CITY OF BURBANK
WATER AND POWER

2020 URBAN WATER MANAGEMENT PLAN

Draft

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ACRONYMS

AF	Acre-Feet
AFY	Acre-Feet per Year
AMI	Automated Metering Infrastructure
AMR	Automated Meter Reading
AWIA	America's Water Infrastructure Act
AWWA	American Water Works Association
BOU	Burbank Operable Unit
BWRP	Burbank Water Reclamation Plant
BWP	Burbank Water and Power
CalWEP	California Water Efficiency Partnership
cfs	Cubic Feet per Second
CII	Commercial, industrial and institutional
CIP	Capital Improvement Program
Cr6	Hexavalent Chromium
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DBP	Disinfection Byproducts
DDW	Division of Drinking Water
DMM	Demand Management Measure
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
EPA	Environmental Protection Agency
ES	Executive Summary
ESR	Emergency Storage Requirement
ET	Evapotranspiration
EWMP	Enhanced Watershed Management Plan
F	Fahrenheit
gpm	Gallons per minute
GAC	Granular Activated Carbon
GPCD	Gallons per capita per day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HVAC	Heating, Ventilation, and Air Conditioning
in	Inches
IRC	Import Return Credit
kWh	Kilowatt-hours
LADWP	Los Angeles Department of Water and Power
LID	Low Impact Development
MCL	Maximum Contaminant Level
MG	Million Gallons
MS4	Municipal Separate Storm Sewer System
MSL	Mean Sea Level
MWD	Metropolitan Water District of Southern California
n/a	Not Applicable
ppb	Parts Per Billion
RWMP	Recycled Water Master Plan

SB	Senate Bill
SBx7-7	Water Conservation Act of 2009
SCAG	Southern California Association of Governments
SEMS	Standardized Emergency Management System
SFB	San Fernando Basin
SGMA	Sustainable Groundwater Management Act
SNMP	Salt and Nutrient Management Plan
SWP	State Water Project
SWRCB	State Water Resources Control Board
TBD	To Be Determined
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
ULAR	Upper Los Angeles River
ULARA	Upper Los Angeles River Area
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compounds
VPP	Valley Pumping Plant
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM	Water Surplus and Drought Management
yr	Year
ZLD	Zero Liquid Discharge

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EXECUTIVE SUMMARY

Burbank Water and Power (BWP), Water Division of the City of Burbank (City or Burbank), has prepared this 2020 Urban Water Management Plan (UWMP) in accordance and compliance with the Urban Water Management Planning Act (UWMP Act). Burbank's 2020 UWMP serves as the long-term planning document that will help to ensure the City can provide its customers with reliable water supplies through 2045. Pursuant to the requirements of the California Water Code (CWC) 10630.5, this Executive Summary provides a simple lay description of the information needed to provide a general understanding of this 2020 UWMP and includes a description BWP's reliable water supplies, anticipated challenges, and strategies for managing system reliability risks.

ES.1 INTRODUCTION

Preparation of an UWMP is required by the California Department of Water Resources (DWR) for all urban water suppliers within the State of California. Urban water suppliers are defined as publicly or privately owned water suppliers that provide water for municipal purposes, either directly or indirectly, to more than 3,000 customers or supply more than 3,000 acre-feet (AF) of water annually. UWMPs must meet requirements established by the CWC and the Urban Water Management Planning Act (Act).

This report constitutes the *2020 Urban Water Management Plan* for BWP, which must be adopted by the City Council and submitted to DWR by July 1, 2021. This 2020 UWMP satisfies the requirements of the CWC, the Act, and subsequent amendments.

ES.2 SERVICE AREA INFORMATION

The City of Burbank is located in southern California approximately 12 miles north of downtown Los Angeles, as shown on Figure 2-1. The City covers approximately 17 square miles (10,880 acres) of the eastern end of the San Fernando Valley. The City of Los Angeles lies to the north and west and the City of Glendale to the south and east.

Burbank's climate is considered Mediterranean which is warm and dry during summer and cool and wet during winter. The average temperature is 59 degrees Fahrenheit (°F). The warmest month of the year is August with an average high near 90˚F, while the coldest month of the year is December with an average low in the low 40°F. The historical annual average precipitation in Burbank is 17.5 inches. Winter months tend to be wetter than summer months.

Burbank consists of a mix of land uses, including residential, commercial, industrial, institutional and open space, with residential and commercial being the dominating uses. Burbank is largely built-out, meaning there are few vacant sites available for new developments and growth is expected to be due primarily to increases in housing density and land use intensity.

ES.3 SYSTEM DEMANDS

System demands are primarily driven by housing growth and development. The City of Burbank is expecting a significant increase in housing growth in response to the projected need for housing in the future, and will be incorporated as a goal in the City of Burbank's General Plan's Housing Element. In addition, growth in commercial areas and other associated land uses are also expected.

BWP's historical water demands have varied from year to year, which can be attributed to annual variations in weather and droughts, economic conditions, land use policies, changes in technology, and water costs. BWP's 2020 potable and raw water deliveries comprised of 50% single-family residential, 27% multi-family residential, 17% commercial, 1% City departments, and 0.1% fire protection. Between 2020 and 2045, total potable demands are projected to increase by 6,286 acre-feet per year (AFY) from 15,724 AFY to 22,010 AFY.

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In additional to potable water use, BWP provides recycled water for uses such as irrigation, cooling towers, golf courses, and power plants. **Table ES-1** shows current and projected water demand by use sector.

Table ES-1: Historical, Current, and Projected Direct-Use Water Demand

Water Use Sector	2020	2025	2030	2035	2040	2045
Single Family	7,940	8,166	8,245	8,238	8,292	8,300
Multi-Family	4,275	4,511	4,710	4,945	5,136	5,366
Housing Element Goal	0	1,160	2,926	3,480	3,480	3,480
Commercial	2,738	3,314	3,473	3,638	3,702	3,745
Institutional/Governmental	155	205	230	249	254	259
Fire Protection	11	11	12	13	13	13
Losses	614	695	768	823	835	847
Total Potable Use	**15,724**	**18,062**	**20,380**	**21,386**	**21,712**	**22,010**
Recycled Water Use	**3,149**	**3,540**	**3,540**	**3,540**	**3,540**	**3,540**

All urban water suppliers in California are mandated by the Water Conservation Act of 2009 (also referred to as SBX7-7) to reduce per capita potable water demands by 20% by the year 2020. For 2020, the BWP was required to have a per capita water use (measured in gallons per capita per day [GPCD]) of 157 GPCD. BWP's actual potable water demands for 2020 were 138 GPCD, which is well below the 2020 target. Reduced demands in the City are likely the result of ongoing conservation programs that have been implemented in response to the SBX7-7 legislation, as well as demand hardening from enhanced conservation implemented in response to the most recent multi-year drought and associated state-mandated emergency conservation requirements. BWP has therefore met its 2020 water use target of 157 GPCD.

ES.4 SYSTEM SUPPLIES

BWP's current water supplies include imported water from Metropolitan Water District of Southern California (MWD), groundwater from the San Fernando Groundwater Basin, and non-potable recycled water. MWD delivers both treated and untreated water to Southern California via two sources. Water from Northern California is imported by way of the State Water Project and water from the Colorado River reaches the region through the Colorado River Aqueduct. In 2020, BWP supplied 6,165 AF of imported water from MWD, 9,997 AF of groundwater, and 3,149 AF of recycled water from the Burbank Water Reclamation Plant. BWP also replenished the groundwater basin with 152 AF of raw imported water from MWD. Raw imported water replenishment was lower than normal due to planned improvements of the spreading grounds by Los Angeles County.

BWP continues to increase local supply reliability and offset demands for imported water by participating in local resources programs through MWD and continues to develop the recycled water program. **Table ES-2** provides a summary of BWP's projected water supplies from 2025 through 2045.

As part of this UWMP, BWP estimated its water services' operational energy intensity using the best available information to identify energy savings opportunities, calculate greenhouse gas (GHG) emission reductions associated with the BWP's water conservation program, and identify potential opportunities for receiving energy efficiency funding. The energy required for conveyance, extraction, treatment and distribution of water to the BWP service area is estimated at 1,671 kilowatt hours per acre-foot (kWh/AF) for retail potable deliveries.

Table ES-2: Summary of Projected Supplies (AFY)

Source	2020 (AF) (actual)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Potable:						
MWD Treated Potable	6,165	7,407	9,722	10,714	11,012	11,310
Supplier-Produced Groundwater	9,997	10,655	10,658	10,672	10,700	10,700
Potable Total	***16,162***	***18,062***	***20,380***	***21,386***	***21,712***	***22,010***
Non-potable:						
MWD Replenishment	152	6,800	6,800	6,800	6,800	6,800
Recycled Water	3,149	3,540	3,540	3,540	3,540	3,540
Non-Potable Total	***3,301***	***10,340***	***10,340***	***10,340***	***10,340***	***10,340***
Total Supplies	**19,463**	**28,402**	**30,720**	**31,726**	**32,052**	**32,350**

ES.5 RECYCLED WATER

Wastewater generated within the City is treated at the Burbank Water Reclamation Plant (BWRP). This water is treated to “tertiary levels”, and therefore can be used for non-potable uses. BWP currently delivers recycled water for landscape irrigation, power plant use, commercial uses, golf course irrigation, and water truck filling. In 2020, approximately 3,105 AF was recycled within the BWP service area, and 45 AF was recycled within the neighboring Los Angeles Department of Water and Power (LADWP) service area. Based on known recycled water projects, recycled water demand is projected to increase by approximately 200 AFY within the BWP service area. BWP will also continue to deliver up to 260 AFY of recycled water to the LADWP service area. BWP will also continue to identify potential sites for non-potable use, as well as other potential uses such as groundwater recharge or direct potable use.

ES.6 WATER SUPPLY RELIABILITY

Water supply reliability is a measure of a water supplier’s ability to manage shortages. Shortages can be the result of legal issues, environmental factors, water quality, or climactic factors.

Burbank depends heavily on MWD for its water supply. Ultimately, if MWD has a sufficient water supply, so does BWP. MWD strives for a “diverse water portfolio” that allows it to meet demands even in years when its primary supplies would not be enough. Part of MWD’s 2020 UWMP is to have water storage capacity to draw on when supplies are short. Using surplus water from normal and wet years, MWD’s large storage portfolio contains both dry-year storage and emergency storage that can be used to meet demand in case of a shortage. MWD has completed extensive modeling to create management options that will handle future variations in supply and demand.

Groundwater helps BWP’s overall supply reliability by providing a reserve during emergencies or droughts. The capacity and reliability of BWP’s groundwater supply requires consideration of many issues including:

- Water rights
- Aquifer storage capacity
- Physical well and pump capacity
- Treatment capacity
- Water quality issues

BWP can purchase MWD water for groundwater replenishment through spreading in order to add to its stored water credits in the groundwater basin. To maintain and optimize groundwater pumping, BWP needs to acquire about 7,000 AF of groundwater per year, on average, through replenishment or a combination of replenishment and “physical solution” purchases. Unavailable replenishment water during a long drought could limit the City’s ability to add to its groundwater “bank”. However, the City plans to keep a reserve of 10,000 AF in groundwater credits. BWP also closely monitors groundwater quality and treats groundwater to ensure that it meets drinking water requirements set by the State.

All of Burbank’s recycled water is supplied by BWRP. The BWRP is managed to be highly reliable and drought resistant, but contingencies for recycled water outages must be considered. In case of outages, BWP can use potable water to meet recycled water customer demands.

This 2020 UWMP presents the BWP’s water reliability assessments from 2025 through 2045. Consistent with the UWMP Act requirements, each assessment compares total projected water supply to total projected water demands in five-year increments over the next 20 years under the following scenarios:

- Normal water year
- Single dry-year
- Multiple dry-year

BWP projects increased demands (as weather conditions get hotter and drier) during multiple dry year scenarios, but projects that there will be enough supply to meet demands. Therefore, BWP’s water supply reliability analysis shows that supplies will meet demands under all hydrologic scenarios from 2025 through 2045.

Pursuant to a new requirement, a water supplier must also include in its 2020 UWMP a drought risk assessment (DRA) to compare supplies and demands over a five-year consecutive dry period, or extended drought. All supplies assume no reduction in availability over the five-year period due to the drought resilience of local supplies and MWD’s diverse water supply portfolio.

ES.7 WATER SHORTAGE CONTINGENCY PLAN

BWP’s Water Shortage Contingency Plan (WSCP) lays out various methods for mitigating the effects of water shortages of increasing intensity in five stages. The WSCP includes voluntary and mandatory water use restrictions designed to reduce flexible water use depending on the cause, severity, and anticipated duration of the supply shortage. The WSCP details the protocols and procedures that BWP will implement at each stage of a declared water shortage to help water users comply with the shortage response actions. The WSCP is an adaptive management plan that is designed to be responsive to the effectiveness of water shortage actions during a declared water shortage. As such, the WSCP will be adjusted and refined as needed to ensure that actions are appropriate and effective.

Beginning 2022, BWP will prepare and submit an annual water supply and demand assessment (Annual Assessment) to DWR by July 1 of every year to evaluate actual forecasted near-term water supply conditions (for the next 12 months), followed by a dry year, and determine if a water shortage is imminent. If the Annual Assessment anticipates that demands will exceed available supply, the City Council will vote to determine the appropriate water shortage level and associated actions necessary to reduce demand to ensure adequate supply.

ES.8 WATER DEMAND MANAGEMENT MEASURES

The CWC defines “Demand Management” as water conservation measures, programs, and incentives that prevent the waste of water and promote reasonable and efficient use and reuse of available supplies. Demand management measures (DMMs) are developed and implemented for the purpose of reducing overall demand on a water supplier. Demand reductions can be achieved using several methods including water conservation, which is a relatively low-cost way to supplement water supply that is typically easy to implement.

BWP has demonstrated its commitment to water use efficiency and conservation through an aggressive water conservation portfolio structure and ordinances, customer water conservation programs, and extensive customer communication and outreach program. BWP is a member of the California Water Efficiency Partnership, which provides resources and tools for utilities to use to face challenges related to climate change and new State regulations.

The City Council enacted the Sustainable Water Use Ordinance in 2008 which prohibits the wasteful use of potable water. The Ordinance is comprehensive, including prohibitions on landscape water overspray, prompt leak repair, and that restaurants only serve water by request.

ES.9 WATER AUDIT/WATER LOSS CONTROL

Beginning in 2015 with the passage of Senate Bill (SB) 555, agencies are required to calculate losses using the American Water Works Association (AWWA) Method. As required for this UWMP, BWP used the AWWA Water Audit Software (version 5) to complete a water loss audit and calculate water losses.

Water losses can include “apparent losses”, which are due to meter inaccuracies, and “real losses”, which are the physical losses of water from the system through leakage and tank overflows. Apparent losses are controlled through regular meter maintenance, testing and replacement, Automatic Meter Reading (AMR) and Automated Metering Infrastructure (AMI). Real losses are managed through regular replacement of water mains and BWP’s proactive leak detection program.

BWP’s average losses between 2016 and 2019 were 630 acre-feet per year, which is approximately 3.8 percent of water supplied, which is lower than the industry standard.

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1. INTRODUCTION

1.1 Purpose

This Urban Water Management Plan (UWMP) has been prepared in accordance with the California Urban Water Management Planning Act (Act), California Water Code Sections 10610 through 10656 and Section 10608. The Act requires urban water suppliers that provide over 3,000 acre-feet (AF) of water annually or serve 3,000 or more connections to assess, every five years, the reliability of its water sources over a 20-year planning horizon. The UWMP must include:

- Assessment of past and future water supplies and demands
- Evaluation of the future reliability of Burbank's water supplies over a 20-year planning horizon
- Discussion of demand management measures and Burbank's water shortage contingency plan
- Discussion of use and planned use of recycled water
- Evaluation of distribution system water losses

The complete text of the Act is available on the internet at https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans. The California Department of Water Resources' (DWR) guidance contains a checklist for the requirements of the Act. The completed 2020 UWMP checklist for the City of Burbank is contained in Appendix A. All required Tables are included in Appendix B.

Burbank Water and Power (BWP) provides water service to the residents of the city of Burbank (the City). BWP is a departmental utility of the City. Burbank's City Council (City Council), elected by Burbank's residents establishes the policies under which the utility operates. As such, the City Council has established the policy that the City will continue and expand its efforts to encourage the efficient use of water within its service area. Table 1-1 provides public water system information for Burbank Water and Power and Table 1-2 provides identification information.

Table 1-1: DWR Table 2-1: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA1910179	Burbank – City, Water Dept.	27,061	19,463 AF

Table 1-2: DWR Table 2-3: Supplier Identification

Type of Supplier	
✓	Supplier is a retailer
Fiscal or Calendar Year	
✓	UWMP Tables are in calendar years
Units of measure used in UWMP	
Unit	Acre-feet (AF)

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1.2 Previous Efforts and Overlap with Other Local and Regional Plans

The City prepared UWMPs for the years 1985, 1990, 1995, 2000, 2005, 2010, and 2015 which fulfilled Water Code 10620(b) requirements. In 1992, the City prepared an Urban Water Shortage Contingency Plan, which was also required by the Legislature, which was subsequently integrated into the 1995 UWMP. In 1997, the City prepared an Integrated Water Resources Plan containing some of the same information regarding expected water supplies and demands. The basic information from the Integrated Water Resources Plan was incorporated into subsequent UWMPs, starting in 2000.

1.3 UWMP Preparation

BWP coordinated efforts with several agencies in the preparation of the 2020 UWMP which are shown in **Table 1-3** and **Table 1-4**. BWP worked with Metropolitan Water District of Southern California (MWD), County of Los Angeles, City of Glendale, City of Los Angeles, Burbank Community Development Department, Burbank Public Works Department, and the General Public in developing the 2020 UWMP. BWP also notified the public, via a post on its website on April 22, 2021 that the UWMP was in review. This posting also encouraged the involvement of the public with diverse social, cultural, and economic elements. Another website posting on May 19, 2021 made the 2020 UWMP Draft version available for the public review and notified the public of the time and place of the City Council hearing to adopt the 2020 UWMP. This plan has been prepared as an individual UWMP, as shown in **Table 1-5**.

Burbank provides all retail water service to the City of Burbank, and therefore not overlap with any other local water plans. Burbank coordinates with its wholesaler, Metropolitan Water District of Southern California, which overlaps a large area of Southern California and is developing a 2020 UWMP for its wholesale service area. Burbank has provided comments on the demands and local supplies projected to be used within the City, and has aligned the projections and reliability analysis in this plan with MWD's UWMP.

Table 1-3: DWR Table 10-1: Coordination with appropriate agencies

Coordinating Agencies	60 Day Notice	Notice of Public Hearing
Burbank Community Development Dept.	April 22, 2021	June 22, 2021
Burbank Public Works Department	April 22, 2021	June 22, 2021
Los Angeles County	April 22, 2021	June 22, 2021
City of Glendale	April 22, 2021	June 22, 2021
City of Los Angeles	April 22, 2021	June 22, 2021

Table 1-4: DWR Table 2-4: Water Supplier Information Exchange

The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631
Metropolitan Water District of Southern California

Table 1-5: DWR Table 2-2: Plan Identification

	Type of Plan
✓	Individual UWMP

1.4 UWMP Adoption

State law requires the 2020 UWMP be adopted by the City Council prior to its electronic submittal to DWR on or before July 1, 2021. The BWP Board unanimously endorsed the UWMP at its meeting on May 6, 2021. A public hearing regarding the adoption of the UWMP will be held at Burbank's City Council Meeting on June 22, 2021. At the conclusion of the hearing, the City Council is expected to adopt the 2020 UWMP via resolution and a copy of the adopted resolution will be included in Appendix C. No later than 30 days after City Council's adoption the City will submit the adopted 2020 UWMP to the California State Library and post it on BWP's website. Burbank will implement its adopted UWMP through the actions and policies of the Water Division of BWP.

1.5 Organization of This Document

- Section 1 is an introduction and a brief history of Burbank's UWMP
- Section 2 provides background information on the City of Burbank including:
    - Historical and expected future development
    - Climate and demographic information, including historical and projected population figures
    - Description of the water system
    - Past and current water use data
- Section 3 covers the City's projected water demands
- Section 4 describes the City's water supplies
- Section 5 outlines the City's water recycling efforts
- Section 6 describes water supply reliability
- Section 7 summarizes the Water Shortage Contingency Plan
- Section 8 describes demand management measures which have been and will be enacted
- Section 9 contains an evaluation of water distribution system losses

The Appendices provide detailed information that is best presented outside the body of the Plan text.

2. SERVICE AREA INFORMATION

2.1 Historical Background

The City of Burbank is located in southern California approximately 12 miles north of downtown Los Angeles, as shown on Figure 2-1. The City covers approximately 17 square miles (10,880 acres) of the eastern end of the San Fernando Valley. The City of Los Angeles lies to the north and west and the City of Glendale to the south and east.

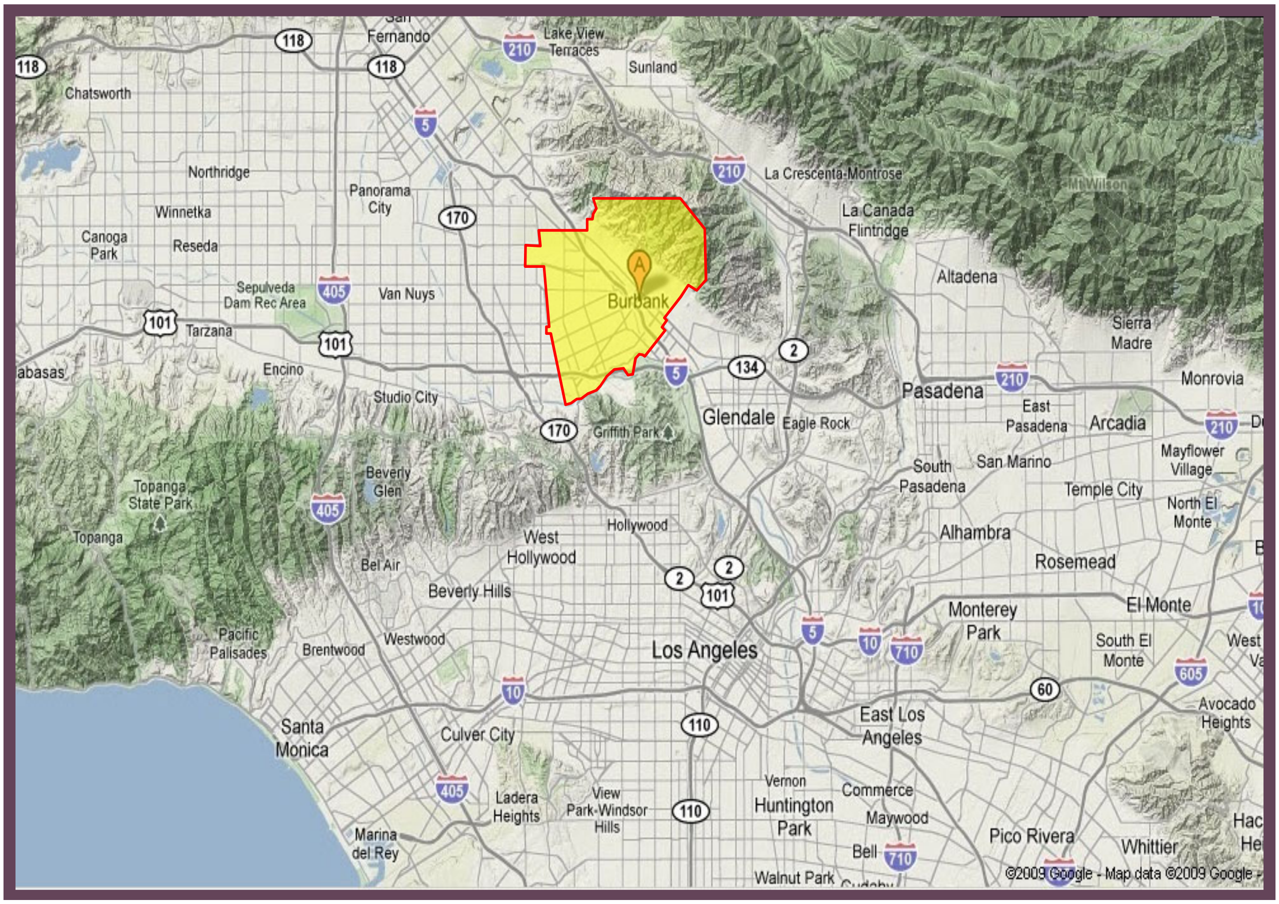

Figure 2-1: Burbank Vicinity Map

There has been a community known as Burbank since 1887. The City of Burbank was officially established in 1911. The municipal water and electric utility was founded in 1913. In 1914, an additional 9.4 square miles were annexed, establishing today's total area of 17.1 square miles and the population grew to almost 14,000. Burbank was one of the 13 founding agencies of MWD in 1928 to secure its future water supplies.

World War II brought rapid industrial growth. During the war, 94,000 people were employed at Lockheed Corporation (Lockheed) aircraft facilities within the City. Population grew to 53,899 by 1943, and to 78,577 by 1950. Growth continued at a slower rate for the next 20 years. In 1970 the population was 88,871. By 1980 the population had decreased to 84,625 and the average age of citizens had increased. The 1980s brought new growth, including several high-rise office buildings and dozens of new apartment and condominium buildings on lots that originally had single-family homes although they were zoned for multi-family. Population had increased to 93,643 by 1990.

Lockheed closed its facilities in 1991. During a period when there was economic recession, the population did not decline. The 1990s brought expansion of the movie and television industry and a revitalization of the downtown area. The population grew to 100,316 by the 2000 census. Since 2000, former Lockheed and other industrial sites have been redeveloped for commercial and retail uses. Downtown renewal continues. There has been a return to intensive multi-family residential construction that replaces, or sometimes adds on to, older single-family and small multi-family units.

2.2 Land Use

Burbank consists of a mix of land uses, including residential, commercial, industrial, institutional and open space, with residential and commercial being the dominating uses. Burbank is largely built-out, meaning there are few vacant sites available for new developments and growth is expected to be due primarily to increases in housing density and land use intensity.

According to Burbank's General Plan (Burbank2035) prepared in 2013, notes that the greatest amount of growth in the next several decades is expected to be in the commercial area. The City expects to see an intensification of commercial land use in the downtown area and an increased amount of mixed-use development (i.e., residential/commercial/retail) along transportation corridors and transportation nodes. According to Burbank's General Plan (Burbank2035), new residential development will be predominantly multi-family which will increase the population density due to redevelopment of older single-family homes on lots zoned for multi-family use. Redevelopment of areas adjacent to downtown is expected to continue, especially along the South San Fernando Boulevard corridor and the area around the Metrolink station.

The City is currently updating the Housing Element of the General Plan. Because the Housing Element update is under development, BWP staff coordinated with the City's Community Development Department to obtain information related to expected changes to housing growth. The Housing Element is expected to lay the foundation for achievement of the City's goal for 12,000 new units through 2035.

Additional information regarding housing and employment growth was obtained from the Southern California Association of Governments (SCAG) demographic projections developed for the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (referred to as Connect SoCal). These projections incorporate data from past trends, key demographic and economic assumptions, and local, regional, state and national policy. The SCAG forecasting process also incorporates participation of local jurisdictions and stakeholders.

Employment growth is expected in a variety of commercial and industrial operations, notably entertainment/media, retail, health care, and manufacturing. (Burbank 2035 General Plan Housing Element, January 2014.; United States Census Bureau Quick Facts, July 2019).

The expected growth in housing units and employment is provided in **Table 2-1**, and are used to project the demands discussed in Section 3. It's assumed that the Housing Element goal of 12,000 new housing units is in addition to the SCAG housing unit growth projections.

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Table 2-1: Housing Unit and Employment Growth Projections

	2025	2030	2035	2040	2045
SCAG Projections					
Single Family Housing Units	21,490	21,697	21,678	21,822	21,842
Multi-Family Housing Units	22,554	23,552	24,723	25,678	26,830
Housing Element Goal					
New Housing Units	4,000	10,088	12,000	12,000	12,000
Total Housing Units	**48,044**	**55,337**	**58,401**	**59,500**	**60,672**
Employment	**122,652**	**128,544**	**134,669**	**137,027**	**138,614**

2.3 Population and Demographics

Projected Burbank population estimates are shown in **Table 2-2**. The current (2020) population is consistent with California's Department of Finance estimates of population for the City of Burbank. Projected population includes population projections as provided in the SCAG 2020 Demographic and Growth Forecast plus the expected population growth associated with the Housing Element goal which assumes a population of 2.46 per housing unit based on the persons per household estimated by the California Department of Finance.

Table 2-2: DWR Table 3-1: Population Projections

Year	2020	2025	2030	2035	2040	2045
2020 SCAG Projections	105,861	107,765	109,599	111,531	113,460	115,482
Population Associated with Housing Element Goal	0	9,840	24,816	29,520	29,520	29,520
Total Population Served	**105,861**	**117,605**	**134,415**	**141,051**	**142,980**	**145,002**
Notes: Growth projections are based on SCAG 2020 Regional Transportation Plan, SANDAG Series 14 Forecast (Version 17), and the Housing and Safety Element of the Burbank General Plan						

2.4 Climate

Burbank's climate is considered Mediterranean which is warm and dry during summer and cool and wet during winter. A summary of monthly climate data is contained in **Table 2-3** below. The warmest month of the year is August with an average high temperature near 90˚ Fahrenheit (F), while the coldest month of the year is December with an average low in the low 40° F. Temperature variations between night and day tend to be moderate during summer and winter.

