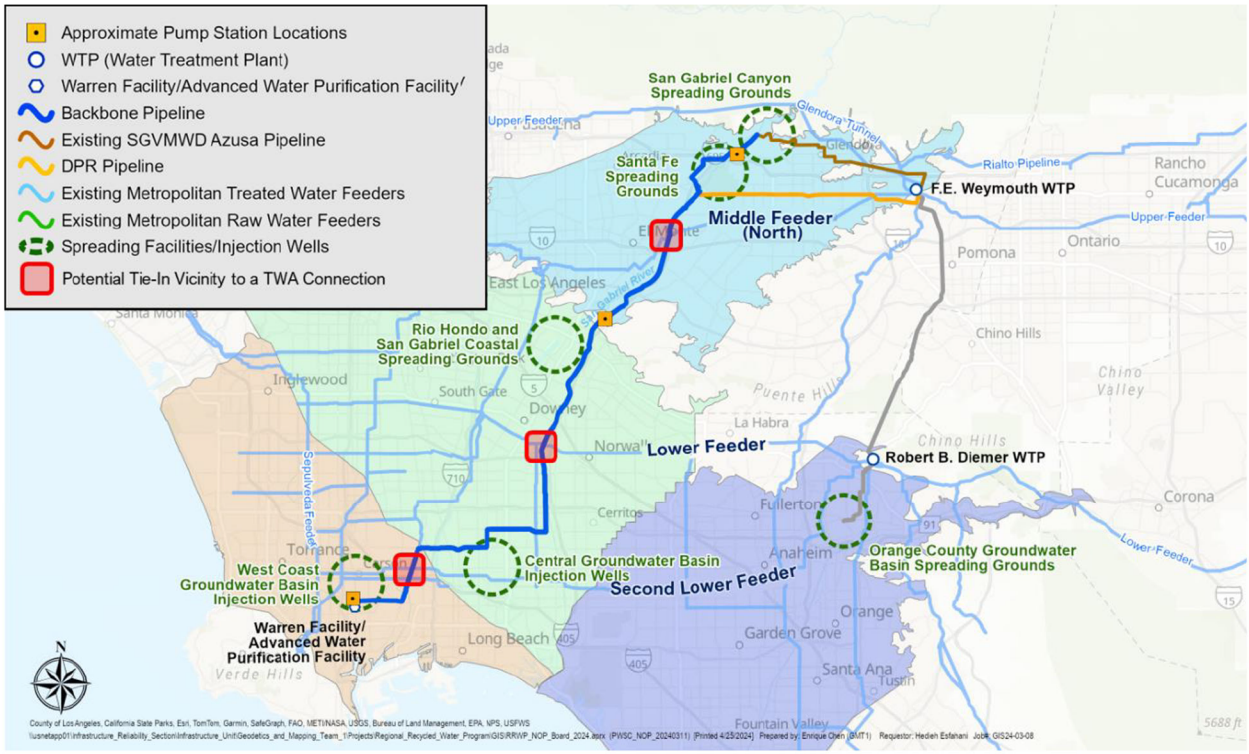
Recycled Water Use

The City has also constructed infrastructure to deliver recycled water to its customers instead of continuing to use its potable water supplies. The historical recycled water demands for 2015, 2020, and 2025, along with the projected recycled water demands (2025 UWMP Table 4-2) are incorporated in Table C-1. These quantities are in addition to the reduced demand resulting from decreased GPCD.

Recycled Water for Groundwater Replenishment

MWD is currently partnering with LACSD to investigate the viability of providing up to 150 million gallons per day (MGD) (approximately 168,000 AFY) of advanced treated wastewater from LACSD's A.K. Warren Water Resource Facility (formerly Joint Water Pollution Control Plant) located in Carson, California (Carson Plant). The "Pure Water Southern California" (Pure Water) project would deliver purified water from the Carson Plant in up to 60 miles of transmission pipelines to groundwater basins within MWD's service area, including the Central, West Coast, Main San Gabriel, and Orange County Basins. The purified water would be used for groundwater recharge, groundwater storage, and industrial facilities. In addition, purified water could potentially be treated further at two of MWD's existing water treatment plants for direct potable reuse. The locations of the proposed pipeline alignments are provided in the figure below.

Regional Recycled Water Program Location



Source: https://www.mwdh2o.com/building-local-supplies/pure-water-southern-california/

MWD began construction of a $17 million small-scale demonstration plant (0.5 MGD) in late 2017 which was completed in October 2019. The results of the demonstration plant will allow MWD and others to determine if expansion to a full-scale plant is beneficial. The full-scale plant would take approximately 11 years to construct once approved (with a cost of over $3 billion).

Pursuant to MWD's "*Regional Recycled Water Program Conceptual Planning Studies Report*", February 2019, the proposed Pure Water project would potentially deliver up to 9 MGD (about 10,000 AFY) of purified water for injection at the Montebello Forebay or for spreading at the Rio Hondo Spreading Grounds in Pico Rivera for Central Basin replenishment purposes. Water produced from the proposed Pure Water project would offset an equal amount of untreated imported water from the State Water Project and/or the Colorado River, which otherwise historically may have been used for groundwater

replenishment (including in the Central Basin). For the Central Basin, MWD has entered into a letter of intent with Central Basin Municipal Water District for up to 69,000 AFY. As noted in Section 6.2.2 of the 2025 UWMP, all producers in Central Basin are levied a "Replenishment Assessment" to replenish Central Basin on each acre-foot of groundwater produced. Therefore, the benefit to each producer in this Plan is based on the proportional share of its anticipated production to the total Central Basin production.

WRD has developed the "Water Independence Now" (WIN) Project, formerly referred to as the Groundwater Reliability Improvement Program (GRIP), which consists of about 10,500 AFY of highly treated recycled water blended with an additional 10,500 AFY of recycled water, for a total of 21,000 AFY. This recycled water is produced from LACSD's San Jose Creek Water Reclamation Plant and is used to replenish the Central Basin. The WIN Project will offset an equal amount of SWP water. As noted in Section 6.2.2 of the 2025 UWMP, all producers in Central Basin are levied a "Replenishment Assessment" to replenish Central Basin on each acre-foot of groundwater produced. Therefore, the benefit to each producer in this Plan is based on the proportional share of its anticipated production to the total Central Basin production. The recharged water hypothetically assigned to the City is based on the City's share of the Central Basin's total Allowable Pumping Allocation (217,367 AFY) multiplied by the amount of recycled water replenished and is shown on Table C-3.

The decrease in GPCD, increase in recycled water use, and enhanced groundwater recharge programs compared to the Baseline year has resulted in an overall decrease in reliance on imported water supplies. As shown in Table C-4, the percentage of imported water supplies relative to the City's total supply has decreased, and is projected to decrease, from the percentage in the Baseline year.

Metropolitan Water District of Southern California

In addition, as the wholesale provider, the Metropolitan Water District of Southern California has included a detailed discussion regarding measurable reduction in Delta

reliance in Appendix 10 of its 2025 Regional Urban Water Management Plan. That discussion is included by reference and also included in Attachment 1 of this Plan.

Table C-1: Optional Calculation of Water Use Efficiency -To be completed if Water Supplier does not specifically estimate Water Use Efficiency as a supply

Service Area Water Use Efficiency Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For[1]	9,552	7,053	7,522	6,720	7,558	7,626	7,638	7,652	7,669
Non-Potable Water Demands	444	506	488	423	485	485	485	485	485
Potable Service Area Demands with Water Use Efficiency Accounted For	9,108	6,547	7,034	6,298	7,073	7,141	7,153	7,167	7,184

Total Service Area Population	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Service Area Population	59,660	62,399	63,470	60,019	63,781	64,397	64,512	64,628	64,781

Water Use Efficiency Since Baseline (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Per Capita Water Use (GPCD)	136	94	99	94	99	99	99	99	99
Change in Per Capita Water Use from Baseline (GPCD)		(43)	(37)	(43)	(37)	(37)	(37)	(37)	(37)
Estimated Water Use Efficiency Since Baseline		2,979	2,656	2,865	2,664	2,690	2,696	2,699	2,706

Table C-2: Calculation of Service Area Water Demands Without Water Use Efficiency

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	9,552	7,053	7,522	6,720	7,558	7,626	7,638	7,652	7,669
Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline		2,979	2,656	2,865	2,664	2,690	2,696	2,699	2,706
Service Area Water Demands without Water Use Efficiency Accounted For	9,552	10,032	10,178	9,585	10,222	10,316	10,334	10,351	10,375

Table C-3: Calculation of Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Water Use Efficiency	-	2,979	2,656	2,865	2,664	2,690	2,696	2,699	2,706
Water Recycling	444	506	488	423	435	435	435	435	435
Stormwater Capture and Use									
Advanced Water Technologies (WIN Project)[2]	-	-	-	443	443	443	443	443	443
Advanced Water Technologies (Pure Water - Central Basin)[3]	-	-	-	-	-	434	434	434	434
Conjunctive Use Projects									
Local and Regional Water Supply and Storage Projects									
Other Programs and Projects the Contribute to Regional Self-Reliance									
Water Supplies Contributing to Regional Self-Reliance	444	3,485	3,144	3,731	3,542	4,002	4,008	4,011	4,018

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	9,552	10,032	10,178	9,585	10,222	10,316	10,334	10,351	10,375

Change in Regional Self Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Water Supplies Contributing to Regional Self-Reliance	444	3,485	3,144	3,731	3,542	4,002	4,008	4,011	4,018
Change in Water Supplies Contributing to Regional Self-Reliance		3,041	2,700	3,287	3,098	3,558	3,564	3,567	3,574

Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Percent of Water Supplies Contributing to Regional Self-Reliance	4.6%	34.7%	30.9%	38.9%	34.7%	38.8%	38.8%	38.8%	38.7%
Change in Percent of Water Supplies Contributing to Regional Self-Reliance		30.1%	26.2%	34.3%	30.0%	34.1%	34.1%	34.1%	34.1%

Table C-4: Calculation of Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
CVP/SWP Contract Supplies									
Delta/Delta Tributary Diversions									
Transfers and Exchanges									
Other Water Supplies from the Delta Watershed (Untreated)[4]	1,141	803	-	-	-	-	-	-	-
Other Water Supplies from the Delta Watershed (Treated)[5]	-	-	-	-	-	-	-	-	-
Total Water Supplies from the Delta Watershed	1,141	803	-	-	-	-	-	-	-

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	9,552	10,032	10,178	9,585	10,222	10,316	10,334	10,351	10,375

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Water Supplies from the Delta Watershed	1,141	803	-	-	-	-	-	-	-
Change in Water Supplies from the Delta Watershed		(337)	(1,141)	(1,141)	(1,141)	(1,141)	(1,141)	(1,141)	(1,141)

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050 (Optional)
Percent of Water Supplies from the Delta Watershed	11.9%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Percent of Water Supplies from the Delta Watershed		-3.9%	-11.9%	-11.9%	-11.9%	-11.9%	-11.9%	-11.9%	-11.9%

[1] Does not include water deliveries made to the City of Long Beach or Golden State Water Company.

[2] As part of the Water Independence Now Project, the Albert Robles Center was completed in 2019 and supplies about 21,000 AFY to Central Basin for replenishment purposes. The projected amount available to the City is based on the City's share of the total Allowable Pumping Allocation (4.339205%) and recent historical replenishment.

[3] The Pure Water project is anticipated to result in 10,000 AFY for the Central Basin starting in 2035. The projected amount available to the City is based on the share of Central Basin's total Allowable Pumping Allocation (4.339205%).

[4] Represents imported water for replenishment purposes by the Water Replenishment District of Southern California in the Central Basin.

[5] Represents treated imported water supplies from Central Basin Municipal Water District, a member agency of Metropolitan Water District.

Attachment 1

Appendix 10

QUANTIFYING REGIONAL SELF-RELIANCE AND REDUCED RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED

Appendix 10
METROPOLITAN'S
REDUCED DELTA RELIANCE REPORTING

A.10.1 Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action in the Delta,[1] prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.[2] Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.[3]

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and subsequent Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[4]

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:

(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);

(2) That failure has significantly caused the need for the export, transfer, or use; and

(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

[1] Water Code, § 85057.5; Cal. Code Regs. tit. 23, § 5001.
[2] Water Code, § 85225; Delta Plan, App. D.
[3] Water Code, §§ 85225.10-85225.25; Delta Plan, App. D.
[4] Cal. Code Regs., tit. 23, § 5003.

(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:

- *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
- *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*
- *(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The analysis and documentation provided below include all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

A.10.2 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

The expected outcomes for Metropolitan's Delta reliance and regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2025 (Guidebook Appendix C) issued in 2025.

The data used in this analysis represent the total regional efforts of Metropolitan and its member agencies and their customers (many of them, retail agencies) and were developed in conjunction with Metropolitan's member agencies as part of the UWMP coordination process as described in Chapter 5 of Metropolitan's UWMP. In accordance with UWMP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta.

While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed.

For water suppliers that make investments in regional projects or programs it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta. Due to the extensive, long-standing and successful implementation of regional demand management and local resource incentive programs in Metropolitan's service area, this infeasibility holds true for Metropolitan's members as well as their customers. For Metropolitan's service area, reduced reliance on supplies from the Delta watershed can only be accurately accounted at the regional level, as is demonstrated in this analysis.

The following provides a summary of the near-term (2030) and long-term (2050) expected outcomes for Metropolitan's Delta reliance and regional self-reliance. The results show that as a region, Metropolitan and its members as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

Expected Outcomes for Regional Self-Reliance

- Near-term (2030) – Normal water year regional self-reliance is expected to increase by 601 TAF from the 2010 baseline; this represents an increase of almost 20 percent of 2030 normal water year retail demands (Table A.10-2).
- Long-term (2050) – Normal water year regional self-reliance is expected to increase by more than 1.02 MAF from the 2010 baseline, this represents an increase of more than 20 percent of 2050 normal water year retail demands (Table A.10-2).

Expected Outcomes for Reduced Reliance on Supplies from the Delta Watershed

- Near-term (2030) – Normal water year reliance on supplies from the Delta watershed decreased by 466 TAF from the 2010 baseline, this represents a decrease of more than 6 percent of 2030 normal water year retail demands (Table A.10-3).
- Long-term (2050) – Normal water year reliance on supplies from the Delta watershed decreased by 537 TAF from the 2010 baseline, this represents a decrease of just over 9 percent of 2050 normal water year retail demands (Table A.10-3).

A10.3 Demonstration of Reduced Reliance on the Delta

The methodology used to determine Metropolitan's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and

the documentation of specific data sources. Some of the key assumptions underlying Metropolitan's demonstration of reduced reliance include:

- All data were obtained from the current 2025 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of Metropolitan and its members as well as their customers.
- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

Baseline and Expected Outcomes

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from Metropolitan's 2005 UWMP as the UWMPs generally do not provide normal water year data for the year that they are adopted (i.e., 2005 UWMP forecasts begin in 2010, 2010 UWMP forecasts begin in 2015, and so on).

Consistent with the 2010 baseline data approach, the expected outcomes for reduced Delta reliance and improved regional self-reliance for 2015, 2020, and 2025 were taken from Metropolitan's 2010, 2015, and 2020 UWMPs respectively. Expected outcomes for 2030-2050 are from the current 2025 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

Service Area Demands Without Water Use Efficiency

In alignment with the Guidebook Appendix C, this analysis uses normal water year demands, rather than normal water year supplies to calculate expected outcomes in terms of the percentage of water used. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as Metropolitan that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. Table A.10-1 shows the results of this adjustment for Metropolitan. Supporting narratives and documentation for all of the data shown in Table A.10-1 are provided below.

Table A.10-1
Demands without Water Use Efficiency Accounted For

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demands with Water Use Efficiency Accounted For	4,628,000	4,563,000	4,163,000	3,763,000	3,798,000	3,879,000	3,920,000	3,945,000	3,972,000
Reported Water Use Efficiency	865,000	936,000	1,056,000	1,162,000	1,171,000	1,223,000	1,289,000	1,357,000	1,419,000
Service Area Demands without Water Use Efficiency Accounted For	**5,493,000**	**5,499,000**	**5,219,000**	**4,925,000**	**4,969,000**	**5,102,000**	**5,209,000**	**5,302,000**	**5,391,000**

Service Area Demands without Water Use Efficiency

The service area demands shown in Table A.10-1 represent the total retail water demands for Metropolitan's service area and include municipal and industrial demands, agricultural demands, seawater barrier demands, and storage replenishment demands. These demand types and the modeling methodologies used to calculate them are described in Chapter 2.2 and Appendix 1 of Metropolitan's UWMP.

Water Use Efficiency

The water use efficiency numbers shown in Table A.10-1 represent the total water use efficiency savings (conservation) for Metropolitan's region, including savings from active, code-based, price-effect and pre-1990 sources. These sources of water use efficiency and the methodologies used to calculate them are described in Chapter 2.2, Chapter 3.4, Chapter 3.7 and Appendix 1 of Metropolitan's UWMP.

The demand and water use efficiency data shown in Table A.10-1 were collected from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year
- 2030-2050 values – Metropolitan's 2025 UWMP, Table 2-1: Metropolitan Regional Water Demands Normal Water Year

Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table A.10-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table A.10-2 represent efforts to improve regional self-reliance for Metropolitan's entire service area and include the total contributions of Metropolitan and its members as

well as their customers. Supporting narratives and documentation for the all of the data shown in Table A.10-2 are provided below.

The results shown in Table A.10-2 demonstrate that Metropolitan's service area is measurably improving its regional self-reliance. In the near-term (2030), the expected outcome for normal water year regional self-reliance increases by 601 TAF from the 2010 baseline; this represents an increase of almost 20 percent of 2030 normal water year retail demands. In the long-term (2050), normal water year regional self-reliance is expected to increase by more than 1.0 MAF from the 2010 baseline; this represents an increase of 20 percent of 2050 normal water year retail demands.

Table A.10-2
Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Water Use Efficiency	865,000	936,000	1,056,000	1,162,000	1,171,000	1,223,000	1,289,000	1,357,000	1,419,000
Water Recycling	316,000	348,000	436,000	550,000	520,000	608,000	641,000	648,000	656,000
Stormwater Capture and Use	100,000	103,000	110,000	80,000	76,000	73,000	70,000	71,000	72,000
Advanced Water Technologies	111,000	101,000	194,000	194,000	200,000	215,000	218,000	220,000	222,000
Conjunctive Use Projects	1,416,000	1,429,000	1,303,000	1,255,000	1,222,000	1,239,000	1,244,000	1,243,000	1,242,000
Local and Regional Water Supply and Storage Projects	252,000	224,000	261,000	257,000	97,000	96,000	96,000	95,000	94,000
Other Programs and Projects that Contribute to Regional Self-Reliance	875,000	1,250,000	1,200,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Water Supplies Contributing to Regional Self-Reliance	**3,935,000**	**4,391,000**	**4,560,000**	**4,748,000**	**4,536,000**	**4,704,000**	**4,808,000**	**4,884,000**	**4,955,000**

Service Area Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demands without Water Use Efficiency Accounted For	5,493,000	5,499,000	5,219,000	4,925,000	4,969,000	5,102,000	5,209,000	5,302,000	5,391,000

Change in Regional Self Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Water Supplies Contributing to Regional Self-Reliance	3,935,000	4,391,000	4,560,000	4,748,000	4,536,000	4,704,000	4,808,000	4,884,000	4,955,000
Change in Supplies Contributing to Regional Self-Reliance	**NA**	**456,000**	**625,000**	**813,000**	**601,000**	**769,000**	**873,000**	**949,000**	**1,020,000**

Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Percent of Supplies Contributing to Regional Self-Reliance	71.6%	79.9%	87.4%	96.4%	91.3%	92.2%	92.3%	92.1%	91.9%
Change in Percent of Supplies Contributing to Regional Self-Reliance	**NA**	**8.2%**	**15.7%**	**24.8%**	**0**	**20.6%**	**20.7%**	**20.5%**	**0**

Water Use Efficiency

The water use efficiency information shown in Table A.10-2 is taken directly from Table A.10-1 above.

Water Recycling

The water recycling values shown in Table A.10-2 reflect the total recycled water production in Metropolitan's service area as described in Chapter 3.5 and Appendix 2 of Metropolitan's UWMP.

Stormwater Capture and Use

The stormwater capture and use data shown in Table A.10-2 include supplies from local surface water production as described in Chapter 1.4 and Appendix 2 of Metropolitan's UWMP.

These values do not include production from regional storage reservoirs; storage in these reservoirs is comprised of previously stored water from sources already reflected in

Tables A.10-2 and A.10-3. These regional storage resources are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The regional storage reservoirs and their yields are described in Chapter 3.6, Appendix 2 and Appendix 3 of Metropolitan's UWMP.

The stormwater capture and use values shown in Table A.10-2 also do not include stormwater capture that is used to recharge local groundwater basins. Stormwater capture for groundwater recharge supports production of groundwater in the region, and for the purposes of this analysis that production is already captured in Table A.10-2 under conjunctive use projects.

Advanced Water Technologies

The advanced water technologies data shown in Table A.10-2 include total groundwater recovery and seawater desalination production in Metropolitan's service area as described in Chapter 3.5 and Appendix 2 of Metropolitan's UWMP.

Conjunctive Use Projects

The values for conjunctive use projects shown in Table A.10-2 represent total groundwater production in the region as described in Chapter 1.4 and Appendix 2 of Metropolitan's UWMP.

The conjunctive use projects numbers shown in Table A.10-2 do not include production from regional groundwater conjunctive use programs. As described in the stormwater capture and use discussion above, these regional storage programs rely on previously stored water from sources already reflected in Tables A.10-2 and A.10-3 and are generally used to provide additional regional self-reliance in dry years. The regional groundwater conjunctive use programs and their yields are described in Chapter 3.6 and Appendix 3.

Local and Regional Water Supply and Storage Programs

The data for local and regional water supply and storage programs shown in Table A.10-2 include supplies from the Los Angeles Aqueduct. This supply is described in Chapter 1.4 and Appendix 2 of Metropolitan's UWMP.

The local and regional supply numbers shown in Table A.10-2, except for "Other Programs and Projects that Contribute to Regional Self-Reliance" which is discussed below, were obtained from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year
- 2030-2050 values – Metropolitan's 2025 UWMP, Table 2-1: Metropolitan Regional Water Demands Normal Water Year

Other Programs and Projects that Contribute to Regional Self-Reliance

Other programs and projects that contribute to regional self-reliance shown in Table A.10-2 include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct supplies and programs are described in Chapter 3.1 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.10-2 for other programs and projects that contribute to regional self-reliance come from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2010 (Average Year)
- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2020 (Average Year)
- 2025 values – Metropolitan's 2020 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2025 (Normal Water Year)
- 2030-2050 values – Metropolitan's 2025 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Years 2030, 2035, 2040, 2045, 2050 (Normal Water Year)

Reliance on Water Supplies from the Delta Watershed

In order for a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations. Based on the methodology described in Guidebook Appendix C, and consistent with the approach of this analysis in not including projects under development, this accounting does not include any supplies from potential future covered actions. Table A.10-3 shows the expected outcomes for reliance on supplies from the Delta watershed for Metropolitan's service area. Supporting narratives and documentation for the all of the data shown in Table A.10-3 are provided below.

The results shown in Table A.10-3 demonstrate that Metropolitan's service area is measurably reducing its Delta reliance. In the near-term (2030), the expected outcome for normal water year reliance on supplies from the Delta watershed decreased by 466 TAF from the 2010 baseline; this represents a decrease of 6 percent of 2030 normal water year retail demands. In the long-term (2050), normal water year reliance on supplies from the Delta watershed decreased by 537 TAF from the 2010 baseline; this represents a decrease of just over 9 percent of 2050 normal water year retail demands.

Table A.10-3
Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
CVP/SWP Contract Supplies	1,472,000	1,029,000	984,000	1,133,000	949,000	924,000	901,000	877,000	877,000
Delta/Delta Tributary Diversions	-	-	-	-	-	-	-	-	-
Transfers and Exchanges of Supplies from the Delta Watershed	20,000	44,000	91,000	58,000	77,000	77,000	78,000	78,000	78,000
Other Water Supplies from the Delta Watershed	-	-	-	-	-	-	-	-	-
Total Water Supplies from the Delta Watershed	**1,492,000**	**1,073,000**	**1,075,000**	**1,191,000**	**1,026,000**	**1,001,000**	**979,000**	**955,000**	**955,000**

Service Area Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demands without Water Use Efficiency Accounted For	5,493,000	5,499,000	5,219,000	4,925,000	4,969,000	5,102,000	5,209,000	5,302,000	5,391,000

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Water Supplies from the Delta Watershed	1,492,000	1,073,000	1,075,000	1,191,000	1,026,000	1,001,000	979,000	955,000	955,000
Change in Supplies from the Delta Watershed	**NA**	**(419,000)**	**(417,000)**	**(301,000)**	**(466,000)**	**(491,000)**	**(513,000)**	**(537,000)**	**(537,000)**

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Percent of Supplies from the Delta Watershed	27.2%	19.5%	20.6%	24.2%	20.6%	19.6%	18.8%	18.0%	17.7%
Change in Percent of Supplies from the Delta Watershed	**NA**	**-7.6%**	**-6.6%**	**-3.0%**	**-6.5%**	**-7.5%**	**-8.4%**	**-9.1%**	**-9.4%**

CVP/SWP Contract Supplies

The CVP/SWP contract supplies shown in Table A.10-3 include Metropolitan's SWP Table A and Article 21 supplies. These supplies are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.10-3 do not include Desert Water Agency/Coachella Valley Water District SWP contract supplies. These supplies are exchanged with Desert Water Agency and Coachella Valley Water District for an equal amount of Colorado River water, which is reflected in the Colorado River Aqueduct supplies shown in Table A.10-2. In addition, Desert Water Agency and Coachella Valley Water District should include their SWP contract supplies in their own accountings of reduced reliance. Additional information on these exchange agreements can be found in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

These values also do not include supplies from San Luis Carryover storage or Central Valley storage programs because storage in these programs comprises previously stored water from sources already reflected in Table A.10-3. These storage programs are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The Central Valley storage projects and their yields are described in Chapter 3.3, and Appendix 3. San Luis Carryover storage is described in Chapter 3.2 and Appendix 3.

Transfers and Exchanges of Supplies from the Delta Watershed

The transfers and exchanges of supplies from the Delta watershed shown in Table A.10-3 include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

Supplies from the Delta Watershed shown in Table A.10-3 are from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2010 (Average Year)
- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2020 (Average Year)
- 2025 values – Metropolitan's 2020 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2025 (Normal Water Year)
- 2030-2050 values – Metropolitan's 2025 UWMP, Table A.3-7: California Aqueduct Program Capabilities Years 2030, 2035, 2040, 2045, 2050 (Normal Water Year)

A.10.4 UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta*[.]

In accordance with Water Code Chapter 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Chapter 3 of Metropolitan's UWMP summarizes the implementation plan and continued progress in developing a diversified water portfolio to meet the region's water needs.

Water Use Efficiency

The water use efficiency numbers used in this analysis include the total water use efficiency savings (conservation) for the service area, including savings from active, code-based, price-effect and pre-1990 savings. The specific water use efficiency programs and their implementation are described in Chapter 3.4 of Metropolitan's UWMP.

Water Recycling

The water recycling values used in this analysis reflect the total recycled water production in Metropolitan's service area. Water recycling programs and implementation are discussed in Chapter 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

Stormwater Capture and Use

The stormwater capture and use data used in this analysis include supplies from local surface water production. Local surface water production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

Advanced Water Technologies

The advanced water technologies data used in this analysis include total groundwater recovery and seawater desalination production in Metropolitan's service. Groundwater recovery and seawater desalination programs and implementation are described in Chapter 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

Conjunctive Use Projects

The values for conjunctive use projects used in this analysis represent total groundwater production in the region. Groundwater production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

Local and Regional Water Supply and Storage Programs

The data for local and regional water supply and storage programs shown in this analysis include supplies from the Los Angeles Aqueduct. This program and its implementation are described in Appendix 2 of Metropolitan's UWMP.

Other Programs and Projects that Contribute to Regional Self-Reliance

Other programs and projects that contribute to regional self-reliance used in this analysis include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct programs and their implementation are described in Chapter 3.1 and Appendix 3 of Metropolitan's UWMP.

CVP/SWP Contract Supplies

The CVP/SWP contract supplies shown in this analysis include Metropolitan's SWP Table A and Article 21 supplies. These supplies and their implementation are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

Transfers and Exchanges of Supplies from the Delta Watershed

The transfers and exchanges of supplies from the Delta watershed shown in this analysis include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs and their implementation are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX D

60-DAY NOTIFICATION LETTERS

April 15, 2026

Emailed to: reymundot@centralbasin.org
With a cc to: luciac@centralbasin.org

Reymundo Trejo
Interim General Manager
Central Basin Municipal Water District
17785 Center Court Dr., Ste. 120
Cerritos, CA 90703

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Trejo:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

The public comment period will begin June 1, 2026, and the public hearing and plan adoption is tentatively scheduled for June 23, 2026. If you would like to review the draft 2025 UWMP Update, please send an email to amanzano@lakewoodca.gov with your contact information, and it will be emailed to you. If your organization has any comment on Lakewood's 2025 UWMP Update, please contact Anthony Manzano, Assistant Director of Water Resources, at (562) 866-9771, extension 2703, or email to amanzano@lakewoodca.gov.

Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: jarroyo@cerritos.gov

Jose Arroyo
Water Superintendent
City of Cerritos
18125 Bloomfield Ave.
Cerritos, CA 90703

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Arroyo:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

The public comment period will begin June 1, 2026, and the public hearing and plan adoption is tentatively scheduled for June 23, 2026. If you would like to review the draft 2025 UWMP Update, please send an email to amanzano@lakewoodca.gov with your contact information, and it will be emailed to you. If your organization has any comment on Lakewood's 2025 UWMP Update, please contact Anthony Manzano, Assistant Director of Water Resources, at (562) 866-9771, extension 2703, or email to amanzano@lakewoodca.gov.

Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: nem.ochoa@gswater.com

Nem Ochoa, P.E.
General Manager
Golden State Water Company
12035 Burke St., Ste. 1
Santa Fe Springs, CA 90670

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Ochoa:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

The public comment period will begin June 1, 2026, and the public hearing and plan adoption is tentatively scheduled for June 23, 2026. If you would like to review the draft 2025 UWMP Update, please send an email to amanzano@lakewoodca.gov with your contact information, and it will be emailed to you. If your organization has any comment on Lakewood's 2025 UWMP Update, please contact Anthony Manzano, Assistant Director of Water Resources, at (562) 866-9771, extension 2703, or email to amanzano@lakewoodca.gov.

Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: EHartling@lacsd.org

Earle Hartling
Water Recycling Coordinator
Los Angeles County Sanitation Districts
1955 Workman Mill Road
Whittier, CA 90601

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Hartling:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

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Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: dean.wang@lbwater.org

Dean Wang
Director of Utilities Resources
Long Beach Water Department
1800 East Wardlow Road
Long Beach, CA 90807

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Wang:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

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Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: jbednarski@mwdh2o.com

John Bednarski
Assistant General Manager of Water Resources and Technical Services
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054-0153

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Bednarski:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

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Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: GLuna@cityofsignalhill.org

Gabino Luna
Deputy Director
City of Signal Hill
2175 Cherry Ave.
Signal Hill, CA 90755

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Luna:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

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Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

April 15, 2026

Sent via email to: stucker@wrd.org
With a cc to: info@wrd.org

Stephan Tucker, P.E.
General Manager
Water Replenishment District
4040 Paramount Boulevard
Lakewood, CA 90712

SUBJECT: CITY OF LAKEWOOD 2025 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Tucker:

The City of Lakewood Department of Water Resources is currently in the process of preparing the 2025 Urban Water Management Plan (UWMP) Update, as required by the California Water Codes. The City would like to give your agency an opportunity to provide input for the preparation of this long-term resource planning document.

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Sincerely,

Derek Nguyen, Ph.D., P.E., BCEE
Director of Water Resources

Column

OFFICIAL AD PROOF

This is the proof of your ad scheduled to run in **Long Beach Press-Telegram** on the dates indicated below. If changes are needed, please contact us prior to deadline at **(310) 540-5511**.

Notice ID: kG2v2q7W5290jfB63bR9 | **Proof Updated: Jun. 09, 2026 at 09:20am PDT**
Notice Name: Notice of Public Hearing for 2025 Urban Water | Publisher ID: 0011797897

See Proof on Next Page

This is not an invoice. Below is an estimated price, and it is subject to change. You will receive an invoice with the final price upon invoice creation by the publisher.

FILER	FILING FOR
Isabelle Schultz cityclerk@lakewoodca.gov (562) 866-9771	Long Beach Press-Telegram

Columns Wide:	4	**Ad Class:**	Legals
Total Column Inches:	21.33		
Number of Lines:	48		

06/11/2026: City Notices Notice	453.49
06/18/2026: City Notices Notice	453.49
Subtotal	$906.98
Tax	$0.00
Processing Fee	$0.00
Total	**$906.98**

NOTICE OF PUBLIC HEARING

INVITING PUBLIC REVIEW AND COMMENT CONCERNING THE 2025 URBAN WATER MANAGEMENT PLAN, UPDATE AND ADOPTION OF THE WATER SHORTAGE CONTINGENCY PLAN

NOTICE IS HEREBY GIVEN that a public hearing will be held before the City Council of the City of Lakewood concerning the City of Lakewood's 2025 Update of the Urban Water Management Plan (UWMP) and the adoption of the Water Shortage Contingency Plan. You, and/or a collective representative of your group, may be present and heard at the date, time, and place of meeting given above. The City of Lakewood, in accordance with the Urban Water Management Planning Act of 1983, is providing the 2025 update to their Urban Water Management Plan as well as adopting a Water Shortage Contingency Plan.

NOTICE IS FURTHER GIVEN that the public hearing will be held on TUESDAY, June 23, 2026, at 7:30 P.M., in the City Council Chambers at the Civic Centre, 5000 Clark Avenue, Lakewood, California. All persons interested may appear at that time and testify in this matter. The Draft 2025 Urban Water Management Plan may be inspected by the public prior to the hearing at the office of the City Clerk's Office of Lakewood City Hall, 5050 Clark Avenue, Lakewood, California, Department of Water Resource's Office, 5812 Arbor Road, Lakewood, California, the Angelo M. Iacoboni Library, 4990 Clark Avenue, Lakewood, California, and the George Nye, Jr. Library, 6600 Del Amo Boulevard, Lakewood, California. Should you wish to contact the Department of Water Resources by phone, please call (562) 866-9771, extension 2703.

NOTICE IS FURTHER GIVEN that if you challenge the aforementioned action in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City at, or prior to, the public hearing.

DATED: 9th day of June, 2026

Dakota Wallace, CMC
City Clerk

Long Beach Press-Telegram
Published: 6/11, 6/18/26

NOTICE OF PUBLIC HEARING

INVITING PUBLIC REVIEW AND COMMENT CONCERNING THE 2025 URBAN WATER MANAGEMENT PLAN, UPDATE AND ADOPTION OF THE WATER SHORTAGE CONTINGENCY PLAN

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DATED: 9th day of June, 2026

Dakota Wallace, CMC
City Clerk

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX E

CLIMATE CHANGE CONSIDERATIONS (CAL- ADAPT DATA)

Annual Averages

Explore projected changes in annual average Maximum Temperature, Minimum Temperature and Precipitation through end of this century for California.

EXPLORE DATA
ABOUT THE TOOL
RESOURCES
HELP

Central Basin.kml

Change Location

Projected changes in **Annual Average Precipitation** under a **Medium Emissions (RCP 4.5) Scenario**.

MODELED HISTORICAL
Baseline (1961-1990)
Change Period

30 YEAR AVG	30 YEAR RANGE
15.1 inch	3.9–33.7 inch

Learn More

FUTURE PROJECTIONS
Mid-Century (2035-2064)
Change Period

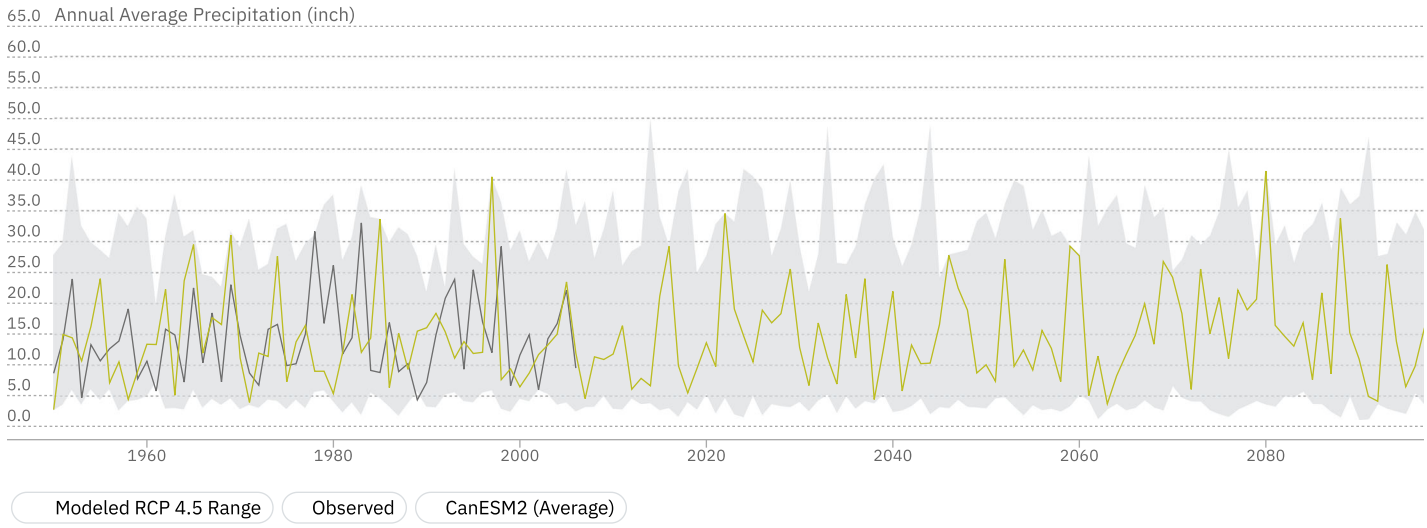
30 YEAR AVG	30 YEAR RANGE
14.2 inch	3.7–29.3 inch

Learn More

FUTURE PROJECTIONS
End-Century (2070-2099)
Change Period

30 YEAR AVG	30 YEAR RANGE
16.5 inch	4.1–41.5 inch

Learn More

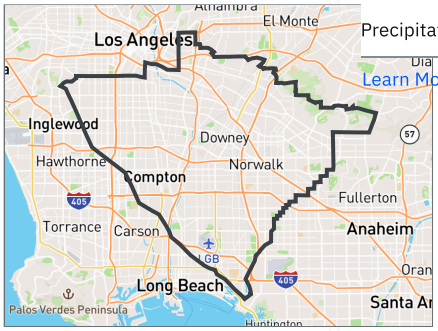


Source: Cal-Adapt. Data: LOCA Downscaled CMIP5 Climate Projections (Scripps Institution of Oceanography), Gridded Observed Meteorological Data (University of Colorado Boulder), LOCA Derived Products (Geospatial Innovation Facility).

Explain Chart ⓘ

Download Chart Share

SELECT LOCATION



Learn More ⓘ

SELECT CLIMATE VARIABLE

Precipitation

Learn More ⓘ

SELECT SCENARIO

- ○ Medium (RCP 4.5)
- ○ High (RCP 8.5)

Learn More ⓘ

SELECT MODELS

1 Select...

CanESM2

Learn More ⓘ

About the Tool

Overall temperatures are projected to rise substantially throughout this century. These projections differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. On average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized.

With this tool you can explore projections of annually averaged maximum temperature, minimum temperature and precipitation. These climate projections have been downscaled from global climate models from the CMIP5 archive, using the Localized Constructed Analogs (LOCA) statistical technique developed by Scripps Institution Of Oceanography. LOCA is a statistical downscaling technique that uses past history to add improved fine-scale detail to global climate models.

Data Sources

The following list of datasets were used to create this tool. Download data visualized in the charts by clicking the Download Chart button. For more download options follow the links below.

LOCA Downscaled CMIP5 Climate Projections

Scripps Institution of Oceanography

Daily climate projections for California at a resolution of 1/16° (about 6 km, or 3.7 miles) generated to support climate change impact studies for California's Fourth Climate Change Assessment. The data, derived from 32 coarse-resolution (~100 km) global climate models from the CMIP5 archive, were bias corrected and downscaled using the Localized Constructed Analogues (LOCA) statistical

method. The data cover 1950-2005 for the historical period and 2006-2100 (some models stop in 2099) for two future climate projections. Details are described in Pierce et al., 2018.

Download dataset:

- Cal-Adapt Data Download Tool
- Cal-Adapt Data Server - loca (netcdf)

References:

- LOCA Statistical Downscaling (link)
- Pierce et al. (2018). Climate, drought, and sea level rise scenarios for California's fourth climate change assessment. California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CNRA-CEC-2018-006. (link)

Gridded Observed Meteorological Data

University of Colorado Boulder

Historical observed daily temperature data from approximately 20,000 NOAA Cooperative Observer (COOP) stations form the basis of this gridded dataset from 1950–2013 at a spatial resolution of 1/16° (approximately 6 km). Observation-based meteorological data sets offer insights into changes to the hydro-climatic system by diagnosing spatio-temporal characteristics and providing a historical baseline for future projections. Details are described in Livneh et al., 2015.

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LOCA Derived Products

Geospatial Innovation Facility

Datasets created from LOCA downscaled CMIP5 climate projections for Cal-Adapt tools. These currently include the modeled annual variability envelope (maximum and minimum from range of annual average values from all 32 GCMs); precalculated data tables of extreme heat counts for California counties and census tracts for 4 priority models and 2 scenarios.

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- Extreme heat data for California counties and census tracts (csv)

References:

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Resources

California Adaptation Clearinghouse

The Adaptation Clearinghouse is the State of California's consolidated searchable database of resources for local, regional and statewide climate adaptation planning and decision-making.

VIEW RESOURCE

California's 4th Climate Change Assessment

California's Fourth Climate Change Assessment advances actionable science that serves the growing needs of state and local-level decision-makers from a variety of sectors.

VIEW RESOURCE

Related Cal-Adapt Tools

Maps of Projected Change

Maps depicting long-term (30 years) changes in annual average temperature and precipitation.

EXPLORE

Help

Get Started

An introduction to climate data, models, and projections.

LEARN MORE

FAQs

Frequently asked questions about Cal-Adapt's tools and data.

LEARN MORE

Cal-Adapt has been developed by the Geospatial Innovation Facility at the University of California, Berkeley with funding and advisory oversight by the California Energy Commission and the California Strategic Growth Council.

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EXPLORE DATA
ABOUT THE TOOL
RESOURCES
HELP

Central Basin.kml

Change Location

Projected changes in **Annual Average Maximum Temperature** under a **Medium Emissions (RCP 4.5) Scenario**.

MODELED HISTORICAL
Baseline (1961-1990)
Change Period

30 YEAR AVG	30 YEAR RANGE
74.7 °F	72.1–77.7 °F

Learn More

FUTURE PROJECTIONS
Mid-Century (2035-2064)
Change Period

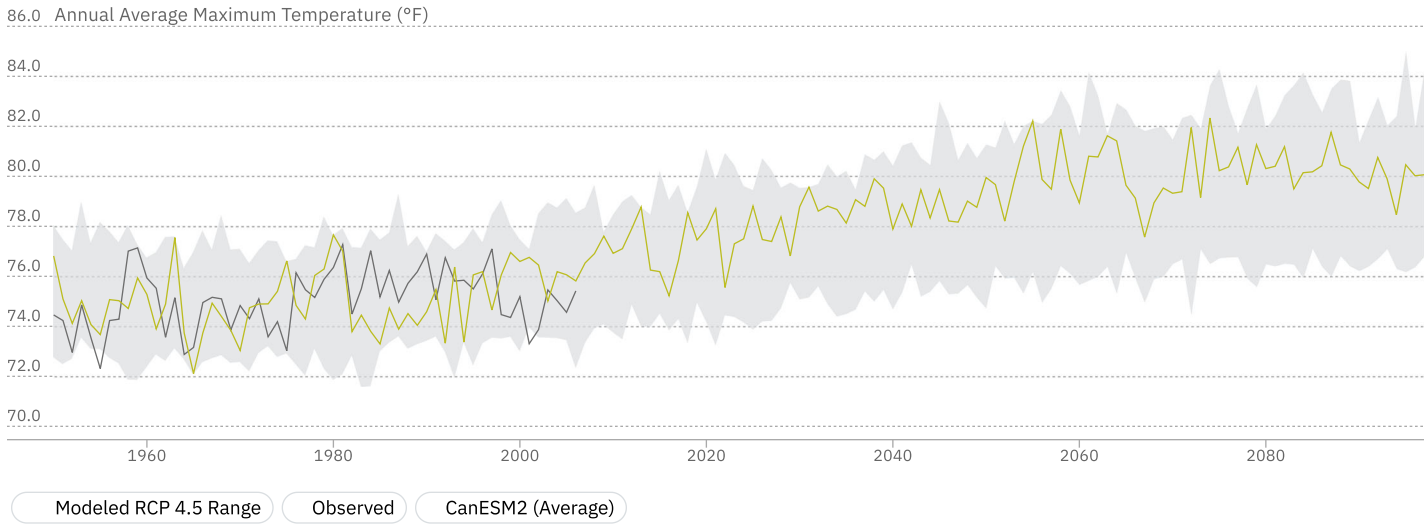
30 YEAR AVG	30 YEAR RANGE
79.6 °F	77.9–82.2 °F

Learn More

FUTURE PROJECTIONS
End-Century (2070-2099)
Change Period

30 YEAR AVG	30 YEAR RANGE
80.3 °F	78.5–82.3 °F

Learn More



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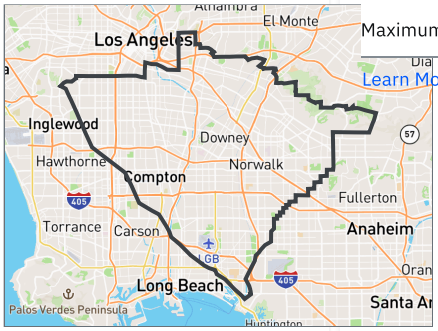
Explain Chart

Download Chart Share

SELECT LOCATION



Learn More

SELECT CLIMATE VARIABLE

Maximum Temperature

Learn More

SELECT SCENARIO

- Medium (RCP 4.5)
- High (RCP 8.5)

Learn More

SELECT MODELS

1 Select...

CanESM2

Learn More

About the Tool

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Frequently asked questions about Cal-Adapt's tools and data.

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CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX F

SB X7-7 2025 COMPLIANCE FORM

SB X7-7 Table 0: Units of Measure Used in 2025 UWMP **Water Code Section 10608.20 (e) and 10608.20(h)(1)(2)** (select one from the drop down list)
Acre Feet
The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.
NOTES:

SB X7-7 Table 2: Method for 2025 Population Estimate Water Code Section 10608.20 (e) and 10608.20(h)(1)(2)	
Method Used to Determine 2025 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**3. Other** DWR recommends pre-review
NOTES: 2025 population was estimated using U.S. Census estimates for 2025 and a GIS Census tract analysis.	

SB X7-7 Table 3: 2025 Service Area Population Water Code Section 10608.20 (e) and 10608.20(h)(1)(2)	
2025 Compliance Year Population	
2025	60,019
NOTES:	

SB X7-7 Table 4: 2025 Gross Water Use
Water Code Section 10608.20 (e) and 10608.20(h)(1)(2)

Compliance Year 2025	2025 Volume Into Distribution System This column will remain blank until SB X7-7 Table 4-A is completed.	2025 Deductions					2025 Gross Water Use
		Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water This column will remain blank until SB X7-7 Table 4-B is completed.	Water Delivered for Agricultural Use	Process Water This column will remain blank until SB X7-7 Table 4-D is completed.	
	6,297	-		-		-	**6,297**

DWR NOTES: Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2025 Volume Entering the Distribution System(s), Meter Error Adjustment
Water Code Section 10608.20 (e) and 10608.20(h)(1)(2)
Complete one table for each source.

Name of Source	Central Basin Groundwater

This water source is (check one)**:**

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2025	Volume Entering Distribution System	Meter Error Adjustment Optional (+/-)	Corrected Volume Entering Distribution System
	6,297	-	6,297

DWR NOTES: Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.
Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document

NOTES

SB X7-7 Table 5: 2025 Gallons Per Capita Per Day (GPCD) Water Code Section 10608.20 (e) and 10608.20 (h)(1)(2)		
2025 Gross Water **Fm SB X7-7 Table 4**	**2025 Population Fm** **SB X7-7 Table 3**	**2025 GPCD**
6,297	60,019	**94**
NOTES:		

SB X7-7 Table 9: 2025 Compliance
Water Code Section 10608.24(d)

Actual 2025 GPCD	Optional Adjustments to 2025 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments	Adjusted 2025 GPCD (Adjusted if applicable)	2020 Target	**Did Supplier Achieve Targeted Reduction for 2025?**
	Extraordinary Events (GPCD)	Weather Normalization (GPCD)	Economic Adjustment (GPCD)				
94		-	-	-	93.66309539	99	**YES**

DWR NOTES: All values are reported in GPCD
Suppliers that had a merger or consolidation since 2020 may use a population weighted average 2020 target. See Section P.1.2.1 of Appendix P.

NOTES:

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX G

CENTRAL BASIN THIRD AMENDED JUDGMENT

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

CENTRAL AND WEST BASIN WATER REPLENISHMENT DISTRICT, etc., Plaintiff, vs. CHARLES E. ADAMS, et al., Defendant	Case No.: 786,656 THIRD AMENDED JUDGMENT (Declaring and establishing water rights in Central Basin, enjoining extractions therefrom in excess of specified quantities and providing for the storage and extraction of stored water.)
CITY OF LAKEWOOD, a municipal corporation, Cross-Complainant vs. CHARLES E. ADAMS, et al., Cross-Defendants.	Assigned for all purposes to Hon. Abraham Khan Dept. 51

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The original judgment in this action was entered on or about August 27, 1965. Pursuant to the reserved and continuing jurisdiction of the court under the Judgment herein, certain amendments to said Judgment and temporary orders have heretofore been made and entered. Continuing jurisdiction of the court for this action is currently assigned to Hon. Abraham Khan.

The Motion of Plaintiff WATER REPLENISHMENT DISTRICT OF SOUTHERN CALIFORNIA (which originally brought this action under its former name "Central and West Basin Water Replenishment District"), and of defendants, City of Lakewood, City of Long Beach, Golden State Water Company, California Water Service Company, City of Los Angeles, City of Cerritos, City of Downey, City of Signal Hill, Pico Water District, Bellflower-Somerset Mutual Water Company, LaHabra Heights County Water District, City of Norwalk, Orchard Dale Water District, Montebello Land & Water Company, South Montebello Irrigation District, Sativa Los Angeles County Water District, City of Vernon and Central Basin Municipal Water District ("Moving Parties") herein for further amendments to the Judgment, notice thereof and of the hearing thereon having been duly and regularly given to all parties, came on for hearing in Department 51 of the above-entitled court on December 18, 2013 at 9:00 a.m. before said Hon. Abraham Khan. This "Third Amended Judgment" incorporates amendments and orders heretofore made to the extent presently operable and amendments pursuant to said last mentioned motion. To the extent this Amended Judgment is a restatement of the Judgment as heretofore amended, it is for convenience in incorporating all matters in one document, is not a readjudication of such matters and is not intended to reopen any such matters. As used hereinafter the word "Judgment" shall include the original Judgment entered in this action as amended to date, including this Third Amended Judgment.