The historical annual average precipitation in Burbank is 16.3 inches. Winter months tend to be wetter than summer months. The wettest month of the year is February with an average rainfall of 3.8 inches.

Due to its moderate climate, there is considerable water demand for landscape irrigation for growing a variety of plants. The total average evapotranspiration (ET) deficit, which must be made up with irrigation, is over 38 inches (in)/year (yr). Water meter data indicates that historic irrigation rates between 42 in/yr and 48 in/yr are common for turf areas.

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Table 2-3: Climate Data for Burbank

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Max °F	67.5	68.7	70.4	73.7	76.6	81.4	88.3	89.0	87.2	80.9	73.7	67.9
Average Min °F	41.7	43.5	45.7	48.9	53.5	57.3	61.2	61.4	59.2	53.3	46.0	41.6
Average Total Precip. (in)	3.35	3.84	2.84	1.17	0.27	0.07	0.01	0.10	0.20	0.60	1.51	2.34
ET (in)	2.20	2.45	3.64	4.74	5.31	6.06	6.75	6.66	5.01	3.95	2.73	2.31
ET deficit (in)	0.00	0.00	0.80	3.57	5.04	5.99	6.74	6.56	4.81	3.35	1.22	0.00

Source: Western Regional Climate Center. Burbank Valley Pump, California (041194). https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1194.

Climate change adds uncertainties to the projection of water supply planning. The effects of higher temperatures and precipitation changes induced by climate change may Burbank's impact water supplies in a number of ways including:

- Reduction in Sierra Nevada snowpack
- Increased intensity and frequency of extreme weather events
- Prolonged drought periods
- Water quality issues associated with increase in wildfires
- Changes in runoff pattern and amount
- Rising sea levels resulting in potential pumping cutbacks on the State Water Project
- Effects on the groundwater basin
- Changes in demand levels and patterns
- Increased evapotranspiration from higher temperatures

While it is unknown what the magnitude and timing of these impacts will be, Burbank is participating in regional planning efforts that incorporate climate change into long range supply planning. Additional discussion of climate change effects and impacts is provided in Section 4.10.

2.5 Water System

Burbank does not own any native groundwater rights and extracts groundwater supplies under terms outlined in the 1979 water rights Judgment for the San Fernando Basin which is discussed fully in Section 4.2. BWP provides potable water and recycled water to customers within the City. BWP's potable water supply is comprised of water from MWD and groundwater from production wells within the City. MWD imports its water from Northern California via the State Water Project (SWP) and also the Colorado River via the Colorado River Aqueduct (CRA). All groundwater extracted in Burbank is treated to remove Volatile Organic Compounds (VOCs) at the Burbank Operable Unit (BOU) prior to entering the distribution system. Recycled water is produced at the Burbank Water Reclamation Plant (BWRP), operated by the Burbank Public Works Department, and is delivered via an independent distribution system. Section 3 contains more information about potable water supplies, and Section 5 describes the recycled water system.

Burbank's potable water system includes approximately 286 miles of pipelines ranging in size from 30 inches to 1-1/2 inches in diameter, 35 booster pumps, 21 tanks and reservoirs, eight wells, five MWD connections, and over 26,000 service connections. The water distribution system consists of three major pressure zones and eight smaller hillside zones (see **Figure 2-2**). The three largest pressure zones are denoted Zones 1, 2, and 3. Zone 1 encompasses approximately 90% of the total City land area and represents 88% of the total City demand. The ground surface elevations in Zone 1 range from 480 feet above mean sea level (MSL) at the southerly boundary at Chavez Street and Linden Avenue, to 830 feet MSL on Bel Aire Drive at Orange Grove Avenue. The reservoirs that serve Zone 1 have a hydraulic elevation of 904 feet MSL.

Almost all of the water supplies enter the system in Zone 1. The only exception is that some water from one of the five MWD treated water connections (B-5) can feed Zone 2. Water is pumped from Zone 1 to Zones 2 and 3 at hydraulic elevations 991 and 1,156 feet MSL, respectively. From Zones 2 and 3, water is pumped to the eight hillside zones through successive pumping stations.

The potable system's tanks and reservoirs range in capacity from 13,500 gallons to 25 million gallons (MG). The combined storage capability of all the reservoirs is approximately 60 MG. The storage capacity of Zone 1 is approximately 50 MG, 83% of the total system storage.

Water demands by individual customers are subject to wide daily and seasonal fluctuations. Burbank's system has been designed to accommodate variability of water demands. The system includes large storage reservoirs to accommodate hourly flow and demand variations throughout the distribution system. The storage capacity is large enough to allow for short interruptions (1 to 3 days at average flow) in the water supply.

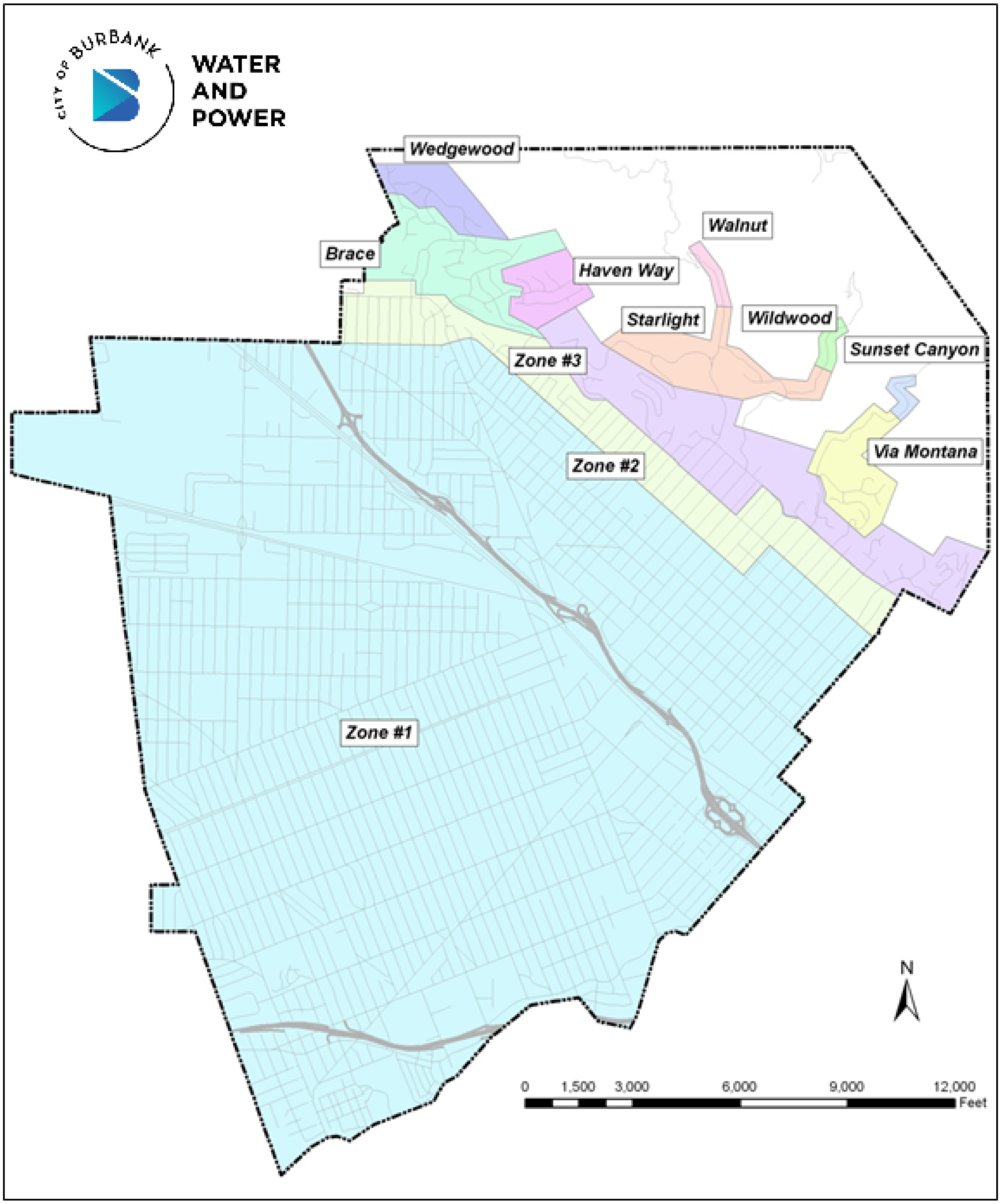

Figure 2-2: Burbank's Potable Water System and Pressure Zones

3. SYSTEM DEMANDS

3.1 Past and Current Water Use

Burbank's water use is urban encompassing residential, commercial, and governmental uses. There are no agricultural water services although some services are used exclusively for landscape irrigation. Burbank maintains records of the following:

- Water delivered from MWD
- Groundwater produced and treated
- Potable water sales in units of 100 cubic feet (CCF) by class of service
- Number of water meters for each of the customer classes
- Recycled water delivered

The following customer classes are contained in BWP's billing system:

- Single-family residential
- Multi-family residential
- Commercial
- City departments
- Fire protection
- Temporary water
- Recycled

Recycled water is discussed separately in Section 5, while the rest of Section 3 focuses on potable water.

2020 calendar year water deliveries to customers by water use sector are presented in **Table 3-1**. Burbank's potable deliveries were comprised of 50% single-family residential, 27% multi-family residential, 17% commercial, 1% City departments, and 0.1% fire protection. All Burbank customers are metered, therefore the deliveries reported for 2020 are from meter readings.

2020 water losses are estimated as 3.8 percent of water supplied, which is based on unaccounted-for water from 2015 to 2019 (which is equivalent to 4 percent of metered potable use). Unaccounted-for water is calculated as the difference between water delivered to the system and metered sales to customers, accounting for changes in reservoir storage. Unaccounted-for water is lost through unmetered use (flow testing, reservoir cleaning, main flushing, firefighting, etc.), faulty meters, evaporation, sheared hydrants, and system leaks. It should be noted that the industry average for unaccounted-for water is 7%.

Variation in water demand is attributed to changes in temperature and rainfall, as well as changes in economic conditions, and scarcity (i.e., requests to conserve during droughts). An exceptionally wet, cool year will reduce the water use, while a hot, dry year will increase water use. Demands may be higher than average during drought years, although calls for conservation can reduce demand.

Burbank's water demands have decreased compared to the early 1970s. The average daily water demand decreased from 24.0 to 19.6 MGD between 1970 and 1999. Maximum day water demands were 37 to 39 MGD in the early 1970s, but have not exceeded 36 MGD since 1976. The demands have decreased due to efficient water use after major droughts in the 1970s, 1990s, and especially in response to the previous significant water shortage. Industrial use has also reduced since some major industries have closed. Stepped-up programs of water meter maintenance, testing, and replacement have significantly helped to reduce unaccounted-for water.

Table 3-1: DWR Table 4-1: 2020 Actual Potable and Raw Water Deliveries

Use Type	Additional Description	Level of Treatment When Delivered	Total Volume (AF)
Single-family residential		Drinking Water	7,940
Multi-family residential		Drinking Water	4,275
Other Potable	Housing Element Goal	Drinking Water	0
Commercial		Drinking Water	2,738
Institutional/Governmental	City Departments	Drinking Water	155
Other Potable	Fire Protection	Drinking Water	11
Losses		Drinking Water	614
Total Direct Use Demand			**15,724**
Groundwater Recharge		Raw Water	152
Total Replenishment Demand			**152**
TOTAL			**15,876**

3.2 Baselines, Targets and 2020 Target Compliance

The California Water Conservation Act (also known as Senate Bill X7-7 or SBX7-7), passed in November 2009, required urban water suppliers to reduce per capita water use 20% by 2020. DWR prepared a manual with methodologies for calculating compliance and these calculations were shown in the 2010 Plan. The water use target calculation was recalculated in the 2015 UWMP using 2010 census population data. For Burbank, the 2020 target changed from 156 gallons per capita per day (GPCD) to 157 GPCD. SBX7-7 also included 5-year interim targets to be achieved for 2015 and reported in the 2015 UWMP. The first step to compliance is determining the target which will represent a 20% reduction in water sales. Calculating the target begins with collecting the data contained in **Table 3-2**.

Table 3-2: Base Period Information

Base Period	Parameter	Value
10 to 15-year Base Period	2008 Total Water Deliveries	23,909 AF
	2008 Total Volume of Delivered Recycled Water	2,032 AF
	2008 Recycled Water as a Percent of Total Deliveries	8.5%
	Number of Years in Base Period	10 years
	Year Beginning Base Period	1997
	Year Ending Base Period Range	2006
5-Year Base Period	Number of Years in Base Period	5 years
	Year beginning Base Period Range	2003
	Year Ending Base Period Range	2007

Recycled water use in 2008 was less than 10% of total deliveries. As a result, the City is required to use a ten-year base period for the calculation. Any ten-year base period between 1995 and 2010 can be selected for the base period. After evaluating water production for the calendar years from 1995 through 2010, the ten-year base period of 1997 through 2006 was selected. Similarly, a five-year base period between 2003 and 2010 was selected for another step of the calculation. The years 2003 through 2007 were used for the five-year period.

Water use is BWP's total potable production is based on supply production which is comprised of MWD treated water and local treated groundwater. The population data was obtained from the California Department of Finance website. Averaging over the ten-year base period results in a base daily per capita water use of 197 GPCD for the ten-year base period.

Per DWR's calculation method 1, the Urban Water Use Target for the year 2020 is 80% of the ten-year base period average. Accordingly, 80% of 197 is equal to 157 GPCD. Regulations require this target be less than 95% of the five-year base period annual average. The five-year base period data is contained in **Table 3-3** below. The five-year base period average use is 196 GPCD. 95% of that value is 186 GPCD, which is greater than 157 GPCD ten-year target. Therefore, the Burbank's urban water use target for the year 2020 is 157 GPCD (20x2020 Target).

Based on a 2020 potable supply production of 16,162 AF, BWP's 2020 water use was 138 GPCD (Table 3-4), which is below the BWP's 2020 target of 157 GPCD.

Table 3-3: DWR Table 5-1: Baselines and Targets Summary

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1997	2006	197	n/a
5 Year	2003	2007	196	157
*All values are in Gallons per Capita per Day (GPCD)				

Table 3-4: DWR Table 5-2: 2020 Compliance

Actual 2020 GPCD*	Optional Adjustments to 2020 GPCD Enter "0" if no adjustment is made *From Methodology 8*					2020 GPCD*	Did Supplier Achieve Targeted Reduction for 2020?
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2020 GPCD*		
138	0	0	0	0	138	138	Y
All values are in Gallons per Capita per Day (GPCD)							

3.3 Water Demand Projections

MWD provided Burbank and other agencies with population and supply and demand calculations developed for their 2020 UWMP. Burbank's potable water demands for 2025, 2030, 2035, 2040 and 2045 are estimated by using the total retail demand projections provided by MWD as part of the regional planning process. The total demands are divided among water use sectors by starting with 2020 records of water sales by customer class, then using projected growth numbers for housing units and employment. Demands incorporate passive conservation (code-based and price-effect savings) and active conservation (for installed active devices through 2020). Losses are assumed to be equal to the five-year average of losses from 2015 to 2019, which is approximately 4% of potable direct use demand. Table 3-6 contains the projected demands by water use classes. In general, total demands are expected to increase, primarily due to the expected increase in housing units as discussed in Section 2.

It's assumed that existing codes and ordinances will remain in place, which include those codes related to water conservation in the City's Title 9 Building Regulations, and the City's Sustainable Water Use Ordinance passed in June 2008.

Table 3-5: DWR Table 4-2: Future Water Demands

Use Type	Additional Description	Projected Water Use (AF)				
		2025	2030	2035	2040	2045
Single Family		8,166	8,245	8,238	8,292	8,300
Multi-Family		4,511	4,710	4,945	5,136	5,366
Other Potable	Housing Element	1,160	2,926	3,480	3,480	3,480
Commercial		3,314	3,473	3,638	3,702	3,745
Institutional/Governmental	City Depts.	205	230	249	254	259
	Fire Protection	11	12	13	13	13
Losses		695	768	823	835	847
Total Direct Use Demand		**18,062**	**20,380**	**21,386**	**21,712**	**22,010**
Groundwater recharge	Replenishment with imported water	6,800	6,800	6,800	6,800	6,800
Total Replenishment Demand		**6,800**	**6,800**	**6,800**	**6,800**	**6,800**
Total Demand		**24,862**	**27,180**	**28,186**	**28,512**	**28,810**

Table 3-7: DWR Table 4-5: Inclusion in Water Use Projections

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found.	Section 8.1: Burbank's Local Water Conservation Portfolio and Ordinances
Are Lower Income Residential Demands Included In Projections?	Yes

The single-family and multi-family residential classes include low-income households. According to the US Census Bureau, approximately 10.5% of the City of Burbank population lives in poverty. The water demands attributed to low-income households were estimated by applying this 10.5% to residential water use projections. Burbank has a Lifeline program that offers financial support for low-income customers who are either, (1) a senior over 62, (2) a person with a permanent disability, or (3) require the use of life support in their home. In addition, Burbank's projected populations and households includes assumptions regarding new construction of low-income housing to take place within the timeframe of this UWMP. The estimated volumes are shown in Table 3-6. Burbank's future water demand may be impacted by large development projects.

Table 3-6: Projected Low-Income Water Demands

Water Use Sector	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Single-family	857	866	865	871	872
Multi-family	474	495	519	539	563
Housing Element	122	307	365	365	365
Total	**1,453**	**1,668**	**1,750**	**1,775**	**1,800**

Non-potable water uses and losses must be evaluated as a component of total water demands. Table 3-9 contains the expected amounts of potable, raw water and, recycled water demands (described in Section 5).

Table 3-7: DWR Table 4-3: Total Gross Water Use (Potable and Non-Potable)

	2020 (AF) (actual)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Potable Water, Raw	15,885	24,862	26,776	28,186	28,512	28,810
Recycled Water Demand	3,149	3,540	3,540	3,540	3,540	3,540
Total Water Use	**19,034**	**28,402**	**30,316**	**31,726**	**32,052**	**32,350**

4. SYSTEM SUPPLIES

4.1 Imported Water

The water supply for the City of Burbank is imported from outside the region through Burbank's membership in MWD. MWD delivers both treated and untreated water to Southern California via two sources. Water from Northern California is imported by way of the SWP and water from the Colorado River reaches the region through the CRA. MWD has five treatment plants which supply most of Southern California with treated water through their distribution system. Burbank obtained about 38% of its treated potable water from MWD in the Calendar Year 2020.

Burbank has five treated potable water connections to the MWD system, with a maximum rated capacity of 115 cubic feet per second (cfs) (51,610 gallons per minute; see Table 4-1 below). The MWD system pressure is high enough to deliver water to Burbank's Zone 1 and Zone 2 without pumping, but booster pumps are available at MWD connections B-1 and B-2 to increase the capacity for periods of high demand.

Table 4-1: MWD Service Connection Capacity

MWD Connection	Minimum Flow	Normal Range	90% of Maximum	Maximum Flow
B-1	3.0 cfs	15.0 - 22.0 cfs	27.0 cfs	30.0 cfs
B-2	1.5 cfs	3.0 - 7.0 cfs	13.5 cfs	15.0 cfs
B-3	1.0 cfs	3.0 - 4.0 cfs	9.0 cfs	10.0 cfs
B-4	2.0 cfs	11.0 - 14.0 cfs	18.0 cfs	20.0 cfs
B-5	2.5 cfs	7.0 - 26.0 cfs	36.0 cfs	40.0 cfs
Total Treated	**n/a**	**39.0 - 73.0 cfs**	**103.5 cfs**	**115.0 cfs**
B-6 Untreated Water Connection at Pacoima	**3 cfs**	**25 - 65 cfs**	**63 cfs**	**70 cfs**

Burbank's MWD service connections are not able to take the maximum flows. Improvements to the service connections could be performed to realize their maximum potential if future demands make it necessary. The nominal maximum capacity of the five connections is vastly more than expected requirements for the next 25 years. The water supply tables in this UWMP use expected requirements not maximum capacity.

Burbank's demand for treated MWD water has decreased since groundwater treatment facilities described in Section 4.2 have come on-line. In 1990, Burbank used approximately 23,000 AF of treated MWD water, which decreased to 7,852 AF in 2010 and 4,765 AF in 2015. Burbank projects the demand for treated MWD water to be 11,310 AF in 2045 (Table 4-2). The City will continue to depend on MWD treated water for blending purposes and MWD non-potable water to augment its groundwater pumping rights. Additional information regarding reducing Delta reliance is provided in Appendix D.

Table 4-2: Projected MWD Supplies

Source	2020 (AF) (actual)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
MWD Treated Potable	6,165	7,407	9,722	10,714	11,012	11,310
MWD Replenishment	152	6,800	6,800	6,800	6,800	6,800

Note: MWD Replenishment supply was especially low in 2020 due to previous recharge of large quantities of surplus water through MWD's cyclic storage program. Over the long term, Burbank projects the need to recharge approximately 6,800 AFY to balance groundwater inventory.

In 2010 the City completed a MWD connection (B-6) to deliver untreated imported water for groundwater replenishment to the existing Pacoima and Lopez spreading grounds in the north San Fernando Valley. A schematic of the project is shown in Figure 4-1 below. The City purchased and spread 18,751 AF between 2018 and 2020. Only 152 AF was purchased and spread in 2020 due to planned improvements of the spreading grounds by Los Angeles County. These totals include both water for direct groundwater replenishment and cyclic storage deliveries of MWD surplus water. Accepting cyclic storage deliveries from MWD in wet years may reduce the demand in future years for groundwater replenishment purchases. In water year 2019 and 2020, 52% and 100% respectively, of untreated imported water from MWD was from cyclic storage.

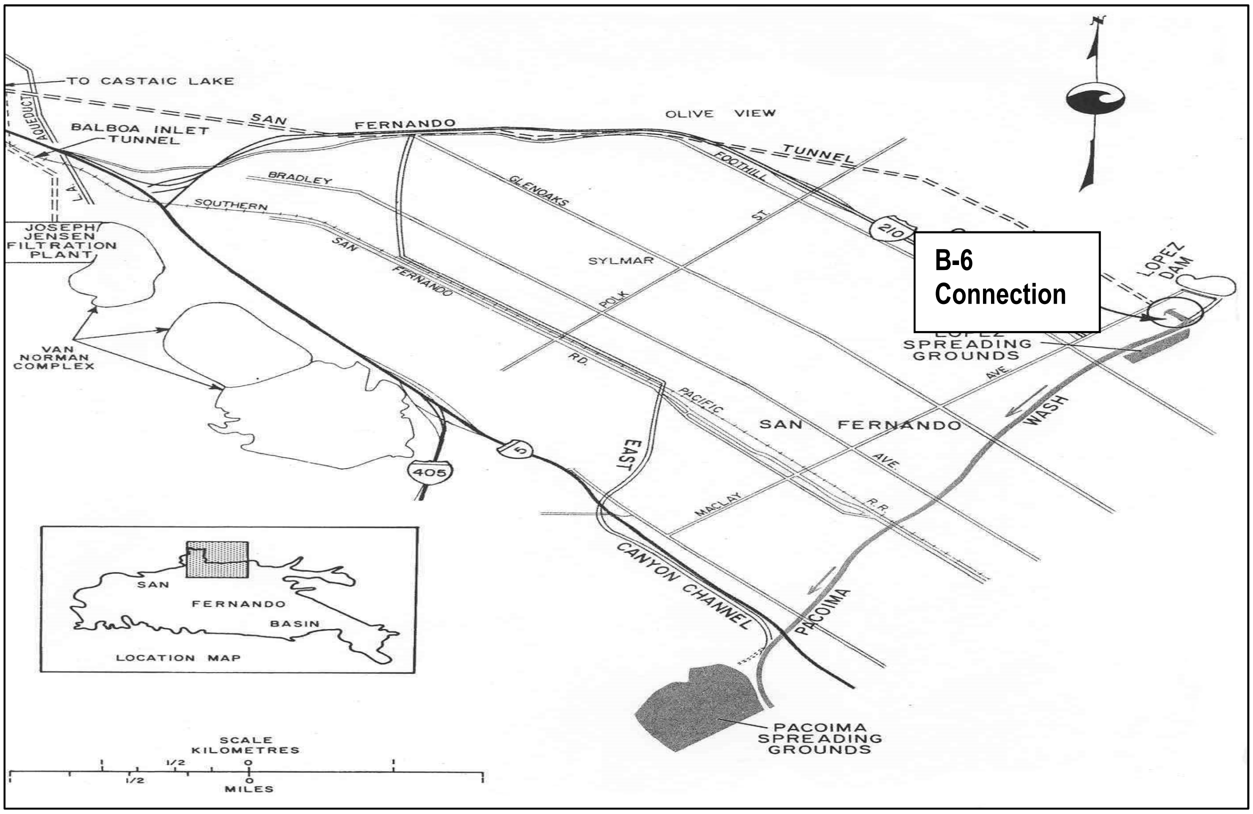

Figure 4-1: Burbank's Groundwater Recharge Project

4.2 Groundwater

Burbank pumps its groundwater from the aquifer in the San Fernando Basin (SFB). The SFB consists of 112,000 acres and comprises over 90% of the total San Fernando Valley fill. A map of the basin is shown in Figure 4-2 below. The San Rafael Hills, Verdugo Mountains, and San Gabriel Mountains bound the SFB on the east and northeast. The northern border of the basin is defined by the San Gabriel Mountains and the eroded south limb of the Little Tujunga Syncline which separates it from the Sylmar Basin. The basin is bounded on the northwest and west by the Santa Susana Mountains and Simi Hills and on the south by the Santa Monica Mountains.

Burbank has historically utilized its groundwater resources. Imported water from MWD in the early years was a supplemental supply. During this time, well and pumping capacity was adequate to serve most of the City's needs with local groundwater. As the City grew, it used more MWD water, but groundwater was still a major source.

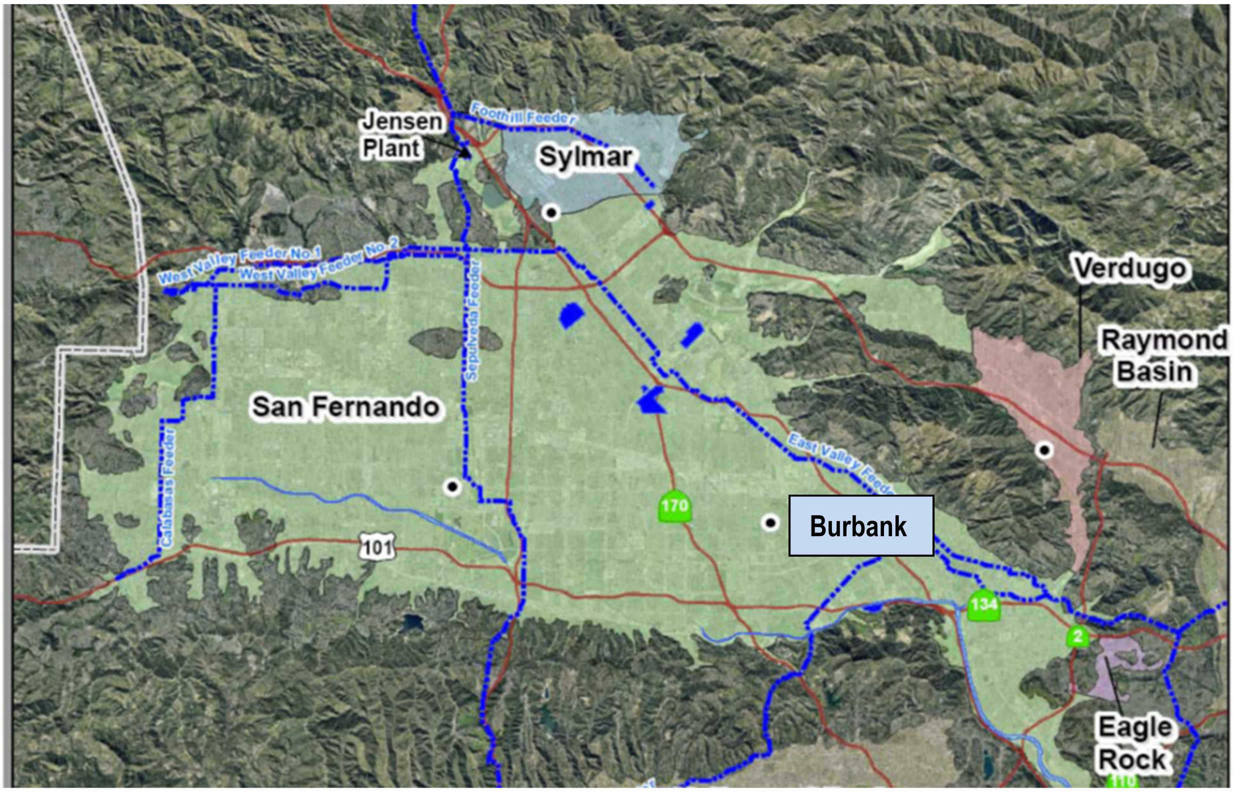

Figure 4-2: San Fernando Groundwater Basin (green)

The ownership or rights to naturally occurring water in the SFB, also known as the Upper Los Angeles River Area (ULARA), was decided in Superior Court Case No. 650079, City of Los Angeles vs. the City of San Fernando, et al. and are adjudicated in the Final Judgment (Judgment) entered on January 26, 1979 (included as Appendix E). The Judgment upheld the Pueblo Water Rights of the City of Los Angeles to all groundwater in the SFB derived from precipitation (infiltration of direct rain fall plus surface water runoff) within ULARA. The Judgment also included provisions for an Import Return Credit (IRC), storage of imported water, stored water credits, and Physical Solution Water for certain parties.