There exists in the County of Los Angeles, State of California, an underground water basin or reservoir known and hereinafter referred to as the "Central Basin" or "Basin" described in Appendix "1" to this Judgment.

Within this Judgment, the following terms, words, phrases and clauses are used by the Court with the following meanings:

"Adjudicated Storage Capacity" means 220,000 acre-feet of the Available Dewatered

Space which has been apportioned herein for Individual Storage Accounts and Community Storage.

"Administrative Body" is defined in Section II(A).

"Administrative Year" means the twelve (12) month period beginning July 1 and ending June 30.

"Allowed Pumping Allocation" is that quantity in acre feet which the Court adjudges to be the maximum quantity which a party should be allowed to extract annually from Central Basin as set forth in Part I hereof, which constitutes 80% of such party's Total Water Right.

"Allowed Pumping Allocation for a particular Administrative Year" and "Allowed Pumping Allocation in the following Administrative Year" and similar clauses, mean the Allowed Pumping Allocation as increased in a particular Administrative Year by any authorized carryovers pursuant to Section III(A) of this Judgment and as reduced by reason of any over-extractions in a previous Administrative Year.

"Artificial Replenishment" is the replenishment of Central Basin achieved through the spreading or injection of imported or recycled water for percolation thereof into Central Basin by a governmental agency, including WRD.

"Artificial Replenishment Water" means water captured or procured by WRD to replenish the Basin, either directly by percolating or injecting the water into the Basin, or through in lieu replenishment by substituting surface water (or payment therefor) in lieu of production and use of groundwater.

"Available Dewatered Space" means the total amount of space available to hold groundwater within the Central Basin without causing Material Physical Harm, which space is allocated between Adjudicated Storage Capacity and Basin Operating Reserve.

"Base Water Right" is the highest continuous extractions of water by a party from Central Basin for a beneficial use in any period of five consecutive years after the commencement of overdraft in Central Basin and prior to the commencement of this action, as to which there has been no cessation of use by that party during any subsequent period of five consecutive years. As employed in the above definition, the words "extractions of water by a party" and "cessation

of use by that party" include such extractions and cessations by any predecessor or predecessors in interest.

"Basin Operating Reserve" means a total of 110,000 acre feet of Available Dewatered Space available for Basin operations as provided in Section IV(L). The Basin Operating Reserve added to the Adjudicated Storage Capacity equals the amount of Available Dewatered Space.

"Calendar Year" is the twelve month period commencing January 1 of each year and ending December 31 of each year.

"Carryover" is defined in Section III(A).

"Carryover Conversion" means the process of transferring water properly held as Carryover into Stored Water, or the water so converted to Stored Water.

"Central Basin" is the underground basin or reservoir underlying the Central Basin Area, the exterior boundaries of which Central Basin are the same as the exterior boundaries of Central Basin Area.

"Central Basin Area" is the territory described in Appendix "1" to this Judgment and is a segment of the territory comprising Plaintiff District.

"Central Basin Water Rights Panel" means the constituent body of Watermaster consisting of seven (7) Parties elected from among parties holding Allowed Pumping Allocations as provided in Section II(B).

"CEQA" refers to the California Environmental Quality Act, Public Resources Code §§ 21000 *et seq*.

"Community Storage Pool" is defined in Section IV(E).

"Declared Water Emergency" means a period commencing with the adoption of a resolution of the Board of Directors of WRD declaring that conditions within the Central Basin relating to natural and imported supplies of water are such that, without implementation of the water emergency provisions of this Judgment, the water resources of the Central Basin risk degradation. Such Declaration may be made as provided in Section III(A)(3).

"Disadvantaged Community" means any area that is served by a Water Purveyor and that consists of one or more contiguous census tracts which, based upon the most-recent United

States Census data, demonstrates a median household income which is less than eighty percent (80%) of the median household income for all Census Tracts within the state of California. The identification of Disadvantaged Communities shall be made by Watermaster following each decennial census.

"Extraction," "extractions," "extracting," "extracted," and other variations of the same noun and verb, mean pumping, taking, diverting or withdrawing groundwater by any manner or means whatsoever from Central Basin.

"Imported Water" means water brought into Central Basin Area from a non-tributary source by a party and any predecessors in interest, either through purchase directly from Metropolitan Water District of Southern California ("MWD"), the Central Basin Municipal Water District ("CBMWD"), or any other MWD member agency and additionally, as to the Department of Water and Power of the City of Los Angeles, water brought into the Central Basin Area by that party by means of the Owens River Aqueduct. In the case of water imported for storage by a party pursuant to this Judgment, "Imported Water" means water brought into the Central Basin from any non-tributary source as one method for establishing storage in the Central Basin.

"Imported Water Use Credit" is the annual amount, computed on a calendar year basis, of Imported Water which any party and any predecessors in interest, who have timely made the required filings under Water Code Section 1005.1, have imported into Central Basin Area in any calendar year and subsequent to July 9, 1951, for beneficial use therein, but not exceeding the amount by which that party and any predecessors in interest reduces his or their extractions of groundwater from Central Basin in that calendar year from the level of his or their extractions in the preceding calendar year, or in any prior calendar year not earlier than the calendar year 1950, whichever is the greater.

"Individual Storage Allocation" is defined in Section IV(D).

"Majority Protest" means a written protest filed with the Administrative Body of Watermaster within sixty (60) days following a protested event or decision, which evidences the concurrence of a majority of the Allowed Pumping Allocations held within the Basin as of the

date thereof.

"Material Physical Harm" means material physical injury or a material diminution in the quality or quantity of groundwater available within the Basin to support extraction of Total Water Rights or Stored Water, that is demonstrated to be attributable to the placement, recharge, injection, storage or recapture of Stored Water in the Central Basin, including, but not limited to, degradation of water quality, liquefaction, land subsidence and other material physical injury caused by elevated or lowered groundwater levels. Material Physical Harm does not include "economic injury" that results from other than direct physical causes, including any adverse effect on water rates, lease rates, or demand for water. Once fully mitigated, physical injury shall no longer be considered to be material.

"Natural Replenishment" means and includes all processes other than "Artificial Replenishment" by which water may become a part of the groundwater supply of Central Basin.

"Natural Safe Yield" is the maximum quantity of groundwater, not in excess of the long term average annual quantity of Natural Replenishment, which may be extracted annually from Central Basin without eventual depletion thereof or without otherwise causing eventual permanent damage to Central Basin as a source of groundwater for beneficial use, said maximum quantity being determined without reference to Artificial Replenishment.

"Outgoing Watermaster" is the State of California, Department of Water Resources, the Watermaster appointed pursuant to the terms of the Judgment before this Third Amendment.

"Overdraft" is that condition of a groundwater basin resulting from extractions in any given annual period or periods in excess of the long term average annual quantity of Natural Replenishment, or in excess of that quantity which may be extracted annually without otherwise causing eventual permanent damage to the basin.

"Party" means a party to this action. Whenever the term "party" is used in connection with a quantitative water right, or any quantitative right, privilege or obligation, or in connection with the assessment for the budget of the Watermaster, it shall be deemed to refer collectively to those parties to whom are attributed a Total Water Right in Part I of this Judgment.

"Person" or "persons" include individuals, partnerships, associations, governmental

agencies and corporations, and any and all types of entities.

"Recycled Water" means water that has been reclaimed through treatment appropriate for its intended use in compliance with applicable regulations.

"Regional Disadvantaged Communities Incentive Program" means a program to be developed by Watermaster in the manner provided in Section II(H) of this Judgment, and approved by the Court, whereby a portion of the Community Storage Pool is made available to or for the benefit of Disadvantaged Communities, on a priority basis within the Central Basin.

"Replenishment Assessment" means the replenishment assessment imposed by WRD upon each acre-foot of groundwater extracted from the Central Basin pursuant to WRD's enabling act, California Water Code §§ 60000 et seq.

"Small Water Producers Group" means a body consisting of parties holding no greater than 5,000 acre-feet of Allowed Pumping Allocation, as set forth on Appendix 3 hereto and as may be modified from time to time by the Group's own procedures and the requirements set forth in Appendix 3.

"Storage Panel" or "Central Basin Storage Panel" means a bicameral constituent body of Watermaster consisting of (i) the Central Basin Water Rights Panel and (ii) the Board of Directors of WRD.

"Storage Project" means an activity pertaining to the placement, recharge, injection, storage, transfer, or recapture of Stored Water within the Basin, but does not include actions by WRD undertaken in connection with its replenishment activities.

"Stored Water" means water, including Recycled Water, held within Available Dewatered Space as a result of spreading, injection, in-lieu delivery, or Carryover Conversion, where there is an intention to subsequently withdraw the water for reasonable and beneficial use pursuant to this Judgment.

"Total Water Right" is the quantity arrived at in the same manner as in the computation of "Base Water Right," but including as if extracted in any particular year the Imported Water Use Credit, if any, to which a particular party may be entitled.

"Water" includes only non-saline water, which is that having less than 1,000 parts of

chlorides to 1,000,000 parts of water.

"Water Augmentation Project" means pre-approved physical actions and management activities that provide demonstrated appreciable increases in long-term annual groundwater yield in the Basin that are initiated as provided in this Judgment after January 1, 2013.

"Water Purveyor" means a Party (and successors in interest) which sells water to the public, whether a regulated public utility, mutual water company or public entity. As that term is used in Section III(B)(6), "Water Purveyor," in addition to the foregoing, means a Party which has a connection or connections for the taking of Imported Water through the Metropolitan Water District of Southern California ("MWD"), or through a MWD-member agency, or access to such Imported Water through such connection, and which normally supplies at least a part of its customers' water needs with such Imported Water.

"Watermaster" is defined in Part II and is comprised of (i) the Administrative Body, (ii) the Central Basin Water Rights Panel, and (iii) the Central Basin Storage Panel. Watermaster, and the various constituent bodies of Watermaster, as designated in this Judgment, exist as a special master pursuant to this Judgment and Watermaster serves at the pleasure of the Court. Nothing herein shall be construed as creating an independent designation of "Watermaster" as a public agency subject to the provisions of CEQA, nor does membership or participation as the designated Watermaster expand any statutory, constitutional, or other powers of the members serving as part of the Watermaster.

"West Coast Basin" is the groundwater basin adjacent to the Central Basin which is the subject of a separate adjudication of groundwater rights in *California Water Service Company, et al. v. City of Compton, et al.*, Los Angeles Superior Court Case No. 506806.

"WRD" or "Water Replenishment District" is the plaintiff herein, the Water Replenishment District of Southern California, a special district of the State of California, which brought this action under its former name, "Central and West Basin Water Replenishment District."

In those instances where any of the above-defined words, terms, phrases or clauses are utilized in the definition of any of the other above-defined words, terms, phrases and clauses,

such use is with the same meaning as is above set forth.

NOW THEREFORE, IT IS ORDERED, DECLARED, ADJUDGED AND DECREED WITH RESPECT TO THE ACTION AND CROSS-ACTION AS FOLLOWS:

I. DECLARATION AND DETERMINATION OF WATER RIGHTS OF PARTIES; RESTRICTION ON THE EXERCISE THEREOF.[1]

A. Determination of Rights of Parties.

(1) Each party, except defendants The City of Los Angeles and Department of Water and Power of the City of Los Angeles, whose name is set forth in Appendix 2 and by this reference made a part hereof, and after whose name there appears under the column "Total Water Right" a figure other than "0," is the owner of and has the right to extract annually groundwater from Central Basin for beneficial use in the quantity set forth after that party's name under said column "Total Water Right" as of the close of the Administrative Year ending June 30, 2012 in accordance with the Watermaster Reports on file with this Court and the records of the Plaintiff. This tabulation does not take into account additions or subtractions from any Allowed Pumping Allocation of a producer for the 2012-2013 Administrative Year, nor other adjustments not representing change in fee title to water rights, such as leases of water rights, nor does it include the names of lessees of landowners where the lessees are exercising the water rights. The exercise of all water rights is subject, however, to the provisions of this Judgment as hereinafter contained. All of said rights are of the same legal force and effect and are without priority with reference to each other. Each party whose name is set forth in the tabulation in Appendix "2" of this

[1] Headings in the Judgment are for purposes of reference and the language of said headings do not constitute, other than for such purpose, a portion of this Judgment.

Judgment, and after whose name there appears under the column "Total Water Right" the figure "0," owns no rights to extract any groundwater from Central Basin, and has no right to extract any groundwater from Central Basin.

(2) Defendant The City of Los Angeles is the owner of the right to extract fifteen thousand (15,000) acre feet per annum of groundwater from Central Basin, but it has the right and ability to purchase or lease additional rights to extract groundwater and increase its Allowed Pumping Allocation. Defendant Department of Water and Power of the City of Los Angeles has no right to extract groundwater from Central Basin except insofar as it has the right, power, duty or obligation on behalf of defendant The City of Los Angeles to exercise the water rights in Central Basin of defendant The City of Los Angeles. The exercise of said rights is subject, however, to the provisions of this Judgment hereafter contained, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet (and any increase in its Allowed Pumping Allocation) bears to the Allowed Pumping Allocations of the other parties.

(3) No party to this action is the owner of or has any right to extract groundwater from Central Basin except as herein affirmatively determined.

B. Parties Enjoined as to Quantities of Extractions.

(1) Each party, other than The State of California and The City of Los Angeles and Department of Water and Power of The City of Los Angeles, is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting from Central Basin any quantity of Water greater than the party's Allowed Pumping Allocation as hereinafter set forth next to the name of the party in the tabulation appearing in Appendix 2 at the end of this Judgment, subject to further provisions of this Judgment. Subject to such further provisions, the officials, agents and employees of The State of

California are enjoined and restrained in any such Administrative Year from extracting from Central Basin collectively any quantity of water greater than the Allowed Pumping Allocation of The State of California as hereinafter set forth next to the name of that party in the same tabulation. Each party adjudged and declared above not to be the owner of and not to have the right to extract groundwater from Central Basin is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting any groundwater from Central Basin, except as may be hereinafter permitted to any such party under this Judgment.

(2) The total extraction right for each party includes a party's Allowed Pumping Allocation (to the extent not transferred by agreement or otherwise), any contractual right acquired through lease or other agreement to extract or use the rights of another party, and any right to extract Stored Water or Carryover as provided in this Judgment. No party may extract in excess of 140% of the sum of (i) the party's Allowed Pumping Allocation and (ii) the party's leased water, except upon prior approval by the applicable body of Watermaster as required pursuant to Section IV(J)as provided herein. Upon application, the body specified in Section IV(J) shall approve a party's request to extract water in excess of such limit, provided there is no Material Physical Harm. Requests to extract water in excess of such limit shall be reviewed and either approved or denied within thirty (30) days of such request.

(3) Defendant The City of Los Angeles is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting from Central Basin any quantity of water greater than fifteen thousand (15,000) acre feet or its Allowed Pumping Allocation, as recognized by the Watermaster, if it acquires additional rights to pump groundwater through purchase or lease, subject to further provisions of this Judgment, including but not limited to, sharing with other parties in any subsequent decreases or increases in

the quantity of extractions permitted from Central Basin by parties, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet (or the adjusted Allowed Pumping Allocation if additional rights are acquired) bears to the Allowed Pumping Allocations of the other parties. Defendant Department of Water and Power of The City of Los Angeles is enjoined and restrained in any Administrative Year commencing after the date this Judgment becomes final from extracting from Central Basin any quantity of water other than such as it may extract on behalf of defendant The City of Los Angeles, and which extractions, along with any extractions by said City, shall not exceed that quantity permitted by this Judgment to that City in any Administrative Year. Whenever in this Judgment the term "Allowed Pumping Allocation" appears, it shall be deemed to mean as to defendant The City of Los Angeles the quantity of fifteen thousand (15,000) acre feet unless the City of Los Angeles has acquired through purchase or lease right to extract additional groundwater. The limit on extraction as provided in the preceding Section I(B)(1) shall also apply to The City of Los Angeles.

(4) Any rights decreed and adjudicated herein may be transferred, assigned, licensed or leased by the owner thereof provided, however, that no such transfer shall be complete until compliance with the appropriate notice procedures established by Watermaster.

(5) Unless a party elects otherwise, production of water from the Basin for the use or benefit of the parties hereto shall be counted against the party's total extraction right in the following order: (i) Increased extractions by certain qualified water rights holders pursuant to Section IV(K), (ii) Exchange Pool production, (iii) production of Carryover water, (iv) production of leased water, , (v) production of Allowed Pumping Allocation, (vi) production of Stored Water, (vii) production of Drought Carryover (according to Watermaster's Rules), and (viii) production of water under an agreement with WRD during a period of

emergency pursuant to Section III(B)(6).

C. Parties Enjoined as to Export of Extractions.

Except as expressly authorized herein, or upon further order of the Court, all parties are enjoined and restrained from transporting water extracted from the Central Basin outside the boundaries of the Central Basin Area. For purposes of this Section, water supplied by a Water Purveyor to its customers located within any of its service areas contiguous to the Central Basin or within WRD's service area shall be exempt from the export prohibition of this Section provided that the Water Purveyor also provides water to a service area that overlies the Basin in whole or in part. The foregoing exemption is not made, nor is it related to, a determination of an underflow between the basins, a cost or benefit allocation, or any other factor relating to the allocation of the Replenishment Assessment by WRD. Further, this injunction and restriction does not apply to export of water that will take place pursuant to contractual obligations specifically identified on Appendix 4, nor does it apply to export of Stored Water not having its origin in Carryover Conversion. The export identified on Appendix 4 may continue to the extent that any such extraction does not violate any other provisions of this Judgment, provided however that no such export identified on Appendix 4 shall exceed 5,000 acre-feet in any Year.

II. APPOINTMENT OF WATERMASTER; WATERMASTER ADMINISTRATION PROVISIONS.

The particular bodies specified below are, jointly, hereby appointed Watermaster, for an indefinite term, but subject to removal by the Court, to administer this Judgment. Such bodies, which together shall constitute the "Watermaster," shall have restricted powers, duties and responsibilities as specified herein, it being the court's intention that particular constituent bodies of Watermaster have only limited and specified powers over certain aspects of the administration of this Judgment. The Outgoing Watermaster will exercise reasonable diligence in the complete transition of Watermaster duties and responsibilities within a reasonable time

following entry of this order, and to make available to the new Watermaster all records concerning Watermaster activities. The chair of the Central Basin Water Rights Panel (defined below) shall thereafter represent the Watermaster before the Court.

A. The Administrative Body.

Plaintiff Water Replenishment District of Southern California ("WRD") is appointed the Administrative Body of the Central Basin Watermaster ("Administrative Body"). In order to assist the Court in the administration of the provisions of this Judgment and to keep the Water Rights Panel and the Court fully advised in the premises, the Administrative Body shall have the following duties, powers and responsibilities:

(1) To Require Reports, Information and Records.

In consultation with the Water Rights Panel, the Administrative Body shall require the parties to furnish such reports, information and records as may be reasonably necessary to determine compliance or lack of compliance by any party with the provisions of this Judgment.

(2) Storage Projects.

The Administrative Body shall exercise such powers as may be specifically granted to it under this Judgment with regard to Stored Water.

(3) Annual Report.

The Administrative Body shall prepare, on or before the 15th day of the fourth month following the end of the preceding Administrative Year, an annual report for the consideration of the Water Rights Panel. The Chair of the Water Rights Panel shall submit to the Court either (1) the annual report prepared by the Administrative Body, following the adoption by the Water Rights Panel, or (2) an annual report separately prepared and adopted by the Water Rights Panel. The annual report prepared by the Administrative Body shall be limited to the following, unless otherwise required by the Court:

(a) Groundwater extractions

(b) Storage Accounts maintained by each party

(c) Status of the Regional Disadvantaged Community Incentive Program, if approved by the Court

(d) Exchange Pool operation

(e) Use of Imported Water

(f) Violations of this Judgment and corrective action taken by bodies of Watermaster having jurisdiction as provided in this Judgment

(g) Change of ownership of Total Water Rights

(h) Watermaster administration costs

(i) Water spread or imported into the Basin

(j) Water Augmentation Projects

(k) Whether the Administrative Body has become aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, as required pursuant to Section IV(B) of this Judgment

(l) Other matters as agreed with the Water Rights Panel

(m) Recommendations, if any.

In consultation with the Water Rights Panel, the Administrative Body shall provide reasonable notice to all parties of all material actions or determinations by Watermaster or any constituent body thereof, and as otherwise provided by this Third Amended Judgment.

(4) Annual Budget and Appeal Procedure in Relation Thereto.

By April 1 of each Administrative Year, the Administrative Body shall prepare a proposed administrative budget for the subsequent year stating the anticipated expense for performing the administrative functions specified in this Judgment (the "Administrative Budget"). The Administrative Body shall mail a copy of the proposed Administrative Budget to each of the Parties at least 60 days

before the beginning of each Administrative Year. The Administrative Budget mailed to the Parties shall provide sufficient detail in the Administrative Budget to demonstrate a separation in accounting between the Administrative Budget and WRD's Replenishment Assessment and operating budget. For the first Administrative Year of operation under this Third Amended Judgment, if the Administrative Body is unable to meet the above time requirement, the Administrative Body shall mail said copies as soon as possible. The first year the Administrative Budget is prepared, the amount of that budget shall not exceed an amount equal to fifty percent (50%) of the 2012-2013 charge for Watermaster service for the Central Basin collected from Parties by the California Department of Water Resources. At all times, the Administrative Body shall maintain a separation in accounting between the Administrative Budget and WRD's Replenishment Assessment and operating budget. All increases in future budgets for the Administrative Body above the amount set forth above shall be subject to approval by the Water Rights Panel following a public meeting to be held prior to the beginning of the Administrative Year, provided that the approved budget shall not be less than the amount of the first-year budget for the Administrative Body, except upon further order of the Court. Any administrative function by WRD already paid for by the Replenishment Assessment shall not be added as an expense in the Administrative Budget. Similarly, any expense paid for by the Administrative Budget shall not be added to WRD's operating budget, or otherwise added to the calculation of the Replenishment Assessment. While WRD may approve the proposed Administrative Budget at the same meeting in which WRD adopts its annual Replenishment Assessment or annual budget, the Administrative Body's budget shall be separate and distinct from the Replenishment Assessment imposed pursuant to Water Code §60317 and WRD's operating budget.

If approval by the Water Rights Panel is required pursuant to the

foregoing, the Water Rights Panel shall act upon the proposed budget within 15 calendar days after the public meeting. If the Water Rights Panel does not approve the budget prior to such deadline, the matter may be appealed to the Court within sixty (60) days. If any Party hereto has any objection to the Administrative Budget, it shall present the same in writing to Watermaster within 15 days after the date of mailing of said tentative budget by the Administrative Body. The Parties shall make the payments otherwise required of them to the Administrative Body even though an appeal of such budget may be pending. Upon any revision by the Court, the Administrative Body shall either remit to the Parties their pro rata portions of any reduction in the budget, or shall credit their accounts with respect to their budget assessments for the next ensuing Administrative Year, as the Court shall direct.

The amount of the Administrative Budget to be assessed to each party shall be determined as follows: If that portion of the final budget to be assessed to the Parties is equal to or less than $20.00 per party then the cost shall be equally apportioned among the Parties. If that portion of the final budget to be assessed to Parties is greater than $20.00 per party then each Party shall be assessed a minimum of $20.00. The amount of revenue expected to be received through the foregoing minimum assessments shall be deducted from that portion of the final budget to be assessed to the Parties and the balance shall be assessed to the Parties having Allowed Pumping Allocation, such balance being divided among them proportionately in accordance with their respective Allowed Pumping Allocation.

Payment of the assessment provided for herein, subject to adjustment by the Court as provided, shall be made by each such party prior to beginning of the Administrative Year to which the assessment relates, or within 40 days after the mailing of the tentative budget, whichever is later. If such payment by any Party is not made on or before said date, the Administrative Body shall add a penalty of 5% thereof to such party's statement. Payment required of any Party hereunder

may be enforced by execution issued out of the Court, or as may be provided by order hereinafter made by the Court, or by other proceedings by the Watermaster or by any Party on the Watermaster's behalf.

Any money unexpended at the end of any Administrative Year shall be applied to the budget of the next succeeding Administrative Year. The Administrative Body shall maintain no reserves.

Notwithstanding the above, no part of the budget of the Administrative Body shall be assessed to WRD or to any Party who has not extracted water from Central Basin for a period of two successive Administrative Years prior to the Administrative Year in which the tentative budget should be mailed by the Administrative Body under the provisions of this subparagraph (4).

(5) Rules.

The Administrative Body may adopt, and amend from time to time, rules consistent with this Judgment as may be reasonably necessary to carry out duties under the provisions of this Judgment within its particular area of responsibility. The Body shall adopt its first set of rules and procedures within three (3) months following entry of this Third Amended Judgment. The rules shall be effective on such date after the mailing thereof to the Parties as is specified by the Body, but not sooner than thirty (30) days after such mailing.