Burbank is entitled to an IRC of 20% of all water delivered in Burbank, including recycled water. This provision was incorporated into the Judgement since a portion of the water delivered in Burbank, which originates from outside ULARA, percolates into the aquifer, becoming part of the groundwater supply. The IRC is calculated on an annual basis by the ULARA Watermaster. For example, total deliveries in the 2017-18 water year were 19,937 AF, so the 20% ICR is calculated to be 3,987 AF. The Watermaster prepares an annual report which describes pumping activities for the basin. Additional information regarding the SFB can be found on the ULARA Watermaster's website at http://ularawatermaster.com/.

Burbank is also entitled to import water and spread or percolate this water into the aquifer thus creating additional groundwater and the right to pump that additional groundwater. Burbank is entitled to accumulate or store these groundwater credits if they are unused in the year they are earned or created.

The provision of a right to Physical Solution Water recognized the investment in wells, pumping equipment, and transmission mains that were made by Burbank and others prior to the Judgment when the parties in ULARA, other than the City of Los Angeles, were believed to have rights to pump water originating from local precipitation. Physical Solution stipulates a right to a specified volume of groundwater "credits" that may be purchased from the City of Los Angeles at the sole discretion of the purchasing party on an annual basis. The cost of this water is set by a formula in the Judgment and is tied to the average cost of water supply to the City of Los Angeles in the preceding year. Burbank is entitled to purchase 4,200 AF of Physical Solution Water annually.

In the 1980s groundwater from the City's production wells were found to have varying degrees of VOC contamination. At this time similar contamination was being found in many parts of the country. Burbank's contamination resulted in a complete loss of the groundwater supply until treatment plants could be built. Burbank has one active treatment plant for VOC removal, described in the following sections and shown in Figure 4-3 below. Also, inorganic substances like nitrate and chromium have presented problems which are discussed in the following sections. In 1997 California State regulators classified highly contaminated groundwater including the aquifer underlying Burbank as "Extremely Impaired Sources".

4.2.1 Burbank Operable Unit and Valley Pumping Plant

The Burbank Operable Unit (BOU) is an Environmental Protection Agency (EPA)-led project to clean up groundwater impacted by historical industrial releases, primarily by Lockheed-Martin. The BOU project consisted of drilling 8 extraction wells and constructing a state-of-the-art treatment plant using Best Available Technology (Air Stripping Towers and Granular Activated Carbon Filters) to remove and stabilize the VOC plumes within the aquifer. Completion of this project restored a major component to the City's water supply. The Consent Decree for the project was "entered" on March 25, 1992. Lockheed-Martin started construction on June 23, 1993 and the project began operation in January 1996.

The eight wells and the VOC removal treatment plant were operated by Lockheed-Martin until March 2001, when the City of Burbank took over operation. The BOU's design capacity is 9,000 gallons per minute (gpm). Assuming 85% availability, the annual production would be 12,336 AF per year, about two thirds of the City's current potable water requirement. However, regular maintenance and regulated blending requirements to lower nitrate and chromium concentrations in conjunction with lower system demand to accept this blended water has reduced the production levels to an average of approximately 9,900 AF over the last five years (2015-2019).

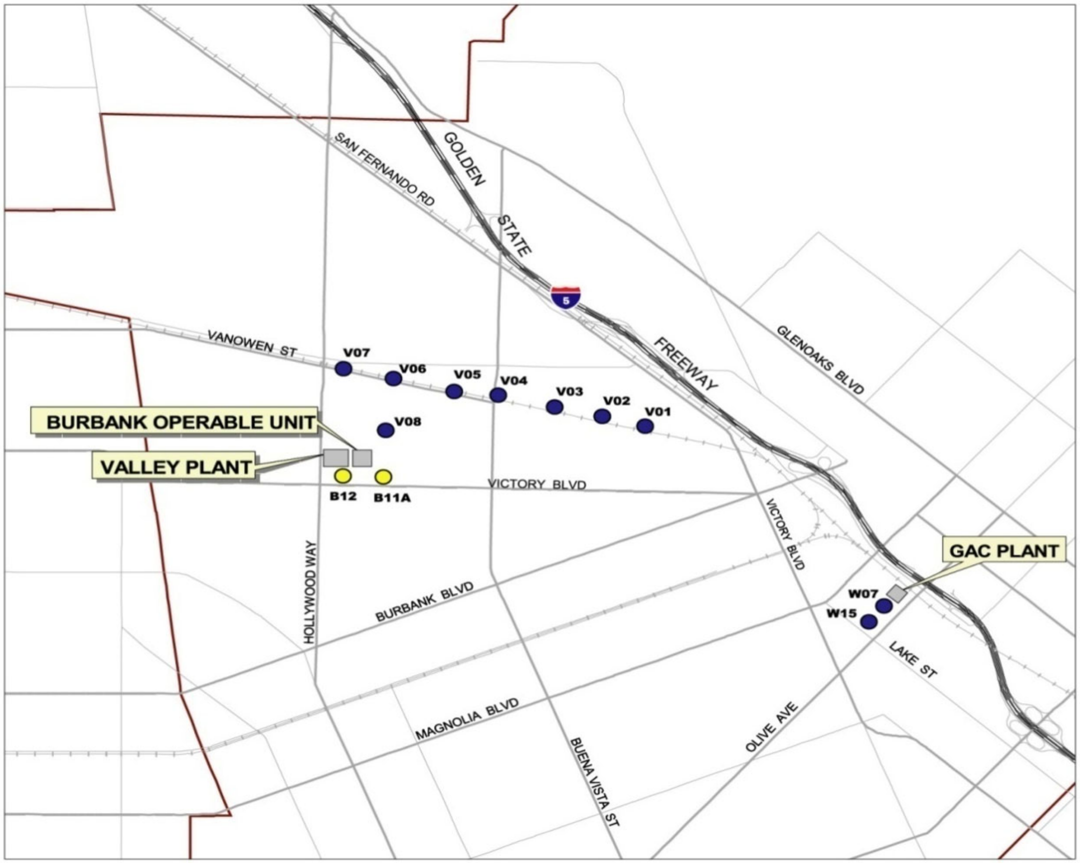

Figure 4-3: Burbank's Groundwater Production Facilities

A summary of recent groundwater pumping is contained in **Table 4-3**. The projected output for 2021 is 10,904 AF due to ongoing plant improvements and modifications in the past five years. The City expects to produce on average 10,700 AF per year through 2045.

Table 4-3: DWR Table 6-1: Groundwater Volume Pumped

Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	San Fernando Basin	9,612	9,521	10,147	10,145	9,997

The Valley Pumping Plant was designed to allow blending of BOU water with MWD water to reduce nitrate levels. Subsequently, hexavalent chromium (Cr6) has also been found in the groundwater. There is currently no maximum contaminant level (MCL) for hexavalent chromium. The previous MCL of 0.010 mg/L (10 parts per billion [ppb]) was withdrawn on September 11, 2017. The DDW is in the process of establishing a new MCL which will be greater than the 10 ppb value. Once a draft MCL has been set, BWP will evaluate the need for treatment.

The City of Burbank's drinking water permit mandates blending of the BOU water with imported MWD water from its B-5 connection to meet acceptable nitrate levels. If the MWD (B-5) supply were interrupted, production of groundwater from the Valley/BOU plant would also need to be stopped to avoid exceeding the nitrate MCL. Recent water quality data shows decreased nitrate levels at the BOU wells indicating it could supply the City without blending in case of an emergency MWD shutdown. However, approval for emergency use of this source without blending would have to be obtained through the State Water Resources Control Board (SWRCB) – Division of Drinking Water (DDW). The Consent Decree calls for treatment at the rate of 9,000 gpm throughout the year, but during low-demand periods, the City's water demand may be lower than the BOU's treatment capacity. When this occurs, BWP uses the additional capacity to continue to treat the contaminated groundwater at a higher rate and send the balance of the treated water to Los Angeles. BWP and LADWP have a transfer agreement which stipulates LADWP will directly reimburse MWD for the water used to blend and will reimburse BWP the costs related to operation and maintenance of the distribution and treatment systems.

Along with nitrate and Cr6, other constituents of concern like 1,4-Dioxane, nitrosamines, and uranium may increase and negatively impact production from the plant. It may eventually be necessary to build additional treatment processes with funding expected to come from parties found to be responsible for the contamination.

4.2.2 Lake Street GAC

The Lake Street Granular Activated Carbon (GAC) Treatment Plant was constructed in 1992 to remove VOCs from City Wells 7 and 15 located on the BWP campus. The designed flow capacity is 2,000 gpm, resulting in a production capacity of 200 to 250 AF per month, allowing for carbon changes about every two months. The plant would normally be operated only during the warmer months of the year, due to seasonal demand and operational requirements for the BOU.

Lake Street GAC also has historical Cr6 concentrations above 10 ppb and no source of blending water. As discussed above, the Cr6 value of 10 ppb was when Cr6 had an MCL but was withdrawn in September 2017. Along with the Cr6 contamination was the need to focus remediation efforts to the BOU, hence the Lake Street GAC has remained shut down since March 2001. The DDW is in the process of establishing a new MCL which will be greater than the 10 ppb value. As of now the Well 7 Cr6 results are between 6-7 ppb. The original well 15 has since been destroyed and much of the equipment is not operable at this time. No production from the GAC plant is included in the current plan.

4.2.3 Sustainable Groundwater Management Act

In 2015, Sustainable Groundwater Management Act (SGMA) 2019 was enacted to provide for the sustainable management of groundwater basins in California. SGMA planning requirements are mandatory for the high- and medium-priority groundwater basins identified by DWR. In these basins, qualifying local agencies are required to create a Groundwater Sustainability Agency (GSA) and adopt a SGMA-compliant Groundwater Sustainability Plan (GSP). Under SGMA, groundwater basin boundaries are as identified in DWR Bulletin 118.

The SGMA 2019 Basin Prioritization process was conducted to reassess the priority of the groundwater basins following the 2016 basin boundary modifications, as required by the Water Code. For the SGMA 2019 Basin Prioritization, DWR followed the process and methodology developed for the CASGEM 2014 Basin Prioritization, adjusted as required by SGMA and related legislation. DWR used the following list of components to re-evaluate prioritization:

1. The population overlying the basin or subbasin.
2. The rate of current and projected growth of the population overlying the basin or subbasin.
3. The number of public supply wells that draw from the basin or subbasin.
4. The total number of wells that draw from the basin or subbasin.
5. The irrigated acreage overlying the basin or subbasin.

6. The degree to which persons overlying the basin or subbasin rely on groundwater as their primary source of water.
7. Any documented impacts on the groundwater within the basin or subbasin, including overdraft, subsidence, saline intrusion, and other water quality degradation.
8. Any other information determined to be relevant by the department, including adverse impacts on local habitat and local streamflows

The San Fernando Basin (DWR Basin No. 4-011.04) has been classified as a very low-priority basin, and is not required to form a groundwater sustainability agency (GSA) and adopt a groundwater sustainability plan (GSP) or submit an alternative to a GSP. DWR determined that as a "Basin with Adjudication & Non-Adjudicated GW Use <9,500 AF," under Component 8C&D of DWR's review, the Basin is a "very low-priority basin." The ULARA Watermaster continues to submit information to the State's SGMA website to help verify that ULARA maintains its compliance with SGMA.

4.3 Surface Water

BWP does not have surface water as a supply source. Therefore, this section is not relevant to this plan.

4.4 Stormwater Capture/Infiltration

Burbank recognizes the multiple benefits of stormwater capture, and has worked to plan and implement stormwater capture projects, as described below. While these projects are expected to increase supplies and improve the health of the groundwater basin, the volume of water supply captured is relatively small and therefore not accounted for as part of supply projections.

4.4.1 EcoCampus

The City continues to evaluate stormwater mitigation methods with the concept of stormwater infiltration and recharge to promote low-impact development (LID). LID improves the effectiveness of groundwater recharge and extraction options by minimizing the loss of recharge areas. This requires certain construction practices that increase or maintain the infiltration capability of lands overlying groundwater basins. BWP has implemented multiple innovative water management features, using its "EcoCampus" vision as a showcase of the variety of benefits that accrue from stormwater capture and infiltration projects. Elements of BWP's EcoCampus are described below.

Green Street Project

In 2010, BWP constructed a Green Street project on the Lake Street frontage of its campus innovative stormwater management technologies implemented as well as energy efficient lighting. The Green Street project captures and percolates stormwater from the public right of way. Capturing stormwater reduces run off and increases groundwater recharge. First flush contaminants are captured on site and do not flow to the Los Angeles River and Pacific Ocean. Citywide adoption of infiltration technology will ultimately result in more percolation to the aquifer.

The five stormwater mitigation methods the City implemented in the Green Street project are:

- *Permeable Pavers with Gravel Reservoir*: Permeable pavers are structural units, such as concrete blocks, bricks, or reinforced plastic mats, with regularly inter-dispersed void areas used to create a load-bearing pavement surface. The void areas are filled with permeable materials (gravel, sand, or grass turf) to create a system that allows for the infiltration of stormwater. The use of permeable pavers results in a reduction of the effective impermeable area on a site.

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- *Infiltration Planter Bump-Outs:* A stormwater bump-out is a vegetated curb extension that protrudes into the street either mid-block or at an intersection, creating a new curb some distance from the existing curb. A bump-out is composed of a layer of stone that is topped with soil and plants. An inlet or curb-cut directs runoff into the bump-out structure where it can be stored, infiltrated, and taken up by the plants (evapotranspiration). Excess runoff is permitted to leave the system and flow to an existing inlet. The vegetation of the bump-out is low enough to allow for open site lines of traffic. Aside from managing stormwater, bump-outs also help with traffic calming, and when located at crosswalks, they provide a pedestrian safety benefit by reducing the street crossing distance.

- *Filtration Planters at Open Space:* A stormwater planter is a specialized planter installed into the sidewalk area that is designed to manage street and sidewalk runoff. It is normally rectangular, with four concrete sides providing structure and curbs for the planter. The planter is lined with a permeable fabric, filled with gravel or stone, and topped off with soil, plants, and, sometimes, trees. The top of the soil in the planter is lower in elevation than the sidewalk, allowing for runoff to flow into the planter through an inlet at street level. These planters manage stormwater by providing storage, infiltration, and evapotranspiration of runoff. Excess runoff is directed into an overflow pipe connected to the existing combined sewer pipe.

- *Silva Cell System:* Silva Cells essentially function as underground scaffolding for trees. It creates an underground frame that can bear traffic loads and in addition offers freely rootable space that allows urban trees to grow into large and beautiful specimen by the catchment of excess rain or stormwater. It also creates large absorption capacity with uncompacted soil in the cell.

- *Kristar Tree Pod System:* The Kristar Tree Pod is a biofiltration system consisting of conventional tree box filter and a pre-filtration chamber. The pre-filtration chamber separates and retains gross pollutants such as trash, debris and coarse sediments – pollutants known to reduce efficiency and increase maintenance frequency of typical tree box filters. Collected gross pollutants are removed from the pre-filtration chamber through the maintenance access cover, without disturbing the biofiltration area.

These five stormwater capture systems work together to help BWP achieve the goal of a zero-runoff campus where all stormwater falling on the campus is percolated back into the aquifer.

Centennial Courtyard

The Centennial Courtyard was transformed from an industrial ruin to a usable, aesthetically pleasing open space. All the stormwater that lands within the courtyard is funneled into a phyto-extraction canal, where specifically selected plants filter different constituents from the water before being infiltrated into the ground. This site has been recognized as a test site for The Sustainable Sites™ Project and being used to generate guidelines for others to incorporate sustainable landscape into their properties.

Multiple LEED Platinum Buildings

The Water, Electric, and Administrative buildings on BWP's campus are all LEED Platinum certified. BWP installed three green roofs on its Administration Building to help capture additional stormwater. A green roof is covered in with vegetation, typically drought tolerant plants. Green roofs are both esthetically pleasing and environmentally preferred. Underground storage tanks were installed to capture the green roof's overflow water during a rain event. The water from these underground tanks is then allowed to percolate through the soil.

Solar Panels were also constructed to serve a multitasking purpose: providing shade to parked cars, channeling rainwater to a filtration system, and providing power to the service center and warehouse. The rainwater that lands on the solar panels is conveyed to massive underground water storage and percolation tanks. These 8-foot diameter underground storage tanks allow stormwater to percolate down through the soil over time. This process ultimately helps recharge the aquifer.

Besides the Rooftop Gardens and solar panels these underground tanks also capture storm water from Lake Street and the Centennial Courtyard. This creates a zero discharge to the streets during a storm and mitigates storm related discharges to the flood channels which ultimately lead to the Pacific Ocean.

4.4.2 Upper Los Angeles River Enhanced Watershed Management Plan (ULAR EWMP)

In addition to local efforts to capture and infiltrate stormwater on BWP's campus, the City of Burbank also participates in regional stormwater planning with other Municipal Separate Storm Sewer System (MS4) permit holders in the surrounding watershed. Nineteen permittees participate in the Enhanced Watershed Management Program for the Upper Los Angeles River with City of Los Angeles as the lead coordinating agency. The 2016 plan outlines various coordinated regional watershed control measures to achieve collective stormwater quality goals that can be achieved through BMPs that fall into the following categories:

- Low impact development
- Green streets
- Regional projects
- Institutional control measures

City of Burbank makes up less than 4 % of the EWMP area, but remains one of the larger entities in the planning group. BWRP is the monitoring site location for data utilized in the water quality priorities process. BWRP discharges into the Burbank West Channel, which drains into LA River Reach 3 in the California Water Quality Control Plan, Los Angeles Region Basin Plan. To meet BMPs within the EWMP effort, City of Burbank has established an LID ordinance as well as a residential LID incentive program, LID retrofits on municipal parcels. Burbank has additionally implemented "enhanced" institutional control measures to achieve a 10% reduction in pollutant load through an enhanced street sweeping program. Effluent limits have been established based on TMDAL through the EWMP planning effort in Burbank Western Channel for trash, ammonia-N, Nitrate-N, Nitrite-N, Nitrate as N + Nitrite as N, Copper and Lead (dry and wet weather), Zinc (wet weather), Cadmium (wet weather), and E. coli. E.coli also has a receiving water limit established based on a TMDL. Other discharges from publicly owned treatment works in the EWMP area include City of Los Angeles' Donald C. Tillman and Los Angeles-Glendale Water Reclamation Plants.

4.5 Exchanges and Transfers

DWR requires water suppliers to describe the opportunities for exchanges or transfers of water on a short-term or long-term basis. Burbank is not currently planning any long-term exchanges or transfers of water. Burbank has two system interconnections with the City of Glendale. These have been used on several occasions to solve short-term operational problems, such as a need for extra water because an MWD connection or pump station is out of service. The policy has been to return the same amount of water, rather than buying and selling water. If MWD had to ration water during a drought, both cities would be affected. The interconnections would only help if one city had extra groundwater capacity to share.

As a member agency of the MWD, Burbank may contribute to the development of exchanges, transfers and water banking through its MWD water purchases. In 2015, BWP and LADWP entered into an agreement to construct and operate an interim water system connection to transfer potable water to LADWP, treated at BOU. This allows LADWP to produce its annual entitlement to groundwater from the SFB, while maximizes the treatment capacity at BOU. Under this agreement, BOU can operate at a higher capacity when demand is down and treat additional contaminated groundwater in the SFB. Total blended delivery (local treated groundwater and MWD treated surface water) from Burbank to LADWP in 2019 was 572 AF. In 2020, deliveries were only made in the month of January for a total of 239 AF.

The City of Glendale's and Burbank's recycled water distribution systems are interconnected at one location. Within the past five years there have been a few occasions where Glendale used Burbank's recycled water to accommodate its planned plant shutdowns. On another occasion, Burbank used Glendale's recycled water to supplement its own supply during an unplanned sewage pump station shutdown. There are four other recycled water interconnections with LADWP. Burbank supplies LADWP with recycled water in exchange for groundwater credit.

4.6 Desalinated Water

Burbank, located inland in the San Fernando Valley, has limited opportunity for desalination of ocean water. The groundwater is not brackish. To remove substances like chromium or nitrate, membrane processes like those often used for desalination may one day be used. However, disposal of the brine from such processes is more of a problem than for seaside locations which can send it to an ocean outfall. As a member agency of the MWD, Burbank supports local water supply projects like the development of desalinated water supplies. Burbank is in favor of desalination projects if they prove to meet standards of engineering and economic feasibility.

4.7 Future Water Projects

Burbank has identified three projects or programs that are currently underway, and are shown in **Table 4-4**.

Table 4-4: DWR Table 6-7: Expected Future Water Supply or Programs

Name of Future Projects or Programs	Joint Project with other supplies?	Description	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
Expanded water recycling	No	Discussed in Section 5	Discussed in Section 5	All Year Types	Up to 200 AFY
North Hollywood Operable Unit (NHOU) wells treated at BOU	No	Lockheed-Martin is leading the effort to pipe nearby NHOU off-line wells to the BOU to receive VOC removal treatment	To be determined (TBD)	All Year Types	TBD
Indirect potable reuse (IPR) / direct potable reuse (DPR) feasibility study	No	As State Regulators wrestle with approval, Burbank's future water supply may be sustained by IPR/DPR technologies	TBD	All Year Types	Up to 5,000 AFY
Notes: Expanded water recycling supplies are included in the recycled water projections discussed in Section 5.					

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4.8 Summary of Existing and Planned Sources of Water

The total water supplies produced or purchased by Burbank in 2020 are shown in Table 4-6 and projected water supplies are shown in **Table 4-5**. As indicated in **Table 4-6**, the water supply types available for use by Burbank are projected to remain unchanged between now and 2045, and increases in demands are largely expected to be met using treated, imported water. Recycled water is discussed further in Section 5 and the projected reliability of each of the supplies is discussed in Section 6.

Table 4-5: DWR Table 6-8: Water Supplies – Actual

Water Supply	Additional Detail on Water Supply	2020	
		Actual Volume (AF)	Water Quality
Purchased or Imported Water	MWD Treated Potable	6,165	Drinking Water
Groundwater (not desalinated)	Supplier Produced, Treated for blending with MWD treated potable	9,997	Drinking Water
	Total Potable Water	***16,162***	
Purchased or Imported Water	MWD untreated for groundwater replenishment	152	Other Non-potable Water
Recycled Water	Supplier-produced for non-potable use	3,149	Recycled Water
	Total Nonpotable Water	***3,301***	
	Total Supplies	**19,463**	

Table 4-6: DWR Table 6-9: Water Supplies – Projected

Water Supply	Additional Detail on Water Supply	Reasonably Available Volume (AF)				
		2025	2030	2035	2040	2045
Purchased or Imported Water	MWD Treated Potable	7,407	9,722	10,714	11,012	11,310
Groundwater (not desalinated)	Supplier Produced, Treated for blending with MWD treated potable	10,655	10,658	10,672	10,700	10,700
	Total Potable Water	***18,062***	***20,380***	***21,386***	***21,712***	***22,010***
Purchased or Imported Water	MWD untreated for groundwater replenishment	6,800	6,800	6,800	6,800	6,800
Recycled Water	Supplier-produced for non-potable use	3,540	3,540	3,540	3,540	3,540
	Total Nonpotable Water	***10,340***	***10,340***	***10,340***	***10,340***	***10,340***
	Total Supplies	**28,402**	**30,720**	**31,726**	**32,052**	**32,350**

Notes: Recycled water includes proposed deliveries to LA in exchange for groundwater credits. The amounts estimated for untreated replenishment depend on these LA exchange amounts. If less recycled water is exchanged for groundwater credits, the difference must be made up by increased replenishment purchases.

4.9 Energy Intensity

Energy intensity reporting offers several benefits to Burbank and its customers. Benefits include identifying energy savings opportunities, calculating GHG emission reductions associated with the Burbank's water conservation program, and identifying potential opportunities for receiving energy efficiency funding. Burbank estimated its water services' operational energy intensity using the best available information. Operational energy intensity is defined as the total amount of energy expended by the District on a per acre-foot basis to take water from where BWP acquires water to its point of delivery to customers.

The energy required for conveyance, extraction, treatment and distribution of water is described below.

Conveyance

Energy associated with moving water from water supplies to water treatment plants or distribution systems is termed "conveyance". For the purposes of this UWMP, Burbank considers conveyance to be the movement of imported water to the service area to be "conveyance". The energy used by MWD to convey imported water throughout its system is reported in their 2020 UWMP, and is estimated at 1,837 kilowatt-hours (kWh) per AF for treated water, and 1,767 kWh per AF for untreated water.

Treatment

As described previously, Burbank's local supplies are treated at the BOU for removal of VOCs from groundwater. In 2020, the BOU treatment plant used approximately 4,156,526 kWh (based on meter data) to treat 9,997 AF of groundwater, or approximately 416 kWh per AF.

Extraction

The energy required to pump water from groundwater basins is termed "extraction". In 2020, the energy used to pump the 9,997 AF of groundwater is estimated at 6,666,053 kWh (based on meter data), or approximately 667 kWh per AF.

Distribution

Once water is either treated or pumped, it is distributed to customers. In order to distribute to all customers and maintain system pressure, various pumps, reservoirs, and other facilities are necessary. The energy required to distribute water to customers in 2020 totaled 4,590,747kWh (based on meter data) for the 16,162 AF of potable water delivered, or approximately 284 kWh per AF.

Table 4-7 provides a summary of the energy intensity of BWP's water management processes. In total, BWP's water deliveries are estimated to have an energy intensity of 1,671 kWh per AF. Note that this energy intensity calculation includes the energy associated with "upstream" imported water conveyance and treatment.

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Table 4-7: DWR Table O-1A: Energy Intensity by Water Management Process

Reporting Period: 1/1/2020 to 12/31/2020	Water Management Process				Total Utility
	Extract and Divert	Conveyance	Treatment	Distribution	
Volume of Water Entering Process (AF)	9,997	6,317	9,997	16,162	16,162
Energy Consumed (kWh)	6,666,053	11,593,735	4,156,526	4,590,747	27,007,061
Energy Intensity (kWh per AF)	667	1,835	416	284	1,671

5. WATER RECYCLING

5.1 Wastewater Collection and Treatment

Wastewater generated within the City is collected and conveyed by approximately 230 miles of pipelines ranging in diameter from 6” to 30”, two pump stations, and 19 diversion manholes. The Los Angeles 48” North Outfall Sewer (NOS) line runs from west to east through the southern portion of the City.

Wastewater flows to the BWRP which currently treats 8.5 MGD with a design capacity of 12.5 MGD. The BWRP treatment system consists of the following:

- Flow equalization
- Coarse solids grinding
- Primary sedimentation
- Activated sludge biological treatment with nitrification and denitrification
- Secondary sedimentation with coagulation
- Single media deep bed gravity sand filtration
- Chloramination
- Dechlorination with sodium bisulfite (for discharge to surface water)

BWRP produces a disinfected tertiary effluent which meets discharge limitations contained in its National Pollutant Discharge Elimination System (NPDES) permit issued by the Los Angeles Regional Water Quality Control Board (RWQCB-LA). BWRP’s effluent also meets the most stringent criteria for recycled water defined in the California Code of Regulations, Title 22, Division 4, Chapter 3 requirement as *Disinfected Tertiary Recycled Water* in that it is approved for all uses, including full body contact, with the exception of human consumption.

Table 5-1: DWR Table 6-2: Wastewater Collected Within Service Area in 2020

<table>
<tr><td>100%</td><td colspan="6">Percentage of 2020 service area covered by wastewater collection system</td></tr>
<tr><td>100%</td><td colspan="6">Percentage of 2020 service area population covered by wastewater collection system</td></tr>
<tr><th>Name of Wastewater Collection Agency</th><th>Wastewater Volume Metered or Estimated?</th><th>Volume of Wastewater Collected from UWMP Service Area in 2020 (AF)</th><th>Name of Wastewater Treatment Agency Receiving Collected Wastewater</th><th>Treatment Plant Name</th><th>Is WWTP Located Within UWMP Area?</th><th>Is WWTP Operation Contracted to Third Party</th></tr>
<tr><td>City of Burbank</td><td>Metered</td><td>7,138</td><td>City of Burbank Department of Public Works</td><td>Burbank Water Reclamation Plant</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="2">Total Wastewater Collected from Service Area in 2020</td><td>7,138</td><td></td><td></td><td></td><td></td></tr>
</table>

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Table 5-2: DWR Table 6-3: Wastewater Treatment and Discharge Within Service Area in 2020

Wastewater Treatment Plant Name	Burbank Water Reclamation Plant
Discharge Location Name or Identifier	Burbank Western Channel
Discharge Location Description	Discharge adjacent to Burbank WRP
Wastewater Discharge ID Number	NPDES No. CA0055531
Method of Disposal	River or creek outfall
Does this Plant Treat Wastewater Generated Outside the Service Area?	Yes
Treatment Level	Tertiary
Wastewater Treated (AF)	6,940
Discharged Treated Wastewater (AF)	3,790
Recycled Within Service Area (AF)	3,105
Recycled Outside Service Area (AF)	45
Instream Flow Permit Required	N//A

Up to 10,000 AF of recycled water per year is available for reuse. Recycled water produced at BWRP can be used in one of three ways:

- Flowed via gravity pipeline to the BWP campus
- Pumped into the recycled water distribution system
- Discharged to the Burbank Western Channel adjacent to BWRP

Water discharged to the Burbank Western Channel flows to the LA River and eventually to the Pacific Ocean.

5.2 Current Recycled Water Use

The recycled water from the BWRP is used in one of three general categories within the City: power production, landscape irrigation, and evaporative cooling. Burbank's recycled water is approved for all uses including full body contact with the exception of human consumption.

Power Production

Recycled water was first used at BWP's power production facilities for cooling in 1967. Originally, all excess recycled water from BWRP not pumped into the recycled water system flowed to the BWP campus. Blowdown water from the cooling towers and excess recycled water was discharged to the Burbank Western Channel, which is adjacent to both the BWRP and the BWP campus.

In August 2005, Construction of the Magnolia Power Project (MPP), a 310 megawatt, natural gas-fired, combined cycle turbine power plant was completed and all recycled water discharges to the Burbank Western Channel were discontinued at the BWP campus. MPP uses recycled water exclusively for cooling and all other power plant uses, including high purity boiler feed. The average annual usage is 1,350 AF (1.2 MGD).

MPP recycles all its process and cooling water to extinction through its zero liquid discharge (ZLD) unit. The ZLD unit purifies cooling tower blowdown and other recaptured water for reuse as cooling tower makeup. The byproduct of the ZLD process is a salt cake that is dried and trucked to a landfill for disposal.

Three other power plants are located at the BWP campus: Lake 1, Olive 1, and Olive 2. Lake 1 is a simple cycle natural gas fired turbine which is used intermittently to meet peak demands. This plant has a small cooling tower and uses minimal amounts of recycled water for gas compressor and lubrication oil cooling. Demineralized recycled water is also used and air emissions control equipment.

The two Olive power plants are on long-term standby. Cooling and process water used in these plants is recycled water with the blowdown from their cooling towers being discharged to the sanitary sewer.

Recycled water use for power production was approximately 20% lower than projected in the 2015 UWMP. It is expected that recycled water sales will increase to 1,200 AF per year after 2025.

Landscape Irrigation

CalTrans began using recycled water in 1988 for landscape irrigation along the Golden State (I-5) Freeway. The City installed a pipeline under the Golden State Freeway (I-5) in 1992 to distribute recycled water to the east side of the freeway to new customers in the area of the Media City Center, a regional shopping center.

A significant expansion of the recycled water system to quadruple recycled water use began in 1994. This expansion was completed in 1997 and recycled water was used at the Burbank landfill, the DeBell Golf Course, John Muir Middle School, and McCambridge Park. The AMC theater complex and Burbank High School were eventually also connected to these pipelines. The project included upgrading BWRP's existing booster station plus two new booster stations, storage tanks, and 17,000 feet of pipeline.

Expansion of the distribution system continued with the joint support of the Redevelopment Agency, BWP, and infrastructure improvements at major redevelopment sites. These expansions extended the recycled water system to the Chandler Bikeway, the Empire Center, the Burbank (Bob Hope) Airport, and Robert Gross Park. Sales of recycled water for landscape irrigation were about 800 AFY in 2007.

BWP prepared a Recycled Water Master Plan (RWMP) in October 2007 that was subsequently approved by the BWP Board and City Council. The 2007 RWMP outlined a phased expansion of the recycled water system to ultimately increase the use of recycled water provided by BWP by over 900 AF per year. BWP's revised its RWMP in October 2010 to include additional projects which were determined to be economical.

This recycled water system expansion included construction of six major pipeline projects totaling over 20 miles in length and an upgrade of pump station PS-1. Construction of this expansion was completed in 2012. All major landscaped areas which could be economically served, including city parks and schools are now irrigated with recycled water. **Figure 5-1** contains a map of the current recycled water system.

Landscape irrigation demand for recycled water approximately 20% higher in 2020 than was projected in the 2015 UWMP. This trend is expected to continue through 2045.

Planning efforts by the LADWP have identified potential recycled water use sites within LA which cannot be economically served from LADWP's recycled water system. Several of these sites are close to the Burbank/LA border, including the LA portion of the Chandler Bikeway. BWP and LADWP have worked together to identify other locations within LA which are feasible to serve with recycled water provided by BWP.

Deliveries to the City of Los Angeles

BWP's agreement with the City of Los Angeles to exchange BWRP produced recycled water for groundwater credits in-kind is projected to contribute up to 260 AF of additional recycled water deliveries going forward. City of Los Angeles is continuing to convert their customers to recycled water in their North Hollywood service area. In 2020, 44.2 AF of water was delivered to LADWP.

HVAC Cooling

Early in 2010, BWP identified a major opportunity for use of its recycled water in Heating, Ventilation, and Air Conditioning (HVAC) cooling towers of commercial buildings. The cooling tower serving BWP's administration building was converted to use recycled water in the summer of 2010. BWP has identified 22 cooling locations in Burbank which are feasible to serve with recycled water. These locations use nearly 650 AF of recycled water per year. Commercial use for recycled water is expected to remain relatively constant through 2045.

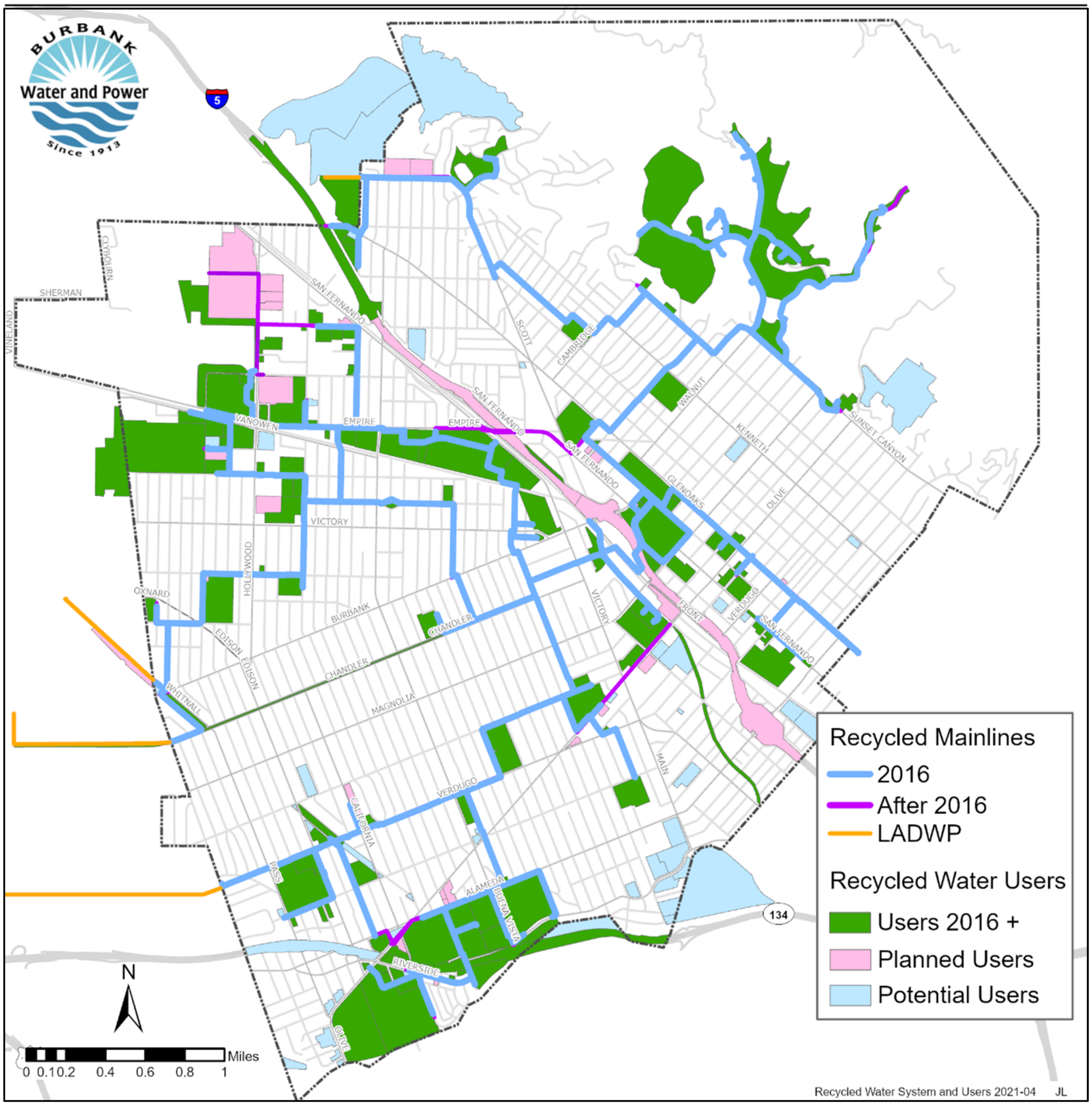

Figure 5-1: Existing Recycled Water System

Table 5-3 below contains an estimate of future recycled water use. **Table 5-4** contains a comparison between the projected use in 2020 from the 2015 UWMP and the actual use in 2020.

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Table 5-3: DWR Table 6-4: Recycled Water Direct Beneficial Uses Within Service Area

Beneficial Use Type	Beneficial Use Type Description	Amount of Potential Uses of Recycled Water (AF)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape Irrigation		1,219	Landscape irrigation	Tertiary	1,198	1,200	1,200	1,200	1,200	1,200
Golf Course Irrigation		230	Golf course irrigation	Tertiary	227	230	230	230	230	230
Commercial Use		659	Mixed cooling towers and landscaping	Tertiary	648	650	650	650	650	650
Geothermal and Other Energy Production	Power Plant use	1,200	Magnolia Power Plant, Olive Power Plant	Tertiary	1,029	1,200	1,200	1,200	1,200	1,200
Other	LADWP	260	Deliveries to LADWP	Tertiary	44	260	260	260	260	260
Other	Water Truck Fill Station	0	Water Truck Fill Station	Tertiary	3	3	3	3	3	3
Total					**3,149**	**3,540**	**3,540**	**3,540**	**3,540**	**3,540**

Table 5-4: DWR Table 6-5: Recycled Water Use Projection Compared to 2020 Actual

Beneficial Use Type	2015 Projects for 2020 (AF)	2020 Actual Use (AF)
Landscape irrigation (excl golf courses)	1,007	1,198
Golf course irrigation	230	227
Commercial use	470	648
Industrial use	20	0
Geothermal and other energy production	1,300	1,029
Other (deliveries to LADWP)	300	44
Other (water trucks)	0	3
Total	**3,327**	**3,149**

5.3 Recycled Water Policies

City Council and Department Managers have always maintained a positive outlook towards the use of recycled water. The use of recycled water has been a tremendous opportunity for the City of Burbank to do its part in conserving the scarce and very important State and local potable water supplies. The citizens and existing users have expressed positive feedback about the use of the recycled water system. Also, public notification signs required by regulations provide a friendly message about its use.

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The City has full-time staff to help existing users comply with regulatory requirements as well as to inform and encourage the development of new users. To encourage the use of recycled water, the City offers recycled water at approximately 85% of the corresponding potable water rate. The Rules and Regulations also contain other procedures to clarify what is required to receive recycled water service, which standardizes and thus facilitates recycled water use.

City Council expressed support for the addition of new required uses of recycled water where practical and appropriate when the 2007 RWMP was endorsed in October 2007. City Council approved a policy in December 2008 which mandated recycled water use under certain conditions. The City Council policy authorized modifications to BWP's Rules and Regulations to require the use of recycled water where these conditions are met. The use of recycled water, when required, is a condition of potable water service.

BWP staff continuously identify and analyze potential recycled water sites and their proximity to existing and proposed recycled water infrastructure. When feasible, BWP will extend water distribution mainlines to potential users. Up to 200 AFY of potential new usage has been identified. It is the parcel owner's responsibility to perform all onsite retrofits necessary to use recycled water on the property. BWP completes all work up to the meter at no charge to the property owner. Conversion to recycled water is required when the recycled transmission main fronting the parcel is put in service. The policy has been critical in facilitating recycled water conversions of landowners unenthusiastic to recycled water use.

BWP's agreement with the City of Los Angeles to exchange BWRP produced recycled water for groundwater credits in-kind is projected to contribute up to 260 AF of additional recycled water deliveries going forward. City of Los Angeles is continuing to convert their customers to recycled water in their North Hollywood service area.

Direct and Indirect potable reuse is not economically feasible at present. However, if in the future economic, political, and environmental feasibility could be established, it may be possible to reuse all BWRP effluent. This could result in up to 5,000 AF per year of recycled water use.

Table 5-5: DWR Table 6-6: Methods to Expand Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
Recycled Water Optimization Report	This report will provide guidance for future expansion and operations.	TBD	N/A
Potable Reuse	Direct/Indirect potable reuse not economically feasible at present. Assuming economic, political, and environmental feasibility, could potentially reuse all BWRP effluent.	TBD	5,000
Recycled Water Exchange with City of Los Angeles	Recycled water produced at BWRP exchanged for groundwater credits in-kind.	ongoing	260
Current Recycled Water Policy Enforcement	Whenever feasible, BWP will extend distribution to potential users. Potential new usage is continually identified.	ongoing	200
		Total	**5,460**

Notes: The expected increase in recycled water use from the Recycled Water Optimization Report is yet to be determined. The remaining actions include the maximum expected increases in recycled water use as a result of each action.

5.4 Recycled Water Fill Stations

On August 25, 2015, Burbank's City Council approved a Residential Recycled Water Fill Station Pilot Program. During the drought, one question BWP heard frequently from residents is "Why can't you provide my home with recycled water?" The costs to do so would have been astronomical, so BWP created an alternative approach to be responsive to this request. BWP's Water Division fabricated a community recycled water fill station. This enabled Burbank residents and businesses interested in obtaining recycled water to do so, at no cost. They were required to bring appropriate containers to the recycled water fill station and transport the recycled water to their property. Up to three hundred gallons of recycled water could be obtained per visit but residents were allowed to make multiple visits per day. Customers were also required to complete a training program on the safe use of recycled water and sign a form indicating their understanding of the following recycled water guidelines:

- Don't drink recycled water
- Don't use recycled water to wash hands or any other part of body
- Don't remove recycled water identification signs, tags or labels
- Don't cross-connect two dissimilar water systems (recycled to potable)
- Don't allow recycled water to contact drinking fountains or eating areas
- Don't allow recycled water to pond or puddle
- Don't allow recycled water to run off the use site property
- Don't pump recycled water into any on-site irrigation system
- Don't put hose bibbs on recycled water containers
- Don't use the same equipment on both recycled water and domestic water systems (for example, quick couplers, hoses, tools, etc.)

Additionally, BWP provided and applied "Recycled Water – Do Not Drink" stickers, to each container used to transport the water.

While this service represented only a drop in the bucket in potable water savings during a crucial moment in the drought, it provided valuable publicity regarding BWP's recycled water efforts. This program is no longer active, but it serves as a successful example of a program that can implemented to meet potable water use reduction goals and encourage customer interest in recycled water conversion.

5.5 Potable Reuse

The City of Los Angeles, which owns the rights to the groundwater in the SFB, developed an initiative called Operation NEXT in 2019 to support efforts at water supply sustainability in the Los Angeles Basin. The program aims to use 100 percent of recycled water produced at Hyperion Water Reclamation Plant for beneficial use by 2035. LADWP will utilize advanced treatment that includes reverse osmosis, microfiltration, and advanced oxidation. This level of treatment will address water quality concerns for the health of the SFB. Burbank's excess recycled water produced at BWRP may be used to supplement LADWP's recycled water supply for indirect or eventually, direct potable reuse. This program could build upon the agreement Burbank and City of Los Angeles already have for recycled water exchanges to LADWP customers in their North Hollywood service area.

6. WATER SUPPLY RELIABILITY

6.1 MWD Supply Reliability

Burbank depends heavily on MWD for its water supply since Burbank does not have the right to pump native groundwater in the SFB. The City of Los Angeles owns all naturally occurring groundwater as discussed in Section 4.2. Burbank maximizes local resources and minimizes the need to import water from other regions through aggressive use of recycled water, spreading and storing imported water when feasible, and promoting potable water conservation. These are detailed in Sections 5 and 7.

Burbank's location in MWD's distribution system allows it to be supplied by two separate MWD treatment plants, Weymouth and Jensen. The Weymouth plant can treat water from the CRA and the SWP. The Jensen plant can only treat water from the SWP. MWD's multiple supplies allow operational flexibility in case of a treatment plant shutdown or temporary problem within the distribution system. The City also purchases untreated MWD water for groundwater replenishment. Untreated water delivered through the city's MWD B-6 connection is spread at Pacoima or Lopez spreading grounds in order to add to its stored groundwater credits.

MWD discusses regional water supply reliability in its 2020 UWMP. The MWD UWMP uses lessons learned from their previous planning efforts to inform how uncertainty and reliability are evaluated. These plans include the previous and 2020 Integrated Water Resources Plan (IRP), the 1999 Water Surplus and Drought Management (WSDM) Plan, and Water Supply Allocation Plan (WSAP). The 2020 IRP is different than previous IRPs in that scenario planning components are being implemented to capture a broader range of possible futures both on the demand and supply side. The reliability assessments included in MWD's UWMP, including the Water Shortage Contingency Planning and Drought Risk Assessments, mirror a similar approach. The assumptions in their UWMP fall within the plausible future scenarios analyzed in the 2020 IRP to ensure the two efforts complement each other.

To develop average year supply and demand estimates, MWD used the historic hydrology for 1922 through 2017. This 96-year period was selected based on the historical hydrology period reported in the 2019 SWP Delivery Capability Report, which represents MWD's largest and most variable supply. During that period, the driest one-year period occurred in 1977. A five-consecutive year (1988-1992) dry period was additionally used for MWD's water service reliability and drought risk assessments, representing the driest five-year consecutive period during that time frame. These time periods are summarized in Table 6-1.

MWD strives for a "diverse water portfolio" that allows it to meet demands even in years when its primary supplies would not be enough. Part of MWD's 2020 UWMP is to have water storage capacity to draw on when supplies are short. Using surplus water from normal and wet years, MWD's large storage portfolio contains both dry-year storage and emergency storage that can be used to meet demand in case of a shortage. MWD has completed extensive modeling to create management options that will handle future variations in supply and demand.

Ultimately, if MWD has a sufficient water supply, so does BWP. In the 2015 IRP update, MWD describes unprecedented challenges on both the SWP and the CRA imported water supplies. The 2020 IRP looks beyond these experienced challenges and recognizes that the future is not predicable. Expanding the range of planning scenarios that MWD considers in their supply and demand modeling will only increase the reliability of this resource for BWP.

MWD's 2020 UWMP includes water quality information regarding CRA and SWP supplies. Salinity is the main water quality concern for the CRA supply. MWD is investigating desalination as a contingency plan for the CRA supply to combat its salinity. Treatment plant improvements are expensive and desalination leads to some water loss. Invasive species are also a growing concern due to the introduction of the quagga mussel (*Dreissena* bugensis) in the Colorado

River. The quagga mussel does not appear to impact drinking water quality, but costly measures to mitigate the spread of the invasive species are in place to control the impact on conveyance infrastructure and aquatic ecology of reservoirs.

For the SWP supply the main water quality concern is high levels of total organic carbon (TOC) and bromide. Disinfection byproducts (DBPs) form when source water containing TOC and bromide is treated with disinfectants such as chlorine or ozone. Studies have shown a link between certain cancers and DBP exposure. Ozonation reduces trihalomethane and haloacetic acid formation (both considered DBPs) but produces bromate which is regulated at 10 ppb. MWD has upgraded its pre-treatment process with ozonation capabilities at four of its five treatment plants and monitors bromate to keep the treated water at safe levels. However, MWD does not anticipate any reductions in water supply availability from SWP and CRA supplies due to water quality concerns over the study period.

6.2 Groundwater Supply Reliability

Groundwater helps BWP's overall supply reliability by providing a reserve during emergencies or droughts. The capacity and reliability of BWP's groundwater supply requires consideration of many issues including:

- Water rights
- Aquifer storage capacity
- Physical well and pump capacity
- Treatment capacity
- Water quality issues

City of Los Angeles owns the native groundwater rights to the SFB as detailed in the Judgment described in Section 4.2. The Judgment gives Burbank the right to store water in the aquifer under the administration of the ULARA Watermaster.

BWP can purchase MWD water for groundwater replenishment through spreading in order to add to its stored water credits. To maintain and optimize groundwater pumping, BWP needs to acquire about 7,000 AF of groundwater per year, on average, through replenishment or a combination of replenishment and "physical solution" purchases.

Unavailable replenishment water during a long drought could limit the City's ability to add to its groundwater "bank". However, the City plans to keep a reserve of 10,000 AF in groundwater credits. This would allow normal extractions to continue for about three years without replenishment, assuming the purchase of 4,200 AFY of physical solution water annually from LADWP (see section 4.2). After that, assuming the groundwater basin still held enough water, BWP would have to negotiate the purchase of additional groundwater from LADWP.

Groundwater VOC contamination underlying Burbank has necessitated the construction of two treatment plants for VOC removal, the BOU and Lake Street Granular Activated Carbon (GAC) plants. Burbank's BOU well capacity (12,000 gpm) is greater than its treatment capacity (9,000 gpm). Well pumping redundancy within BOU's well field and rotating their use keeps operations flexible and reliable. Groundwater from the BOU is pumped into Burbank's distribution system via the Valley Pumping Plant (VPP). The Lake Street GAC is not currently used as described in Section 4.2.2.

All of the City's production wells have varying degrees of VOC contamination and a shutdown of both treatment plants would create a complete loss of the groundwater supply. Elevated nitrate levels in the groundwater make it necessary to blend with MWD water to meet drinking water standards. The VPP was designed to allow blending water from the BOU treatment plant and a MWD connection to reduce nitrate levels, whereas the Lake Street GAC has no such ability. New regulations for lower nitrate levels would require additional and costly treatment processes.

Regulations prior to 2017 for Cr6 threatened to affect the BOU's supply. An increase in VOC levels or the determination of a Cr6 MCL in the future could affect groundwater reliability until costly treatment was constructed. Other emerging constituents like 1,4-Dioxane, nitrosamines, perchlorate, and uranium that cannot be removed by Burbank's existing treatment plants could affect groundwater reliability and may also need costly treatment.

Starting in 2018, BWP has increased sampling for PFAs in drinking water in accordance with recent SWRCB requirements. Policy regarding PFAS is rapidly evolving. As of now BOU Wells have remained in compliance through BWP's effort to stay ahead of regulations. However, regulatory constraints for emerging contaminants such as PFAS do pose a possible risk to the reliability of groundwater if they are to change in the future.

Redundant pumps at the VPP boost treated groundwater to blend with MWD water before entering the distribution system. This supply can be maintained in case of failure of one of the pumps. Water stored in the elevated tanks and reservoirs could supply the City by gravity in the event of a short-term power outage. An electric power outage would interrupt the groundwater supply as well as treatment plant operations. However, Burbank has excellent power supply reliability including local generation making a long-term power outage extremely unlikely.

6.3 Recycled Water Supply Reliability

All of Burbank's recycled water is supplied by BWRP. The BWRP is managed to be highly reliable but contingencies for recycled water outages must be considered. The existing recycled water distribution system includes potable water makeup facilities at the BWRP, Stough Tank, and the Golf Course Tank. A recycled water system interconnect with the City of Glendale was completed in 2010 which results in a backup recycled water supply from the LA-Glendale Water Reclamation Plant. MPP has the ability to supplement or replace the recycled water supply with water from the City well which normally feeds the Lake Street GAC.

Increased salt and nutrient loading is a growing concern to the San Fernando Basin. The State Water Resource Control Board mandated each basin to adopt a Salt and Nutrient Management Plan (SNMP) by 2016. The City participated in the SNMP process through the ULARA Watermaster. Recycled water usually has higher Total Dissolved Solids (TDS) and chloride content than potable water which may affect groundwater as it infiltrates. Recent groundwater data suggest TDS and Chloride loading from irrigation with recycled water have not negatively affected the groundwater in the SFB but future salt and nutrient regulations may limit recycled water's availability and use.

Additionally, the strong interest and support by LADWP for indirect and eventually direct potable reuse would help facilitate the development of such programs using BWRP produced water. If these programs are deemed economically and environmentally feasible in the future, all effluent from BWRP could potentially be reused. This would contribute up to 5,000 AFY of recycled water supply.

6.4 Supply and Demand Comparison

DWR requires agencies to provide a comparison of projected water supply and demand for the next 20 years, through 2045. This plan has been extended to 25 years, through 2045 to be useful through the next five years for Water Supply Assessments (SB 610) and Written Verifications of Water Supply (SB 221), which also require a 20-year planning horizon from the year they are performed.

The future water demands for the City and the entire region have been estimated by MWD using its new and improved model, the MWD Econometric Demand Model, developed by the Brattle Group. This model uses forecast data from SCAG for variables including population, housing units, and employment. Although Burbank is using lower demand projections which take into account the reductions to meet 20x2020 targets, these MWD projections provide the basis for dry-year reliability planning. **Table 6-1** contains the years used by MWD for their reliability analysis.

Table 6-1: DWR Table 7-1: Basis of Water Year Data

Water Year Type	Base Year(s)
Average Year	1922 – 2004
Single-Dry Year	1977
Consecutive Dry Years (5 Years)	1988 – 1992

Generally, dry weather, especially hot, dry weather, causes an increase in water demand, mostly for landscape irrigation. But conservation practices during past droughts have been sufficient to lower demands. Burbank achieved a 10% reduction in water use during the 1990/91 drought, a 20% reduction for the 2008-10 drought, and a 24% reduction in 2015, compared to use in 2013, saving over 1 billion gallons of water. Based on the analysis completed by MWD, Burbank's reliability analysis assumes a slight decrease in potable demands during a single dry year (decrease of 0.4 percent) and a slight increase in potable demands during multiple dry years that start at 0.85 percent in 2025 and increase to 1.8 percent in 2045. Non-potable demands are assumed to be unchanged during dry periods.

MWD projects 100% reliability for full-service demands through the year 2045 based on its 2020 UWMP. As a result, Burbank does not expect critical shortages during the 25-year planning period, though shortage response actions described in the WSCP in Section 7 will be implemented as appropriate. The City will continue to rely on MWD for water either for direct use or for groundwater replenishment. Burbank cooperates with MWD's regional water supply planning. MWD believes that all member agencies will continue with their demand management efforts since MWD's water demand projections include significant increases in conservation throughout the planning period. Groundwater and recycled water supplies are assumed to not be affected by dry periods. **Tables 7-2 through 7-7** provide a comparison of supply to demand during normal, single dry and multiple dry year periods.

An important component of MWD's contingency plan for responding to water shortages is the Water Supply Allocation Plan (WSAP) which MWD's Board of Directors approved in February 2008. It is based on a guiding principle developed out of the WSDM Plan for allocating shortages across MWD's service area. The WSAP formula uses different adjustments and credits to balance impacts of water shortage at the retail level, where local supplies can vary dramatically, and provide equity on the wholesale level among member agencies. It also takes into account the following: growth in demand, local investments, change in local supply conditions, the reduction in potable water demand from recycled water, and the implementation of water conservation programs. Both the WSAP and the WSDM have been incorporated into MWD's 2020 WSCP that was prepared in conjunction with MWD's 2020 UWMP.