B. The Central Basin Water Rights Panel.

The Central Basin Water Rights Panel of the Central Basin Watermaster ("Water Rights Panel") shall consist of seven (7) members, each of which is a Party. The term of each member of the Panel, with the exception of the seat held by the Small Water Producers Group, as provided herein, shall be limited to four years. The Court will make the initial appointments to the Central Basin Water Rights Panel upon motion by Parties consistent with the categories set forth below at or about the time of entry of this Third Amended Judgment, and shall establish a procedure for the staggered terms of such members. Thereafter, elections of members of the Panel shall be held as provided herein. One (1) such member of the Water Rights Panel shall be

elected by vote of the Small Water Producers Group conducted in accordance with its own procedures, provided such Group, as of the date of the election, consists of at least five (5) members who are Water Purveyors. One (1) such member of the Water Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of less than 5,000 acre-feet who are not members of the Small Water Producers Group or, if the Small Water Producers Group does not then qualify following a continuous six-month period of non-qualification as provided herein, then two (2) such members shall be so selected. One (1) such member of the Water Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of at least 5,000 acre-feet but less than 10,000 acre-feet. Three (3) such members of the Water Rights Panel shall be elected by vote of Parties with Allowed Pumping Allocation of 10,000 acre-feet or greater. One (1) such member of the Water Rights Panel shall be elected by a vote of all holders of Allowed Pumping Allocations, with each such holder being entitled to one vote, such member to be elected by a plurality of the votes cast, following a nomination procedure to be established in the Water Rights Panel's rules. In the event of a tie, the seventh member shall be determined as may be provided in the Water Rights Panel's rules, or otherwise by the court. Except as otherwise provided in this Section, each such rights holder shall have the right to cast a total number of votes equal to the number of acre-feet of its Allowed Pumping Allocation (rounded to the next highest whole number). With the exception of voting for the seventh member, Parties shall be entitled to vote only for candidates within the category(ies) that represent that Party's Allowed Pumping Allocation. For example, parties who are members of the Small Water Producers Group are entitled to vote only for the Small Water Producer Group member and the seventh member of the Water Rights Panel, and so on. Parties are not permitted to split votes. The results of such election shall be reported to the Court for confirmation of each member's appointment to the Water Rights Panel of Watermaster. The elected members of the Water Rights Panel shall be those candidates receiving the highest vote total in their respective categories. The Water Rights Panel shall hold its first meeting within thirty (30) days of the date this Third Amended Judgment becomes final. The Water Rights Panel shall develop rules for its operation consistent with this Judgment. The Water Rights Panel shall take action, including the

election of its Chair, by majority vote of its members. Election of the Chair shall occur every two years, with no Party serving as Chair for consecutive terms. Members of the Water Rights Panel shall serve without compensation. All references to Annual Pumping Allocation, as used herein, are as determined by the last published Watermaster report.

(1) The Water Rights Panel shall have the following duties and responsibilities:

(a) Enforcement of Adjudicated Rights. As against the other bodies of Watermaster, the Water Rights Panel shall have exclusive authority to move the Court to take such action as may be necessary to enforce the terms of the Judgment with regard to the extraction of Allowed Pumping Allocation and the maintenance of adjudicated groundwater extraction rights as provided in this Judgment.

(b) Requirement of Measuring Devices. The Water Rights Panel shall require all parties owning or operating any facilities for the extraction of groundwater from Central Basin to install and maintain at all times in good working order at such party's own expense, appropriate measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(c) Inspections by Watermaster. The Water Rights Panel may make inspections of groundwater production facilities, including aquifer storage and recovery facilities, and measuring devices at such times and as often as may be reasonable under the circumstances and to calibrate or test such devices.

(d) Reports. Annually, the Water Rights Panel, in cooperation with the Administrative Body, shall report to the Court, concerning any or all of the following:

(i) Groundwater extractions

(ii) Exchange Pool operation

(iii) Status of the Regional Disadvantaged Community Incentive Program, if approved by the Court

(iv) Violations of this Judgment and corrective action taken or sought

(v) Change of ownership of Total Water Rights

(vi) Assessments made by the Water Rights Panel and any costs incurred

(vii) Whether the Water Rights Panel has become aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, as required pursuant to Section IV(B) of this Judgment

(viii) Recommendations, if any.

As provided in Section II.A(3), the Water Rights Panel may adopt the annual report prepared by the Administrative Body, and submit the same to the Court, or the Water Rights Panel may prepare, adopt and submit to the Court a separate report. The Chair of the Water Rights Panel shall be responsible for reporting to the Court concerning adjudicated water rights issues in the Basin.

(2) Assessment. The Water Rights Panel shall assess holders of water rights within the Central Basin an annual amount not to exceed $1.00 per acre-foot of Allowed Pumping Allocation, by majority vote of the members of the Water Rights Panel. The body may assess a higher amount, subject to being overruled by Majority Protest. The assessment is intended to cover any costs associated with reporting responsibilities, any Judgment enforcement action, and the review of storage projects as a component of the "Storage Panel" as provided below. It is anticipated that this body will rely on the Administrative Body's staff for the functions related to the Administrative Body's responsibilities, but the

Water Rights Panel may engage its own staff if required in its reasonable judgment. Assessments will constitute a lien on the water right assessed, enforceable as provided in this Judgment.

(3) Rules. The Water Rights Panel may adopt and amend from time to time, at an open meeting of that Panel, rules consistent with this Judgment as may be reasonably necessary to carry out duties under the provisions of this Judgment within its particular area of responsibility. The Panel shall adopt its first set of rules and procedures within three (3) months following entry of this Third Amended Judgment. The rules shall be effective on such date after the mailing thereof to the Parties as is specified by the Panel, but not sooner than thirty (30) days after such mailing.

C. The Storage Panel.

The Storage Panel of the Central Basin Watermaster ("Storage Panel") shall be a bicameral body consisting of (i) the Water Rights Panel and (ii) the Board of Directors of WRD. Action by the Storage Panel shall require separate action by a majority of each of its constituent bodies. The Storage Panel shall have the duties and responsibilities specified with regard to the Provisions for the Storage and Extraction of Stored Groundwater as set forth in Part IV and the other provisions of this Judgment.

D. Use of Facilities and Data Collected by Other Governmental Agencies.

Where practicable, the three bodies constituting the Central Basin Watermaster should not duplicate the collection of data relative to conditions of the Central Basin which is then being collected by one or more governmental agencies, but where necessary each such body may collect supplemental data. Where it appears more economical to do so, the Watermaster and its constituent bodies are directed to use such facilities of other governmental agencies as are available to it under either no cost or cost agreements with respect to the receipt of reports, billings to parties, mailings to parties, and similar matters.

E. Appeal from Watermaster Decisions.

Appeals concerning the budget proposed by the Administrative Body shall be governed by Section II(A)(4) of this Judgment. Appeals concerning decisions by the Storage Panel shall be governed by Section IV(P) of this Judgment. With respect to all other objections by a Party to any action or decision by the Watermaster, such objections will be governed by this Section II(E). Any party interested therein who objects to any rule, determination, order or finding made by the Watermaster or any constituent body thereof, may object thereto in writing delivered to the Administrative Body within 30 days after the date the Watermaster, or any constituent body thereof, mails written notice of the making of such rule, determination, order or finding. Within 30 days after such delivery the Watermaster, or the affected constituent body thereof, shall consider said objection and shall amend or affirm his rule, determination, order or finding and shall give notice thereof to all parties. Any such party may file with the Court within 60 days from the date of said notice any objection to such rule, determination, order or finding of the Watermaster, or any constituent body thereof, and bring the same on for hearing before the Court at such time as the Court may direct, after first having served said objection upon all other parties. The Court may affirm, modify, amend or overrule any such rule, determination, order or finding of the Watermaster or its affected constituent body. Any objection under this paragraph shall not stay the rule, determination, order or finding of the Watermaster. However, the Court, by *ex parte* order, may provide for a stay thereof on application of any interested party on or after the date that any such party delivers to the Watermaster any written objection.

F. Effect of Non-Compliance by Watermaster With Time Provisions.

Failure of the Watermaster to perform any duty, power or responsibility set forth in this Judgment within the time limitation herein set forth shall not deprive the Watermaster or its applicable constituent body of authority to subsequently discharge such duty, power or responsibility, except to the extent that any such failure by the Watermaster may have rendered some otherwise required act by a party impossible.

G. Limitations on Administrative Body.

WRD shall not acquire Central Basin water rights, nor lease Central Basin water or water rights to or from any Party or third party. However, the foregoing shall (i) not be interpreted to restrict WRD's ability or authority to acquire water from any source for purposes of Artificial or Natural Replenishment or for water quality activities, and (ii) not restrict WRD's authority under California Water Code Section 60000 et seq. to develop reclaimed, recycled or remediated water for groundwater replenishment activities.

H. Regional Disadvantaged Communities Incentive Program.

The Water Rights Panel, acting through the General Manager of WRD, shall develop a Regional Disadvantaged Communities Incentive Program, pursuant to which a portion of the Community Storage Pool is reserved for the benefit of Disadvantaged Communities within the Central Basin. Nothing in this Judgment, nor the establishment of such a program, shall diminish the rights otherwise granted to Parties under this Judgment, including but not limited to the right to place water in storage in the Community Storage Pool. The Water Rights Panel shall meet within thirty (30) days of its formation to identify and consider potential third-party independent consultants who may be retained to design the program, including those recommended by the General Manager of WRD. The Water Rights Panel shall select a consultant within thirty (30) days thereafter. In the event the General Manager of WRD objects to the selected consultant, in writing, then the Water Rights Panel and the General Manager of WRD shall exchange a list of no more than two (2) consultants each for further consideration. If the Water Rights Panel and the General Manager of WRD are unable to agree to a consultant within an additional thirty (30) days, then the Chair of the Water Rights Panel shall file a request with the Court for an order appointing a consultant. Upon selection of a third-party independent consultant, whether through the Water Rights Panel process or the court process identified herein, the consultant shall design a detailed program and deliver it to the Water Rights Panel within ninety (90) days of the consultant's retention. All costs associated with design of the program shall be paid for out of the Water Rights

Panel's assessment, as provided in Section II.B(2). The Water Rights Panel shall present the program to the Court for its review and approval within one year of entry of this Third Amended Judgment. If approved by the Court, the Water Rights Panel, acting through the General Manager of WRD, shall be responsible for administration of the Regional Disadvantaged Communities Incentive Program, including insuring that any funds generated through the program benefit Disadvantaged Communities. Any Storage Project established pursuant to this Program shall have priority to use up to 23,000 acre-feet of Available Storage within the Community Storage Pool, as further provided in Section IV.E(2). Watermaster shall report to the Court concerning such program as a part of its annual report.

III. PROVISIONS FOR PHYSICAL SOLUTION TO MEET THE WATER REQUIREMENTS IN CENTRAL BASIN.

In order to provide flexibility to the injunction set forth in Part I of the Judgment, and to assist in a physical solution to meet water requirements in Central Basin, the injunction so set forth is subject to the following provisions.

A. Carryover of Portion of Allowed Pumping Allocation.

(1) Amount of Carryover.

Each party adjudged to have a Total Water Right or water rights and who, during a particular Administrative Year, does not extract from Central Basin a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative Year, less any allocated subscriptions by such party to the Exchange Pool, or plus any allocated requests by such party for purchase of Exchange Pool water, is permitted to carry over (the "One Year Carryover") from such Administrative Year the right to extract from Central Basin in the next succeeding Administrative Year so much of said total quantity as it did not extract in the particular Administrative Year, not to exceed (i) the Applicable Percentage of such party's Allowed Pumping Allocation for the particular Administrative

Year, or 20 acre-feet, whichever of said percentage or 20 acre-feet is the larger, less (ii) the total quantity of water then held in that party's combined Individual and Community Storage accounts, as hereinafter defined, but in no event less than 20% of the party's Allowed Pumping Allocation for the particular Administrative Year. For purposes of this Section, the "Applicable Percentage" shall be as follows for the years indicated:

For the Administrative Year in which this Third Amended Judgment becomes final:	30%
For the next Administrative Year:	40%
For the next Administrative Year:	50%
For the next Administrative Year and years following:	60%

(2) Conversion of Carryover to Stored Water.

A party having Carryover may, from time to time, elect to convert all or part of such party's Carryover to Stored Water as authorized herein ("Carryover Conversion") upon payment of the Replenishment Assessment to WRD. Such Stored Water shall be assigned to that party's Individual Storage Allocation, if available, and otherwise to the Community Storage Pool.

(3) Declared Water Emergency.

The Board of Directors of WRD may, from time to time, declare a water emergency upon a determination that conditions within the Central Basin relating to natural and imported water supplies are such that, without implementation of the Declared Water Emergency provisions of this subsection, the water resources of the Central Basin risk degradation. In making such declaration, the Board of Directors shall consider any information and requests provided by water producers, purveyors and other affected entities and shall, for that purpose, hold a public hearing in advance of such declaration. A Declared Water Emergency

shall extend to the end of the Administrative Year during which such resolution is adopted, unless sooner ended by similar resolution.

(4) Drought Carryover.

Following the declaration of a Declared Water Emergency and until the Declared Water Emergency ends either by expiration or by resolution of the Board of Directors of WRD, each party adjudged to have a Total Water Right or water rights and who, during a particular Administrative Year, does not extract from Central Basin a total quantity equal to such party's Allowed Pumping Allocation for the particular Administrative Year, less any allocated subscriptions by such party to the Exchange Pool, or plus any allocated requests by such party for purchase of Exchange Pool water, is permitted to carry over (the "Drought Carryover") from such Administrative Year the right to extract from Central Basin so much of said total quantity as it did not extract during the period of the Declared Water Emergency, to the extent such quantity exceeds the One Year Carryover, not to exceed an additional 35% of such party's Allowed Pumping Allocation, or additional 35 acre feet, whichever of said 35% or 35 acre feet is the larger, less the amount of such party's Stored Water. Carryover amounts shall first be allocated to the One Year Carryover and any remaining carryover amount for that year shall be allocated to the Drought Carryover.

(5) Accumulated Drought Carryover.

No further amounts shall be added to the Drought Carryover following the end of the Declared Water Emergency, provided however that in the event another Declared Water Emergency is declared, additional Drought Carryover may be added, to the extent such additional Drought Carryover would not cause the total Drought Carryover to exceed the limits set forth above. The Drought Carryover shall be supplemental to and shall not affect any previous drought carryover acquired by a party pursuant to previous order of the court.

B. When Over-Extractions May be Permitted.

(1) Underestimation of Requirements for Water.

Any party hereto without Stored Water, having an Allowed Pumping Allocation, and not in violation of any provision of this Judgment may extract in an Administrative Year an additional quantity of water not to exceed: (a) 20% of such party's Allowed Pumping Allocation or 20 acre feet, whichever is greater, and (b) any amount in addition thereto which may be approved in advance by the Water Rights Panel of Watermaster.

(2) Reductions in Allowed Pumping Allocations in Succeeding Years to Compensate for Permissible Overextractions.

Any such party's Allowed Pumping Allocation for the following Administrative Year shall be reduced by the amount over-extracted pursuant to paragraph 1 above, provided that if the Water Rights Panel determines that such reduction in the party's Allowed Pumping Allocation in one Administrative Year will impose upon such a party an unreasonable hardship, the said reduction in said party's Allowed Pumping Allocation shall be prorated over a period of five (5) Administrative Years succeeding that in which the excessive extractions by the party occurred. Application for such relief to the Water Rights Panel must be made not later than the 40th day after the end of the Administrative Year in which such excessive pumping occurred. The Water Rights Panel shall grant such relief if such over-extraction, or any portion thereof, occurred during a period of Declared Water Emergency.

(3) Reductions in Allowed Pumping Allocations for the Next Succeeding Administrative Year to Compensate for Overpumping.

Whenever, pursuant to Section III(B)(1), a party over-extracts in excess of such party's Allowed Pumping Allocation plus that party's available One-Year Carryover and any Stored Water held by that party, and such excess has not been approved in advance by the Water Rights Panel, then such party's Allowed Pumping Allocation for the following Administrative Year shall be reduced by an

amount equivalent to its total over-extractions in the particular Administrative Year in which it occurred.

(4) Reports of Certain Over-extractions to the Court.

Whenever a party over-extracts in excess of 20% of such party's Allowed Pumping Allocation for the particular Administrative Year plus that party's available One-Year Carryover and any Stored Water held by that party, without having obtained prior approval of the Water Rights Panel, such shall constitute a violation of the Judgment and the Water Rights Panel shall make a written report to the Court for such action as the Court may deem necessary. Such party shall be subject to such injunctive and other processes and action as the Court might otherwise take with regard to any other violation of such Judgment.

(5) Effect of Over-extractions on Rights.

Any party who over-extracts from Central Basin in any Administrative Year shall not acquire any additional rights by reason of such over-extractions; nor shall any required reductions in extractions during any subsequent years reduce the Total Water Right or water rights of any party to the extent said over-extractions are in compliance with paragraph 1 above.

(6) Pumping Under Agreement With Plaintiff During Periods of Emergency.

Plaintiff WRD overlies Central Basin and engages in activities of replenishing the groundwaters thereof. Plaintiff by resolution has appropriated for use during emergencies the quantity of 17,000 acre feet of imported and reclaimed water replenished by it into Central Basin, and pursuant to such resolution Plaintiff reserves the right to use or cause the use of such quantity during such emergency periods for the benefit of Water Purveyors.

(a) Notwithstanding any other provision of this Judgment, parties who are Water Purveyors (including successors in interest) are authorized to enter into agreements with Plaintiff for extraction of a

portion of Plaintiff's 17,000 acre-feet of appropriated water, in excess of their respective Allowed Pumping Allocations for the particular Administrative Year when the following conditions are met:

(i) Plaintiff is in receipt of a resolution of the Board of Directors of the Metropolitan Water District of Southern California ("MWD") that there is an actual or immediately threatened temporary shortage of MWD's imported water supply compared to MWD's needs, or a temporary inability to deliver MWD's imported water supply throughout its area, which will be alleviated by overpumping from Central Basin.

(ii) The Board of Directors of both Plaintiff and Central Basin Municipal Water District by resolutions concur in the resolution of MWD's Board of Directors, and the Board of Directors of Plaintiff finds in its resolution that the average minimum elevation of water surface among those wells in the Montebello Forebay of the Central Basin designated as Los Angeles County Flood Control District Wells Nos. 1601T, 1564P, 1615P, and 1626L, is at least 43.7 feet above sea level. This computation shall be based upon the most recent "static readings" taken, which shall have been taken not more than four weeks prior. Should any of the wells designated above become destroyed or otherwise be in a condition so that readings cannot be made, or should the owner prevent their use for such readings, the Board of Directors of the Plaintiff may, upon appropriate engineering recommendation, substitute such other well or wells as it

may deem appropriate.

(iii) In said resolution, Plaintiff's Board of Directors sets a public hearing, and notice of the time, place and date thereof (which may be continued from time to time without further notice) is given by First Class Mail to the current designees of the Parties, filed and served in accordance with Section VI(C) of this Judgment. Said notice shall be mailed at least five (5) days before the scheduled hearing date.

(iv) At said public hearing, parties (including successors in interest) are given full opportunity to be heard, and at the conclusion thereof the Board of Directors of Plaintiff by resolution decides to proceed with agreements under this Section III(B)(6).

(b) All such agreements shall be subject to the following requirements, and such others as Plaintiff's Board of Directors shall require:

(i) They shall be of uniform content except as to quantity involved, and any special provisions considered necessary or desirable with respect to local hydrological conditions or good hydrologic practice.

(ii) They shall be offered to all Water Purveyors, excepting those which Plaintiff's Board of Directors determines should not overpump because such overpumping would occur in undesirable proximity to a sea water barrier project designed to forestall sea water intrusion, or within or in undesirable proximity to an area within Central Basin wherein groundwater levels are at an

elevation where overpumping is under all the circumstances then undesirable.

(iii) The maximum terms for the agreements shall be four (4) months, which agreements shall commence on the same date and end on the same date (and which may be executed at any time within the four-month period), unless an extension thereof is authorized by the Court, under Part V of this Judgment.

(iv) They shall contain provisions requiring that the Water Purveyor executing the agreement pay to the Plaintiff a price in addition to the applicable replenishment assessment determined on the following formula. The normal price per acre-foot of Central Basin Municipal Water District's (CBMWD) treated domestic and municipal water, as "normal" price of such category of water is defined in Section III(C)(10) (price to be paid for Exchange Pool Water) as of the beginning of the contract term less the deductions set forth in said paragraph 10 for the Administrative Year in which the contract term commences. The agreement shall provide for adjustments in the first of said components for any proportional period of the contract term during which the CBMWD said normal price is changed, and if the agreement straddles two administrative years, the said deductions shall be adjusted for any proportionate period of the contract term in which the amount thereof or of either subcomponent changes for purposes of said paragraph 10. Any price for a partial acre-foot shall be computed pro rata. Payments shall be due and

payable on the principle that over extractions under the agreement are of the last water pumped in the Administrative Year, and shall be payable as the agreement shall provide.

(v) They shall contain provisions that: (1) All of such agreements (but not less than all) shall be subject to termination by Plaintiff if, in the Judgment of Plaintiff's Board of Directors, the conditions or threatened conditions upon which they were based have abated to the extent over extractions are no longer considered necessary; and (2) that any individual agreement or agreements may be terminated if the Plaintiff's Board of Directors finds that adverse hydrologic circumstances have developed as a result of over extractions by any Water Purveyor(s) which have executed said agreements, or for any other reason that Plaintiff's Board of Directors finds good and sufficient.

(c) Other matters applicable to such agreements and overpumping thereunder are as follows, without need for express provisions in the agreements;

(i) The quantity of overpumping permitted shall be additional to that which the Water Purveyor could otherwise overpump under this Judgment.

(ii) The total quantity of permitted overpumping under all said agreements during said four months shall not exceed seventeen thousand (17,000) acre feet, but the individual Water Purveyor shall not be responsible or affected by any violation of this requirement. That total is additional to over extractions otherwise permitted under

this Judgment.

(iii) Only one four month period may be utilized by Plaintiff in entering into such agreements, as to any one emergency or continuation thereof declared by MWD's Board of Directors under Section III(B)(6)(a).

(iv) If any party claims it is being damaged or threatened with damage by the over extractions by any party to such an agreement, the first party or the Water Rights Panel may seek appropriate action of the Court for termination of any such agreement upon notice of hearing to the party complaining, to the party to said agreement, to the plaintiff, and to any parties who have filed a request for special notice. Any termination shall not affect the obligation of the party to make payments under the agreement for over extractions which did occur thereunder.

(v) Plaintiff shall maintain separate accounting of the proceeds from payments made pursuant to agreements entered into under this Part. Said fund shall be utilized solely for purposes of replenishment in replacement of waters in Central Basin and West Basin. Plaintiff shall as soon as practicable cause replenishment in Central Basin by the amounts to be overproduced pursuant to this Paragraph 6, whether through spreading, injection, or in lieu agreements.

(vi) Over extractions pursuant to the agreements shall not be subject to the "make up" provisions of the Judgment as amended, provided that if any party fails to make payments as required by the agreement, Plaintiff may

require such "make up" under Section III(B)(3) of this Judgment.

(vii) A Water Purveyor under any such agreement may, and is encouraged to enter into appropriate arrangements with customers who have water rights in Central Basin under or pursuant to this Judgment whereby the Water Purveyor will be assisted in meeting the objectives of the agreement.

(7) Exemption for Extractors of Contaminated Groundwater.

Any party herein may petition WRD for a Non-consumptive Water Use Permit as part of a project to remedy or ameliorate groundwater contamination. If the petition is granted as set forth in this paragraph, the petitioner may extract the groundwater as permitted hereinafter, without the production counting against the petitioner's production rights.

(a) If the Board of WRD determines by Resolution that there is a problem of groundwater contamination that a proposed program will remedy or ameliorate, an operator may make extractions of groundwater to remedy or ameliorate that problem without the production counting against the petitioner's production rights if the water is not applied to beneficial surface use, its extractions are made in compliance with all the terms and conditions of the Board Resolution, and the Board has determined in the Resolution either of the following:

(i) The groundwater to be extracted is unusable and cannot be economically treated or blended for use with other water.

(ii) The proposed program involves extraction of usable water in the same quantity as will be returned to the

underground without degradation of quality.

(b) The Resolution may provide those terms and conditions the Board deems appropriate, including, but not limited to, restrictions on the quantity of the extractions to be so exempted, limitations on time, periodic reviews, requirement of submission of test results from a Board-approved laboratory, and any other relevant terms or conditions.

(c) Upon written notice to the operator involved, the Board may rescind or modify its Resolution. The rescission or modification of the Resolution shall apply to groundwater extractions occurring more than ten (10) days after the rescission or modification. Notice of rescission or modification shall be either mailed first class mail, postage prepaid, at least two weeks prior to the meeting of the Board at which the rescission or modification will be made to the address of record of the operator or personally delivered two weeks prior to the meeting.

(d) The Board's decision to grant, deny, modify or revoke a permit or to interrupt or stop a permitted project may be appealed to this court within thirty days of the notice thereof to the applicant and upon thirty days' notice to the designees of all parties herein.

(e) WRD shall monitor and periodically inspect the project for compliance with the terms and conditions for any permit issued pursuant to these provisions.

(f) No party shall recover costs from any other party herein in connection with determinations made with respect to this Part.

(8) "Call" on Carryover Converted to Stored Water.

Where any Party has elected, as permitted by Section III(A)(2), to convert Carryover to Stored Water, any other Party which has not, within the previous ten (10) years, been granted approval to extract Carryover Conversion under this

Section III(B)(8) more than five (5) times, may apply to the Storage Panel for the right to extract all or a portion of that Carryover Conversion in the year such Conversion occurs. The Storage Panel shall grant such request, providing there is no Material Physical Harm, if it determines that leased groundwater to meet the applicant's needs within the Basin cannot be obtained for less than forty-five percent (45%) of MWD's Imported Water rate for delivery of untreated water to the Central Basin spreading facilities (which rate is presently MWD's "Full Service Untreated Volumetric Cost, Tier 1"), and that the applicant will fully extract its Allowed Pumping Allocation, Carryover, and Stored Water, if any, in addition to its permitted overextraction under Section III(B)(1), prior to accessing such Carryover Conversion.

Upon such approval, the applicant may thereafter extract such water as provided herein. A Party so extracting groundwater shall fully restore such extracted water (either through under-extraction of its rights or through importing water) during the five-year period following the Year in which the extraction under this Section occurs. Otherwise, the extracting Party shall pay to the Watermaster an amount equal to 100% of MWD's Imported Water rate for purchase and delivery of untreated water to the Central Basin spreading facilities (which rate is presently MWD's "Full Service Untreated Volumetric Cost, Tier 1") whether or not such water is available that year, for the year during which is the fifth anniversary of the year during which such Carryover Conversion extraction occurs, multiplied by the amount of Carryover Conversion so extracted and not restored during such five-year period. Payment shall be made within thirty (30) days of demand by Watermaster. No Replenishment Assessment shall be due on Carryover Conversion so extracted. However, the Party must deposit with the Watermaster an amount equal to the Replenishment Assessment that would otherwise be imposed by WRD upon such extraction. If the party restores the water within the 5-year repayment period, then the Watermaster shall

promptly return the deposit to the Party, without interest. If the Party does not restore the water within the 5-year repayment period, the deposit shall be credited towards the Party's obligation to pay 100% of MWD's Imported Water rate as required herein.

Should there be multiple requests to so extract Carryover Conversion in the same year, the Storage Panel shall allocate such extraction right such that each requesting party may extract a pro rata portion of the available Carryover Conversion for that year. No party may extract in excess of 2,500 acre feet of groundwater pursuant to this Section III(B)(8) in a single Year. Amounts paid to Watermaster hereunder shall be used by WRD solely for purchase of water for replenishment in the Basin. Watermaster, through the Storage Panel, shall give reasonable notice to the Parties of any application to so extract Carryover Conversion in such manner as the Storage Panel shall determine, including, without limitation, notice by electronic mail or by website posting, at least ten (10) days prior to consideration of any such application.

C. Exchange Pool Provisions.

(1) Definitions.

For purposes of these Exchange Pool provisions, the following words and terms have the following meanings:

(a) "Exchange Pool" is the arrangement hereinafter set forth whereby certain of the parties, ("Exchangees") may, notwithstanding the other provisions of the Judgment, extract additional water from Central Basin to meet their needs, and certain other of the parties ("Exchangors"), reduce their extractions below their Allowed Pumping Allocations in order to permit such additional extractions by others.

(b) "Exchangor" is one who offers, voluntarily or otherwise, pursuant to subsequent provisions, to reduce its extractions below its Allowed Pumping Allocation in order to permit such additional

extractions by others.

(c) "Exchangee" is one who requests permission to extract additional water from Central Basin.

(d) "Undue hardship" means unusual and severe economic or operational hardship, other than that arising (i) by reason of any differential in quality that might exist between water extracted from Central Basin and water available for importation or (ii) by reason of any difference in cost to a party in subscribing to the Exchange Pool and reducing its extractions of water from Central Basin in an equivalent amount as opposed to extracting any such quantity itself.

(2) Parties Who May Purchase Water Through the Exchange Pool.

Any party not having existing facilities for the taking of imported water as of the beginning of any Administrative Year, and any party having such facilities as of the beginning of any Administrative Year who is unable, without undue hardship, to obtain, take, and put to beneficial use, through its distribution system or systems existing as of the beginning of the particular Administrative Year, imported water in a quantity which, when added to its Allowed Pumping Allocation for that particular Administrative Year, will meet its estimated needs for that particular Administrative Year, may purchase water from the Exchange Pool, subject to the limitations contained in this Section III(C) (Subpart "C" hereinafter).

(3) Procedure for Purchasing Exchange Pool Water.

Not later than the 40th day following the commencement of each Administrative Year, each such party desiring to purchase water from the Exchange Pool shall file with the Watermaster a request to so purchase, setting forth the amount of water in acre feet that such party estimates that it will require during the then current Administrative Year in excess of the total of:

(a) Its Allowed Pumping Allocation for that particular

Administrative Year; and

(b) The imported water, if any, which it estimates it will be able, without undue hardship, to obtain, take and put to beneficial use, through its distribution system or systems existing as of the beginning of that particular Administrative Year.

Any party who as of the beginning of any Administrative Year has existing facilities for the taking of imported water and who makes a request to purchase from the Exchange Pool must provide with such request substantiating data and other proof which, together with any further data and other proof requested by the Water Rights Panel, establishes that such party is unable without undue hardship, to obtain, take and put to beneficial use through its said distribution system or systems a sufficient quantity of imported water which, when added to its said Allowed Pumping Allocation for the particular Administrative Year, will meet its estimated needs. As to any such party, the Water Rights Panel shall make a determination whether the party has so established such inability, which determination shall be subject to review by the court under the procedure set forth in Part II of this Judgment. Any party making a request to purchase from the Exchange Pool shall either furnish such substantiating data and other proof, or a statement that such party had no existing facilities for the taking of imported water as of the beginning of that Administrative Year, and in either event a statement of the basis for the quantity requested to be purchased.

(4) Subscriptions to Exchange Pool.

(a) Required Subscription. Each party having existing facilities for the taking of imported water as of the beginning of any Administrative Year hereby subscribed to the Exchange Pool for purposes of meeting Category (a) requests thereon, as more particularly defined in paragraph 5 of this Subpart C, twenty percent

(20%) of its Allowed Pumping Allocation, or the quantity of imported water which it is able, without undue hardship, to obtain, take and put to beneficial use through its distribution system or systems existing as of the beginning of the particular Administrative Year in addition to such party's own estimated needs for imported water during that Administrative Year, whichever is the lesser. A party's subscription under this subparagraph (a) and subparagraph (b) of this paragraph 4 is sometimes hereinafter referred to as a "required subscription."

(b) Report to Watermaster Water Rights Panel by Parties with Connections and Unable to Subscribe 20%. Any party having existing facilities for the taking of imported water and estimating that it will be unable, without undue hardship, in that Administrative Year to obtain, take and put to beneficial use through its distribution system or systems existing as of the beginning of that Administrative Year, sufficient imported water to further reduce its extractions from the Central Basin by twenty percent (20%) of its Allowed Pumping Allocation for purposes of providing water to the Exchange Pool must furnish not later than the 40th day following the commencement of such Administrative Year substantiating data and other proof which, together with any further data and other proof requested by the Water Rights Panel, establishes said inability or such party shall be deemed to have subscribed twenty percent (20%) of its Allowed Pumping Allocation for the purpose of providing water to the Exchange Pool. As to any such party so contending such inability, the Water Rights Panel shall make a determination whether the party has so established such inability, which determination shall be subject to review by the Court under the procedure set forth in Part II of this Judgment.

(c) Voluntary Subscriptions. Any party, whether or not having

facilities for the taking of imported water, who desires to subscribe to the Exchange Pool a quantity or further quantity of its Allowed Pumping Allocation, may so notify the Water Rights Panel in writing of the quantity of such offer on or prior to the 40th day following the commencement of the particular Administrative Year. Such subscriptions are referred to hereinafter as "voluntary subscriptions." Any Exchangor who desires that any part of its otherwise required subscription not needed to fill Category (a) requests shall be available for Category (b) requests may so notify the Water Rights Panel in writing on or prior to said 40th day. If all of that Exchangor's otherwise required subscription is not needed in order to fill Category (a) requests, the remainder of such required subscription not so used, or such part thereof as such Exchangor may designate, shall be deemed to be a voluntary subscription.

(5) Limitations on Purchases of Exchange Pool Water and Allocation of Requests to Purchase Exchange Pool Water Among Exchangors.

(a) Categories of Requests. Two categories of Exchange Pool requests are established as follows:

(i) Category (a) requests. The quantity requested by each Exchangee, whether or not that Exchangee has an Allowed Pumping Allocation, which quantity is not in excess of 150% of its Allowed Pumping Allocation, if any, or 100 acre feet, whichever is greater. Requests or portions thereof within the above criteria are sometimes hereinafter referred to as "Category (a) requests."

(ii) Category (b) requests. The quantity requested by each Exchangee having an Allowed Pumping Allocation to the extent the request is in excess of 150% of that Allowed

Pumping Allocation or 100 acre feet, whichever is greater, and the quantity requested by each Exchangee having no Allowed Pumping Allocation to the extent the request is in excess of 100 acre feet. Portions of requests within the above criteria are sometimes hereinafter referred to as "Category (b) requests."

(b) Filling of Category (a) Requests. All Exchange Pool subscriptions, required and voluntary, shall be available to fill Category (a) requests. Category (a) requests shall be filled first from voluntary subscriptions, and if voluntary subscriptions should be insufficient to fill all Category (a) requests required subscriptions shall be then utilized to fill Category (a) requests. All Category (a) requests shall be first filled before any Category (b) requests are filled.

(c) Filling of Category (b) Requests. To the extent that voluntary subscriptions have not been utilized in filling Category (a) requests, Category (b) requests shall be filled only out of any remaining voluntary subscriptions. Required subscriptions will then be utilized for the filling of any remaining Category (b) requests.

(d) Allocation of Requests to Subscriptions When Available Subscriptions Exceed Requests. In the event the quantity of subscriptions available for any category of requests exceeds those requests in that category, or exceeds the remainder of those requests in that category, such requests shall be filled out of such subscriptions proportionately in relation to the quantity of each subscription.

(e) Allocation of Subscriptions to Category (b) Requests in the Event of Shortage of Subscriptions. In the event available subscriptions are insufficient to meet Category (b) requests, available subscriptions shall be allocated to each request in the proportion that

the particular request bears to the total requests of the particular category.

(6) Additional Voluntary Subscriptions.

If subscriptions available to meet the requests of Exchangees are insufficient to meet all requests, additional voluntary subscriptions may be solicited and received from parties by the Water Rights Panel. Such additional subscriptions shall be allocated first to Category (a) requests to the extent unfilled, and next to Category (b) requests to the extent unfilled. All allocations are to be otherwise in the same manner as earlier provided in paragraph 5 (a) through 5 (e) inclusive.

(7) Effect if Category (a) Requests Exceed Available Subscriptions, Both Required and Voluntary.

In the event that the quantity of subscriptions available to fill Category (a) requests is less than the total quantity of such requests, the Exchangees may, nonetheless, extract the full amount of their Category (a) requests otherwise approved by the Water Rights Panel as if sufficient subscriptions were available. The amounts received by the Water Rights Panel on account of that portion of the approved requests in excess of the total quantities available from Exchangors shall be paid by the Water Rights Panel to WRD in trust for the purpose of purchasing imported water and spreading the same in Central Basin for replenishment thereof. Thereafter WRD may, at any time, withdraw said funds or any part thereof so credited in trust for the aforesaid purpose, or may by the 40th day of any Administrative Year utilize all or any portion of said funds for the purchase of water available from subscriptions by Exchangors in the event the total quantity of such subscriptions exceeds the total quantity of approved requests by parties to purchase Exchange Pool water. To the extent that there is such an excess of available subscriptions over requests and to the extent that the existing credit in favor of WRD is sufficient to purchase such excess quantity at

the price established for Exchange Pool purchases during that Administrative Year, the money shall be paid to the Exchangors in the same manner as if another party had made such purchase as an Exchangee. WRD shall not extract any such Exchange Pool water so purchased.

(8) Additional Pumping by Exchangees Pursuant to Exchange Pool Provisions.

An Exchangee may extract from Central Basin in addition to its Allowed Pumping Allocation for a particular Administrative Year that quantity of water which it has requested to purchase from the Exchange Pool during that Administrative Year and which has been allocated to it pursuant to the provisions of paragraphs 5, 6 and 7. The first pumping by an Exchangee in any Administrative Year shall be deemed to be pumping of the party's allocation of Exchange Pool water.

(9) Reduction in Pumping by Exchangors.

Each Exchangor shall in each Administrative Year reduce its extractions of water from Central Basin below its Allowed Pumping Allocation for the particular year in a quantity equal to the quantity of Exchange Pool requests allocated to it pursuant to the provisions of paragraphs 4, 5, 6 and 7 of this Subpart C.

(10) Price to be Paid for Exchange Pool Water.

The price to be paid by Exchangees and to be paid to Exchangors per acre foot for required and voluntary subscriptions of Exchangors utilized to fill requests on the Exchange Pool by Exchangees shall be the dollar amount computed as follows by the Water Rights Panel for each Administrative Year. The "normal" price as of the beginning of the Administrative Year charged by Central Basin Municipal Water District (CBMWD) for treated MWD (Metropolitan Water District of Southern California) water used for domestic and municipal purposes shall be determined, and if on that date there are any changes

scheduled during that Administrative Year in CBMWD's "normal" price for such category of water, the weighted daily "normal" CBMWD price shall be determined and used in lieu of the beginning such price; and there shall be deducted from such beginning or weighted price, as the case may be, the "incremental cost of pumping water in Central Basin" at the beginning of the Administrative Year and any then current rate or rates, of assessments levied on the pumping of groundwater in Central Basin by Plaintiff District and any other governmental agency. The "normal" price charged by CBMWD shall be the highest price of CBMWD for normal service excluding any surcharge or higher rate for emergency deliveries or otherwise failing to comply with CBMWD rates and regulations relating to earlier deliveries. The "incremental cost of pumping water in Central Basin" as of the beginning of the Administrative Year shall be deemed to be the Southern California Edison Company Schedule No. PA-1 rate per kilowatt-hour, including all adjustments and all uniform authorized additions to the basic rate, multiplied by 560 kilowatt-hours per acre-foot, rounded to the nearest dollar (which number of kilowatt-hours has been determined to represent the average energy consumption to pump an acre-foot of water in Central Basin). In applying said PA-1 rate the charge per kilowatt-hour under the schedule shall be employed and if there are any rate blocks then the last rate block shall be employed. Should a change occur in Edison schedule designations, the Water Rights Panel shall employ that applicable to motors used for pumping water by municipal utilities.

(11) Carry-over of Exchange Pool Purchases by Exchangees.

An Exchangee who does not extract from Central Basin in a particular Administrative Year a quantity of water equal to the total of (a) its Allowed Pumping Allocation for that particular Administrative Year, reduced by any authorized amount of carryover into the next succeeding Administrative Year pursuant to the provisions of Section III(A) of this Judgment, and (b) the quantity

that it purchased from the Exchange Pool for that particular Administrative Year, may carry over into the next succeeding Administrative Year the right to extract from Central Basin a quantity equal to the difference between said total and the quantity actually extracted in that Administrative Year, but not exceeding the quantity purchased from the Exchange Pool for that Administrative Year. Any such carryover shall be in addition to that provided in said Section III(A).

If the "Basinwide Average Exchange Pool Price" in the next succeeding Administrative Year exceeds the "Exchange Pool Price" in the previous Administrative Year any such Exchangee exercising such carryover rights hereinabove provided shall pay to the Watermaster, forthwith upon the determination of the "Exchange Pool Price" in said succeeding Administrative Year, and as a condition to such carryover rights, an additional amount determined by multiplying the number of acre feet of carryover by the difference in "Exchange Pool Price" as between the two Administrative Years. Such additional payment shall be miscellaneous income to the Watermaster which shall be applied by it against that share of the Watermaster's Administrative Body's budget to be paid by the parties to this Agreement for the second Administrative Year succeeding that in which the Exchange Pool water was so purchased. For purposes of this paragraph, the term Basinwide Average Exchange Pool Price means the average price per acre foot paid for Exchange Pool water produced within the Central Basin during the year for which such determination is to be made, taking into account all Exchange Pool transactions consummated during that year.

(12) Notification by Watermaster to Exchangors and Exchangees of Exchange Pool Requests and Allocations Thereof and Price of Exchange Pool Water.

Not later than the 65th day after the commencement of each Administrative Year, the Administrative Body of Watermaster shall determine

and notify all Exchangors and Exchangees of the total of the allocated requests for Exchange Pool water and shall provide a schedule divided into categories of requests showing the quantity allocated to each Exchangee and a schedule of the allocation of the total Exchange Pool requirements among the Exchangors. Such notification shall also advise Exchangors and Exchangees of the prices to be paid to Exchangors for subscriptions utilized and the Exchange Pool Price for that Administrative Year as determined by the Water Rights Panel. The determinations of the Watermaster in this regard shall be subject to review by the Court in accordance with the procedure set forth in Part II of this Judgment.

(13) Payment by Exchangees.

Each Exchangee shall, on or prior to last day of the third month of each Administrative Year, pay to the Watermaster one-quarter of said price per acre-foot multiplied by the number of acre feet of such party's approved request and shall, on or before the last day of each of the next succeeding three months, pay a like sum to the Watermaster. Such amounts must be paid by each Exchangee regardless of whether or not it in fact extracts or uses any of the water it has requested to purchase from the Exchange Pool.

(14) Payments to Exchangors.

As soon as possible after receipt of moneys from Exchangees, the Watermaster shall remit to the Exchangors their pro rata portions of the amount so received in accordance with the provisions of paragraph 10 above.

(15) Delinquent Payments.

Any amounts not paid on or prior to any due date above shall carry interest at the rate of 1% per month or any part of a month. Any amounts required to be so paid may be enforced by the equitable powers of the Court, including, but not limited to, the injunctive process of the Court. In addition thereto, the Watermaster, as Trustee for the Exchangors and acting through the Water Rights Panel, may enforce such payment by any appropriate legal action, and shall be

entitled to recover as additional damages reasonable attorneys' fees incurred in connection therewith. If any Exchangee shall fail to make any payments required of it on or before 30 days after the last payment is due, including any accrued interest, said party shall thenceforward not be entitled to purchase water from the Exchange Pool in any succeeding Administrative Year except upon order of the Court, upon such conditions as the Court may impose.

IV. PROVISIONS FOR THE STORAGE OF WATER AND THE EXTRACTION OF STORED WATER.

A. Adjudication of Available Dewatered Space, Storage Capacity and Storage Apportionment.

There exists within the Basin a substantial amount of available space which has not been optimally utilized for basin management and for storage of native and imported waters. The Court finds and determines that (i) there is 330,000 acre feet of Available Dewatered Space in the Basin; (ii) use of this Available Dewatered Space will increase reasonable and beneficial use of the Basin by permitting the more efficient procurement and management of Replenishment Water, conjunctive use, and for direct and in-lieu recharge, thereby increasing the prudent storage and recovery of Stored Water for later use by parties to this Judgment, conservation of water and reliability of the water supply available to all Parties; and (iii) use of the Available Dewatered Space pursuant to the terms and conditions of this Judgment will not result in Material Physical Harm.

B. Avoidance of Material Physical Harm.

It is essential that the use of the Available Dewatered Space be undertaken for the greatest public benefit pursuant to uniform, certain, and transparent regulation that encourages the conservation of water and reliability of the water supply, avoids Material Physical Harm, and promotes the reasonable and beneficial use of water. Accordingly, in the event Watermaster becomes aware of the development of a Material Physical Harm, or imminent threat of the development of a Material Physical Harm, relating to the

use of the Available Dewatered Space, Watermaster shall, within thirty (30) days thereafter, notice a hearing before the Court and concurrently file a report with the Court, served on all parties, which shall explain the relevant facts then known to Watermaster relating to the Material Physical Harm, or imminent threat thereof, including without limitation, the location of the occurrence, the source or cause, existing and potential physical impacts or consequences of the identified or threatened material Physical Harm, and any recommendations to remediate the identified or threatened Material Physical Harm.

C. Apportionment of Available Dewatered Space.

To fairly balance the needs of the divergent interests of parties having water rights in the Basin, on the one hand, and the replenishment functions of WRD on the other hand, and in consideration of the shared desire and public purpose of removing impediments to the voluntary conservation, storage, exchange and transfer of water, all of the Available Dewatered Space is hereby adjudicated and apportioned into complimentary classifications of Stored Water and a Basin Operating Reserve as set forth in this Part IV. The apportionment contemplates flexible administration of storage capacity where use is apportioned among competing needs, while allowing all Available Dewatered Space to be used from time to time on a "space available" basis, subject to the priorities specified in this Judgment, and as further defined in Section IV(I) of this Judgment. The Court further finds and determines that, of the Available Dewatered Space, there is 220,000 acre-feet of storage capacity in the Central Basin which is presently available ("Adjudicated Storage Capacity"). The use of Adjudicated Storage Capacity as provided in this Judgment will not adversely affect the efficient operation of the Basin or the recharge of water necessary for the production of the parties' respective Allowed Pumping Allocations. The apportionment of Adjudicated Storage Capacity as provided herein will allow for flexible administration of groundwater storage within the Basin. The Adjudicated Storage Capacity is hereby assigned to Individual Storage Allocations and Community Storage as provided herein, provided however that if all

space in a particular classification is fully occupied then, on a "space available" basis, to available space within the other classifications of Adjudicated Storage Capacity and, only then, to available space within Basin Operating Reserve.

The Court further finds and determines that, out of the Available Dewatered Space, there is 110,000 acre feet that should be set aside for use by WRD as a Basin Operating Reserve, provided in Section IV(L), and subject to temporary occupancy by Stored Water as permitted hereunder.

No storage of water shall occur in the Basin except in conformity with this Judgment.

D. Individual Storage Allocation.

Each Party having an adjudicated groundwater extraction right hereunder shall have a priority right to store water in an Individual Storage Account, through conversion of Carryover to Stored Water as provided herein, or by any means authorized by this Judgment, up to a maximum of 50% of such party's Allowed Pumping Allocation. The cumulative quantity of Adjudicated Storage Capacity subject to individual storage allocation is 108,750 acre-feet. In recognition of prior importation of water which was introduced into the Basin as Stored Water, and which has not yet been extracted, the Court finds and determines that, as of the date of this Order, the following Parties have occupied a portion of their respective Individual Storage Allocations and have all associated rights therein, as follows:

City of Long Beach:	13,076.8 acre-feet
City of Lakewood:	500 acre-feet
City of Downey:	500 acre-feet
City of Cerritos	500 acre-feet

E. Community Storage; Regional Disadvantaged Communities Incentive Program.

In addition to Individual Storage Allocation, a Party that has fully occupied its Individual Storage allocation may, on a first in time, first in right basis (subject to the

limits expressed below) place water into storage in the "Community Storage Pool." The cumulative quantity of Adjudicated Storage Capacity allocated to Community Storage shall be 111,250 acre-feet. So long as there is available capacity in the Community Storage Pool, any Party may store water in the Community Storage Pool through conversion of Carryover to Stored Water as provided herein, or by any other means authorized by this Judgment, provided such Party has first fully occupied that party's available Individual Storage Allocation.

(1) Parties to this Judgment which, as of January 1, 2013, held Allowed Pumping Allocation of not greater than 5,000 acre-feet shall have a first priority right to occupy, in the aggregate, up to 10,000 acre-feet of storage space within the Central Basin Community Storage Pool, on the basis of first in time, first in right.

(2) Water stored pursuant to the Regional Disadvantaged Communities Incentive Program shall have a second priority right to occupy up to 23,000 acre-feet within the Community Storage Pool, on such terms as shall be determined by the Court.

(3) Any further storage in excess of the maximum quantity of Community Storage will be on a "space-available" interim basis. From time to time, and on a "space-available" basis, the total quantity of water available for storage is permitted to exceed Adjudicated Storage Capacity for the Community Storage Pool on an interim basis. This interim storage may occur if storage capacity exists as a result of unused Adjudicated Storage Capacity within other classifications, or available space exists in the Basin Operating Reserve. Such interim storage, however, is subject to priority rights to such Dewatered Space as provided in this Judgment. A party that seeks to convert the water temporarily held in interim storage to a more firm right, may contract for the use of another party's Individual Storage Allocation, or may add such water to the Community Storage Pool once space therein becomes available.

(4) After a party occupies available storage capacity within the Community Storage Pool and then withdraws water from the Community Storage Pool, the storing party will be allowed a period of twenty-four (24) months to refill the evacuated storage before the capacity will be determined excess and available for use by other parties. Once the Basin's Community Storage Pool has been filled for the first time, a party may exercise its twenty-four (24) month refill priority only once, and then only provided there is then capacity available to permit that party to refill the vacated space. Except to the extent Community Storage space may be subject to such priority right to re-fill, all space therein shall be occupied on a first in time, first in right basis.

(5) A party that has occupied storage in the Community Storage Pool for ten (10) consecutive years shall be deemed to extract its Stored Water first in subsequent years (notwithstanding the order of water production set forth in Section I(B)(3)) until its entire Community Storage account has been extracted, but thereafter may again make use of Community Storage on the same terms available to other parties on a first in time, first in right, space-available basis.

(6) Any quantity of water held in the Community Storage Pool for a term greater than ten (10) consecutive years shall be assessed an annual water loss equal to 5% of the lowest quantity of water held within the party's Community Storage Pool account at any time during the immediately preceding ten-year period. The lowest quantity means the smallest amount of water held by the Party in the Community Storage Pool during any of the preceding ten (10) years, with a new loss calculation being undertaken every year. Water subject to the loss assessment will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation. Water lost to the Basin shall constitute water replenished into the Central Basin for the benefit of all parties

F. Limit on Storage.

Irrespective of the category of storage utilized, each party to this Judgment may not cumulatively have in storage at any time Stored Water totaling more than two hundred percent (200%) of that party's Allowed Pumping Allocation. Subject to the foregoing, the right to produce Stored Water may be freely transferred to another party to this Judgment, or as otherwise permitted herein.

G. Extractions of Stored Water; Exemption from Replenishment Assessment.

The Court finds and declares that the extraction of Stored Water as permitted hereunder does not constitute "production of groundwater" within the meaning of Water Code Section 60317 and that no Replenishment Assessment shall be levied on the extraction of Stored Water. WRD has stipulated to the same. This determination reflects the practical application of certain provisions of this Judgment concerning storage of water, including, without limitation, understanding the following: (1) payment of the Replenishment Assessment is required upon the conversion of Carryover Water into storage, and; (2) developed water introduced into the Basin for storage by or on behalf of a Party through spreading or injection need not be replenished by WRD and should not be subject to the Replenishment Assessment.