Table 6-2: DWR Table 7-2: Normal Year Supply and Demand Comparison – Potable

	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Supply Totals	18,062	20,380	21,386	21,712	22,010
Demand Totals	18,062	20,380	21,386	21,712	22,010
Difference	**0**	**0**	**0**	**0**	**0**

Table 6-3: DWR Table 7-2: Normal Year Supply and Demand Comparison – Non-Potable

	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Supply Totals	10,340	10,340	10,340	10,340	10,340
Demand Totals	10,340	10,340	10,340	10,340	10,340
Difference	**0**	**0**	**0**	**0**	**0**

Table 6-4: DWR Table 7-3: Single Dry Year Supply and Demand Comparison - Potable

	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
MWD Treated Potable	7,334	9,640	10,628	10,925	11,222
Supplier-Produced Groundwater	10,655	10,658	10,672	10,700	10,700
Supply Totals	**17,989**	**20,298**	**21,300**	**21,625**	**21,922**
Demand Totals	**17,989**	**20,298**	**21,300**	**21,625**	**21,922**
Difference	**0**	**0**	**0**	**0**	**0**

Table 6-5: DWR Table 7-3: Single Dry Year Supply and Demand Comparison – Non-Potable

	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
MWD Replenishment	6,800	6,800	6,800	6,800	6,800
Recycled Water	3,540	3,540	3,540	3,540	3,540
Supply Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
Demand Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
Difference	**0**	**0**	**0**	**0**	**0**

Table 6-4: DWR Table 7-4: Multiple Dry Year Supply and Demand Comparison - Potable

		2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Year 1	MWD Treated Potable	7,559	10,072	11,021	11,411	11,706
	Supplier-Produced Groundwater	10,655	10,658	10,672	10,700	10,700
	Supply Totals	**18,214**	**20,730**	**21,693**	**22,111**	**22,406**
	Demand Totals	**18,214**	**20,730**	**21,693**	**22,111**	**22,406**
	Difference	**0**	**0**	**0**	**0**	**0**

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		2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Year 2	MWD Treated Potable	7,945	10,277	11,021	11,472	11,706
	Supplier-Produced Groundwater	10,655	10,658	10,672	10,700	10,700
	Supply Totals	**18,600**	**20,935**	**21,693**	**22,172**	**22,406**
	Demand Totals	**18,600**	**20,935**	**21,693**	**22,172**	**22,406**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 3	MWD Treated Potable	8,331	10,481	11,021	11,532	11,706
	Supplier-Produced Groundwater	10,655	10,658	10,672	10,700	10,700
	Supply Totals	**18,986**	**21,139**	**21,693**	**22,232**	**22,406**
	Demand Totals	**18,986**	**21,139**	**21,693**	**22,232**	**22,406**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 4	MWD Treated Potable	8,718	10,686	11,219	11,593	11,706
	Supplier-Produced Groundwater	10,655	10,658	10,672	10,700	10,700
	Supply Totals	**19,373**	**21,344**	**21,891**	**22,293**	**22,406**
	Demand Totals	**19,373**	**21,344**	**21,891**	**22,293**	**22,406**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 5	MWD Treated Potable	9,104	10,891	11,286	11,654	11,706
	Supplier-Produced Groundwater	10,655	10,658	10,672	10,700	10,700
	Supply Totals	**19,759**	**21,549**	**21,958**	**22,354**	**22,406**
	Demand Totals	**19,759**	**21,549**	**21,958**	**22,354**	**22,406**
	Difference	**0**	**0**	**0**	**0**	**0**

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Table 6-4: DWR Table 7-4: Multiple Dry Year Supply and Demand Comparison – Non-Potable

		2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Year 1	MWD Replenishment	6,800	6,800	6,800	6,800	6,800
	Recycled Water	3,540	3,540	3,540	3,540	3,540
	Supply Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Demand Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 2	MWD Replenishment	6,800	6,800	6,800	6,800	6,800
	Recycled Water	3,540	3,540	3,540	3,540	3,540
	Supply Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Demand Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 3	MWD Replenishment	6,800	6,800	6,800	6,800	6,800
	Recycled Water	3,540	3,540	3,540	3,540	3,540
	Supply Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Demand Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 4	MWD Replenishment	6,800	6,800	6,800	6,800	6,800
	Recycled Water	3,540	3,540	3,540	3,540	3,540
	Supply Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Demand Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Difference	**0**	**0**	**0**	**0**	**0**
Year 5	MWD Replenishment	6,800	6,800	6,800	6,800	6,800
	Recycled Water	3,540	3,540	3,540	3,540	3,540
	Supply Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Demand Totals	**10,340**	**10,340**	**10,340**	**10,340**	**10,340**
	Difference	**0**	**0**	**0**	**0**	**0**

6.5 Drought Management Experience

Burbank has not experienced many water supply deficiency problems or water emergencies in the past. During the 1976-77 drought there was no shortage of imported water but customers were encouraged to conserve water. This resulted in a 16% reduction in water usage which helped mitigate the drought effects throughout the City.

In 1991, due to the prolonged drought of 1987-92, the City implemented an Incremental Water Conservation Ordinance. There had already been a call for voluntary conservation efforts to achieve a 10% reduction in water use. The ordinance included a mandatory 20% conservation requirement, compared to base calendar year 1989. This resulted in financial disincentives (Drought Surcharge) to users who failed to conserve the required amount. There was also a Base Rate Adjustment of 15% from April 1, 1991 through March 31, 1992. By April 1, 1992, the water supply outlook had improved as well as water sales reduced 25%, and Burbank went back to a voluntary conservation program. Temperature and rainfall did affect the demand for water with a cool summer and rainy March in 1991. In addition, Lockheed had vacated most of its manufacturing plant since the base year of 1989, accounting for some of the reduction in water use.

In the years 2008-10, California water supplies saw low levels in major reservoirs and on the Colorado River system. Stricter limits on Delta water exports were enacted due to ecological issues. MWD implemented water supply allocation, which had not been expected during the previous UWMP update cycle in 2005. With SBX7-7, California passed important new legislation calling for 20% reductions in per-capita urban water use by 2020 (20x2020). Burbank took action by adopting a Sustainable Water Use Ordinance and other actions which are described in more detail in Section 6.7 and other parts of this UWMP. In September 2009, the City entered into partial Stage II requirements which limit home watering to three days per week. Customer response was excellent and in 2010 Burbank met its 20% reduction.

When the most recent drought period started in 2012 and progressed into 2014 Governor Edmund G. Brown Jr. issued a drought emergency proclamation calling for Californians to reduce their water use by 20 percent and for water agencies to implement water shortage plans. Burbank has always implemented Stage I of its Sustainable Water Use Ordinance which includes prudent water saving actions, such as not watering on rainy days or while the sun is out, not hosing down driveways, patios and other hardscape surfaces, and repairing plumbing and irrigation leaks promptly.

On July 22, 2014, Burbank's City Council adopted a Resolution to implement Stage II full requirements of the Sustainable Water Use Ordinance. This was in response to the July 15, 2014 California State Water Board emergency regulations requiring urban water suppliers, such as the City of Burbank, to implement by August 1, 2014 their Water Shortage Contingency Plans at a level that triggered mandatory restrictions on outdoor water use or be directed to limit outdoor water use to two days per week.

California's drought worsened through 2014/2015 and on April 1, 2015 Governor Brown issued an Executive Order (B-29-15) mandating a 25% statewide reduction in potable urban water use through February 2016 which included provisions to fine water agencies by up to $10,000/day for not meeting the water use reduction goals established by the SWRCB for each Water Agency.

On April 14, 2015, the MWD Board voted to implement the Water Supply Allocation Plan at a Stage III or 15% reduction in retail supplies. Water agencies exceeding a draw on MWD supplies above the Agency allocation would pay substantial penalties for excess water.

On April 18, 2015, the SWRCB issued conservation requirements for water agencies. The Governor's Executive Order directed the SWRCB to impose restrictions on water agencies to achieve the statewide 25% reduction in potable urban water use through February 2016 as measured against 2013 monthly use. Because of Burbank's historical conservation efforts, the reduction was established at 24%.

On April 21, 2015, a Drought Update and Potential Water Conservation Measures Report was presented to City Council and recommending three actions:

1. Scheduling a Public Hearing to implement Stage III of the Sustainable Water Use Ordinance
2. Establish fines for large commercial, industrial and institutional customers not compliant with recycled water conversions
3. Immediately begin issuing fines provided for in the Sustainable Water Use Ordinance to those ignoring repeated outreach related to prohibited water waste practices

An Emergency Public Hearing was held in the City Council chambers on May 14, 2015 which resulted in a 5-0 approval of implementing Stage III of the Sustainable Water Use Ordinance and to begin issuance of water waste fines.

Stage III of Burbank's Sustainable Water Use Ordinance includes all prohibitions contained in Stages I and II plus these four additional requirements:

1. Landscape irrigation during April through October is limited to no more than two days per week, on Tuesdays and Saturdays. One day per week landscape watering on Saturdays, as provided for in Stage II of the Ordinance, remains unchanged during Stage III for the cooler months of November through March.
2. Do not use outdoor evaporative cooling devices (for example, misters).
3. The prohibition on watering outdoor landscaped areas between the hours of 9:00 a.m. to 6:00 p.m. extends to include attended hand-watering.
4. Cover all swimming pools, wading pools, or spas when not in use with acceptable protection designed to decrease water evaporation.

BWP estimated a 24% total reduction by implementing the following:

- Sustainable Water Use Ordinance Stage III Restrictions an 11% reduction
- Recycled Water Conversion Projects a 3% reduction
- Enforcement of Water Waste Restrictions already in place an 8% reduction
- Indoor Water Waste Behavioral Improvements a 2% reduction

As a result of these efforts, Burbank met the 24% reduction from 2013 usage each month in 2015 and conserved over one billion gallons of water.

6.6 Drought Risk Assessment

A Drought Risk Assessment (DRA) was performed in the preparation of this 2020 UWMP to evaluate the reliability of each supply source under a long-term drought. The results of the DRA are considered in the development of demand management measures and water supply projects. The DRA provides an opportunity to evaluate the functionality of Burbank's Water Shortage Contingency Plan (WSCP). This evaluation can help identify undesired risks and allow for proactive steps to be taken prior to the next actual long-term drought. The DRA can be modified or updated on an interim cycle, as needed, to allow for the incorporation of new information as it becomes available or in the event of unforeseen circumstances.

The five-consecutive-year drought period supply and demand comparison examines the effect of the driest five-year historical sequence occurring in the future. The historical dry year period was identified as the five-year period from 1988-1992, consistent with MWD's 2020 UWMP. Burbank has completed this analysis consistent with MWD's 2020 UWMP, which projected an average increase in demand of 0.8% in multiple dry years. Replenishment is assumed to be lower in 2021 and 2022 (300 AFY), then increase to 6,800 AFY in 2023. Groundwater is assumed to be limited by a combination of storage and pumping capacity, and for the purposes of the DRA is assumed to be limited to 10,700 AFY. Projected imported are assumed to meet remaining potable demand not met by groundwater pumping. Recycled water supplies are assumed to be reliable in five-consecutive drought years and are assumed to equal recycled water demand.

As shown in **Table 6-6** and **Table 6-7**, no shortfall is expected if there were a drought over the next five years.

Table 6-6: DWR Table 7-5: Five Year Drought Risk Assessment - Potable

	2021	2022	2023	2024	2025
Gross Water Use	10,967	12,777	14,587	16,396	18,206
Total Supplies	10,967	12,777	14,587	16,396	18,206
Surplus/Shortfall w/o WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	0
Revised Surplus/(shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	0%

Table 6-7: DWR Table 7-5: Five Year Drought Risk Assessment – Non-Potable

	2021	2022	2023	2024	2025
Gross Water Use	3,281	3,374	9,966	9,971	9,991
Total Supplies	3,281	3,374	9,966	9,971	9,991
Surplus/Shortfall w/o WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	0	0	0	0	0
WSCP - use reduction savings benefit	0	0	0	0	0
Revised Surplus/(shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP action	0%	0%	0%	0%	0%

6.7 Climate Change Effects and Impacts

The uncertainty that climate change impacts bring to the future of water supply is a continual challenge for agencies like BWP. Accurate forecasting is increasingly harder due to increasingly variable hydrology that feeds each of BWP's supply sources. As historical hydrologic patterns are expected to shift in the future, adaptable supply and demand management will be necessary to ensure reliable service. Sections 7 and 8 of this Plan discusses this approach in further detail.

The effects of climate change are expected to be significantly felt in both of BWP's principal supply sources: imported water from MWD and groundwater. Additionally, as a result, BWP's recycled water operations will likely be required to change to meet this challenge.

6.7.1 Metropolitan Water District

MWD has for decades done extensive forecasting and resource planning through their Integrated Resources Planning (IRP) efforts to understand supply portfolios that will be required to meet demand in the future. In their 2020 UWMP, MWD lists the following broad effects of climate change that water resource planners should consider in California:

- Increased intensity and frequency of extreme weather events
- Prolonged drought periods,
- Water quality issues associated with increase in wildfires
- Changes in runoff pattern and amount; and
- Rising sea levels resulting in
    - Impacts to coastal groundwater basins due to seawater intrusion
    - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
    - Potential pumping cutbacks on the SWP and Central Valley Project

Impacts to water resources that indirectly affect MWD's supply reliability are also listed. These include important issues such as impacts to human health from water-borne pathogens and water quality degradation that might make MWD's operations more expensive and increase regulatory hurdles. Declines in ecosystem health and function could diminish the benefits that a natural and healthy ecosystem provides to supply sources as well as recreation viability of those ecosystems. MWD requires reliable power generation to deliver service to its customers. Alterations and increased vulnerability of the power would indirectly impact MWD customers in an important way. Lastly, increases in ocean algal blooms is mentioned that could affect seawater desalinations supplies for those communities that rely on this source.

MWD has also investigated risk from other sources that may result from climate change impacts, including demographic and growth uncertainty, infrastructure reliability, and regulatory and operational changes.

The timing, magnitude, and location of these impacts is largely uncertain. However, MWD has continued to invest in a portfolio that is diverse in both supply source and source region to meet these challenges.

6.7.2 Groundwater

Groundwater is an important local resource within BWP supply portfolio to use for blending with MWD treated water. The San Fernando Groundwater Basin is adjudicated and highly managed historically. Because groundwater is stored underground, the vulnerabilities of groundwater as a resource are usually delayed under drought conditions. While episodic or short-term changes may not impact groundwater, long-term stressors related to climate change are expected to limit the availability of surface flows which result in a greater dependence on groundwater production coupled with a decrease in recharge of groundwater basins. Further, dwindling imported water supplies combined with increased treatment costs associated with SWP and CRA water will increase reliance on groundwater as a cheaper and more accessible alternative. However, due to regulatory pressures, if MWD's blending supply were to not be available, BWP would not be able to meet water quality regulatory requirements to use local groundwater alone. Additionally, increased evaporation rates at spreading grounds as groundwater is replenished may contribute more non-recoverable loss that will need to be accounted for in future operations.

7. WATER SHORTAGE CONTINGENCY PLAN

Section 7 includes BWP's Water Shortage Contingency Plan (WSCP). The WSCP complies with California Water Code (CWC) Section 1063, which requires that every urban water supplier shall prepare and adopt a WSCP as part of its UWMP. Section 10623 states that a Supplier must develop a WSCP in the event of a drought, water supply reductions, failure of a water distribution system, or other emergencies. The objectives of this WSCP are to describe and demonstrate the Supplier's ability to meet water demands where emphasis is placed on the protection of public health and safety.

The Plan is consistent with the California Department of Water Resources 2020 UWMP Guidebook, California Water Code §§350 – 359, Government Code §§8550-8551, and the Urban Water Management Planning Act (UWMP Act). This Plan serves as a guide for BWP's intended actions during water shortage conditions to ensure a quick and adequate response in managing and mitigating possible water shortages.

The WSCP is organized into twelve sections and includes each of the following elements as indicated by the California Department of Water Resources 2020 UWMP Guidebook:

- Water Supply Reliability Analysis
- Annual Water Supply and Demand Assessment Procedures
- Six Standard Water Shortage Stages
- Shortage Response Actions
- Communication Protocols
- Compliance and Enforcement
- Legal Authorities
- Financial Consequences of WSCP Activation
- Monitoring and Reporting
- WSCP Refinement Procedures
- Special Water Feature Distinction
- Plan Adoption, Submittal, and Availability

7.1 Water Supply Reliability Analysis

This section describes the findings related to water system reliability and key issues that may create a shortage condition. Burbank's supply during a dry period could exceed the supplies used during a normal year given the ability to purchase additional imported supplies from its wholesaler, Metropolitan Water District of Southern California (MWD). Further MWD projects sufficient supplies and storage to meet demands in future single and multi-dry year scenarios. The City's supply is determined to be reliable in normal year, single-dry year, and multiple-dry years scenarios, with additional supplies purchased from MWD to meet demands in dry years as needed. The City has also taken steps to bolster its local supplies in order to reduce reliance on imported water supplies.

In determining the availability of supply for any given period, must look beyond the total quantity of supplies and consider other factors that affect water supply availability.

- **Infrastructure Capacity:** Evaluating the infrastructure capacity to extract groundwater, deliver State Water Project water, and distribute water through the distribution systems is of high importance in determining the availability of water supplies.

- **Timing of Delivery:** The timing of delivery of water supplies must be considered in assessing the supply availability, particularly water from the State Water Project. For example, in January 2014 California Department of Water Resources dropped State Water Project Allocation to zero, limiting water supplies.

7.2 Annual Water Supply and Demand Assessment Procedures

The annual water supply and demand assessment (Annual Assessment) is a new requirement for UWMPs. The assessment is used to determine if there will be a shortfall in City water supplies for the current year and one dry year. This section describes the procedures used to 1) approve the Annual Assessment and 2) conduct the Annual Assessment. While the UWMP's Drought Risk Assessment (DRA) evaluates longer-term, multi-year water supply reliability, the Annual Assessment focuses on actual forecasted near-term water supply conditions (i.e., next 12 months). The steps and timing to complete the Annual Assessment and submit the final report are listed below to provide consistency year-after-year regardless of City staff changes:

1. March - April
    a. Burbank determines available local supplies.
    b. Burbank coordinates with MWD to gather necessary information for MWD to conduct its wholesaler Annual Assessment.
2. April-May
    a. MWD makes a Water Supply Allocation Plan Determination
    b. Burbank conducts Annual Assessment:
        i. Burbank determines total available supply – inclusive of imported water supply.
        ii. Burbank determines infrastructure constraints (including water quality conditions limiting local sources).
        iii. City determines expected demand for current year.
        iv. City compares supply and demand and makes a determination of the water supply reliability.
3. June
    a. Burbank's City Council reviews and approves Annual Assessment determination.
    b. Annual Assessment report to be submitted to the state by July 1.

It should be noted that this timeline serves as a guideline for preparing the Annual Assessment and may be modified based on circumstances relevant at that time.

7.2.1 Decision-Making Process

A formal decision-making process will occur each year to approve the water supply reliability determination of the Annual Assessment. The Annual Assessment will document anticipated shortages if any, triggered shortage response actions, associated compliance and enforcement actions, and communication actions. These results will be presented to the City Council for approval. If the Annual Assessment determines a potential supply shortage, the City Council's approval of the Annual Assessment, with potential coordination with MWD, will also serve as a formal declaration of any foreseen water shortage level, and trigger recommendations for specific shortage response actions.

7.2.2 Data and Methodologies

This section describes the key data inputs and Annual Assessment methodologies used to evaluate the water system reliability for the coming year, while considering that the year to follow would be considered dry. For purposes of this analysis, a dry year is considered to be years in which supply availability is lower than in an average year, which aligns with the water shortage levels described in Section 7.3.

Evaluation Criteria

The City will evaluate both local supplies and imported supplies as part of the Annual Assessment. The local supply evaluation will include evaluation of changes in groundwater availability, changes in recycled water availability, and recent demand trends to determine any deviations from normal availability. To evaluate imported water, the City will rely on MWD's evaluation of regional supplies and demands to evaluate shortage levels.

Water Supply

BWP will quantify each source of water supply on a monthly basis. The evaluated supply sources will include surface water supplies from imported water via MWD, groundwater from the San Fernando Basin, and recycled water.

Imported Water: As noted above, Burbank will rely on MWD to evaluate imported water supplies. MWD will evaluate the availability of SWP and CRA supplies in conjunction with locally availability supplies and unconstrained regional demand to develop the imported water availability. Under normal (non-shortage) conditions, the City can purchase as much water as necessary from MWD to meet demands. When that supply (imported supply) is under shortage conditions, the amount of shortage (allocation of shortage) specific to the City is determined in a process lead by MWD. In years where there is a shortage of imported water, MWD will implement its Water Shortage Allocation Plan (WSAP) and provide information to member agencies regarding allocations.

Groundwater: Burbank uses groundwater from the Court-adjudicated Upper Los Angeles River Area (ULARA), which is part of the San Fernando groundwater basin. The City will evaluate groundwater availability based on annual entitlement, accounting of import return water, groundwater storage credits, and production capacity. Burbank reports projected pumping to the ULARA Watermaster for inclusion in the Pumping and Spreading Plan developed each water year that provides the annual entitlement and planned pumping for each pumper in the basin.

Recycled Water: The City's non-potable recycled water supply is produced at the Burbank Water Reclamation Plant (BWRP). This source of supply is reliable during single and multi-year droughts because it uses wastewater as its source, and the City produces sufficient wastewater to meet recycled water demands even in drought years.

Unconstrained Customer Demand

Unconstrained demand projections will be consistent with the methodology outlined in Section 3 of the BWP 2020 UWMP. Anticipated unconstrained demand will be based on the baseline demand established for every sector in the BWP 2020 UWMP. Baseline demands will then be adjusted to account for population changes in the service area, planned developments, and land use changes.

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Current Year Available Supply

Burbank will evaluate how the anticipated supplies for the coming year will be used. Water supply projections will be informed by Section 4 and Section 5 of the 2020 UWMP.

Infrastructure Considerations

Burbank will evaluate the infrastructure capabilities and constraints that may affect the ability to deliver supplies to meet expected customer water use needs in the coming year. The Annual Assessment will also outline anticipated projects that may add capacity or constrain capabilities to meet demands.

7.3 Water Shortage Levels

Burbank adopted the Sustainable Water Use Ordinance in June 2008 and defines six stages covering the range from normal water supply to extreme shortages. Although shortage percentages are not linked to the ordinance, Stage VI bans all landscape watering with potable water. This could provide the 50% reduction required by the Act. Also, the Water Division would defer main and fire hydrant flushing and reservoir drainage for maintenance. It is likely that a water supply emergency would be declared by the time the maximum reduction was called into effect.

Table 7-1: DWR Table 8-1: Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions
I	Up to 10%	Implement Stage I of Burbank's Sustainable Water Use Ordinance
II	10% to 20%	Implement Stage II of Burbank's Sustainable Water Use Ordinance
III	20% to 30%	Implement Stage III of Burbank's Sustainable Water Use Ordinance
IV	30% to 40%	Implement Stage IV of Burbank's Sustainable Water Use Ordinance
V	40% to 50%	Implement Stage V of Burbank's Sustainable Water Use Ordinance
VI	Over 50%	Implement Stage VI of Burbank's Sustainable Water Use Ordinance

7.4 Shortage Response Actions

Burbank's Sustainable Water Use Ordinance provides a basis for achieving water demand reductions which may be required because of emergency or drought conditions. Stage I, consisting of 13 sustainable water use measures, is always in effect. The other five stages can be activated by the City Council in times of water shortage. The measures contained in the Sustainable Water Use Ordinance are shown in **Table 7-2**. It is not expected that the City will implement supply augmentation actions in response to emergency or drought conditions.

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Table 7-2: DWR Table 8-2: Demand Reduction Actions

Stage	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge or Other Enforcement
I	Landscape - Limit landscape irrigation to specific days	3%	Do not water outdoor landscaped areas more than fifteen (15) minutes per day per station and no more than three (3) days per week, year-round. Areas watered with low volume irrigation systems that require additional spray time are exempt from the 15-minute time restriction of this requirement, but must comply with the three (3) days per week watering limit. The three allowable irrigation days are Tuesdays, Thursdays and Saturdays. With the exception of attended hand- watering, irrigation will not be allowed any day outside of the requirement listed here. Attended hand-watering is allowed any day of the week. Do not water outdoor landscaped areas on rainy days and at least two days thereafter.	Yes
I	Landscape - Limit landscape irrigation to specific times	2%	Do not water outdoor landscaped areas between the hours of 9:00 a.m. to 6:00 p.m. or during daylight hours from November through March except by use of attended hand-watering, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system	Yes
I	Landscape - Restrict or prohibit runoff from landscape irrigation	1%	Adjust sprinklers and irrigation systems to eliminate overspray and avoid run-off into streets, sidewalks, parking lots, alleys or other paved surfaces	Yes
I	Other - Prohibit use of potable water for washing hard surfaces	2%	Do not hose or wash driveways, patios, sidewalks, or other hard or paved surfaces except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a high pressure, low volume spray hose using only potable water with no cleaning agents at an average water usage of 0.006 gallons per square feet of sidewalk area in accordance with Resolution No. 98-08 issued by the Los Angeles Regional Water Quality Control Board, or a low-	Yes

Stage	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge or Other Enforcement
			volume, high-pressure cleaning machine equipped to recycle any water used.	
I	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	2%	No additional explanation	Yes
I	Other	1%	When washing vehicles, use a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off device. This does not apply to any commercial car washing facility.	Yes
I	CII - Restaurants may only serve water upon request	<1%	No additional explanation	Yes
I	CII - Lodging establishment must offer opt out of linen service	<1%	No additional explanation	Yes
I	CII - Other CII restriction or prohibition	0.4%	Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.	Yes
I	Water Features - Restrict water use for decorative water features, such as fountains	1%	Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.	Yes
I	Other	<1%	Installation of single pass cooling systems is prohibited in buildings requesting new water service.	Yes
I	Other	<1%	Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.	Yes
I	Other	<1%	All commercial conveyor car wash systems and commercial laundry systems must have installed operational re-circulating water systems.	Yes
I	Landscape - Other landscape restriction or prohibition	2%	Do not irrigate ornamental turf on public street medians.	Yes

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Stage	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge or Other Enforcement
II	Landscape - Limit landscape irrigation to specific days	1%	Landscape watering limited to 15 minutes/day. Three days per week, April – October and one day per week, November - March	Yes
III	Landscape - Limit landscape irrigation to specific days	1%	Landscape watering limited to 15 minutes/day, two days per week, April – October	Yes
III	Other	<1%	Use of outdoor cooling devices (misters) prohibited	Yes
III	Landscape - Prohibit certain types of landscape irrigation	1%	Hand watering also prohibited between 9AM and 6 PM	Yes
III	Other water feature or swimming pool restriction	2%	Use of pool and spa covers required	Yes
IV	Landscape - Limit landscape irrigation to specific days	5%	Landscape watering limited to one day per week	Yes
V	Landscape - Prohibit certain types of landscape irrigation	5%	Watering limited to deep irrigation of trees and shrubs, 20 min, 2 days per month	Yes
V	Other	5%	No new or upgraded potable water services permitted, except R-1 and R-2, unless building permit already issued	Yes
VI	Landscape - Prohibit all landscape irrigation	10%	No additional explanation	Yes

7.5 Catastrophic Supply Interruption

A water shortage can result from a catastrophe like an earthquake, a major power outage, or a water supply source problem, i.e. major breakdown or a water quality disruption. Catastrophes like these occur with little or no warning but typically a partial restoration of supply can be expected within days or at most a few weeks. MWD developed a catastrophic supply interruption plan which contains the Emergency Storage Requirements (ESR).

The ESR is based on the three major aqueducts (SWP, CRA, and Los Angeles) being out of service for six months after a major earthquake. Diamond Valley Lake and other Southern California reservoirs and groundwater basins provide emergency storage. After such a disaster, MWD's emergency plan implements a mandatory 25% cutback in firm supplies to member agencies. Extraordinary conservation would be required to stay within the reduced supply in either of the above extreme cases.

Burbank has a formal disaster preparedness program. Every City employee is considered a disaster services worker. Training and drills are held regularly. When an emergency occurs, the Emergency Operations Center can be activated. This involves personnel from all City departments, and it operates according to the formal Standardized Emergency Management System (SEMS) procedures. There is a formal process for checking the water system for problems.

Burbank could manage a short-term deficiency or emergency situations by mandating voluntary water conservation and also with the following actions:

- Increasing local groundwater pumping
- Purchasing additional water from the MWD to the extent available
- Using emergency interconnections to adjacent water agencies

If Burbank experiences a major power failure, but MWD is still producing water, Burbank can receive water to Zones 1 and 2. Portable diesel pumps are available to move water to higher zones if necessary. If all the City's water supplies were interrupted, stored water in local reservoirs would last up to three days at average use. Immediate curtailment of non-essential uses, i.e. landscaping, could make supplies last much longer. Burbank's "SUSTAINABLE WATER USE ORDINANCE" provides procedures to reduce water use citywide and thereby mitigate the effect of a shortage of water resources. Through the use of incremental stages, as appropriate for prevailing conditions, the ordinance provides for increasing levels of water use restrictions and penalties in order to discourage wasteful water use practices and achieve reduced water consumption. In the case of a major local earthquake, a portion of stored water could be lost due to broken pipelines. Several of Burbank's main water reservoirs are equipped with seismic sensors that will automatically valve off a portion of the water in storage, to prevent a total loss in case of uncontrolled main breaks.

Since Burbank has one groundwater treatment plant, as well as five MWD connections, there is some flexibility in emergency operations. Burbank is situated where several reaches of the MWD distribution systems converge. Burbank can receive water from various sources within the MWD system. If a problem developed with Burbank's plants, MWD could supply additional water from the five connections. If MWD supply had to be reduced, then treated groundwater could supplement the MWD supply. Blending MWD water with Valley/BOU water is necessary to maintain production due to groundwater nitrate levels but an increased BOU/MWD blending ratio could suffice.

There are presently two emergency interconnections with the City of Glendale (one from Glendale to BWP and one from BWP to Glendale). These emergency interconnections have proven to be effective in providing a short-term supplemental supply but the capacity is very low and Glendale relies on MWD water under the same conditions as Burbank. If no emergency connection is possible, mandatory rationing could be imposed by stages which are outlined below in Section 6.7.