H. Storage Procedure.

The Administrative Body shall (i) prescribe forms and procedures for the orderly reporting of Stored Water, (ii) maintain records of all water stored in the Basin, and (iii) undertake monitoring and modeling of Stored Water as may be reasonably required. As to any Storage Projects that will require review and approval by the Storage Panel, the Administrative Body shall provide appropriate applications, and shall work with project applicants to complete the application documents for presentation to the Storage Panel. The Administrative Body shall be responsible for conducting any groundwater modeling necessary to evaluate a proposed Storage Project. The proponent of a proposed project will bear all costs associated with the review of the application for approval of the project and all costs associated with its implementation. Nothing in this Judgment shall alter the applicant(s) duty to comply with CEQA or to meet other legal requirements as to any

proposed Storage Project. Within thirty (30) days after final submission of the storage application documents, the Administrative Body shall provide notice of the storage application (either by electronic mail or U.S. postal mail), together with a copy of the application documents, to all parties possessing an Allowed Pumping Allocation, and to any other person requesting notice thereof. Following notice, any necessary hearings before the Storage Panel shall be conducted as provided in Section IV(O) of this Judgment.

I. Loss of Stored Water/Relative Priority.

To balance the need to protect priority uses of storage and to encourage the full utilization of Adjudicated Storage Capacity and Basin Operating Reserve where it can be accommodated without interference with priority uses, and except as otherwise provided in this Judgment, no water held in any authorized storage account will be deemed lost from that storage account unless the cumulative quantity of water held as Stored Water plus the quantity of water held within the Basin Operating Reserve exceeds 330,000 acre-feet. Where all Adjudicated Storage Capacity and Basin Operating Reserve has been occupied, the first Stored Water to be deemed lost shall be the last water stored as Community Storage. Upon receipt of a bona fide request by another use entitled to priority hereunder, Watermaster shall issue a notice requiring the other parties to evacuate their Stored Water. Any Stored Water that is not evacuated shall be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation and accounted for accordingly.

J. Limits on Extraction.

Anything in this Judgment to the contrary notwithstanding, no party shall extract greater than 140% of the sum of (i) the party's Allowed Pumping Allocation and (ii) the party's leased water, except upon prior approval by the Water Rights Panel. For this purpose, a party's total extraction right for a particular year shall include that party's Allowed Pumping Allocation and any contractual right through lease or other means to utilize the adjudicated rights of another party. Where such proposed extraction would

occur within the Central Basin Pressure Area as defined by Watermaster consistent with historical records, the Water Rights Panel shall submit such request for review by the Board of WRD. The Water Rights Panel shall not approve any request for over-extraction within the Pressure Area without a written finding by the Board of WRD that such over-extraction will not cause Material Physical Harm. The role of the Board of WRD in this process shall not be read to expand or restrict WRD's statutory authority. Consideration shall be on an expedited basis.

K. Increased Extractions in the Central Basin for Certain Water Purveyors.

(1) This Court also maintains continuing jurisdiction over the West Coast Basin, which bounds the Central Basin to the west.

(2) Certain Water Purveyors are parties to both this Amended Judgment and the judgment governing the West Coast Basin and serve communities overlying both the Central Basin and the West Coast Basin.

(3) Certain Water Purveyors may exceed their Allowed Pumping Allocation in any Administrative Year, subject to all of the following conditions:

(a) The Water Purveyor is one of the following eligible Parties:

(i) City of Los Angeles

(ii) Golden State Water Company

(iii) California Water Service Company.

(b) Increased extractions pursuant to this Section shall not exceed 5,000 acre-feet per Water Purveyor for the particular Administrative Year.

(c) Increased extractions pursuant to this Section shall not exceed the Water Purveyor's unused "Adjudicated Rights" in the West Coast Basin.

(d) Increased extractions pursuant to this Section shall not result in Material Physical Harm.

(4) Notwithstanding the foregoing, nothing herein permits extraction

of water within the Central Basin in excess of 140% of Allowed Pumping Allocation for the particular Administrative Year, except as otherwise permitted under this Judgment.

(5) Replenishment of any water extracted from the Central Basin pursuant to this Section shall occur exclusively in the Central Basin.

(6) The benefits of this Section are made available only to the certain Water Purveyors that serve communities overlying the Central Basin and communities overlying the West Basin, in recognition of the management of water resources by those Water Purveyors to serve such overlying communities. It is not made, nor is it related to, a determination of an underflow between the basins, a cost or benefit allocation, or any other factor relating to the allocation of the Replenishment Assessment.

L. Special Provisions for Temporary Storage within Community Storage Pool.

The Central Basin Municipal Water District ("CBMWD") shall take such action as may be necessary to reduce its Allowed Pumping Allocation to five (5) acre-feet or fewer by December 31, 2018, and has agreed, by stipulation, not to acquire any additional Central Basin water rights. Upon application by CBMWD, the Storage Panel may, after making each of the findings required in this subsection, approve storage of water by CBMWD within the Community Storage Pool subject to the stated conditions. The Storage Panel may only authorize such storage after finding each of the following to be true as of the date of such approval:

(1) CBMWD (a) then owns five (5) acre-feet or fewer of Allowed Pumping Allocation, and (b) has not produced water utilizing any extraction rights it holds within the Basin but has only engaged in the sale or leasing of those rights to others.

(2) There is available space for Storage within the Community Storage

Pool.

(3) CBMWD has identified a source of imported water that may be brought into the Basin and stored underground.

(4) The water identified for storage (a) is unlikely to be acquired by other parties through surface delivery for use within the Basin, and (b) was offered to WRD to purchase for replenishment purposes at the same price that CBMWD otherwise sells imported water to WRD and WRD declined to purchase said water, within a reasonable period of time.

(5) There will be no Material Physical Harm associated with the introduction of the water into storage, or its extraction, in the manner approved by the Storage Panel.

The condition expressed in Section IV(L)(1)(a) above shall not be operative until January 1, 2019, or upon reduction of CBMWD's Allowed Pumping Allocation to five (5) acre-feet or fewer, whichever first occurs. CBMWD may not extract the Stored Water, and may instead only transfer that Stored Water to a party having extraction rights, or to WRD for replenishment purposes only. Such Stored Water not so transferred within three (3) years following its storage may be purchased by WRD, at its option, for replenishment purposes only, at a price not exceeding the actual cost incurred by CBMWD in importing and storing the water in the first instance, plus a reasonable administrative charge for overhead not exceeding five percent (5%) of the price paid by CBMWD for the water with no other fees or markups imposed by CBMWD. Except as otherwise permitted in this Section, any such Stored Water held by CBMWD for a term greater than three (3) years shall be assessed an annual water loss equal to 10% of the amount of such Stored Water at the end of each year. Water subject to the loss

assessment will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without further compensation. The Storage Panel shall grant CBMWD one or more extensions of such term, not exceeding total extensions of three (3) additional years, following public hearing, if the Storage Panel determines that the Stored Water has been actively marketed by CBMWD for transfer to Parties on reasonable terms in the previous year. The Storage Panel may impose such additional reasonable conditions as it determines to be appropriate. Any review by the Storage Panel hereunder shall only occur at a public hearing held following at least 15 days' (but not more than 30 days') mailed notice to all Parties to this Judgment, at which hearing an opportunity for public comment shall be afforded in advance of any such decision. However, the Storage Panel may consider an application on shorter notice under exigent circumstances, including the potential loss of the water proposed to be stored if action is not taken sooner. CBMWD shall have the right to appeal any action or inaction by the Storage Panel to this court. The storage and extraction of Stored Water hereunder shall otherwise be subject to all other provisions of this Judgment. The court finds and declares that this subsection constitutes a "court order issued by a court having jurisdiction over the adjudication of groundwater extraction rights within the groundwater basin where storage is sought" within the meaning of Water Code §71610(b)(2)(B). Nothing in this provision impedes CBMWD's ability to store water pursuant to a contract with an adjudicated groundwater extraction rights holder as permitted by Water Code § 71610(b)(2)(A) and otherwise in accordance with this Judgment.

M. Basin Operating Reserve.

It is in the public interest and in furtherance of the physical solution for WRD to prudently exercise its statutory discretion to purchase, spread, and inject Replenishment Water, to provide for in-lieu replenishment, and otherwise to fulfill its replenishment function within the Basin as provided in Water Code Section 60000 et. seq. Hydrologic,

regulatory and economic conditions now prevailing within the State require that WRD be authorized to exercise reasonable discretion and have flexibility in the accomplishment of its replenishment function. Accordingly, WRD may pre-purchase or defer the purchase of Replenishment Water, and may otherwise purchase and manage available sources of Replenishment Water under the most favorable climatic and economic conditions as it may determine reasonable and prudent under the circumstances. It is the intent of the parties to preserve space for such replenishment activities, including capture of natural inflows during wet years, recapture of water when possible, and artificial replenishment when water is available at discounted rate, for the benefit of the Basin and the parties to the Judgment. The Basin Operating Reserve is intended to allow WRD to meet its replenishment needs to make APA available for extraction by all water rights holders. Accordingly, WRD shall have a priority right to occupy up to 110,000 acre-feet of the Available Dewatered Space as the "Basin Operating Reserve" for the acquisition and replenishment of water, or to ensure space remains available in the Basin to capture natural inflows during wet years for the benefit of the parties to the Judgment, to offset over-production. The priority right is not intended to allow WRD to sell or lease stored water, storage, or water rights. To the extent WRD does not require the use of all of such Basin Operating Reserve, that portion of the Basin Operating Reserve that is not then being used shall be available to other Parties to store water on a temporary and space-available basis. No Party may use any portion of the Basin Operating Reserve for space-available storage unless that Party has already maximized its allowed Storage pursuant to its Individual Storage Allocation and all available Community Storage is already in use. WRD's failure to use any portion of its Basin Operating Reserve shall not cause forfeiture or create a limitation of its right to make use of the designated space in the future. WRD's first priority right to this category of space shall be absolute. To the extent that there is a conflict between WRD and a third party regarding the availability of and desire to use any portion of the space available for replenishment up to the maximum limits set forth in this section, the interests of WRD will prevail. If a party other than

WRD is using the Basin Operating Reserve space on a "space available" basis and a conflict develops between WRD and the storing party, the storing party will, upon notice from WRD, evacuate the Stored Water within ninety (90) days thereafter. In such event, temporary occupancy within the Basin Operating Reserve shall be first in time, first in right, and the last Party to store water shall be required to evacuate first until adequate space shall be made available within the Basin Operating Reserve to meet WRD's needs. The storing party or parties assume all risks of waste, spill and loss regardless of the hardship. Stored Water that is not evacuated following WRD's notice of intent to occupy the Basin Operating Reserve will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation and accounted for accordingly. Nothing herein shall permit WRD to limit or encumber, by contract or otherwise, its right to use the Basin Operating Reserve for Replenishment purposes for any reason, or to make space therein available to any person by any means. Notwithstanding the foregoing, to the extent excess space is available, water evacuated from the Basin Operating Reserve as provided in this Section shall be deemed added to available space within the Individual Storage Allocations and Community Storage Pool, subject to the priority rights otherwise provided in this Judgment.

N. Water Augmentation.

The parties, in coordination with WRD, may undertake projects that add to the long-term reliable yield of the Basin. Innovations and improvements in practices that increase the conservation and maximization of the reasonable and beneficial use of water should be promoted. To the extent that Parties to the Judgment, in coordination with WRD, implement a project that provides additional long-term reliable water supply to the Central Basin, the annual extraction rights in the Central Basin will be increased commensurately in an amount to be determined by the Storage Panel to reflect the actual yield enhancement associated with the project. Augmented supplies of water resulting from such a project may be extracted or stored as permitted in this Judgment in the same manner as other water. Participation in any Water Rights Augmentation Project shall be

voluntary. A party may elect to treat a proposed project as a Water Augmentation Project (for the purpose of seeking an increase in that party's Allowed Pumping Allocation) or may elect to treat such a project as a Storage Project under the other provisions of this Judgment. The terms of participation in any Water Augmentation Project will be at the full discretion of the participating parties. All Water Augmentation Projects will be approved by the Storage Panel.

(1) Participating Parties.

Parties who propose a Water Augmentation Project ("Project Leads") may do so in their absolute discretion, upon such terms as they may determine. All other parties to this Judgment will be offered an opportunity to participate in the Water Augmentation Project on condition that they share proportionally in common costs and benefits, and assume the obligation to bear exclusively the cost of any improvements that are required to accommodate their individual or particular needs. Notice shall be provided which generally describes the project and the opportunity to participate with sufficient time for deliberation and action by any of these parties who could potentially participate. Disputes over the adequacy of notice shall be referred to the Storage Panel, and then to the Court under its continuing jurisdiction. Parties who elect to participate ("Project Participants") may do so provided they agree to offer customary written and legally binding assurances that they will bear their proportionate costs attributable to the Water Rights Augmentation Project, or provide other valuable consideration deemed sufficient by the Project Leads and the Project Participants.

(2) Determination of Additional Extraction Rights.

The amount of additional groundwater extraction as a result of a Water Augmentation project will be determined by the Storage Panel, subject to review by the Court. The determination will be based upon substantial evidence which supports the finding that the Water Augmentation project will increase the long-term sustainable yield of the respective Basin by an amount at least equal to the

proposed increase in extraction rights.

(3) Increase in Extraction Rights.

A party that elects to participate and pays that party's full pro-rata share of costs associated with any Water Augmentation Project and/or reaches an agreement with other participants based upon other valuable consideration acceptable to the Project Leads and Project Participants, will receive a commensurate increase in extraction rights. Non-participating parties will not receive an increase or a decrease in extraction rights. Any party that elects not to participate will not be required to pay any of the costs attributable to the particular Water Augmentation Project, whether directly or indirectly as a component of the WRD Replenishment Assessment.

(4) Nominal Fluctuations.

Because water made available for Water Rights Augmentation will be produced annually, fluctuations in groundwater levels will be temporary, nominal and managed within the Basin Operating Reserve.

(5) Availability of New Water.

The amount of additional groundwater extraction established as a result of a Water Augmentation Project shall be equal to the quantity of new water in the Basin that is attributable to that Water Augmentation Project. No extraction shall occur and no extraction right shall be established until new water has been actually introduced into the Basin as a result of the Project. Any approval for a Water Augmentation Project shall include provisions (a) requiring regular monitoring to determine the actual amount of such new water made available, (b) requiring make-up water or equivalent payment therefor to the extent that actual water supply augmentation does not meet projections, and (c) adjusting extraction rights attributable to the Water Augmentation Project to match the actual water created. The right to extract augmented water from the Basin resulting from a party's participation in a Water Augmentation Project shall be accounted for

separately and shall not be added to a party's Allowed Pumping Allocation. No Replenishment Assessment shall be levied against the extraction of augmented water.

(6) Limitation.

Notwithstanding the foregoing, WRD will not obtain any water rights or extraction rights under this Judgment by virtue of its participation in a Water Augmentation Project. If WRD participates in a Water Rights Augmentation Project through funding or other investments, its allocation of new water from the project shall be used to offset its replenishment responsibilities.

O. Limits on Watermaster Review.

It shall not be necessary for Watermaster, or any constituent body thereof, to review or approve any of the following before the affected Party may proceed: (i) exercise of adjudicated water rights consistent with this Judgment, except for extraction above 140% of a Party's extraction right as set out in Section IV(J) of this Judgment; (ii) replenishment of the Basin with Replenishment Water by WRD consistent with Water Code Section 60000 et seq., including replenishment of water produced by water rights holders through the exercise of adjudicated water rights; (iii) WRD's operations within the Basin Operating Reserve; (iv) Carryover Conversion or other means of the filling of the Individual Storage Accounts and the Community Storage Pool, as provided in this Judgment, as long as existing water production, spreading, or injection facilities are used; and (v) individual transfers of the right to produce Stored Water as permitted in Section IV(F). All other Storage Projects and all Water Augmentation Projects shall be subject to review and approval as provided herein, including (i) material variances to substantive criteria governing projects exempt from the review and approval process, (ii) modifications to previously approved Storage Projects and agreements, (iii) a party's proposal for Carryover Conversion in quantities greater than the express apportionment of Adjudicated Storage Capacity on a non-priority, space-available, interim basis, and (iv) Storage, by means other than Carryover Conversion, when new production,

spreading, or injection facilities are proposed to be utilized.

P. Hearing Process For Watermaster Review.

The following procedures shall be followed by Watermaster where Watermaster review of storage or extraction of Stored Water is required or permitted under this Judgment:

(1) No later than thirty (30) days after notice has been issued for the storage application, the matter shall be set for hearings before the Storage Panel. A staff report shall be submitted by WRD staff in conjunction with the completed storage application documents and the Water Rights Panel may prepare an independent staff report, if it elects to do so.

(2) The Board of WRD and the Water Rights Panel (sitting jointly as the Storage Panel) shall conduct a joint hearing concerning the storage application.

(3) All Watermaster meetings shall be conducted in the manner prescribed by the applicable Rules and Regulations. The Rules shall provide that all meetings of Watermaster shall be open to water rights holders and that reasonable notice shall be given of all meetings.

(4) The Board of WRD and the Water Rights Panel shall each adopt written findings explaining its decision on the proposed Storage Project, although if both entities reach the same decision on the Storage Project, they shall work together to adopt a uniform set of findings.

(5) Unless both the Board of WRD and the Water Rights Panel approve the Storage Project, the Storage Project application shall be deemed denied (a "Project Denial"). If both the Board of WRD and the Water Rights Panel approve the Storage Project, the Storage Project shall be deemed approved (a "Project Approval").

Q. Trial Court Review

(1) The applicant may seek the Storage Panel's reconsideration of a

Project Denial. However, there shall be no process for mandatory reconsideration or mediation of a Project Approval or a Project Denial either before the Administrative Body, or before the Water Rights Panel.

(2) Any Party may file an appeal from a Project Approval or Project Denial with this Court, as further described in Section II(F).

(3) In order to (a) promote the full presentation of all relevant evidence before the Storage Panel in connection with its consideration of any proposed Storage Project, (b) achieve an expeditious resolution of any appeal to the Court, and (c) accord the appropriate amount of deference to the expertise of the Storage Panel, the appeal before the Court shall be based solely on the administrative record, subject only to the limited exception in California Code of Civil Procedure section 1094.5(e).

(4) If both the WRD Board and the Water Rights Panel each vote to deny or approve a proposed Storage Project, it shall be an action by the Storage Panel and that decision shall be accorded by the Court deference according to the substantial evidence test. If one of the reviewing bodies votes to approve the proposed Storage Project and the other reviewing body votes to deny the proposed storage project, then the Court's review shall be *de novo*, although still restricted to the administrative record. In the case of any *de novo* Trial Court review, the findings made by the respective Watermaster bodies shall not be accorded any weight independent of the evidence supporting them.

R. Space Available Storage, Relative Priority, and Dedication of "Spilled" Water.

To balance the need to protect priority uses of storage and to encourage the full utilization of Available Dewatered Space within the Adjudicated Storage Capacity and the Basin Operating Reserve, any Party may make interim, temporary use of then currently unused Available Dewatered Space within any category of Adjudicated Storage Capacity, and then if all Adjudicated Storage Capacity is being fully used for Stored

Water within the Basin Operating Reserve ("Space-Available Storage"), subject to the following criteria:

(1) Any Party may engage in Space-Available Storage without prior approval from Watermaster provided that the storing Party or Parties shall assume all risks of waste, spill, and loss regardless of the hardship. Whenever the Storage Panel determines that a Party is making use of excess Available Dewatered Space for Space-Available Storage, the Storage Panel shall issue written notice to the Party informing them of the risk of spill and loss.

(2) Whenever the Available Dewatered Space is needed to accommodate the priority use within a respective category of Adjudicated Storage Capacity, or WRD seeks to make use of its priority right to the Basin Operating Reserve to fulfill its replenishment function, the Storage Panel shall issue a notice to evacuate the respective category of Adjudicated Storage Capacity or Basin Operating Reserve, as applicable, within the time-periods set forth within this Amended Judgment. To the extent the Stored Water is not timely evacuated such Stored Water will be placed into any other excess Available Dewatered Space, first within the Adjudicated Storage Capacity, if available, and then if all Adjudicated Storage Capacity is being fully used for Stored Water within the Basin Operating Reserve. If no excess Available Dewatered Space is available within the Basin Operating Reserve, then the Stored Water shall be deemed spilled and will be deemed dedicated to the Basin Operating Reserve in furtherance of the physical solution without compensation and accounted for accordingly. A Party that seeks to convert the Stored Water temporarily held in interim storage as Space-Available Storage to a more firm right, may in its discretion, contract for the use of another Party's Individual Storage Allocation, or may add such water to the Community Storage Pool once space therein becomes available.

(3) No Stored Water will be deemed abandoned unless the cumulative

quantity of water held as Stored Water plus the quantity of water held in the Basin Operating Reserve exceeds 330,000 (three hundred and thirty thousand) acre-feet in the Central Basin.

V. CONTINUING JURISDICTION OF THE COURT.

The Court hereby reserves continuing jurisdiction and upon application of any interested party, or upon its own motion, may review and redetermine the following matters and any matters incident thereto:

A. Its determination of the permissible level of extractions from Central Basin in relation to achieving a balanced basin and an economic utilization of Central Basin for groundwater storage, taking into account any then anticipated artificial replenishment of Central Basin by governmental agencies for the purpose of alleviating what would otherwise be annual overdrafts upon Central Basin and all other relevant factors.

B. Whether in accordance with applicable law any party has lost all or any portion of his rights to extract groundwater from Central Basin and, if so, to ratably adjust the Allowed Pumping Allocations of the other parties and ratably thereto any remaining Allowed Pumping Allocation of such party.

C. To remove any Watermaster or constituent body appointed from time to time and appoint a new Watermaster; and to review and revise the duties, powers and responsibilities of the Watermaster or its constituent bodies and to make such other and further provisions and orders of the Court that may be necessary or desirable for the adequate administration and enforcement of the Judgment.

D. To revise the price to be paid by Exchangees and to Exchangors for Exchange Pool purchases and subscriptions.

E. In case of emergency or necessity, to permit extractions from Central Basin for such periods as the Court may determine: (i) ratably in excess of the Allowed Pumping Allocations of the parties; or (ii) on a non-ratable basis by certain parties if

either compensation or other equitable adjustment for the benefit of the other parties is provided. Such overextractions may be permitted not only for emergency and necessity arising within Central Basin area, but to assist the remainder of the areas within The Metropolitan Water District of Southern California in the event of temporary shortage or threatened temporary shortage of its imported water supply, or temporary inability to deliver the same throughout its area, but only if the court is reasonably satisfied that no party will be irreparably damaged thereby. Increased energy cost for pumping shall not be deemed irreparable damage. Provided, however, that the provisions of this subparagraph will apply only if the temporary shortage, threatened temporary shortage, or temporary inability to deliver was either not reasonably avoidable by the Metropolitan Water District, or if reasonably avoidable, good reason existed for not taking the steps necessary to avoid it.

F. To review actions of the Watermaster.

G. To assist the remainder of the areas within The Metropolitan Water District of Southern California within the parameter set forth in subparagraph (e) above.

H. To provide for such other matters as are not contemplated by the Judgment and which might occur in the future, and which if not provided for would defeat any or all of the purposes of this Judgment to assure a balanced Central Basin subject to the requirements of Central Basin Area for water required for its needs, growth and development.

The exercise of such continuing jurisdiction shall be after 30 days' notice to the parties, with the exception of the exercise of such continuing jurisdiction in relation to subparagraphs E and G above, which may be *ex parte*, in which event the matter shall be forthwith reviewed either upon the Court's own motion or the motion of any party upon which 30 days' notice shall be so given. Within ten (10) days of obtaining any *ex parte* order, the party so obtaining the same shall mail notice thereof to the other parties. If any other party desires Court review thereof, the party obtaining the *ex parte* order shall bear the reasonable expenses of mailing notice of the proceedings, or may in lieu thereof undertake the mailing. Any contrary or

modified decision upon such review shall not prejudice any party who relied on said *ex parte* order.

VI. GENERAL PROVISIONS.

A. Judgment Constitutes Inter Se Adjudication.

This Judgment constitutes an inter se adjudication of the respective rights of all parties, except as may be otherwise specifically indicated in the listing of the water rights of the parties of this Judgment, or in Appendix "2" hereof. All parties to this Judgment retain all rights not specifically determined herein, including any right, by common law or otherwise, to seek compensation for damages arising out of any act or omission of any person. This Judgment constitutes a "court order" within the meaning of Water Code Section 71610(B)(2)(b).

B. Assignment, Transfer, Etc., of Rights.

Subject to the other provision of this Judgment, and any rules and regulations of the Watermaster requiring reports relative thereto, nothing herein contained shall be deemed to prevent any party hereto from assigning, transferring, licensing or leasing all or any portion of such water rights as it may have with the same force and effect as would otherwise be permissible under applicable rules of law as exist from time to time.

C. Service Upon and Delivery to Parties of Various Papers.

Service of the Judgment on those parties who have executed that certain Stipulation and Agreement for Judgment or who have filed a notice of election to be bound by the Exchange Pool provisions shall be made by first class mail, postage prepaid, addressed to the designee and at the address designated for that purpose in the executed and filed Counterpart of the Stipulation and Agreement for Judgment or in the executed and filed "Notice of Election to be Bound by Exchange Pool Provisions," as the case may be, or in any substitute designation filed with the Court.

Each party who has not heretofore made such a designation shall, within 30 days after the Judgment shall have been served upon that party, file with the Court, with proof

of service of a copy upon the Watermaster, a written designation of the person to whom and the address at which all future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon that party or delivered to that party are to be so served or delivered.

A later substitute designation filed and served in the same manner by any party shall be effective from the date of filing as to the then future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon or delivered to that party.

Delivery to or service upon any party by the Watermaster, by any other party, or by the Court, or any item required to be served upon or delivered to a party under or pursuant to the Judgment may be by deposit in the mail, first class, postage prepaid, addressed to the designee and at the address in the latest designation filed by that party.