7.6 Seismic Risk Assessment and Mitigation Plan

Urban water suppliers are required to include within its WSCP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. An urban water supply may comply with this requirement by submitting a copy of the most recently adopted multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the multihazard mitigation plan addresses seismic risk.

Appendix F includes a copy of the *City of Burbank Hazard Mitigation Plan*. The Hazard Mitigation Plan was prepared under the federal Disaster Mitigation Act of 2000. Seismic risk is considered and addressed throughout the plan. The Plan identified seismic risks including earthquakes due to proximity to local faults. The City's hazard mitigation goals include adopting building, engineering, and fire codes and zoning ordinances that promote disaster-resistant development, and reducing possibility of damage to critical facilities or infrastructure due to earthquakes (including retrofitting reservoirs to seismic standards).

Historically, damage to Burbank's water system from the 1971 Sylmar and 1994 Northridge earthquakes was limited. However, future earthquakes might cause greater damage. The strictest emergency water use restrictions would be put in place, such as prohibiting landscape irrigation, car washing, and reducing water usage to only public health needs. Arrangements could be made to supply drinking water by truck, or depending on system conditions, at distribution points.

The City has also prepared a Risk and Resiliency Assessment as required by America's Water Infrastructure Act (AWIA) of 2018. Burbank's primary water facilities were analyzed, and recommendations were made to address risks. The following recommendations were made to address seismic risks and are included in the ten-year capital improvement program (CIP):

- **Burbank Operable Unit Wells and Plant:** Seismic retrofits for tanks (such as bracing, anchoring and tiebacks).
- **Reservoir 5:** Install flexible/seismic inlet/outlet connections as part of planned pipe replacements at reservoirs. Install uninterruptible power supply and valve operators.
- **Reservoirs 1, 4, 5:** Document/update procedures for monitoring and responding to seismic sensors, and develop and implement training related to these procedures.
- **Connections B1, B4, B5, Highway 134/Connection B3:** Update the procedures to document the assessment of pipelines and the connection after a seismic event, with a focus on above ground piping, piping at blend facilities, railroad crossings and faults. Document how operational updates that stem from these assessments will be captured and implemented.
- **Valley Pumping Plant:** Conduct a seismic Assessment of the pump house and process piping to identify and prioritize.
- **McClure Tank + Boosters:** Conduct seismic assessment for the storage tank to determine whether the tank should be secured to its footing.
- **Palm Pump Station:** Conduct a seismic assessment of the pump house to identify and prioritize structural recommendations to retrofit the building.

7.7 Communication Protocols

The shortage response actions described in this WSCP will be declared by resolution of the City Council. Before adopting any such resolution, the City Council will hold a public hearing when required by Water Code section 350 or other applicable law. In addition to the formal noticing to the public the City will do at the varying Water Shortage Levels, the City will expand its public information campaign starting in Water Shortage Level 2, which will also serve as a means of communicating Water Shortage Levels and required actions. This information campaign may include bill inserts, public service announcements, or other outreach efforts.

Burbank uses its website, https://www.burbankwaterandpower.com/water/water-drought, as one of its tools to communicate the current shortage level and associated water restrictions. The below notice is one example of how Burbank uses its website to notify customers of water use restrictions. The website also allows for reporting of water waste, respond to water waste citations, and receive information on water conservation and rebates.

Burbank's Watering Schedule is 3 Days Per Week!

Tuesday | Thursday | Saturday

Before 9 am or after 6 pm.
Up to 15 minutes per irrigation station.
Hand watering is allowed any day at any time.

7.8 Compliance and Enforcement

Enforcement of the mandatory restrictions defined in the Sustainable Water Use Ordinance is through the issuance of an administrative citation. A notification process is used to alert citizens of reported water waste so corrections can be made. At least two notifications are made to allow citizens the opportunity to correct reported water waste incidents. Continued violation of the Sustainable Water Use Ordinance after receiving notifications may result in the issuance of an Administrative Citation, per section 1-1-108.1 of Title 1 of the Burbank Municipal Code. An Administrative Citation allows for fines of $100 for the first violation, $200 for the second violation, and $500 for every violation thereafter.

7.9 Legal Authorities

Under California law, including CWC Chapters 3.3 and 3.5 of Division 1, Parts 2.55 and 2.6 of Division 6, Division 13, and Article X, Section 2 of the California Constitution, the City Council is authorized to implement the water shortage actions outlined in this WSCP. In all water shortage cases, shortage response actions to be implemented will be at the discretion of the City Council and will be based on an assessment of the supply shortage (determined by the City's annual supply and demand assessment, notification from MWD to member agencies, or other means as appropriate), customer response, and need for demand reductions.

It is noted that upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the state will defer to implementation of locally adopted water shortage contingency plans to the extent practicable. The City will coordinate with regional and local water suppliers for which it provided water supply services for possible proclamation of a local emergency as necessary.

7.10 Financial Consequences of WSCP

It is difficult to precisely gauge the revenue and expenditure impacts of implementation of the WSCP. The plan provides for prohibitions on outdoor water use and requests for indoor use reductions, enforced by penalties for violation. Ultimate impacts will be based upon a mix of responses to these requirements and overall public cooperation in saving water in additional ways. Revenue will be reduced through lower water sales. However, the City will see this compensated to some degree by lower water purchase, pumping and treatment charges.

During the most recent drought, the City experienced the following revenue impacts:

- FY 2014/15 – Approximately -12.6% consumption reduction from FY 2013/14 levels, which resulted in approximately $2.75 million in reduced revenues
- FY 2015/16 – Approximately -17.9% consumption reduction from FY 2014/15 levels, which resulted in a cumulative decrease in revenues of approximately $6.1 million from FY 2013/14 levels

No additional costs are assumed for WSCP (code) enforcement because it is assumed that enforcement will be completed using existing staff. Most water savings are likely to accrue from reduced outdoor water use.

7.11 Monitoring and Reporting

Under normal conditions, the City monitors water sales and deliveries on a monthly basis. All of the City's water connections are metered with each individual meter read monthly. The City prepares monthly sales and delivery reports which are reviewed and compared to reports and statistics from prior months and the same period of the prior year. Under shortage conditions, the City will determine water savings made from implementing the stages of the WSCP by reviewing and comparing production reports. Each customer or customer group can be evaluated for compliance with conservation requirements.

The WSCP is an adaptive management plan that can be revised and refined to ensure its shortage response actions are effective and produce desired results. Results of monitoring and reporting efforts will be used to evaluated the effectiveness of shortage actions. If certain procedure refinements or new actions are identified by City staff, or suggested by customers or other interested parties, the City Council has the authority to quickly incorporate and implement such refinements to the WSCP, as needed.

At the time the UWMP is being updated, DWR is in the process of preparing guidelines for monthly reporting of water production and other water uses to the State, along with associated enforcement metrics. If necessary, this Plan will be updated once the guidelines are finalized to include any metrics not currently monitored in this Plan. Reporting to DWR will be consistent with future regulations.

7.12 WSCP Refinement Procedures

This WSCP is an adaptive management plan that is designed to be responsive to the effectiveness of water shortage actions during a declared water shortage. As such, the WSCP is subject to adjustments and refinements as needed to ensure that actions are appropriate and effective. In the event that water shortage response actions are not producing the necessary demand reductions, Burbank will take adaptive measures necessary to achieve further demand reductions among the various customer categories. This may include adding new or modifying existing water use restrictions, creating targeted outreach programs, or implementing additional conservation incentive programs.

Plan refinements are accomplished through a legislative process that involves staff analysis, presentations to decision-makers, and consideration and approval by the BWP Board and City Council. Specifically, BWP staff briefs and proposes recommended water shortage response actions to the BWP Board which then approves the action to be brought before the City Council. Once approved, the updates are incorporated into the Plan and implemented at the appropriate water shortage level.

7.13 Special Water Feature Distinction

For the purposes of this WSCP, special water features are defined and analyzed separately from pools and spas. Non-pool and non-spas may use or be able to use recycled water, whereas pools and spas must use potable water for health and safety considerations. Special water features include, but are not limited to, ornamental fountains, lakes, and ponds. According to the City's Sustainable Water Use Ordinance, operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.

7.14 WSCP Adoption, Submittal, and Availability

The final WSCP was included in the adoption of the 2020 UWMP, which was adopted as described in Section 1.4.

However, because the WSCP is a stand-alone document, it can be amended, as needed, without amending outside of a UWMP update cycle. The processes for approving WSCP amendments and conducting required public hearings are similar to those required for UWMP adoption. The City will release a 60-day notice of a public adoption hearing for the amended WSCP. The public hearing to receive public comments on the amended WSCP will be held immediately prior to the adoption of the amended WSCP by the City Council. The amended WSCP will be made available for the public on the City's website within 30 days of the adoption date.

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8. SECTION 8: DEMAND MANAGEMENT MEASURES

8.1 Burbank's Local Water Conservation Portfolio Structure and Ordinances

Burbank moved aggressively forward in creating a sustainable water supply for the future. The City's conservation efforts in response to the recent droughts are described in Sections 6.5. Within this last decade Burbank has realized an annual average of 78 MG (240 AF) of water savings. In 2005, the gallons per capita daily usage was 184 as compared to 127 GPCD in 2015. In 2020, the gallons per capita daily usage was 138 GPCD, indicated a slight bounce-back after drought restrictions, but not returning to pre-drought levels. Burbank hopes to keep the GPCD as low as possible into the future to anticipate restrictions that could arise during future droughts. The following sections contain a description of some of the major tools Burbank used to realize its water savings.

Sustainable Water Use Ordinance

The City Council enacted the Sustainable Water Use Ordinance in 2008 which prohibits the wasteful use of potable water. The Ordinance is comprehensive, including prohibitions on landscape water overspray, prompt leak repair, and that restaurants only serve water by request. Burbank's Sustainable Water Use Ordinance provides a tiered response of water use restrictions, allowing the City a nimble mechanism by which to respond to water supply shortages. The provision of penalties for residents or businesses not acting in accordance with the requirements is built into the Ordinance. City Council enacted Stage III of the Ordinance in 2015 to limit landscape watering to two days per week in the summer and one day per week in the winter.

Retrofit Upon Resale Ordinance

This Ordinance, adopted in July 2010, requires that properties resold in Burbank must certify by both seller and buyer that water-using fixtures, including toilets, showerheads, urinals, and faucet aerators meet current California Plumbing Code standards. While initially strongly opposed by the Burbank Association of Realtors, the requirements have not proved to be problematic. In fact, staff has heard several positive remarks from both realtors and escrow agents, thanking the City for not imposing certification fees and for making the compliance process straight-forward and easy to understand. Due to the robust Burbank housing market, this program has provided an average of 10.5 MG (32 AF) of water savings annually over the past ten years.

Conservation Rate Structure

A tiered water rate, adopted in 2009 for single-family residential water users, increases the cost of potable water as usage increases. The first tier, up to 15 hundred cubic feet (HCF) per month, is generally enough for most families to use for domestic and irrigation purposes. The cost of water then increases up to 30 HCF, and then again for any usage beyond 30 HCF per month. The tiered rate for single-family residential customers sends a price signal that discretionary water use is more costly.

Seasonal water rates were also adopted for multi-family residential, commercial and industrial services to encourage conservation during warmer months of the year. In addition, these two sectors are required to certify that indoor plumbing fixtures meet high efficiency levels or they will be assessed a 25% surcharge during the first year and 50% thereafter until the requirements are met. These penalty fees will be used solely to support water conservation programs in Burbank.

Water Public Benefits Fund

In 2009, the City of Burbank adopted a policy that annually commits 2% of water sales to fund water conservation in the City. This policy is modeled after the Public Goods Charge mandated by the State of California on electric utilities to fund energy efficiency, renewable energy, and research and development. The 2% funding commitment provides a foundation that allows water efficiency programs to have a broader scope as well as a longer time horizon.

Community Demonstration Garden Grants

Five Community Demonstration Garden grants of up to $15,000 each have been awarded to non-profit organizations and schools to demonstrate water efficient landscaping. The host organizations are the Burbank Family YMCA, Burbank Adult School, Burbank Temple Emanu El, the Burbank Housing Corporation, and Providence St. Joseph's Medical Center. Demonstration gardens are supported with interpretive signage and online interactive software to provide detailed information about each garden and practical landscape advice.

8.2 Burbank's Customer Water Conservation Programs

Home Improvement Program

There are a wide variety of water efficiency rebates, programs and services available to Burbank residents and businesses. Many of these programs are very similar to programs offered by other municipal utilities. However, Burbank has an additional service, the Burbank Home Improvement Program, which offers installed water and electric conservation services and upgrades at no cost to residents. This program far exceeds what other agencies offer, especially regarding water use both inside of the home and outdoors. The free water upgrades and services of the Burbank Home Improvement Program include:

- Sprinkler controller programming to meet Burbank's Sustainable Water Use Ordinance
- Sprinkler head adjustments to prevent overspray
- Toilet leak test and repair
- Installation of low flow showerheads and faucet aerators

The program services about 1,000 homes per year, delivering an estimated water savings of over 20 MG (61 AF). These water savings estimates were based on factors contained the in American Water Works Association Research Foundation (AWWARF) Residential End Uses of Water study. This award-winning program is exceptional and we hope that it will serve as a model for others to adopt.

However, due to COVID-19, the Home Improvement Program was placed on temporary hold halfway through 2020.

Turf Removal Program

Through Metropolitan Water District's SoCalWaterSmart program, BWP offers a $2 per square foot rebate to residential customers who remove high water-consuming lawns and replace them with relatively low water demand California Friendly landscapes or synthetic turf. Though participation has fluctuated over the past five years, the program averages fifteen projects per year, yielding an average annual water savings of 0.87 MG (2.7 AF). Specifically, BWP relies on MWD's estimate of 43.8 gallons per square foot (gpsf) converted annually.

Home Water Reports Program

In April 2015, at the peak of the four-year statewide drought, BWP began providing Home Water Reports to 15,000 residential single family water customers. The Home Water Reports contain information on bi-monthly water use, a comparison with similarly sized homes, and program promotional information and tips to reduce water use and monthly bills. A group of 3,600 single family customers that do not receive the reports made up the control group against which BWP measured the success of the program.

The program demonstrated success in realizing water savings for customers and greater conservation for BWP. BWP is continuing to provide Home Water Reports to a randomly selected group of 15,000 households.

The program also provides online access to the reports for customers, which includes hourly, daily and weekly water use so that customers can work to reduce their usage before receiving their next bill. In addition, the online component contains a water conservation tip library and a leak detection module so that customers will know within one to two days when a leak is occurring and can take immediate steps to fix it. Customers can also compare their water usage to similar households with similar occupancy. Through this service, BWP estimates a five percent reduction in water usage, or more than 120 MG annually, based on similar initiatives implemented by the East Bay Municipal Utility District in Oakland and the Irvine Ranch Water District.

Water Leak Detection Program

Through a review of hourly consumption data, similar to the Home Water Reports program, provided by advanced meters, staff reports to customers about possible water leaks. As customers repair these leaks, water savings are tracked. BWP saves customers about 2.9 MG (9 AF) per year through these efforts.

Free Water-Saving Fixture Program

For the past 20 years, BWP has been providing free water-saving devices to Burbank residents and businesses including faucet aerators and low-flow showerheads. At least 25,000 low-flow showerheads and 50,000 water efficient faucet aerators have been distributed since 1989.

Residential Rebate Programs

Through the SoCalWatersmart program, rebates are available to residential customers purchasing premium high efficiency toilets and high efficiency clothes washers. Approximately 300 rebates are issued annually to Burbank residents.

LivingWise Program

For years, BWP has partnered with the Burbank Unified School District (BUSD) to provide sixth grade students in Burbank a LivingWise home retrofit kit. These kits contain water and energy saving devices that teach students the importance of water and energy conservation through a series of in-home and classroom activities. The students and their parents install these devices in their home and are rewarded with immediate and lasting savings. More than 1,100 students participate annually, typically achieving savings of over 6 MG per year, in addition to 60,000 kilowatt-hours per year, though participation decreased in 2020 due to COVID-19 restrictions.

Public Information Programs

BWP provides extensive water conservation and efficiency information through workshops and BWP's native plant landscaping classes. Information is also distributed through advertising, public service announcements, newsletters, and community events, as described in further detail below.

8.3 Other Burbank Conservation Efforts

BWP prides itself on the use of many communications outlets to help spread the sustainability issues forward. In response to changing and challenging environmental issues, the BWP staff has significantly ramped up customer programs and customer communications over the past decade. BWP staff makes use of a variety of media, both active and passive, to engage and inform individuals and organizations about programs and services available to them. BWP hopes that these communication efforts will involve the community to preserve resources with heightened attention on sustainability. Current communication vehicles used by BWP staff are described below:

Print Channels

- *Newsletter, "Currents"* — A twelve-page quarterly newsletter mailed to all Burbank addresses covering a wide range of topics.
- *Direct Mail* — Letters are sent to customers related to specific issues and build awareness about programs and services.
- *Utility Bill Onserts* — BWP places timely and relevant information on customer bills.

Digital Channels

- *BWP Website* — BWP's website has about 45,000 visitors each month, highlighting BWP programs and issues important to the industry and community.
- *Digital Currents electronic newsletter* — A digital newsletter that is emailed monthly to approximately 27,000 Burbank residents.
- *Emails* — BWP sends targeted emails to customers to promote conservation and efficiency programs and services.
- *Social Media* — BWP has *Twitter, Facebook, Instagram, and LinkedIn* social media accounts with over 3,500 cumulative followers and growing.
- *IVR/SMS* — BWP sends messages to customers via IVR and SMS messaging.
    1) *Weekly Energy Updates* — BWP partnered with Opower to send residential customers a weekly email with their electricity usage information to help them save energy and lower their bills.
    2) *High Bill Alerts* — BWP, along with Opower, sends residential customers an alert via email, IVR, or SMS when they are on track to receive a higher bill due to higher than typical usage. The alert notifies the customer early enough so that they can adjust their use and avoid a higher bill.
    3) *IVR On-hold Messaging* — Customers receive BWP messages while on hold for a Customer Service Representative.

Portals

- *WaterSmart Portal* (BWP.watersmart.com) — An online portal for customers to review their water usage and get personalized tips on how to conserve water and save on their bill.

- *Burbank WaterWise Gardening Website* (Burbank.watersavingplants.com) — An informational website that helps customers find California-native and drought-resistant plants, take virtual garden tours, and find resources to help them reduce water used for outdoor landscaping.
- *BWP Online Account Manager* (my.BurbankWaterAndPower.com/portal/)— This online portal allows customers to manage their BWP account, including the ability to view and pay their bill, set up payment arrangements, and add guest users.
- *Home Energy Usage Portal (BWP.opower.com)* — An online portal for customers to review their electricity usage and get personalized tips to reduce their usage and lower their bill.
- *Online EV Buyers Guide* (EV.BurbankWaterAndPower.com) — A website that helps customers get personalized recommendations on electric vehicles, charging stations, and EV vehicle purchase incentives and rebates.

Events and Partnerships

- *Event Sponsorship* — BWP supports several community organizations and events, receiving advertising as part of the sponsorship.
- *City Events with BWP staff present* — BWP has an ongoing presence at City events to disseminate information and respond to customer questions.
- *Workshops* — free workshops on California friendly landscaping are offered to Burbank residents.
- *BWP Guest Speakers* — Presentations to organizations as requested.
- *Student Outreach* — BWP has student sustainability programs in place that are run on an annual basis and also participates in ad hoc programs.

Details of the programs and how to take advantage of them are available at www.BurbankWaterAndPower.com.

8.4 California Water Efficiency Partnership

Compliance with California Urban Water Conservation Council (CUWCC) Best Management Practices (BMPs) used to be required to receive financial assistance from the State of California for water projects (grants and loans). However, CUWCC was replaced in 2018 by the California Water Efficiency Partnership (CalWEP), an organization launched to address increasing pressures utilities face more effectively from a change climate and new State regulations. CalWEP provides resources and tools for utilities to use to face these new challenges in innovative ways through collaboration. BWP has been a member of CalWEP since January 21, 2021.

9. SECTION 9: WATER AUDIT/WATER LOSS CONTROL

Beginning in 2015 with the passage of Senate Bill (SB) 555, agencies are required to calculate losses using the American Water Works Association (AWWA) Method. As required for this UWMP, BWP used the AWWA Water Audit Software (version 5) to complete a water loss audit and calculate water losses. The most recent reporting year included in this section is 2019.

Total water loss was calculated by subtracting water sold (metered) from the total water supplied to the system from all sources (imported and locally produced). There are two broad types of losses which occur in drinking water utilities, apparent losses and real losses.

Apparent Losses

Apparent losses are the non-physical losses that occur in utility operations due to customer meter inaccuracies, systematic data handling errors in customer billing systems, and unauthorized consumption. This is water that is consumed but is not properly measured, accounted, or paid for. These losses cost utilities revenue and distort data on customer consumption patterns.

BWP controls these apparent losses by providing regular meter maintenance, testing, and replacement. Our proactive meter replacement program is on a 20-year cycle, meaning every meter in the system will be replaced after 20 years in service. BWP will continue to refine and enhance our maintenance and replacement programs to minimize meter inaccuracy as much as possible. Additionally, BWP does not allow the installation of unmetered services and provides rental hydrant meters for temporary usage of water.

BWP has also deployed advanced Automatic Meter Reading (AMR) and Automated Metering Infrastructure (AMI) systems. These systems improve efficiency by capturing customer consumption data, identifying wasteful usage and leakage, and include other enhancements to improve revenue capture and manage water losses.

A small component of apparent water losses is Unauthorized Water Consumption, which includes:

- Water illegally withdrawn from fire hydrants
- Illegal connections
- Bypasses to customer consumption meters
- Tampering with metering or meter reading equipment

Unauthorized consumption results in unrealized revenue and creates an error that understates customer consumption. In most water utilities this volume is low. BWP used the default value included in the AWWA Audit software of 0.25% of the volume of water supplied.

Water loss due to meter inaccuracy was calculated as recommended by AWWA Manual #36 using the weighted average meter accuracy method. Random meter testing was done to a sample of meters based on the percentage of each size class of meters in the overall system. Results are shown in **Table 9-1** below:

Table 9-1: 2019 Water Meter Evaluation

Meter Size	Number of Meters in the System	Meters Tested	Average Accuracy	Volume of Water Sold (AF)	Apparent Losses from Meter's Accuracy (AF)
5/8" x 3/4"	15,887	50	0.9927	7,259	52.99
¾"	2,955	6	0.9943	867	4.94
1"	6,154	19	0.9930	2,707	18.95
1.5"	1,274	9	0.9941	1,499	8.84
2"	1,239	12	0.9953	1,803	8.47
3"	53	10	0.9973	205	0.55
4"	55	5	0.9989	183	0.20
6"	29	1	1.000	203	0.00
				14,726	94.94

For data handling and systematic error, BWP used the AWWA Audit software default value of 0.25% of the total water supplied to the system.

Real Losses

Real losses are the physical losses of water from the distribution system, including leakage and storage, and tank overflows. These losses inflate the water utility's production costs and stress water resources since they represent water that is extracted and treated, yet never reaches beneficial use. Real losses are calculated by subtracting apparent losses from total system loss. As the worksheet in Appendix G shows, BWP's real losses in 2019 were approximately 655 AF or 4.4% of the water supplied to the system. BWP minimizes real losses by regularly and methodically replacing vulnerable water mains, which are identified and prioritized on BWP's 5-year CIP. Additionally, BWP has a proactive water leak detection program. When leaks are found and located, repairs are done in a timely manner. BWP budgets to purchase 2.5% more potable water than expected sales to allow for non-revenue water.

Water Loss Audit Reporting

Sources of water loss include both real loss and apparent losses. **Table 9-2** provides a water loss summary for the most recent years available. Estimated water losses between 2016 and 2020 were approximately 3.8 percent of water supplied, which is within the industry standard for system loss. Appendix G contains the Final 2019 AWWA Water Audit Form. A water audit data validity score of 74 out of 100 was determined for 2019.

Table 9-2: DWR Table 4-4: 12 Month Water Loss Audit Reporting

Reporting Period Start Date	Volume of Water Loss (AFY)
1/1/2016	489.9
1/1/2017	637.5
1/1/2018	564.0
1/1/2019	825.6

SB 555 also directed the State Water Resources Control Board (SWRCB) to develop performance standards for volumetric water loss by July 2020. The current proposed standard is to quantify water loss in units of real losses and apparent losses per service connection per day (gallons per connection per day). Although final performance standards have not been released at the time of writing, the draft standards, released in April 2020, have a real water loss standard of 13.4 gallons per connection per day for Burbank. The real losses and apparent losses from the most recent water loss audits are shown in **Table 9-3**. The 2020 water audit was not available at the time of writing.

Table 9-3: Audited Water Loss Reporting

Sector	2016	2017	2018	2019
Real Losses (gallons/connection/day)	11.75	14.57	13.99	21.15
Apparent (gallons/connection/day)	4.66	6.77	4.90	5.51

10. REFERENCES

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APPENDIX A: COMPLETED URBAN WATER MANAGEMENT PLAN CHECKLIST

Appendix A: UWMP Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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	Sections 4.1 - 4.6 (pg. XX - XX)
x	x	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.	Summary	Executive Summary, Sections 1.1 - 1.5
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has	Plan Preparation	Section 1.2, 1.4
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 1.3
x	x	Section 2.6.2	10642	Provide supporting documentation that the water 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	Section 7.7, 7.14, Appendix C
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Appendix C
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	NA
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 2.1 - 2.3, 2.5
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 2.4
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 2.2
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 2.1 - 2.2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 2.2
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 2.3

x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 3.1, 3.3
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 9
x	x	Section 4.2.6	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	Section 8.1 - 8.3
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 3.3
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update	System Water Use	Section 9
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier	System Water Use	Section 3.3
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment	System Water Use	Section 2.4 Section 6.7
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 3.2
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 3.2
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	NA
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	NA
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 3.2
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 3.2
x	x	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.	System Supplies	Sections 6.4 and 6.6
x	x	Sections 6.1	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	Section 6

x	x	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	Section 4.1 - 4.6
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 4.7 - 4.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045	System Supplies	Section 4.8
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier	System Supplies	Sectioni 4.2, 4.8
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 4.2.3
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 4.2
x	x	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	Section 4.2, Appendix E
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	NA
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 4.2
x	x	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	Section 4.8
x	x	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	Section 4.5
x	x	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)	Section 5.1
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 5.2
x	x	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)	Section 5.2 Section 5.3
x	x	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 a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 4.8

x	x	Section 6.2.5	10633(f)	Describe the actions which 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)	Section 4.7, 5.3
x	x	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)	Section 5.3
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 4.6
x	x	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)	Section 5.1
x	x	Section 6.2.8, Section 6.3.7	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 5 consecutive water years.	System Supplies	Section 4.7 - 4.8, 7.1
x	x	Section 6.4 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	Section 4.9
x	x	Section 7.2	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	Water Supply Reliability Assessment	Section 4.2, 4.4, 4.10, 5.5, 6.1 - 6.2
x	x	Section 7.2.4	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	Section 7.1-7.2, Appendix D
x	x	Section 7.3	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 water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 6.1 - 6.4
x	x	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	Section 6.6
x	x	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 5 consecutive years.	Water Supply Reliability Assessment	Section 6.6, Section 7.1 - 7.2
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage	Water Supply Reliability Assessment	Section 6.1 - 6.4
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the	Water Supply Reliability Assessment	Section 6.6

x	x	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	Sections 6.5 - 6.7
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 7
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Section 7.1
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 7.2, 7.11 - 7.12
x	x	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	Section 7.2.1, 7.3 - 7.5, 7.7 - 7.8
x	x	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	Water Shortage Contingency Planning	Section 7.2
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent 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	Section 7.3 - 7.5
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	NA
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply	Water Shortage Contingency Planning	Section 7
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.1 - 8.3
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	
x	x	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	Water Shortage Contingency Planning	Section 8.1 - 8.3
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by	Water Shortage Contingency Planning	Section 7.4
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Section 7.6

x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current	Water Shortage Contingency Planning	Section 7.7
x	x	Section 8.5 and 8.6	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	Section 7.7
x		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	Section 7.8
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 7.9
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code	Water Shortage Contingency Planning	Section 7.3 - 7.4
x	x	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	Section 7.3 - 7.4
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated	Water Shortage Contingency Planning	Section 7.10
x	x	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	Section 7.10
x		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	Section 7.10
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 7.11
x		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	Section 7.13
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix C
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after	Water Shortage Contingency Planning	Section 7.14, Appendix C
	x	Sections 9.1 and 9.3	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	NA

x		Sections 9.2 and 9.3	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	Section 8.1 - 8.4
x		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	Section 1.3, Appendix C
x	x	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 urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Appendix C
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021	Plan Adoption, Submittal, and Implementation	Appendix C
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Appendix C
x	x	Section 10.2.2	10642	The water 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	Appendix C
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified	Plan Adoption, Submittal, and Implementation	Section 1.4, 7.14, Appendix C
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library	Plan Adoption, Submittal, and Implementation	Appendix C
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after	Plan Adoption, Submittal, and Implementation	Section 1.3, Appendix C
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically	Plan Adoption, Submittal, and Implementation	Section 1.3 - 1.4, Appendix C
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 1.3 - 1.4, Appendix C
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 7.14, Appendix C
x	x	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	Not applicable
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption	Plan Adoption, Submittal, and Implementation	Section 7.14

APPENDIX B: REQUIRED DATA TABLES IN DWR FORMAT

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
CA1910179	Burbank - City, Water Dept.		19,463
	TOTAL	0	19,463
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

Submittal Table 2-2: Plan Identification

Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

NOTES:

Submittal Table 2-3: Supplier Identification

Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
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)	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.