D. Judgment Does Not Affect Rights, Powers, Etc., of Plaintiff District.

Nothing herein constitutes a determination or adjudication which shall foreclose Plaintiff District from exercising such rights, powers, privileges and prerogatives as it may now have or may hereafter have by reason of provisions of law.

E. Continuation of Order under Interim Agreement.

The order of Court made pursuant to the "Stipulation and Interim Agreement and Petition for Order" shall remain in effect through the Administrative Year in which this Judgment shall become final (subject to the reserved jurisdiction of the Court).

F. Effect of Extractions by Exchangees; Reductions in Extractions.

With regard to Exchange Pool purchases, the first extractions by each Exchangee shall be deemed the extractions of the quantities of water which that party is entitled to extract pursuant to his allocation from the Exchange Pool for that Administrative Year. Each Exchangee shall be deemed to have pumped his Exchange Pool request so allocated for and on behalf of each Exchangor in proportion to each Exchangor's subscription to the Exchange Pool which is utilized to meet Exchange Pool requests. No Exchangor shall ever be deemed to have relinquished or lost any of its rights determined in this

Judgment by reason of allocated subscriptions to the Exchange Pool. Each Exchangee shall be responsible as between Exchangors and that Exchangee, for any tax or assessment upon the production of groundwater levied for replenishment purposes by WRD or by any other governmental agency with respect to water extracted by such Exchangee by reason of Exchange Pool allocations and purchases. No Exchangor or Exchangee shall acquire any additional rights, with respect to any party to this action, to extract waters from Central Basin pursuant to Water Code Section 1005.1 by reason of the obligations pursuant to and the operation of the Exchange Pool.

G. Judgment Binding on Successors, Etc.

This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but as well to their respective heirs, executors, administrators, successors, assigns, lessees, licensees and to the agents, employees and attorneys in fact of any such persons.

H. Costs.

No party shall recover its costs herein as against any other party.

I. Intervention of Successors in Interest and New Parties.

Any person who is not a party (including but not limited to successors or parties who are bound by this Judgment) and who proposes to produce water from the Basin, store water in the Basin, or exercise water rights of a predecessor may seek to become a party to this Judgment through a Stipulation in Intervention entered into with the Plaintiff. Plaintiff may execute said Stipulation on behalf of the other parties herein, but such Stipulation shall not preclude a party from opposing such intervention at the time of the court hearing thereon. Said Stipulation for Intervention must thereupon be filed with the Court, which will consider an order confirming said intervention following thirty (30) days' notice to the parties. Thereafter, if approved by the Court, such intervenor shall be a party bound by this Judgment and entitled to the rights and privileges accorded under the physical solution herein.

J. Effect of this Amended Judgment on Orders Filed Herein.

This Third Amended Judgment shall not abrogate such rights of additional carryover of unused water rights as may otherwise exist pursuant to orders herein filed June 2, 1977 and September 29, 1977.

THE CLERK WILL ENTER THIS THIRD AMENDED JUDGMENT FORTHWITH.

DATED: _____

_____
Judge of the Superior Court

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX H

WATER CONSERVATION ORDINANCE

§ 7511.1. Authorization to Implement Water Conservation Ordinance. [Added by Ord. 91-3]

The City Council is authorized to implement the provisions of the Water Conservation Ordinance upon the determination that a significant shortage in potable water supply is anticipated and implementation of the ordinance is necessary to protect the public welfare and safety. The implementation of the ordinance will occur upon the adoption of a resolution following a public hearing by the City Council. Such a public hearing shall be held to determine whether a water supply shortage exists and which conservation measures provided within the ordinance shall be implemented.

A. General Prohibition. No person shall make, cause, use or permit the use of water in the City of Lakewood in a manner contrary to any provision of this ordinance or in an amount in excess of that use permitted by any curtailment provisions then in effect pursuant to action taken by the City Council in accordance with the provisions of this section. **[Added by Ord. 91-3]**

B. Reclaimed Water Use. No commercial water customer, including but not limited to commercial shopping centers, schools, office buildings, hospitals, industrial uses, and churches whose property line is located within a reasonable distance from a reclaimed water system shall continue to use potable water for the purpose of landscape irrigation after thirty (30) days written notice to connect to the City's reclaimed water system installed to the property line at the expense of the City. The connection shall be at the expense of the commercial water customer. Those customers using reclaimed water shall be exempt from the emergency rate surcharge and the restrictions regarding landscape irrigation. **[Added by Ord. 91-3; amended by Ord. 2009-5]**

C. Implementation of General Water Conservation Practices. The City Council finds that water conservation should become a way of life for Lakewood water customers, and that water is a precious resource and should not be wasted even in times when water supply meets normal demand. **[Added by Ord. 91-13]**

1. The following water conservation practices shall be implemented when water supply meets normal demand as declared by resolution of the City Council. The following water use practices shall be maintained and no person shall violate the same: **[Amended by Ord. 2009-5]**

   (a) Decorative fountains, or other structures using water for aesthetic purposes shall be shut off unless such fixture operates on a recirculating system.

   (b) No person shall permit leaks or waste of water. A leak shall be defined as any water not used for beneficial use that wastes more than .5 gallons of water per minute. All known leaks from indoor and outdoor plumbing fixtures shall be repaired within seven (7) days upon receipt of written notice of observed water leak.

   (c) Drinking water shall not be served at any restaurant, motel, cafe, or other drinking or eating establishment unless expressly requested.

   (d) Installation of single pass cooling systems shall be prohibited in buildings requesting new water service.

(e) Hotels, motels and other commercial lodging establishments must provide customers the option to refuse daily towel and linen service. Commercial lodging establishments shall prominently display notice of this option in each guest room.

(f) Installation of non-re-circulating commercial car washes and laundry systems shall be prohibited.

(g) New eating and drinking establishments and existing eating and drinking establishments that remodel more than 50 percent of the kitchen area shall install water conserving dish wash spray valves.

2. The following conservation practices are suggested when water supply meets normal demand:

(a) The use of water to wash walkways, driveways, parking areas and other hard surfaces should occur only as necessary to alleviate safety or sanitary hazards, and then only with a hose equipped with a positive shut off nozzle, a handheld bucket or similar container, or a low volume/high pressure water broom. Excessive water runoff into gutters is discouraged. **[Amended by Ord. 2009-5]**

(b) Washing of vehicles and any other mobile equipment should be done only with a bucket or a hose equipped with a positive shut off nozzle for quick rinses. Commercial car washes are exempt from this provision.

(c) Voluntary water conservation field examination, herein referred to as water audits, are encouraged for all Lakewood water customers.

(d) The retrofit of water conserving devices, including but not limited to ultra low flow toilets and low flow showerheads, is encouraged.

(e) The installation of water efficient landscapes and irrigation devices, such as drip irrigation and moisture sensors, is encouraged. A drip irrigation system shall be defined as an irrigation system consisting of individual emitters installed at permanent plantings with a capacity to emit no more than two (2) gallons of water per hour of operation. **[Amended by Ord. 2009-5]**

D. Implementation of a Voluntary Phase Water Conservation Plan. Measures instituted during a Voluntary Phase water supply shortage may be declared by Resolution of the City Council finding it necessary to conserve up to ten percent (10%) of the City's water supply. The following water conservation practices are recommended during a Voluntary Phase water shortage: **[Added by Ord. 91-13; amended by Ord. 2009-5]**

1. The following restrictions on the use of water shall be in effect during a Voluntary Phase of a water shortage and no person shall fail to comply with the following:

(a) Leaks from indoor and outdoor plumbing fixtures shall be repaired within six (6) days upon receipt of written notice of observed water leak.

2. The following water conservation practices are recommended during a Voluntary Phase water shortage:

(a) Water used to wash sidewalks, driveways, parking lots, building exteriors, streets and gutters should be minimized and should be limited to no more than (2) times during a calendar month to alleviate safety or sanitary hazards, and then only with a hose equipped with a positive shut off nozzle, a handheld bucket or similar container, or a low volume/high pressure water broom .

(b) Watering lawns and landscaped areas should be limited to between the hours of 5:00 p.m. and 9:00 a.m. Watering using a handheld bucket or similar container, a hose equipped with a shut off nozzle, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs or adjustments are exempt from this provision.

E. Implementation of a Phase I Mandatory Water Conservation Plan. Measures instituted during a Phase I water supply shortage may be declared by Resolution of the City Council finding it necessary to conserve ten percent (10%) or greater of the City's water supply. **[Added by Ord. 91-3; amended by Ord. 91-13; Ord. 2009-5]**

1. The following restrictions on the use of water shall be in effect during Phase I and any additional phases implemented during the course of a water shortage and no person shall fail to comply with the following:

(a) Water used to wash down driveways, sidewalks, parking lots, building exteriors, streets and gutters shall be limited to no more than two (2) times during a calendar month to alleviate safety or sanitary hazards, and then only with a hose equipped with a positive shut off nozzle, a handheld bucket or similar container, or a low volume/high pressure water broom. Water used in this manner to protect the public health is exempt from this provision.

(b) Washing of vehicles and any other mobile equipment shall be done only with a bucket or a hose equipped with a positive shutoff nozzle for quick rinses. Commercial car washes are exempt from this provision.

(d) Leaks from indoor and outdoor plumbing fixtures shall be repaired within five (5) days upon receipt of written notice of observed water leak.

(e) Sprinklers shall be adjusted to minimize water runoff from landscape on to hardscape areas. No person shall allow excess water runoff after notice from the City to desist therefrom. Excess water runoff is defined as water accumulation in the street, gutters, neighboring properties or in other amounts sufficient to cause a flow of water off of landscape areas on to hardscape areas.

2. The following water conservation practices are also recommended during a Phase I water supply shortage:

(a) Landscape irrigation is recommended during the early morning hours for no more than 10 minutes at a time. Irrigation should be avoided between the hours of 9:00 a.m. and 5:00 p.m. Landscape irrigation for commercial nurseries and growers, active parks and playing fields, school grounds, golf course greens, landscaping for

fire and erosion protection, protecting endangered species, environmental mitigation projects, and properties using reclaimed water shall be exempt from this provision. Watering using a handheld bucket or similar container, a hose equipped with a shut off nozzle, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are also exempt from this provision.

F. Implementation of Phase II Water Conservation Plan. Measures instituted during a Phase II water supply shortage may be declared by Resolution of the City Council finding it necessary to conserve up to twenty percent (20%) of the City's water supply. The following additional restrictions shall be in effect during a Phase II water shortage: **[Added by Ord. 91-3; amended by Ord. 91-13; Ord. 2009-5]**

1. Residential and commercial landscape areas shall be watered no more than three (3) times during a seven (7) day period for no more than ten (10) minutes at a time during the months of June, July, August and September, and prohibited during the hours of 9:00 a.m. and 5:00 p.m. Landscape irrigation shall be restricted to twice (2) during a seven (7) day period for no more than ten (10) minutes at a time during the months of October, November, December, January, February, March, April and May, and prohibited during the hours of 9:00 a.m. and 5:00 p.m. Landscape irrigation for commercial nurseries and growers, active parks and playing fields, school grounds, golf course greens, landscaping for fire and erosion protection, protecting endangered species, environmental mitigation projects, and properties using reclaimed water shall be exempt from this provision. Watering using a handheld bucket or similar container, a hose equipped with a shut off nozzle, a drip irrigation system emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are also exempt from this provision.

2. Non-residential water customers with a consumption in excess of 25,000 cubic feet in any billing period during the prior year, shall prepare a written water conservation plan within sixty (60) days of the effective date of a declared water shortage. The customer shall submit said plan to the Director of Water Resources for approval. The customer shall then implement the approved plan to meet the specific conservation goals stated therein.

3. Leaks from indoor and outdoor plumbing fixtures shall be repaired within four (4) days upon receipt of written notice of observed water leak.

G. Implementation of Phase III Water Conservation Plan. Measures instituted during a Phase III water supply shortage shall be declared by Resolution of the City Council finding it necessary to conserve up to thirty percent (30%) of the City's water supply. The following additional restrictions shall be in effect during a Phase III water shortage: **[Added by Ord. 91-3; amended by Ord. 91-13; Ord. 2009-5]**

1. Residential and commercial landscape areas shall be watered no more than two (2) times during a seven (7) day period for no more than ten (10) minutes at a time during the months of June, July, August and September, and prohibited during the hours of 8:00

a.m. and 8:00 p.m. Landscape irrigation shall be restricted to once during a seven (7) day period for no more than ten (10) minutes at a time during the months of October, November, December, January, February, March, April and May, and prohibited during the hours of 9:00 a.m. and 5:00 p.m. Watering using a handheld bucket or similar container, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are also exempt from this provision.

2. Irrigation of commercial nurseries and growers, active parks and playing fields, school grounds, golf course greens, landscaping for fire and erosion protection, protecting endangered species, environmental mitigation projects, shall be restricted to no more than three (3) times during a seven (7) day period for no more than ten (10) minutes at a time. Irrigation shall be prohibited during the hours of 9:00 a.m. and 4:00 p.m. Watering using a handheld bucket or similar container, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are exempt from this provision. Those properties using reclaimed water are exempt from this provision.

3. Leaks from indoor and outdoor plumbing fixture shall be repaired within three (3) days upon receipt of written notice of observed water leak.

H. Implementation of Phase IV Mandatory Water Conservation Plan. Measures instituted during a Phase IV water supply shortage shall be declared by Resolution of the City Council finding it necessary to conserve up to forty percent (40%) of the City's water supply. The following additional restrictions shall be in effect during a Phase IV water supply shortage: **[Added by Ord. 91-13; amended by Ord. 2009-5]**

1. Residential and commercial landscape areas shall be watered no more than one (1) time during a seven (7) day period for no more than ten (10) minutes at a time during the months of June, July, August and September, and prohibited during the hours of 8:00 a.m. and 8:00 p.m. Landscape irrigation shall be restricted to one (1) time during a fourteen (14) day period for no more than ten (10) minutes at a time during the months of October, November, December, January, February, March, April and May, and prohibited during the hours of 9:00 a.m. and 5:00 p.m. Watering using a handheld bucket or similar container, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are exempt from this provision.

2. Irrigation of commercial nurseries and growers, active parks and playing fields, school grounds, golf course greens, landscaping for fire and erosion protection, protecting endangered species, environmental mitigation projects, shall be restricted to no more than twice (2) during a seven (7) day period for no more than ten (10) minutes at a time. The irrigation shall be prohibited during the hours of 9:00 a.m. and 4:00 p.m. Watering using a handheld bucket or similar container, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream

rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are exempt from this provision. Those properties using reclaimed water are exempt from this provision.

3. Leaks from indoor and outdoor plumbing fixture shall be repaired within two (2) days upon receipt of written notice of observed water leak.

I. Implementation of Phase V Mandatory Water Conservation Plan. Measures instituted during a Phase V water supply shortage shall be declared by Resolution of the City Council finding it necessary to conserve up to fifty percent (50%) of the City's water supply. The following additional restrictions shall be in effect during a Phase V water supply shortage: **[Added by Ord. 91-13; amended by Ord. 2009-5]**

1. Residential and commercial landscaping shall be restricted to watering only permanent trees and shrubs with a handheld bucket or similar container, or a drip irrigation system with emitters producing no more than two (2) gallons per hour one (1) time during a seven (7) day period during the months of June, July, August and September, and prohibited during the hours of 8:00 a.m. and 8:00 p.m. Landscape irrigation shall be restricted to watering only permanent trees and shrubs with a handheld bucket or similar container, or a drip irrigation system with emitters producing no more than two (2) gallons per hour one (1) time during a fourteen (14) day period during the months of October, November, December, January, February, March, April and May, and prohibited during the hours of 9:00 a.m. and 5:00 p.m.

2. Irrigation of commercial nurseries and growers shall be restricted to one (1) time during a seven (7) day period for no more than ten (10) minutes at a time and prohibited during the hours of 9:00 a.m. and 6:00 p.m. Watering using a handheld bucket or similar container, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are exempt from this provision. Those properties using reclaimed water are exempt from this provision.

3. Irrigation of active parks and playing fields, golf course greens, school grounds, landscape for fire protection and the support of protected species, and environmental mitigation projects shall be restricted to no more than twice (2) during a seven (7) day period for no more than ten (10) minutes at a time. The irrigation shall be prohibited during the hours of 9:00 a.m. and 4:00 p.m. Watering using a handheld bucket or similar container, a drip irrigation system with emitters producing no more than two (2) gallons per hour, weather based controllers or stream rotor sprinklers meeting a seventy percent (70%) efficiency standard, or running an irrigation system for short durations to make repairs are exempt from this provision. Those properties using reclaimed water are also exempt from this provision.

4. Leaks from indoor and outdoor plumbing fixtures shall be repaired within 24 hours upon receipt of written notice of observed water leak.

J. Emergency Rate Surcharge to Obtain Water Conservation. **[Added by Ord. 91-3; amended by Ord. 91-13]**

1. At such time that the City Council determines that a specific conservation effort is required, the City Council shall adopt a resolution declaring the specific phase water conservation. The corresponding rate structure as contained in Resolution No. 91-68 shall take effect within thirty (30) days of such determination.

2. Subject to revenue bond covenants, these funds shall be used to offset revenue loss due to reduced water consumption and pay for such conservation measures as approved by the City Council.

3. This ordinance shall not provide any provision for relief from the emergency rate surcharge. **[Added by Ord. 2009-5]**

K. Relief From Compliance. Any person to whom this ordinance applies may file for relief from any or all provisions in this ordinance. The Director of Water Resources or his designee shall develop and implement procedures necessary to consider a customer's application for relief. No relief shall be granted except upon proof of reasonable inability to comply with the provisions of this section, or upon proof of other reasonable conservation alternatives which will achieve conservation measures sought by this section, or upon proof of substantial hardship outweighing the benefits this section would otherwise provide. Commercial customers shall submit a water conservation plan with the request for relief. The Director of Water Resources or his designee shall use the following criteria to grant relief from this ordinance: **[Added by Ord. 91-3; amended by Ord. 91-13; Ord. 2009-5]**

1. The relief from compliance does not constitute a special privilege inconsistent with the limitations upon other water customers in the same rate class.

2. Special circumstances applicable to the property or its use exist and strict application of this ordinance would cause a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally.

3. The relief from compliance will not cause substantial detriment to adjacent properties and will not affect the City of Lakewood's ability to effectuate the purpose of the ordinance and will not be detrimental to the public interest.

4. The condition or situation of the subject property or the intended use of the property is not common.

All criteria shall be met to obtain relief from compliance. The decision of the Director of Water Resources or his designee shall be final unless written appeal to the City Council setting forth the grounds of appeal is filed with the City Clerk within thirty (30) days of the mailing or delivery to said person of the written decision of the Director of Water Resources.

The decision of the Director of Water Resources or his designee shall be forwarded in writing no later than 15 days after the receipt of the application for relief unless additional time has been requested.

L. Failure To Comply with Mandatory Water Conservation Measures. In addition to the provisions of Section 7511.2, any person who fails to comply with any of the mandatory water conservation measures imposed by the implementation of this section shall be subject to an improper water users fee or charge as hereinafter set forth: **[Added by Ord. 91-3; amended by Ord. 91-13; Ord. 2009-5]**

1. The following charges are not imposed as a penalty but as a charge for excessive or improper use of water. The charges are necessary in order to recover the reasonable cost of enforcement of the mandatory water provisions and in order to obtain the goals of the water conservation measures contained in this section:

   (a) First Violation. The City of Lakewood shall issue a written warning to the customer for the first violation.

   (b) Second and Third Violations. The City of Lakewood shall issue a written notice and assess an improper water use fee of $100.00. If the fee is not paid in full within fifteen (15) days of issuance the amount will be added to the customer's bimonthly water bill.

   (c) Fourth Violation. The City of Lakewood shall issue a written notice, charge an improper water use fee of $200.00 and install a flow restricting device on the customer's water service for a period of not less than twenty-four (24) hours. Such flow restricting device shall reduce water flow to one (1) gallon per minute for metered services one and one half inch (1½") or under. Similar devices will be placed on larger meters. The fee shall be paid prior to the resumption of normal water service.

   (d) Fifth Violation. The City of Lakewood shall issue a written notice, charge an improper water use fee of $500.00 and install a flow restricting device on the customer's water service for a period of not less than forty-eight (48) hours. Such flow restriction device shall reduce water flow to one (1) gallon per minute for the metered service, one and one-half inch (1½") or under. A similar device shall be placed on larger meters. The fee shall be paid prior to resumption of normal water service.

2. Notification of Violation. Notice of violation shall be given in writing in one of the following methods:

   (a) Personal delivery of the notice to the customer.

   (b) If the customer is absent from or unavailable at the premises at which the violation occurred, the notice can be left with a responsible person at the premises and a copy mailed to the customer at the billing address.

   (c) If a responsible person is not available at the premises at which the violation occurred, then the notice can be affixed in a conspicuous place on the premises and a copy mailed to the customer at the billing address.

   Notification shall include a description of the facts in regard to the violation, a statement of the possible penalties for each violation and the statement of the customer's right to a hearing on the merits of the violation as stated in Section M.

M. Hearing for Violations. Any customer receiving a fourth (4) or subsequent violation notice shall be entitled to a hearing with the City Manager or his designee within fifteen (15) days of delivery of the violation notice. The following steps shall be taken to process a request for a hearing: **[Added by Ord. 91-3; amended by Ord. 91-13; Ord. 2009-5]**

1. The customer shall provide a written request for a hearing. A prompt request for hearing shall automatically stay installation of a flow restricting device or shut off on the customer's water service until the decision is rendered by the City Manager or his designee.

2. The customer's request for a hearing shall not stay the imposition of a fee. If it is determined that a fee is wrongly assessed, the City will refund any fee paid by the customer.

3. The decision of the City Manager or his designee shall be final except for judicial review. Any and all measures of the provisions stated herein shall be implemented throughout the judicial appeal process.

N. Additional Water Conservation Measures. The City Council may order implementation of further water conservation measures in addition to those set forth in this Section. Such measures shall be instituted by the City Council with the adoption of a resolution. **[Added by Ord. 91-3; amended by Ord. 91-13]**

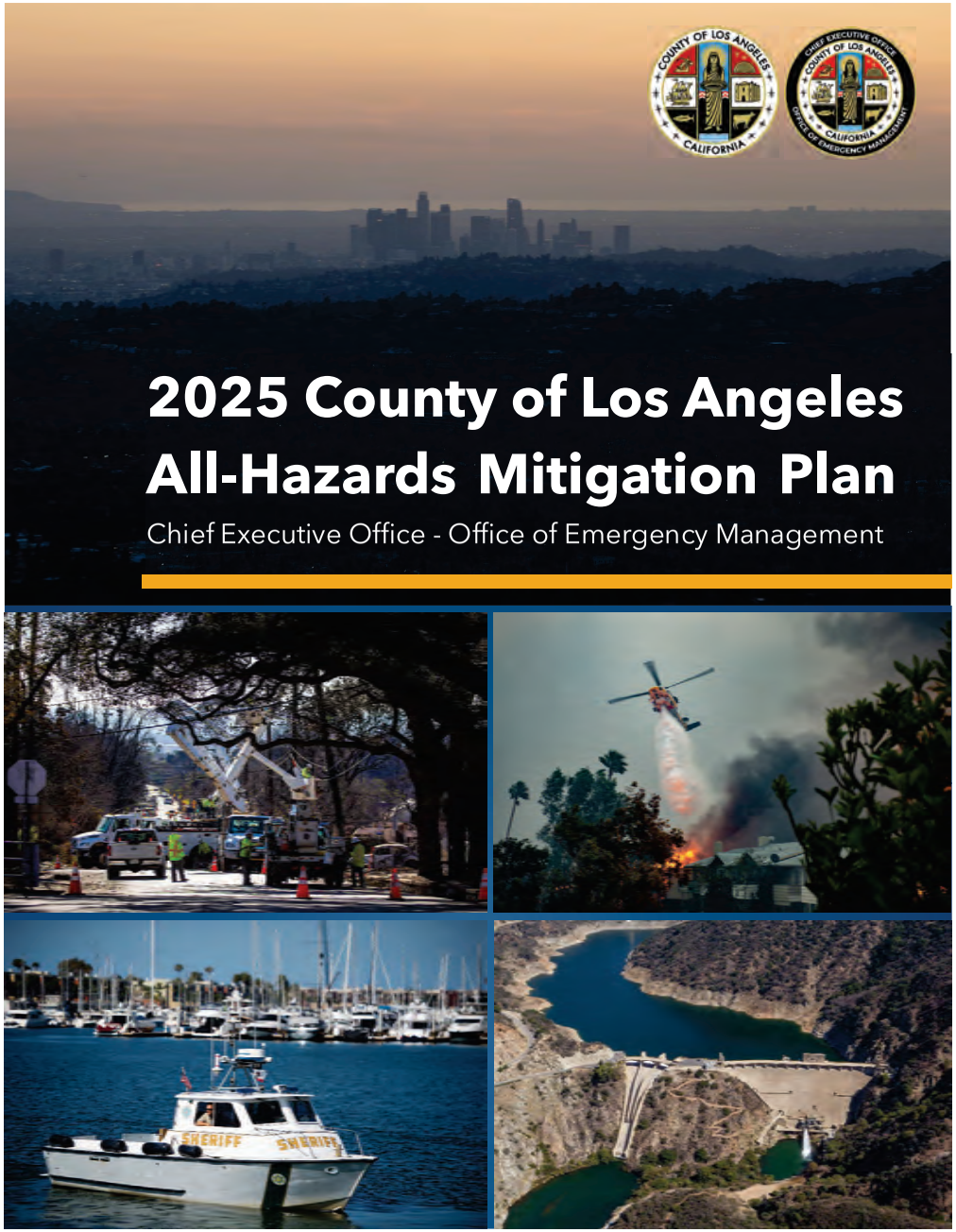
O. Public Health and Safety Shall not be Affected. No provision of this section shall be construed to require the City to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety. **[Added by Ord. 91-3; amended by Ord. 91-13]**

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX I

LOS ANGELES COUNTY ALL-HAZARDS MITIGATION PLAN



Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger 9/9/25

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

Date

Table of Contents

1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team

Date	Tasks	People Involved
February 2025	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview

Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use

Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

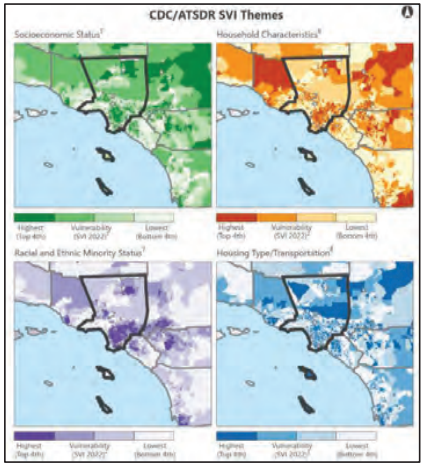


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

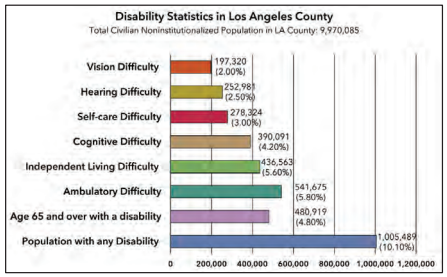


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

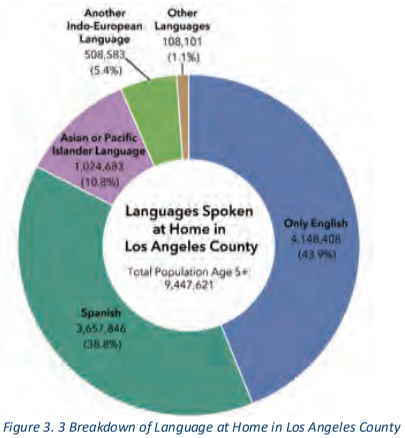


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

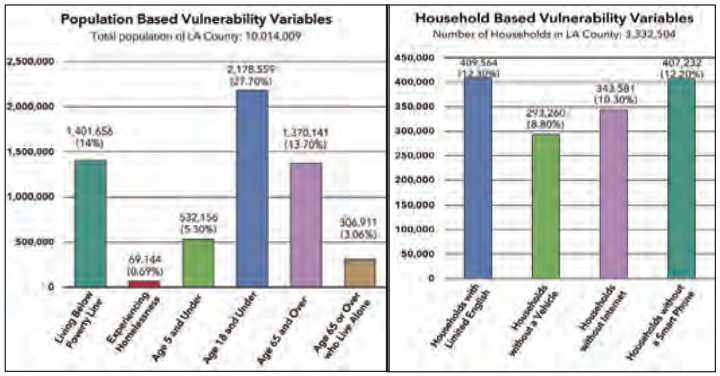


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

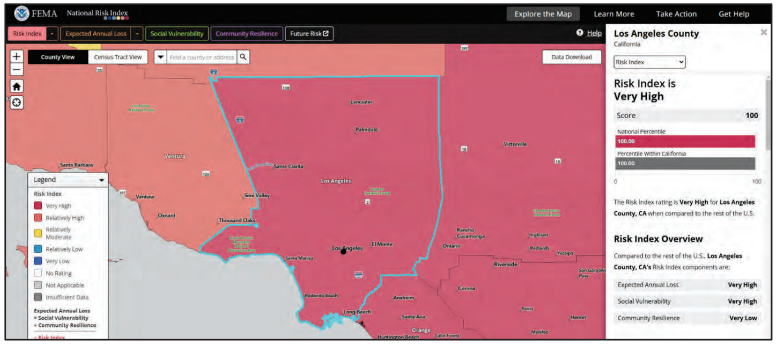


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

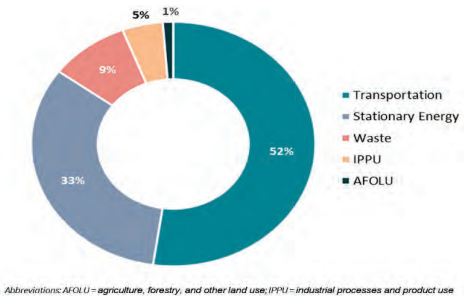


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
    - Surveys of community needs
    - Consultations with AFN advisory groups
    - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.

- **C-MIST Explanation**
    - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
    - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
    - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
    - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
    - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

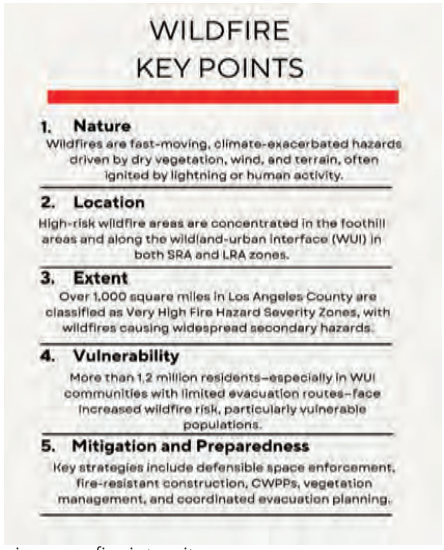
Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.

6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows–especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

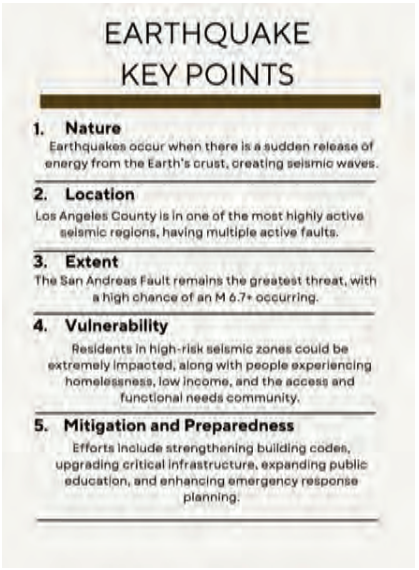
Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.

6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant; buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 1,950.78 sq mi (69.50%)
  - **SD3**: 379.41 sq mi (87.99%)
  - **SD1**: 349.17 sq mi (98.95%)
  - **SD2**: 362.95 sq mi (99.99%)
  - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.

6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.

6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	Figure 6.4.1 Risk of Heat-Related Impacts
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.

Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

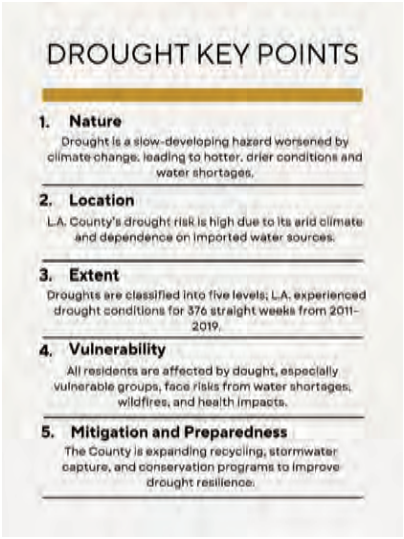
Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.

6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

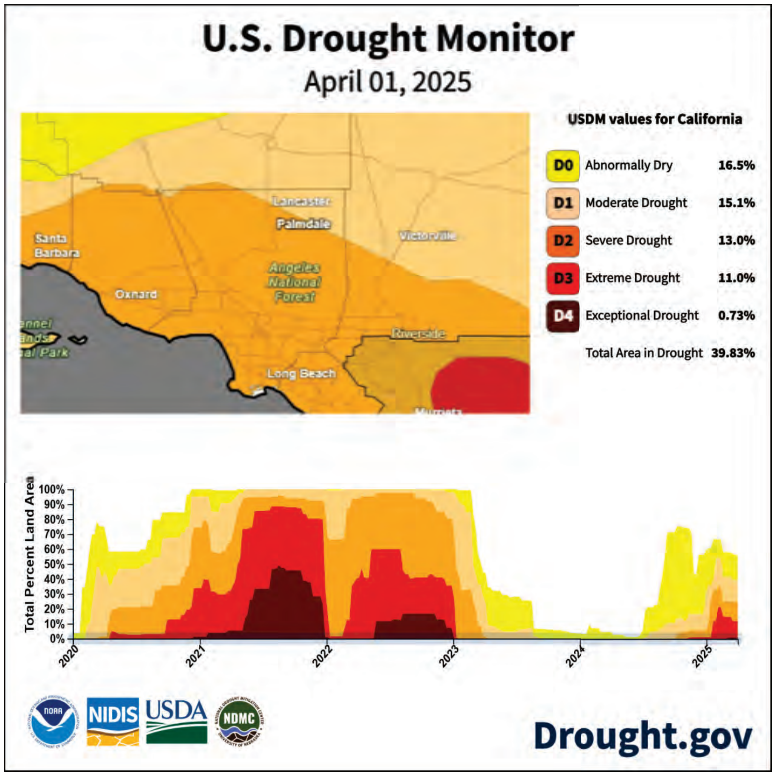


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

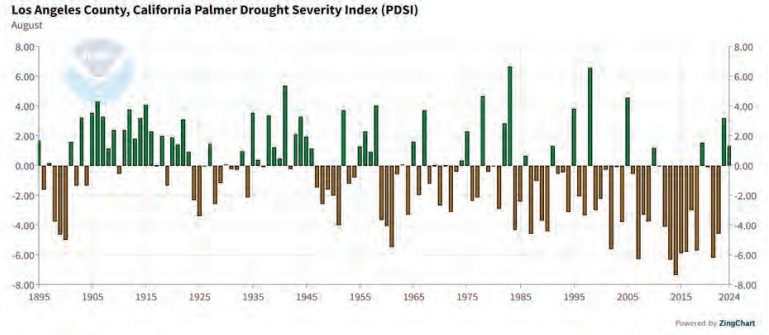


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

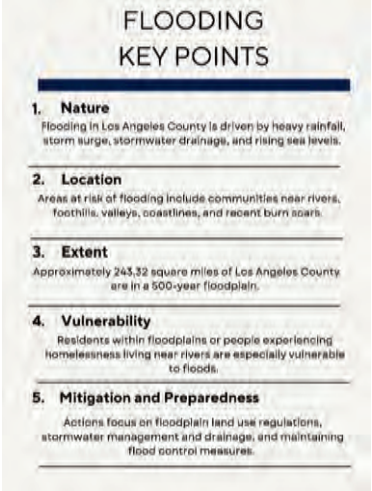
6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.

6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

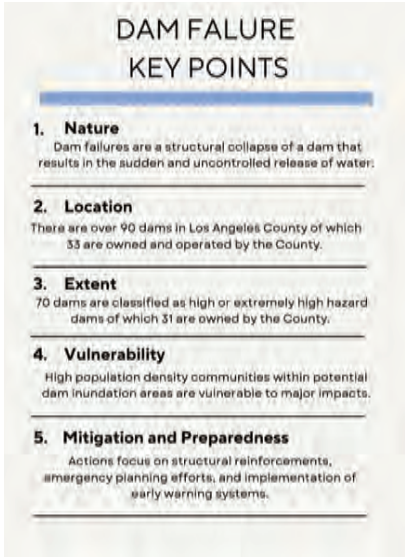
6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.

6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 223.88 sq mi (7.97%)
  - **SD1**: 162.25 sq mi (45.98%)
  - **SD2**: 66.57 sq mi (18.32%)
  - **SD3**: 25.76 sq mi (5.97%)
  - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
  - Fire Department: 112 (33.22%)
  - Public Works: 92 (40.00%)
  - Health Services: 29 (44.62%)
  - Public Health: 17 (42.50%)
  - Libraries: 30 (34.48%)
  - Parks: 65 (35.50%)
  - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness—making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.

6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.

Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

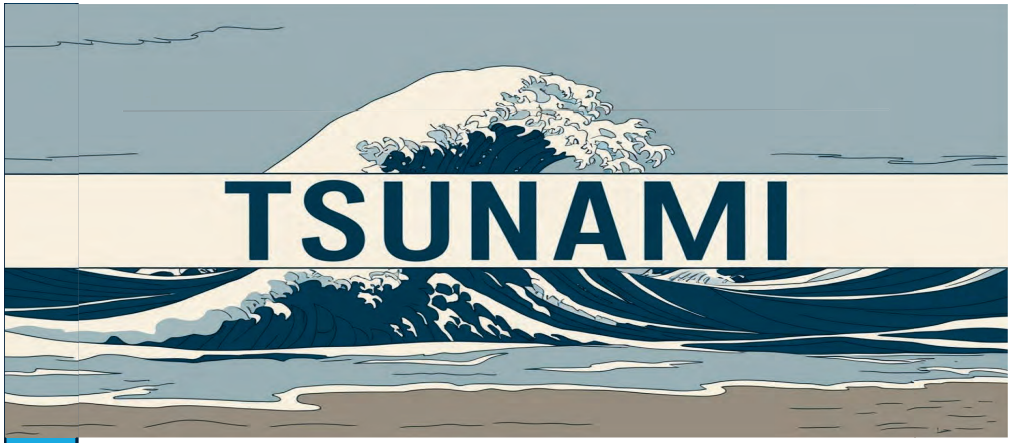
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

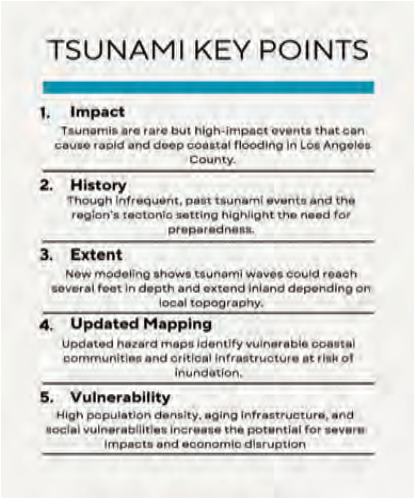
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map–developed using enhanced modeling techniques and updated coastal geomorphology data–highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.

6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.

Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023 (DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

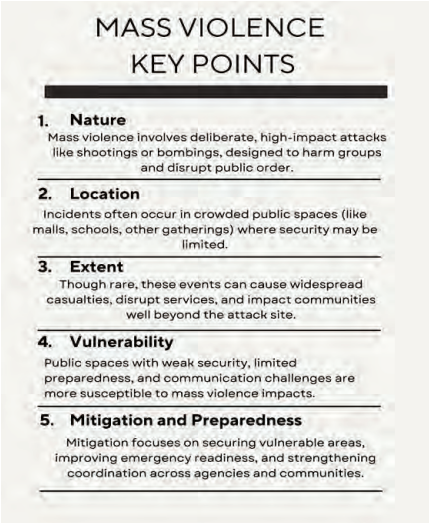
6.10.9 Summary

Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.

6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.

- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

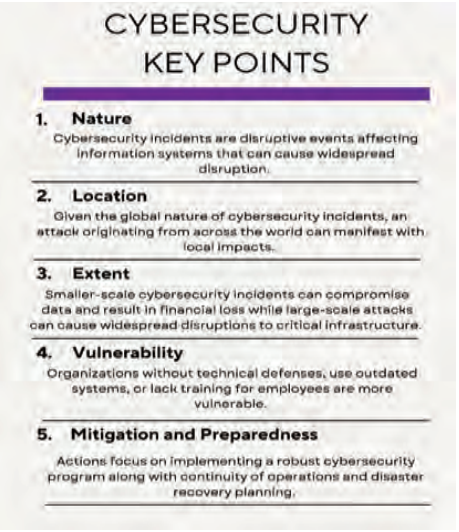
In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.

6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents–both in terms of economic impact and service disruption–highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.

6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

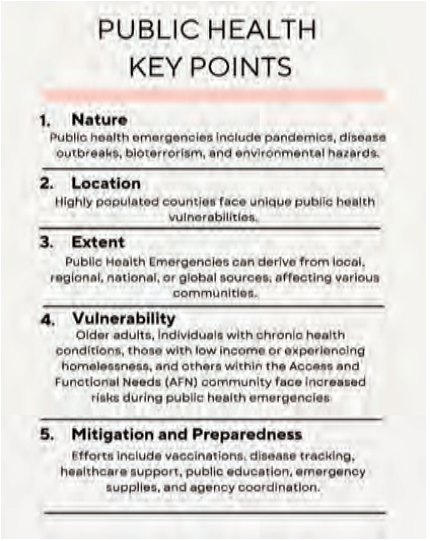
Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.

6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**	
Source: Los Angeles County Department of Public Works		
Type: Local Planning and Regulations		
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.		*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**	
Source: Los Angeles County Department of Public Works		
Type: Structural and Infrastructure Projects		
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.		*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**	
Source: Los Angeles County Department of Public Works, among others.		
Type: Natural Systems Protections		
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.		*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**	
Source: Los Angeles County Department of Public Works		
Type: Structure and Infrastructure Projects		
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).		*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**	
Source: Los Angeles County Sheriff's Department and Office of Emergency Management		
Type: Education and Awareness Programs		
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.		*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**	
Source: Los Angeles County Sheriff's Department and Office of Emergency Management		
Type: Education and Awareness Programs		
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.		*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**	
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works		
Type: Education and Awareness Programs		
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.		*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**	
Source: Los Angeles County Sheriff's Department and Office of Emergency Management		
Type: Education and Awareness Programs		
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.		*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	Earthquake Dam Failure	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	Drought	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	Drought	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	Extreme Heat	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	Flooding Tsunami	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	Mass Violence Cyber Incidents	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	Mass Violence Cyber Incidents	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	Mass Violence	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	Extreme Heat	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	Public Health Emergencies	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	Wildfire Mass Violence	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX J

CITY WATER RATES

Water and Refuse Collection Rate Increase

The Lakewood city water system is fortunate to have 100% of our drinking water provided locally from underground aquifers beneath our city. **That helps Lakewood have some of the lowest water rates in the area.** *For example, Lakewood water costs about $75 for a two-month billing period for the average household, compared to $105 in Bellflower, $113 in Long Beach and $144 in Norwalk.*

However, much of Lakewood's water system infrastructure dates to the early 1950s--even before the city's founding. Thus, Lakewood needs to continue investing in maintenance, repair and--as needed--replacement of our water infrastructure of wells, reservoirs, pumps, pipes and meters.

To continue these needed infrastructure improvements and pay for the ongoing costs of operation of the water system, the city proposes to adjust water rates for the coming three fiscal years in the manner shown in the table on the reverse of this page. The city has structured this rate proposal to be as small in size as possible while allowing the city to maintain our water system in good working condition and provide safe and reliable service to Lakewood customers. By law, all funds generated by customer water rates and fees are used solely for the operation of the water system. None of the funds pay for any other city program or service.

For the average Lakewood household, the proposed adjustment to the Minimum Charge for a standard residential 5/8" or 3/4" meter connection will cause your water bill to rise by $1.92 from $20.62 to $22.54 for a two-month billing period starting on July 1, 2024. As shown on the chart on the reverse of this page, the Minimum Charge for a residential water connection would then increase for a two-month billing period by $1.58 on July 1, 2025 and by $1.69 on July 1, 2026.

A public hearing will be held by the Lakewood City Council on June 11, 2024, at 7:30 PM in the City Council Chambers of the City of Lakewood, 5000 Clark Avenue, Lakewood, California, recommending that for all meter types and uses, the proposed charge for a basic water connection and per-unit charges for water be set in the amounts and terms detailed on the chart on the reverse of this page starting July 1, 2024 and adjusted as shown on the chart starting July 1, 2025 and July 1, 2026. The rate adjustments are necessary to cover increases in the cost of pumping, treating and distributing water, and administration of the utility, as well as required funding for the water utility capital improvement program.

At the same public hearing, it will be recommended that the **residential refuse fee** be adjusted to $28.27 per month starting July 1, 2024, which is partially based on the increase in the January 2023-January 2024 Los Angeles-Long Beach-Anaheim, CA Consumer Price Index and partially on industry cost increases. The rate adjustment is necessary to cover increases in the cost of collecting, recycling and disposing of residential refuse, and administration of the program. Anyone wishing to protest these proposed rates must file a written protest with the City Clerk at City Hall, 5050 Clark Avenue, by the time of said public hearing.

Typical bill for single-family residence with average water use of 18 units every two months

	Current Rate Bi-Monthly	7/1/2024 Bi-Monthly	7/1/2025 Bi-Monthly	7/1/2026 Bi-Monthly
	$75.23	$80.60	$86.39	$92.52
Change in cost	---	$5.37	$5.79	$6.13

Minimum Charge for basic service **(NOTE: 5/8" or 3/4" meter is standard size for residential service)**

Size of Meter	Current Rate Bi-Monthly	7/1/2024 Bi-Monthly	7/1/2025 Bi-Monthly	7/1/2026 Bi-Monthly
5/8" or 3/4"	$20.62	$22.54	$24.12	$25.81
1"	$32.23	$34.22	$36.62	$39.19
1 1/2"	$61.25	$63.43	$67.88	$72.64
2"	$96.09	$98.48	$105.38	$112.76
3"	$206.38	$209.48	$224.15	$239.85
4"	$368.91	$373.05	$399.17	$427.12
6"	$757.83	$764.46	$817.98	$875.24
8"	$1,396.36	$1,407.07	$1,505.57	$1,610.96

Fire Service connection charge for commercial properties

Size of Meter	Current Rate Bi-Monthly	7/1/2024 Bi-Monthly	7/1/2025 Bi-Monthly	7/1/2026 Bi-Monthly
2"	$9.87	$8.14	$8.71	$9.32
3"	$28.67	$23.64	$25.30	$27.08
4"	$61.08	$50.37	$53.90	$57.68
6"	$177.42	$146.32	$156.56	$167.52
8"	$378.07	$311.81	$333.64	$357.00
10"	$679.90	$560.74	$599.99	$641.99

Residential rate per unit of water used (1 unit = 100 cubic feet or 748 gallons)

Units of Water	Current Rate	7/1/2024	7/1/2025	7/1/2026
1-13	$2.87	$3.02	$3.24	$3.47
14-25	$3.46	$3.76	$4.03	$4.32
26+	$4.09	$4.76	$5.10	$5.46

Multi-Family, Commercial, Institutional rate per unit of water used

Units of Water	Current Rate Bi-Monthly	7/1/2024 Bi-Monthly	7/1/2025 Bi-Monthly	7/1/2026 Bi-Monthly
Each Unit	$3.50	$3.50	$3.72	$3.99

Commerical/Institution Irrigation (Potable) rate per unit of water used

Units of Water	Current Rate Bi-Monthly	7/1/2024 Bi-Monthly	7/1/2025 Bi-Monthly	7/1/2026 Bi-Monthly
Each Unit	$3.60	$4.29	$4.60	$4.93

Recycled Water - Minimum Charge for basic service

Size of Meter	Current Rate Bi-Monthly	7/1/2024 Bi-Monthly	7/1/2025 Bi-Monthly	7/1/2026 Bi-Monthly
2"	$96.30	$98.48	$105.38	$112.76
3"	$206.84	$209.48	$224.15	$239.85
4"	$369.74	$373.05	$399.17	$427.12
6"	$759.50	$764.46	$817.98	$875.24
8"	$1,399.44	$1,407.07	$1,505.57	$1,610.96

Recycled water rate per unit of water used

Units of Water	Current Rate	7/1/2024	7/1/2025	7/1/2026
Each Unit	$2.99	$3.38	$3.80	$4.28

CITY OF LAKEWOOD

2025 URBAN WATER MANAGEMENT PLAN

APPENDIX K

RESOLUTION ADOPTING 2025 PLAN AND WSCP

RESOLUTION NO. 2026-31

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAKEWOOD ADOPTING THE 2025 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN PURSUANT TO CALIFORNIA WATER CODE SECTIONS 10610 THROUGH 10657

WHEREAS, the City of Lakewood is an urban water supplier as defined by the California Water Code Section 10617; and

WHEREAS, the California Water Code Sections 10610 through 10657 require urban water suppliers to prepare and adopt an Urban Water Management Plan every five years; and

WHEREAS, the City of Lakewood has prepared the 2025 Urban Water Management Plan in compliance with the requirements of the Urban Water Management Plan Act; and

WHEREAS, the 2025 Urban Water Management Plan includes a Water Shortage Contingency Plan in accordance with California Water Code Section 10632; and

WHEREAS, the City of Lakewood has conducted a duly noticed public hearing in accordance with California Water Code Section 10642; and

WHEREAS, the City Council has reviewed and considered the 2025 Urban Water Management Plan and finds it to be consistent with applicable State laws and in the best interest of the City.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LAKEWOOD DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1.

The City Council hereby adopts the 2025 Urban Water Management Plan and Water Shortage Contingency Plan.

SECTION 2.

The City Council authorizes the City Manager or designee, to file the adopted 2025 Urban Water Management Plan including the Water Shortage Contingency Plan with the California Department of Water Resources, the California State Library and any applicable local agencies within 30 days of adoption.

SECTION 3.

This resolution shall take effect immediately upon adoption.

ADOPTED AND APPROVED THIS 23RD DAY OF JUNE, 2026.

Mayor

ATTEST:

City Clerk

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES)SS
CITY OF LAKEWOOD)

I, **Dakota Wallace**, City Clerk of the City of Lakewood, California, do hereby certify under penalty of perjury that the foregoing Resolution No. 2026-31 was duly passed, approved, and adopted by the City Council of the City of Lakewood at its Regular Meeting of the City Council on June 23, 2026, by the following vote to wit:

AYES: Council Members – Wood, Croft, Arellano, Rogers, and Mayor Chase

Dated: June 24, 2026

Dakota Wallace, City Clerk
City of Lakewood, California

(SEAL)


CITY OF LAKEWOOD
CALIFORNIA