Wholesale Water Supplier Name
Add additional rows as needed
Metropolitan Water District of Southern California

NOTES:

Submittal Table 3-1 Retail: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	105,861	117,605	131,129	141,051	142,980	145,002

NOTES:
Growth projections are based on SCAG 2020 Regional Transportation Plan, SANDAG Series 14 Forecast (Version 17), and the Housing and Safety Element of the Burbank General Plan

If you choose to fill these optional tables, please paste all information in the submittal table to the left for submission into the electronic WUE Data Portal.

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual

Use Type	2020 Actual		
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	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family		Drinking Water	7,940
Multi-Family		Drinking Water	4,275
Other Potable	Housing Element Goal	Drinking Water	0
Commercial		Drinking Water	2,738
Institutional/Governmental	City Departments	Drinking Water	155
Other Potable	Fire Protection	Drinking Water	11
Losses		Drinking Water	614
Groundwater recharge	Replenishment with imported water	Raw Water	152
		TOTAL	15,885

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

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

NOTES:

OPTIONAL Table 4-1 Retail: Demands for Potable Water - Actual

Use Type	2020 Actual		
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	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume*
Add additional rows as needed			
		TOTAL	0

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

NOTES:

OPTIONAL Table 4-1 Retail: Demands for Non-Potable [1] Water - Actual

Use Type	2020 Actual		
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	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
		TOTAL	0

1 Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.

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

NOTES:

ATTACHMENT 1

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use[2] *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		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		8,166	8,245	8,238	8,292	8,300
Multi-Family		4,511	4,710	4,945	5,136	5,366
Other Potable	Housing Element	1,160	2,538	3,480	3,480	3,480
Commercial		3,314	3,473	3,638	3,702	3,745
Institutional/Governmental	City Departments	205	230	249	254	259
Other Potable	Fire Protection	11	12	13	13	13
Losses		695	768	823	835	847
Groundwater recharge	Replenishment with imported water	6,800	6,800	6,800	6,800	6,800
	TOTAL	24,862	26,776	28,186	28,512	28,810

[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4. *[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

OPTIONAL Table 4-2 Retail: Use for Potable Water - Projected

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		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
	TOTAL	0	0	0	0	0

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

NOTES:

OPTIONAL Table 4-2 Retail: Use for Non-Potable[1] Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use[2] 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		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
	TOTAL	0	0	0	0	0

[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.
[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES:

If you choose to fill these optional tables, please paste information in the submittal table to the left.

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	15,885	24,862	26,776	28,186	28,512	28,810
Recycled Water Demand[1] *From Table 6-4*	3,149	3,543	3,543	3,543	3,543	3,543
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	19,034	28,405	30,319	31,729	32,055	32,353

[1] Recycled water demand fields will be blank until Table 6-4 is complete *[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES:

OPTIONAL Table 4-3 Retail: Total Water Use (Potable)

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water *From Tables 4-1R and 4-2 R*	0	0	0	0	0	0
TOTAL WATER USE	0	0	0	0	0	0

NOTES:

OPTIONAL Table 4-3 Retail: Total Water Use (Non-Potable)

	2020	2025	2030	2035	2040	2045 (opt)
Recycled Water Demand[1] *From Table 6-4*	3,149	3,543	3,543	3,543	3,543	3,543
Raw and Other Non-potable *From Tables 4-1R and 4-2 R*	0	24,862	26,776	28,186	28,512	28,810
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	3,149	28,405	30,319	31,729	32,055	32,353

[1] Recycled water demand fields will be blank until Table 6-4 is complete *[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES:

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
01/2016	489.9
01/2017	637.5
01/2018	564
01/2019	825.6

[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. *[2]* ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
2019 is the most recent year of water loss audit reporting.

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *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.	Section 8.1: Burbank's Local Water Conservation
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

NOTES:

Submittal Table 5-1 Baselines and Targets Summary
From SB X7-7 Verification Form

Retail Supplier or Regional Alliance Only

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*1997*	*2006*	*197*	*157*
5 Year	*2003*	*2007*	*196*	

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:
*All values are in Gallons per Capita per Day (GPCD)

Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form *Retail Supplier or Regional Alliance Only*				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
0	*0*	*138*	*138*	*Y*

***All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:
*All values are in Gallons per Capita per Day (GPCD)

Submittal Table 6-1 Retail: Groundwater Volume Pumped

☐ Supplier does not pump groundwater.
The supplier will not complete the table below.

☐ All or part of the groundwater described below is desalinated.

Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	San Fernando Basin	9,612	9,521	10,147	10,145	9,997
	TOTAL	9,612	9,521	10,147	10,145	9,997

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

NOTES:

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 6-1 Retail: Groundwater Volume Pumped - Potable

☐ Supplier does not pump groundwater.
The supplier will not complete the table below.

☐ All or part of the groundwater described below is desalinated.

Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
	TOTAL	0	0	0	0	0

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

NOTES:

OPTIONAL Table 6-1 Retail: Groundwater Volume Pumped - Non-Potable

☐ Supplier does not pump groundwater.
The supplier will not complete the table below.

☐ All or part of the groundwater described below is desalinated.

Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
	TOTAL	0	0	0	0	0

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

NOTES:

ATTACHMENT 1

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100	Percentage of 2020 service area covered by wastewater collection system *(optional)*					
100	Percentage of 2020 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
City of Burbank	Metered	7,138	City of Burbank Department of Public Works	Burbank Water Reclamation Plant	Yes	No
Total Wastewater Collected from Service Area in 2020:		7,138				
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3* **.**						
NOTES:						

ATTACHMENT 1

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

☐ **No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	**2020 volumes** [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Burbank Water Reclamation	Burbank Western	Discharge adjacent to	DES No. CA0055	River or creek outfall	Yes	Tertiary	6,940	3,790	3,105	45	N/A
						Total	6,940	3,790	3,105	45	0

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

[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐ Recycled water is not used and is not planned for use within the service area of the supplier.
The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water: Burbank Water & Power

Name of Supplier Operating the Recycled Water Distribution System: Burbank Water & Power

Supplemental Water Added in 2020 (volume) *Include units*

Source of 2020 Supplemental Water

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Agricultural irrigation										
Landscape irrigation (exc golf courses)		1,219	Landscape irrigation	Tertiary	1,198	1,200	1,200	1,200	1,200	1,200
Golf course irrigation		230	Golf course irrigation	Tertiary	227	230	230	230	230	230
Commercial use		659	Mixed cooling towers and landscaping	Tertiary	648	650	650	650	650	650
Industrial use										
Geothermal and other energy production	Power Plant use	1,200	Magnolia Power Plant, Olive Power	Tertiary	1,029	1,200	1,200	1,200	1,200	1,200
Seawater intrusion barrier										
Recreational impoundment										
Wetlands or wildlife habitat										
Groundwater recharge (IPR)										
Reservoir water augmentation (IPR)										
Direct potable reuse										
Other (Description Required)	LADWP	260	Deliveries to LADWP	Tertiary	44	260	260	260	260	260
	Water Truck Fill Station	0	Water Truck Fill Station	Tertiary	3	3	3	3	3	3
				Total:	3,149	3,543	3,543	3,543	3,543	3,543
				2020 Internal Reuse						

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

NOTES:
Row 21 entry is added as an additional "Other" category in this table. The DWR template would not allow Column A or B to be edited to denote this. Description is included in Column C.

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

☐ Recycled water was not used in 2015 nor projected for use in 2020.
The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.

Beneficial Use Type	2015 Projection for 2020 [1]	2020 Actual Use[1]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)	1,007	1,198
Golf course irrigation	230	227
Commercial use	470	648
Industrial use	20	0
Geothermal and other energy production	1,300	1,029
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)	300	44
	0	3
Total	3,327	3,149

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

NOTE:
Row 18 entry is added as an additional "Other" category in this table. The DWR template would not allow Column A or B to be edited to denote this. This category refers to a Water Truck Fill Station beneficial use.

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	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 5.3, page 33	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
Recycled Water Optimization Report	This report will provide guidance for future expansion and operations.	TBD	N/A
Potable Reuse	Direct/Indirect potable reuse not economically feasible at present. Assuming economic, political, and environmental feasibility, could potentially reuse all BWRP effluent.	TBD	5,000
Recycled Water Exchange with City of LA	Recycled water produced at BWRP exchanged for groundwater credits in-kind.	ongoing	260
Current Recycled Water Policy Enforcement	Whenever feasible, BWP will extend distribution to potential users. Potential new usage is continually identified.	ongoing	200
		Total	5,460
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: The expected increase in recycled water use from the Recycled Water Optimization Report is yet to be determined. The remaining actions include the maximum expected increases in recycled water use as a result of each action.			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.
☐	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.
	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
Expanded water recycling	No		Discussed in Section 5	Discussed in Section 5	All Year Types	Up to 200 AFY
North Hollywood Operable Unit (NHOU) wells treated at BOU	No		Lockheed-Martin is leading the effort to pipe nearby NHOU off-line wells to the BOU to receive VOC removal treatment)	TBD	All Year Types	TBD
Indirect potable reuse (IPR) / direct potable reuse (DPR) feasibility study	No		As State Regulators wrestle with approval, Burbank's future water supply may be sustained by IPR/DPR technologies	TBD	All Year Types	Up to 5,000 AFY

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

NOTES:
Expanded water recycling supplies are included in the recycled water projections discussed in Section 5.

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 6-7 Retail: Expected Future Water Supply Projects or Programs - *Potable*

☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.
☐	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.
	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						

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

NOTES:

OPTIONAL Table 6-7 Retail: Expected Future Water Supply Projects or Programs - *Non-potable*

☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.
☐	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.
	Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						

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

NOTES:

ATTACHMENT 1

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2020		
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		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	MWD Treated Potable	6,165	Drinking Water	
Groundwater (not desalinated)	Supplier Produced, Treated for blending with MWD treated potable	9,997	Drinking Water	
Purchased or Imported Water	MWD untreated for groundwater replenishment	152	Other Non-Potable Water	
Recycled Water	Supplier-produced for non-potable use	3,149	Recycled Water	
	Total	19,463		0

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

NOTES:

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 6-8 Retail: Water Supplies — Actual *Potable*

Water Supply	Additional Detail on Water Supply	2020		
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		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
	Total	0		0

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

NOTES:

OPTIONAL Table 6-8 Retail: Water Supplies — Actual *Non-Potable*

Water Supply	Additional Detail on Water Supply	2020		
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		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
	Total	0		0

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

NOTES:

ATTACHMENT 1

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply * Report To the Extent Practicable									
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		**2025**		**2030**		**2035**		**2040**		**2045**(opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	MWD Treated Potable	7,407		9,318		10,714		11,012		11,310	
Groundwater (not desalinated)	Supplier Produced, Treated for blending with MWD treated potable	10,655		10,658		10,672		10,700		10,700	
Purchased or Imported Water	MWD untreated for groundwater replenishment	6,800		6,800		6,800		6,800		6,800	
Recycled Water	Supplier-produced for non-potable use	3,540		3,540		3,540		3,540		3,540	
	Total	28,402	0	30,316	0	31,726	0	32,052	0	32,350	0

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

NOTES

Recycled water includes proposed deliveries to LA in exchange for groundwater credits. The amounts estimated for untreated replenishment depend on these LA exchange amounts. If less recycled water is exchanged for groundwater credits, the difference must be made up by increased replenishment purchases.

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 6-9 Retail: Water Supplies — Projected *Potable*

Water Supply	Additional Detail on Water Supply	Projected Water Supply * Report To the Extent Practicable									
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		**2025**		**2030**		**2035**		**2040**		**2045**(opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
	Total	0	0	0	0	0	0	0	0	0	0

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

NOTES:

OPTIONAL Table 6-9 Retail: Water Supplies — Projected *Non-Potable*

Water Supply	Additional Detail on Water Supply	Projected Water Supply* Report To the Extent Practicable									
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		**2025**		**2030**		**2035**		**2040**		**2045**(opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
	Total	0	0	0	0	0	0	0	0	0	0

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

NOTES:

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 2019-2020, use 2020	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	Avg. 1922 - 2004	32,350	100%
Single-Dry Year	1977	32262	100%
Consecutive Dry Years 1st Year	1988	32746	101%
Consecutive Dry Years 2nd Year	1989	32746	101%
Consecutive Dry Years 3rd Year	1990	32746	101%
Consecutive Dry Years 4th Year	1991	32746	101%
Consecutive Dry Years 5th Year	1992	32746	101%

Supplier may use multiple versions of Table 7-1 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 Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

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

NOTES:
Volumes included in this table are those projected for potable and non-potable for each year type in 2045.

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment) - Potable

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 2019-2020, use 2020	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

Supplier may use multiple versions of Table 7-1 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 Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

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

NOTES:

OPTIONAL Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment) - Non-Potable

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 2019-2020, use 2020	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

Supplier may use multiple versions of Table 7-1 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 Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

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

NOTES:

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	28,402	30,316	31,726	32,052	32,350
Demand totals *(autofill from Table 4-3)*	28,405	30,319	31,729	32,055	32,353
Difference	(3)	(3)	(3)	(3)	(3)
NOTES:					

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 7-2 Retail: Normal Year Supply and Demand Comparison - Potable

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	0	0	0	0	0
Demand totals *(autofill from Table 4-3)*	0	0	0	0	0
Difference	0	0	0	0	0
NOTES:					

OPTIONAL Table 7-2 Retail: Normal Year Supply and Demand Comparison - NonPotable

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	0	0	0	0	0
Demand totals *(autofill from Table 4-3)*	28,405	30,319	31,729	32,055	32,353
Difference	(28,405)	(30,319)	(31,729)	(32,055)	(32,353)
NOTES:					

ATTACHMENT 1

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 (Opt)
Supply totals*					
Demand totals*					
Difference	0	0	0	0	0

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

NOTES:

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 7-3 Retail: Single Dry Year Supply and Demand Comparison - Potable

	2025	2030	2035	2040	2045 (Opt)
Supply totals*	17,989	19,896	21,300	21,625	21,922
Demand totals*	17,989	19,896	21,300	21,625	21,922
Difference	0	0	0	0	0

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

NOTES:

OPTIONAL Table 7-3 Retail: Single Dry Year Supply and Demand Comparison - Non-Potable

	2025	2030	2035	2040	2045 (Opt)
Supply totals*	10,340	10,340	10,340	10,340	10,340
Demand totals*	10,340	10,340	10,340	10,340	10,340
Difference	0	0	0	0	0

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

NOTES:

ATTACHMENT 1

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Second year	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Third year	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fourth year	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

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

NOTES:

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison - Potable						
		2020*	2025*	2030*	2035*	2040* (Opt)
First year	Supply totals	18,214	20,319	21,693	22,111	22,406
	Demand totals	18,214	20,319	21,693	22,111	22,406
	Difference	0	0	0	0	0
Second year	Supply totals	18,600	20,606	21,693	22,172	22,406
	Demand totals	18,600	20,606	21,693	22,172	22,406
	Difference	0	0	0	0	0
Third year	Supply totals	18,986	20,893	21,693	22,232	22,406
	Demand totals	18,986	20,893	21,693	22,232	22,406
	Difference	0	0	0	0	0
Fourth year	Supply totals	19,373	21,180	21,891	22,293	22,406
	Demand totals	19,373	21,180	21,891	22,293	22,406
	Difference	0	0	0	0	0
Fifth year	Supply totals	19,759	21,466	21,958	22,354	22,406
	Demand totals	19,759	21,466	21,958	22,354	22,406
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

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

NOTES:

OPTIONAL Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison - Non-Potable						
		2020*	2025*	2030*	2035*	2040* (Opt)
First year	Supply totals	10,340	10,340	10,340	10,340	10,340
	Demand totals	10,340	10,340	10,340	10,340	10,340
	Difference	0	0	0	0	0
Second year	Supply totals	10,340	10,340	10,340	10,340	10,340
	Demand totals	10,340	10,340	10,340	10,340	10,340
	Difference	0	0	0	0	0
Third year	Supply totals	10,340	10,340	10,340	10,340	10,340
	Demand totals	10,340	10,340	10,340	10,340	10,340
	Difference	0	0	0	0	0
Fourth year	Supply totals	10,340	10,340	10,340	10,340	10,340
	Demand totals	10,340	10,340	10,340	10,340	10,340
	Difference	0	0	0	0	0
Fifth year	Supply totals	10,340	10,340	10,340	10,340	10,340
	Demand totals	10,340	10,340	10,340	10,340	10,340
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

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

NOTES:

ATTACHMENT 1

Note: Totals can be entered directly or from the Optional Planning Tool available in a different Excel Workbook, available at wuedata.water.ca.gov under Resources in the UWMP section.

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

2021	Total
Total Water Use	
Total Supplies	
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	#DIV/0!

2022	Total
Total Water Use	
Total Supplies	
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	#DIV/0!

2023	Total
Total Water Use	
Total Supplies	
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	#DIV/0!

2024	Total
Total Water Use	
Total Supplies	
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	#DIV/0!

2025	Total
Total Water Use	
Total Supplies	
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	#DIV/0!

If you choose to fill these optional tables, please paste the combined information in the submittal table to the left.

OPTIONAL Table 7-5 Five-year Drought Risk Assessment Tables to address Water Code Section 10635(b) - Potable

2021	Total
Total Water Use - *Potable*	10,967
Total Supplies - *Potable*	10,967
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use [Use Worksheet]	12,777
Total Supplies [Supply Worksheet]	12,777
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use [Use Worksheet]	14,587
Total Supplies [Supply Worksheet]	14,587
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2024	Total
Total Water Use [Use Worksheet]	16,396
Total Supplies [Supply Worksheet]	16,396
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	0%

2025	Total
Total Water Use [Use Worksheet]	18,206
Total Supplies [Supply Worksheet]	18,206
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

OPTIONAL Table 7-5 Five-year Drought Risk Assessment Tables to address Water Code Section 10635(b) - Non-Potable

2021	Total
Total Water Use - Non-potable	3,281
Total Supplies	3,281
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use [Use Worksheet]	3,374
Total Supplies [Supply Worksheet]	3,374
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use [Use Worksheet]	9,966
Total Supplies [Supply Worksheet]	9,966
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2024	Total
Total Water Use [Use Worksheet]	9,971
Total Supplies [Supply Worksheet]	9,971
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2025	Total
Total Water Use [Use Worksheet]	9,991
Total Supplies [Supply Worksheet]	9,991
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions *(Narrative description)*
1	Up to 10%	Implement Stage I of Burbank's Sustainable Water Use Ordinance
2	Up to 20%	Implement Stage II of Burbank's Sustainable Water Use Ordinance
3	Up to 30%	Implement Stage III of Burbank's Sustainable Water Use Ordinance
4	Up to 40%	Implement Stage IV of Burbank's Sustainable Water Use Ordinance
5	Up to 50%	Implement Stage V of Burbank's Sustainable Water Use Ordinance
6	>50%	Implement Stage VI of Burbank's Sustainable Water Use Ordinance

NOTES:

Submittal Table 8-2: Demand Reduction Actions

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? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
Add additional rows as needed				
I	Landscape - Limit landscape irrigation to specific days	3%	Do not water outdoor landscaped areas more than fifteen (15) minutes per day per station and no more than three (3) days per week, year-round. Areas watered with low volume irrigation systems that require additional spray time are exempt from the 15-minute time restriction of this requirement, but must comply with the three (3) days per week watering limit. The three allowable irrigation days are Tuesdays, Thursdays and Saturdays. With the exception of attended hand- watering, irrigation will not be allowed any day outside of the requirement listed here. Attended hand-watering is allowed any day of the week. Do not water	Yes
I	Landscape - Limit landscape irrigation to specific times	2%	Do not water outdoor landscaped areas between the hours of 9:00 a.m. to 6:00 p.m. or during daylight hours from November through March except by use of attended hand-watering, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system	Yes
I	Landscape - Restrict or prohibit runoff from landscape irrigation	1%	Adjust sprinklers and irrigation systems to eliminate overspray and avoid run-off into streets, sidewalks, parking lots, alleys or other paved surfaces	Yes

I	Other - Prohibit use of potable water for washing hard surfaces	2%	Do not hose or wash driveways, patios, sidewalks, or other hard or paved surfaces except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a high pressure, low volume spray hose using only potable water with no cleaning agents at an average water usage of 0.006 gallons per square feet of sidewalk area in accordance with Resolution No. 98-08 issued by the Los Angeles Regional Water Quality Control Board, or a low-volume, high-pressure cleaning machine equipped to recycle any water used.	Yes
I	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	2%	No additional explanation	Yes
I	Other	1%	When washing vehicles, use a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off device. This does not apply to any commercial car washing facility.	Yes
I	CII - Restaurants may only serve water upon request	<1%	No additional explanation	Yes
I	CII - Lodging establishment must offer opt out of linen service	<1%	No additional explanation	Yes
I	CII - Other CII restriction or prohibition	0.40%	Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.	Yes
I	Water Features - Restrict water use for decorative water features, such as fountains	1.00%	Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.	Yes
I	Other	<1%	Installation of single pass cooling systems is prohibited in buildings requesting new water service.	Yes
I	Other	<1%	Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.	Yes

I	Other	<1%	All commercial conveyor car wash systems and commercial laundry systems must have installed operational re-circulating water systems.	Yes
I	Landscape - Other landscape restriction or prohibition	2%	Do not irrigate ornamental turf on public street medians.	Yes
II	Landscape - Limit landscape irrigation to specific days	1%	Landscape watering limited to 15 minutes/day. Three days per week, April – October and one day per week, November - March	Yes
III	Landscape - Limit landscape irrigation to specific days	1%	Landscape watering limited to 15 minutes/day, two days per week, April – October	Yes
III	Other	<1%	Use of outdoor cooling devices (misters) prohibited	Yes
III	Landscape - Prohibit certain types of landscape irrigation	1.00%	Hand watering also prohibited between 9AM and 6 PM	Yes
III	Other water feature or swimming pool restriction	2.00%	Use of pool and spa covers required	Yes
IV	Landscape - Limit landscape irrigation to specific days	5.00%	Landscape watering limited to one day per week	Yes
V	Landscape - Prohibit certain types of landscape irrigation	5.00%	Watering limited to deep irrigation of trees and shrubs, 20 min, 2 days per month	Yes
V	Other	5.00%	No new or upgraded potable water services permitted, except R-1 and R-2, unless building permit already issued	Yes
VI	Landscape - Prohibit all landscape irrigation	10.00%	No additional explanation	Yes
NOTES:				

Submittal Table 8-3: Supply Augmentation and Other Actions			
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? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
NOTES: No supply augmentation is planned in the WSCP.			

<table>
<tr><th colspan="3">Submittal Table 10-1 Retail: Notification to Cities and Counties</th></tr>
<tr><th>City Name</th><th>60 Day Notice</th><th>Notice of Public Hearing</th></tr>
<tr><td colspan="3">Add additional rows as needed</td></tr>
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Drop Down List</th><th>60 Day Notice</th><th>Notice of Public Hearing</th></tr>
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<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">NOTES:</td></tr>
</table>

ATTACHMENT 1

Urban Water Supplier: *City of Burbank*

Water Delivery Product (If delivering more than one type of product use Table O-1C)
Retail Potable Deliveries

Table O-1A: Recommended Energy Reporting - Water Supply Process Approach

Enter Start Date for Reporting Period 1/1/2020
End Date 12/30/2020

☑ Is upstream embedded in the values reported?

		Urban Water Supplier Operational Control							
		Water Management Process						Non-Consequential Hydropower (if applicable)	
	Water Volume Units Used	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process	AF	*9997*	*0*	*6317*	*9997*	*16162*	*16162*	*0*	*16162*
Energy Consumed (kWh)	*N/A*	*6666053*	*0*	*11593734.6*	*4156526*	*4590747*	*27007060.6*	*0*	*27007060.6*
Energy Intensity (kWh/vol.)	*N/A*	*666.8*	*0.0*	*1835.3*	*415.8*	*284.0*	*1671.0*	*0.0*	*1671.0*

Quantity of Self-Generated Renewable Energy
0 kWh

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

Data Quality Narrative:

The energy usage to extract and diver, treat, and distribute water is based on metered data. The energy usage for conveyance (imported water) is based on energy intensity as calculated by Metropolitan Water District in its 2020 UWMP (1,837 kWh/AF for treated, 1,767.3 kWh/AF for untreated).

Narrative:

Energy is used to 1) convey imported water from the Delta to southern California, 2) treat imported water at Metropolitan Water District treatment plants, 3) convey imported water to the City of Burbank, 4) extract groundwater, 5) treat groundwater at local treatment plants, and 6) distribute water to customers.

APPENDIX C: DOCUMENTATION OF POSTINGS/NOTIFICATIONS

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ATTACHMENT 1

From: Sheikh, Asif <ASheikh@burbankca.gov>
Sent: Thursday, April 22, 2021 2:25 PM
To: Plambaeck, Scott
Cc: Wilson, Richard
Subject: Notice of 2020 Urban Water Management Plan Update

Hi Scott,

Every five years, Burbank Water and Power (BWP) is required to develop a State-mandated Urban Water Management Plan (UWMP). State law provides a framework for how water suppliers such as BWP are to carry out their long-term resource planning responsibilities through the UWMP. Specifically, suppliers are to assess supplies and demand, consider and analyze actions to be taken during droughts, and commit to implementing demand management strategies to encourage efficient water use.

This email is to provide notice that an updated Urban Water Management Plan and Water Shortage Contingency Plan (WSCP) are under development. Pursuant to California Water Code Section 10621(b), this notification is being provided at least 60-days prior to the City Council public hearing at which the updated UWMP and WSCP will be considered for adoption, which is currently scheduled for June 22, 2021. The Draft UWMP, which contains the WSCP, will be emailed to you for review and comment prior to the public hearing.

If you would like more information or have any questions, please feel free to contact me. Thank you.

Asif Sheikh, P.E.
PRINCIPAL CIVIL ENGINEER
(818) 238-3500 office
BurbankWaterAndPower.com
Always There for You!

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From: Sheikh, Asif <ASheikh@burbankca.gov>
Sent: Thursday, April 22, 2021 2:27 PM
To: Walker, Stephen
Cc: Wilson, Richard
Subject: Notice of 2020 Urban Water Management Plan Update

Hi Stephen,

Every five years, Burbank Water and Power (BWP) is required to develop a State-mandated Urban Water Management Plan (UWMP). State law provides a framework for how water suppliers such as BWP are to carry out their long-term resource planning responsibilities through the UWMP. Specifically, suppliers are to assess supplies and demand, consider and analyze actions to be taken during droughts, and commit to implementing demand management strategies to encourage efficient water use.

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If you would like more information or have any questions, please feel free to contact me. Thank you.

WATER AND POWER

Asif Sheikh, P.E.
PRINCIPAL CIVIL ENGINEER
(818) 238-3500 office
BurbankWaterAndPower.com
Always There for You!

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ATTACHMENT 1

CITY OF BURBANK
WATER AND POWER

CITY OF BURBANK

April 22, 2021

Michael De Ghetto
Chief Assistant General Manager, Water
141 N. Glendale Ave., Suite 420
Glendale, CA 91206-4976

Subject: Notice of Preparation of Burbank's 2020 Urban Water Management Plan

Dear Mr. De Ghetto,

Every five years, Burbank Water and Power (BWP) is required to develop a State-mandated Urban Water Management Plan (UWMP). State law provides a framework for how water suppliers such as BWP are to carry out their long-term resource planning responsibilities through the UWMP. Specifically, suppliers are to assess supplies and demand, consider and analyze actions to be taken during droughts, and commit to implementing demand management strategies to encourage efficient water use.

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If you would like more information or have any questions, please contact Mr. Asif Sheikh, Principal Civil Engineer at 818-238-3500 or asheikh@burbankca.gov.

Sincerely,

Richard H. Wilson, P.E.
Assistant General Manager, Water Systems

RHW:as

c: Project file

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ATTACHMENT 1

CITY OF BURBANK
WATER AND
POWER

April 22, 2021

County of Los Angeles
Chief Executive Office
Kenneth Hahn Hall of Administration
500 W. Temple St.
Los Angeles, CA 90012

Subject: Notice of Preparation of Burbank's 2020 Urban Water Management Plan

Every five years, Burbank Water and Power (BWP) is required to develop a State-mandated Urban Water Management Plan (UWMP). State law provides a framework for how water suppliers such as BWP are to carry out their long-term resource planning responsibilities through the UWMP. Specifically, suppliers are to assess supplies and demand, consider and analyze actions to be taken during droughts, and commit to implementing demand management strategies to encourage efficient water use.

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If you would like more information or have any questions, please contact Mr. Asif Sheikh, Principal Civil Engineer at 818-238-3500 or asheikh@burbankca.gov.

Sincerely,

Richard H. Wilson, P.E.
Assistant General Manager, Water Systems

RHW:as

c: Project file

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ATTACHMENT 1

CITY OF BURBANK
WATER AND
POWER

April 22, 2021

Mr. David R. Pettijohn
Director of Water Resources
111 N. Hope St Room 1460
Los Angeles, CA 90012

Subject: Notice of Preparation of Burbank's 2020 Urban Water Management Plan

Dear Mr. Pettijohn,

Every five years, Burbank Water and Power (BWP) is required to develop a State-mandated Urban Water Management Plan (UWMP). State law provides a framework for how water suppliers such as BWP are to carry out their long-term resource planning responsibilities through the UWMP. Specifically, suppliers are to assess supplies and demand, consider and analyze actions to be taken during droughts, and commit to implementing demand management strategies to encourage efficient water use.

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If you would like more information or have any questions, please contact Mr. Asif Sheikh, Principal Civil Engineer at 818-238-3500 or asheikh@burbankca.gov.

Sincerely,

Richard H. Wilson, P.E.
Assistant General Manager, Water Systems

RHW:as

c: Project file

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Burbank, City of

Calendar Year

Local Production Forecast Survey provided to Metropolitan Water District of Southern Californi

Local Production

Groundwater Direct	**Use**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
San Fernando Valley Basin	MI	-	-	-	-	-	-	-	-	-	-	-
Total Groundwater Direct		-	-	-	-	-	-	-	-	-	-	-
Groundwater Recovery	**Use**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Burbank Operable Unit/Lockheed Valley Plant	MI	10,185	10,904	10,768	10,711	10,655	10,658	10,672	10,700	10,700	10,700	10,700
Total Groundwater Recovery												
Recycled Water	**Use**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Burbank Reclaimed Water System Projects	MI	2,004	1,981	1,974	1,966	1,971	1,991	1,996	2,000	2,000	2,000	2,000
Power Plants	MI	961	1,000	1,100	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Total Recycled Water		2,965	2,981	3,074	3,166	3,171	3,191	3,196	3,200	3,200	3,200	3,200
Grand Total	**Use**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Total Local Supplies	MI	13,150	13,885	13,841	13,877	13,826	13,849	13,868	13,900	13,900	13,900	13,900

Replenishment Demand on MWD

Groundwater Replenishment		**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Untreated via B-6		5,600	300	300	6,800	6,800	6,800	6,800	6,800	6,800	6,800	6,800

Highlighted annual projections are minimum scenarios while Pacoima Spreading Grounds are offline for scheduled improvements. Actual volumes will depend on Lopez SG capacity and interagency operation strategy.

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Los Angeles Times
MEDIA GROUP

ATTACHMENT 1

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of Los Angeles

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the action for which the attached notice was published. I am a principal clerk of the Los Angeles Times, which was adjudged a newspaper of general circulation on May 21, 1952, Cases 598599 for the City of Los Angeles, County of Los Angeles, and State of California. Attached to this Affidavit is a true and complete copy as was printed and published on the following date(s):
June 02, 2021

I certify (or declare) under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated at El Segundo, California
on this 2nd day of June, 2021.

KG
____
Katherine G. Gundell
[signature]

2300 E. Imperial Hwy.
El Segundo, CA 90245

ATTACHMENT 1

Sold To:
City Clerk - City of Burbank - CA11064602
275 E Olive Ave
BURBANK, CA 91502-1267

Bill To:
City Clerk - City of Burbank - CA11064602
275 E Olive Ave
BURBANK, CA 91502-1267

LEGAL NOTICE

NOTICE OF PUBLIC HEARING BEFORE THE BURBANK CITY COUNCIL REGARDING THE CITY OF BURBANK'S 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

On Tuesday, June 22, 2021, at 6:00 p.m., the City Council will hold a public hearing by video conference/teleconference regarding the City of Burbank's 2020 Urban Water Management Plan and Water Shortage Contingency Plan. The California Urban Water Management Planning Act (Assembly Bill 797, California Water Code Division 6, Part 2.6) requires that the City's Urban Water Management Plan be reviewed and updated this year; that the plan be made available for public inspection; and that a public hearing be held prior to adoption of the plan. Pursuant to California Water Code section 10640(b), the City is also required to develop a Water Shortage Contingency Plan, which must be submitted along with the Urban Water Management Plan to the California Department of Water Resources.

The Urban Water Management Plan includes evaluations of historical and future water supplies and demands, reliability of the supplies, and descriptions of water conservation and water management activities, which includes water recycling and preparation for water shortages. The Urban Water Management Plan includes the Water Shortage Contingency Plan that details how the City will act in the event of an actual water shortage condition.

The Proposed 2020 Urban Water Management Plan for the City of Burbank is available for inspection on the Burbank Water and Power website, www.burbankwaterandpower.com.

APPENDIX D: DELTA RELIANCE

D. REDUCED DELTA RELIANCE REPORTING

D.1 BACKGROUND

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action in the Delta, 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. 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.

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 2020 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).

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.

(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.

D.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 Burbank Water and Power's (BWP's) regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 – Final Draft (Guidebook Appendix C) issued in March 2021. The data used in this analysis represent the total regional efforts of Metropolitan and were developed in conjunction with Metropolitan as part of the UWMP coordination process. The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for BWP's Delta reliance and regional self-reliance. The results show that as a region, Metropolitan and its member agencies 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 for BWP

- Near-term (2025) – Normal water year regional self-reliance is expected to increase by approximately 1,700 AF from the 2010 baseline; this represents an increase of about four percent of 2025 normal water year retail demands (Table D-2).
- Long-term (2045) – Normal water year regional self-reliance is expected to increase by approximately 3,100 AF from the 2010 baseline, this represents an increase of about six percent of 2045 normal water year retail demands (Table D-2).

D.3 DEMONSTRATION OF REDUCED RELIANCE ON THE DELTA

The methodology used to determine BWP'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 BWP's demonstration of reduced reliance include:

- All data were obtained from the current 2020 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 BWP and in conjunction with information provided by Metropolitan.
- 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 BWP'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 and 2020 were taken from BWP's 2010 and 2015 UWMPs respectively. Expected outcomes for 2025-2045 are from the current 2020 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 UWMP 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 BWP need to explicitly calculate and report water use efficiency savings separate from service area demands 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. It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 shows the results of this adjustment for BWP. Supporting narratives and documentation for the data shown in It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 are provided below.

Service Area Demands with Water Use Efficiency

The service area demands shown in It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 represent the total retail water demands for BWP's service area and include municipal, commercial, institutional/governmental and industrial demands, fire protection demands and losses. These demand types and the modeling methodologies used to calculate them are described in Section 3 of BWP's 2020 UWMP.

Recycled Water Demands

The recycled water demands shown in It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 represent demands for non-potable recycled water. Non-potable supplies have a demand hardening effect due to the inability to shift non-potable supplies to meet potable water demands. When water use efficiency or conservation measures are implemented, they fall solely on the potable water users. This is consistent with the approach for water conservation reporting used by the State Water Resources Control Board.

Replenishment Demands

In accordance with section C.3.6 of the UWMP Guidebook, BWP characterizes demands for groundwater basin recharge as indirect uses of water, and are therefore captured separately.

Total Service Area Population

BWP's total service area population as shown in It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 comes from the US Census Bureau and the California Department of Finance, with actuals and projections further described in Section 2 of the 2020 BWP UWMP.

Water Use Efficiency Since Baseline

The water use efficiency numbers shown in It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 represent the formulation that BWP utilized, consistent with Appendix C of the UWMP Guidebook approach. Service area demands, excluding non-potable demands, are divided by the service area population to get per capita water use in the service area in gallons per capita per day (GPCD) for each five-year period. The change in per capita water use from the baseline is the comparative GPCD from that five-year period compared to the 2010 baseline. Changes in per capita water use over time are then applied back to the BWP service area population to calculate the estimated WUE Supply. This estimated WUE Supply is considered an additional supply that may be used to show reduced reliance on Delta water supplies.

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

- Baseline (2010) values – BWP's 2005 UWMP
- 2015 values – BWP's 2010 UWMP
- 2020 values – BWP's 2015 UWMP
- 2025-2045 values – BWP's 2020 UWMP

It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1: Demand Estimates without Water Use Efficiency (Acre-Feet)

Service Area Water Use Efficiency Demands	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Potable Demands with WUE	24,260	17,751	18,422	18,062	19,976	21,386	21,712	22,010
Non-Potable Water Demands	2,800	3,160	3,027	3,540	3,540	3,540	3,540	3,540
Replenishment Demands	7,400	6,300	6300	6,800	6,800	6,800	6,800	6,800
Service Area Demands with Water Use Efficiency	**34,460**	**27,211**	**27,749**	**28,402**	**30,316**	**31,726**	**32,052**	**32,350**
Total Service Area Population	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Service Area Population	103340	106084	105861	107765	109599	111531	113460	115482
Water Use Efficiency Since Baseline	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Per Capita Water Use (GPCD)	210	149	155	150	163	171	171	170
Change in Per Capita Water Use from Baseline (GPCD)	N/A	-60	-54	-60	-47	-38	-39	-39
Estimated Water Use Efficiency Since Baseline (AF)	**N/A**	**7,153**	**6,430**	**7,237**	**5,753**	**4,797**	**4,924**	**5,100**
Total Service Area Water Demands (AF)	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Service Area Water Demands with Water Use Efficiency	34,460	27,211	27,749	28,402	30,316	31,726	32,052	32,350
Estimated Water Use Efficiency Since Baseline	N/A	7,153	6,430	7,237	5,753	4,797	4,924	5,100
Service Area Water Demands without Water Use Efficiency	**34,460**	**34,364**	**34,179**	**35,639**	**36,069**	**36,523**	**36,976**	**37,450**

D.4 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 D-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table D-2 represent efforts to improve regional self-reliance for BWP's service area. Supporting narratives and documentation for the data shown in Table D-2 are provided below.

The results shown in Table D-2 demonstrate that BWP's service area is measurably improving its regional self- reliance. In the near-term (2025), the expected outcome for normal water year regional self-reliance increases by approximately 1,700 AF from the 2010 baseline; this represents an increase of about four percent of 2025 normal water year retail demands. In the long-term (2045), normal water year regional self-reliance is expected to increase by approximately 3,100 AF from the 2010 baseline; this represents an increase of about six percent of 2045 normal water year retail demands.

Water Use Efficiency

The water use efficiency information shown in Table D-2 is taken directly from It should be noted that the results of this calculation differ from what BWP calculated under BWP's 2020 UWMP Section 3 pertaining to the Water Conservation Act of 2009 (SB X7-7) due to differing formulas.

Table D-1 above.

Water Recycling

The water recycling values shown in Table D-2 reflect recycled water sales from the Burbank Water Reclamation Plant and are discussed further in Section 6 of BWP's 2020 UWMP.

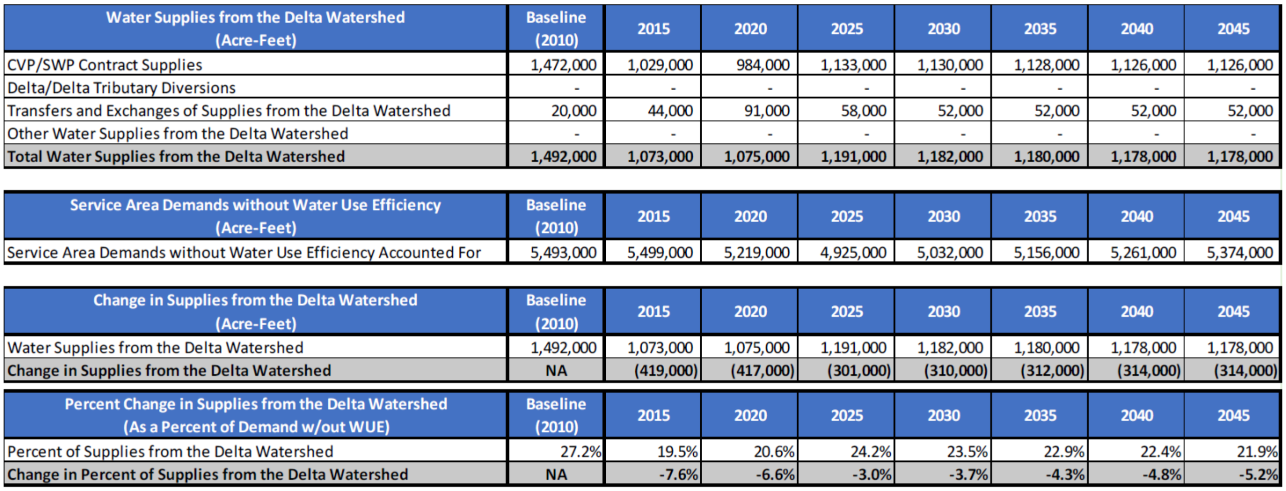
Table D-2: Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)

Water Supplies Contributing to Regional Self-Reliance (AF)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Water Use Efficiency	4,818	5,154	5,491	5,810	6,188	6,487	6,868	7,154
Water Recycling	2,800	3,160	3,027	3,540	3,540	3,540	3,540	3,540
Stormwater Capture and Use	0	0	0	0	0	0	0	0
Advanced Water Technologies	0	0	0	0	0	0	0	0
Conjunctive Use Projects	0	0	0	0	0	0	0	0
Local and Regional Water Supply and Storage Projects	0	0	0	0	0	0	0	0
Other Programs and Projects	0	0	0	0	0	0	0	0
Water Supplies Contributing to Regional Self-Reliance	**7,618**	**8,314**	**8,518**	**9,350**	**9,728**	**10,027**	**10,408**	**10,694**
Service Area Demands w/o WUE (AF)	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Service Area Demands without Water Use Efficiency	34,460	34,364	34,179	35,639	36,069	36,523	36,976	37,450
Change in Regional Self Reliance (AF)	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Water Supplies Contributing to Regional Self-Reliance	7,618	8,314	8,518	9,350	9,728	10,027	10,408	10,694
Change in Supplies Contributing to Regional Self-Reliance	**N/A**	**697**	**901**	**1,732**	**2,110**	**2,409**	**2,790**	**3,076**
Change in Regional Self Reliance (as a percent of water demand w/o WUE)	**Baseline (2010)**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Water Supplies Contributing to Regional Self-Reliance	**22%**	**24%**	**25%**	**26%**	**27%**	**27%**	**28%**	**29%**
Change in Supplies Contributing to Regional Self-Reliance	**N/A**	**2%**	**3%**	**4%**	**5%**	**5%**	**6%**	**6%**

D.5 RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED

Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies and demand management measures. Quantifying BWP's investments in self-reliance, locally, regionally, and throughout Southern California is infeasible for the reasons as noted in Section D.6. Due to the regional nature of these investments, BWP is relying on Metropolitan's regional accounting of measurable reductions in supplies from the Delta Watershed. The results shown in Table A.11-3 (provided as Table D-3, below) from the Metropolitan 2020 UWMP demonstrate that Metropolitan's service area, including BWP, is measurably reducing its Delta reliance. In the near-term (2025), the expected outcome for normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline; this represents a decrease of 3 percent of 2025 normal water year retail demands. In the long- term (2045), normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline; this represents a decrease of just over 5. percent of 2045 normal water year retail demands.

Table D-3: Metropolitan 2020 UWMP Table A.11-3 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
CVP/SWP Contract Supplies	1,472,000	1,029,000	984,000	1,133,000	1,130,000	1,128,000	1,126,000	1,126,000
Delta/Delta Tributary Diversions	-	-	-	-	-	-	-	-
Transfers and Exchanges of Supplies from the Delta Watershed	20,000	44,000	91,000	58,000	52,000	52,000	52,000	52,000
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**	**1,182,000**	**1,180,000**	**1,178,000**	**1,178,000**

Service Area Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Service Area Demands without Water Use Efficiency Accounted For	5,493,000	5,499,000	5,219,000	4,925,000	5,032,000	5,156,000	5,261,000	5,374,000

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045
Water Supplies from the Delta Watershed	1,492,000	1,073,000	1,075,000	1,191,000	1,182,000	1,180,000	1,178,000	1,178,000
Change in Supplies from the Delta Watershed	**NA**	**(419,000)**	**(417,000)**	**(301,000)**	**(310,000)**	**(312,000)**	**(314,000)**	**(314,000)**

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
Percent of Supplies from the Delta Watershed	27.2%	19.5%	20.6%	24.2%	23.5%	22.9%	22.4%	21.9%
Change in Percent of Supplies from the Delta Watershed	**NA**	**-7.6%**	**-6.6%**	**-3.0%**	**-3.7%**	**-4.3%**	**-4.8%**	**-5.2%**

D.6 INFEASIBILITY OF ACCOUNTING SUPPLIES FROM THE DELTA WATERSHED FOR METROPOLITAN'S MEMBER AGENCIES AND THEIR CUSTOMERS

Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. Metropolitan's member agencies coordinate reliance on the Delta through their membership in Metropolitan, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally—not by individual Metropolitan member agencies and not by the customers of those member agencies.

Metropolitan's member agencies, and those agencies' customers, indirectly reduce reliance on the Delta through their collective efforts as a cooperative. Metropolitan's member agencies do not control the amount of Delta water they receive from Metropolitan. Metropolitan manages a statewide integrated conveyance system consisting of its participation in the State Water Project (SWP), its Colorado River Aqueduct (CRA) including Colorado River water resources, programs and water exchanges, and its regional storage portfolio. Along with the SWP, CRA, storage programs, and Metropolitan's conveyance and distribution facilities, demand management programs increase the future reliability of water resources for the region. In addition, demand management programs provide system-wide benefits by decreasing the demand for imported water, which helps to decrease the burden on the district's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Metropolitan's costs are funded almost entirely from its service area, with the exception of grants and other assistance from government programs. Most of Metropolitan's revenues are collected directly from its member agencies. Properties within Metropolitan's service area pay a property tax that currently provides approximately 8 percent of the fiscal year 2021 annual budgeted revenues. The rest of Metropolitan's costs are funded through rates and charges paid by Metropolitan's member agencies for the wholesale services it provides to them.[1] Thus, Metropolitan's member agencies fund nearly all operations Metropolitan undertakes to reduce reliance on the Delta, including Colorado River Programs, storage facilities, Local Resources Programs and Conservation Programs within Metropolitan's service area.

Because of the integrated nature of Metropolitan's systems and operations, and the collective nature of Metropolitan's regional efforts, it is infeasible to quantify each of Metropolitan member agencies' individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as an integrated regional cooperative.

In addition to the member agencies funding Metropolitan's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those member agencies may also invest in their own local programs to reduce water demand. However, to the extent those efforts result in reduction of demands on Metropolitan, that reduction does not equate to a like reduction of reliance on the Delta. Demands on Metropolitan are not commensurate with demands on the Delta because most of Metropolitan member agencies receive blended resources from Metropolitan as determined by Metropolitan—not the individual member agency—and for most member agencies, the blend varies from month-to-month and year-to-year due to hydrology, operational constraints, use of storage and other factors.

D.6.1 Colorado River Programs

As a regional cooperative of member agencies, Metropolitan invests in programs to ensure the continued reliability and sustainability of Colorado River supplies. Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the CRA. The CRA consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four regulating reservoirs, and 242 miles of aqueducts, siphons, canals, conduits and pipelines terminating at Lake Mathews in Riverside County. Metropolitan owns, operates, and manages the CRA. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA, and is responsible for obtaining and scheduling energy resources adequate to power pumps at the CRA's five pumping stations.

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including supplies from the Imperial Irrigation District (IID)-Metropolitan Conservation Program, the implementation of the Quantification Settlement Agreement (QSA) and related agreements, and the exchange agreement with San Diego County Water Authority (SDCWA). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's CRA supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead.

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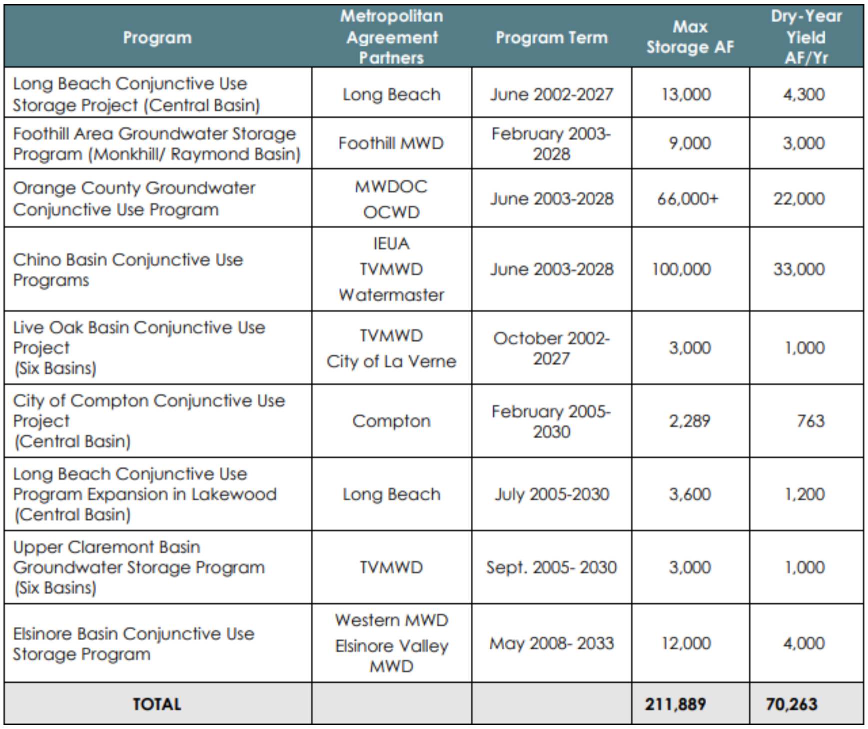
[1] A standby charge is collected from properties within the service areas of 21 of Metropolitan's 26 member agencies, ranging from $5 to $14.20 per acre annually, or per parcel if smaller than an acre. Standby charges go towards those member agencies' obligations to Metropolitan for the Readiness-to-Serve Charge. The total amount collected annually is approximately $43.8 million, approximately 2 percent of Metropolitan's fiscal year 2021 annual budgeted revenues.

D.6.2 Storage Investments/Facilities

Surface and groundwater storage are critical elements of Southern California's water resources strategy and help Metropolitan reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. The Metropolitan system, for purposes of meeting demands during times of shortage, regulating system flows, and ensuring system reliability in the event of a system outage, provides over 1,000,000 acre-feet of system storage capacity. Diamond Valley Lake provides 810,000 acre-feet of that storage capacity, effectively doubling Southern California's previous surface water storage capacity. Other existing imported water storage available to the region consists of Metropolitan's raw water reservoirs, a share of the SWP's raw water reservoirs in and near the service area, and the portion of the groundwater basins used for conjunctive-use storage.

Since the early twentieth century, DWR and Metropolitan have constructed surface water reservoirs to meet emergency, drought/seasonal, and regulatory water needs for Southern California. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and Metropolitan's Diamond Valley Lake (DVL). Some reservoirs such as Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, and Orange County Reservoir, which have a total combined capacity of about 3,500 AF, are used solely for regulating purposes. The total gross storage capacity for the larger remaining reservoirs is 1,757,600 AF. However, not all of the gross storage capacity is available to Metropolitan; dead storage and storage allocated to others reduce the amount of storage that is available to Metropolitan to 1,665,200 AF.

Conjunctive use of the aquifers offers another important source of dry year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region's major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs in the service area; the following table lists the groundwater conjunctive use programs that have been developed in the region.



Program	Metropolitan Agreement Partners	Program Term	Max Storage AF	Dry-Year Yield AF/Yr
Long Beach Conjunctive Use Storage Project (Central Basin)	Long Beach	June 2002-2027	13,000	4,300
Foothill Area Groundwater Storage Program (Monkhill/ Raymond Basin)	Foothill MWD	February 2003-2028	9,000	3,000
Orange County Groundwater Conjunctive Use Program	MWDOC OCWD	June 2003-2028	66,000+	22,000
Chino Basin Conjunctive Use Programs	IEUA TVMWD Watermaster	June 2003-2028	100,000	33,000
Live Oak Basin Conjunctive Use Project (Six Basins)	TVMWD City of La Verne	October 2002-2027	3,000	1,000
City of Compton Conjunctive Use Project (Central Basin)	Compton	February 2005-2030	2,289	763
Long Beach Conjunctive Use Program Expansion in Lakewood (Central Basin)	Long Beach	July 2005-2030	3,600	1,200
Upper Claremont Basin Groundwater Storage Program (Six Basins)	TVMWD	Sept. 2005- 2030	3,000	1,000
Elsinore Basin Conjunctive Use Storage Program	Western MWD Elsinore Valley MWD	May 2008- 2033	12,000	4,000
TOTAL			**211,889**	**70,263**

D.6.3 Metropolitan Demand Management Programs

Demand management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These Demand Management Programs incentivize the development of local water supplies and the conservation of water to reduce the need to import water to deliver to Metropolitan's member agencies. These programs are implemented below the delivery points between Metropolitan's and its member agencies' distribution systems and, as such, do not add any water to Metropolitan's supplies. Rather, the effect of these downstream programs is to produce a local supply of water for the local agencies and to reduce demands by member agencies for water imported through Metropolitan's system. The following discussions outline how Metropolitan funds local resources and conservation programs for the benefit of all of its member agencies and the entire Metropolitan service area. Notably, the history of demand management by Metropolitan's member agencies and the local agencies that purchase water from Metropolitan's members has spanned more than four decades. The significant history of the programs is another reason it would be difficult to attempt to assign a portion of such funding to any one individual member agency.

D.6.3.1 Local Resources Programs

In 1982, Metropolitan began providing financial incentives to its member agencies to develop new local supplies to assist in meeting the region's water needs. Because of Metropolitan's regional distribution system, these programs benefit all member agencies regardless of project location because they help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs and free up conveyance capacity to the benefit of all the agencies that rely on water from Metropolitan.

For example, the Groundwater Replenishment System (GWRS) operated by the Orange County Water District is the world's largest water purification system for indirect potable reuse. It was funded, in part, by Metropolitan's member agencies through the Local Resources Program. Annually, the GWRS produces approximately 103,000 acre-feet of reliable, locally controlled, drought-proof supply of high-quality water to recharge the Orange County Groundwater Basin and protect it from seawater intrusion. The GWRS is a premier example of a regional project that significantly reduced the need to utilize imported water for groundwater replenishment in Metropolitan's service area, increasing regional and local supply reliability and reducing the region's reliance on imported supplies, including supplies from the State Water Project.

Metropolitan's local resource programs have evolved through the years to better assist Metropolitan's member agencies in increasing local supply production. The following is a description and history of the local supply incentive programs.

Local Projects Program

In 1982, Metropolitan initiated the Local Projects Program (LPP), which provided funding to member agencies to facilitate the development of recycled water projects. Under this approach, Metropolitan contributed a negotiated up-front funding amount to help finance project capital costs. Participating member agencies were obligated to reimburse Metropolitan over time. In 1986, the LPP was revised, changing the up-front funding approach to an incentive-based approach. Metropolitan contributed an amount equal to the avoided State Water Project pumping costs for each acre-foot of recycled water delivered to end-use consumers. This funding incentive was based on the premise that local projects resulted in the reduction of water imported from the Delta and the associated pumping cost. The incentive amount varied from year to year depending on the actual variable power cost paid for State Water Project imports. In 1990, Metropolitan's Board increased the LPP contribution to a fixed rate of $154 per acre-foot, which was calculated based on Metropolitan's avoided capital and operational costs to convey, treat, and distribute water, and included considerations of reliability and service area demands.

Groundwater Recovery Program

The drought of the early 1990s sparked the need to develop additional local water resources, aside from recycled water, to meet regional demand and increase regional water supply reliability. In 1991, Metropolitan conducted the Brackish Groundwater Reclamation Study which determined that large amounts of degraded groundwater in the region were not being utilized. Subsequently, the Groundwater Recovery Program (GRP) was established to assist the recovery of otherwise unusable groundwater degraded by minerals and other contaminants, provide access to the storage assets of the degraded groundwater, and maintain the quality of groundwater resources by reducing the spread of degraded plumes.

Local Resources Program

In 1995, Metropolitan's Board adopted the Local Resources Program (LRP), which combined the LPP and GRP into one program. The Board allowed for existing LPP agreements with a fixed incentive rate to convert to the sliding scale up to $250 per acre-foot, similar to GRP incentive terms. Those agreements that were converted to LRP are known as "LRP Conversions."

Competitive Local Projects Program

In 1998, the Competitive Local Resources Program (Competitive Program) was established. The Competitive Program encouraged the development of recycled water and recovered groundwater through a process that emphasized cost-efficiency to Metropolitan, timing new production according to regional need while minimizing program administration cost. Under the Competitive Program, agencies requested an incentive rate up to $250 per acre-foot of production over 25 years under a Request for Proposals (RFP) for the development of up to 53,000 acre-feet per year of new water recycling and groundwater recovery projects. In 2003, a second RFP was issued for the development of an additional 65,000 acre-feet of new recycled water and recovered groundwater projects through the LRP.

Seawater Desalination Program

Metropolitan established the Seawater Desalination Program (SDP) in 2001 to provide financial incentives to member agencies for the development of seawater desalination projects. In 2014, seawater desalination projects became eligible for funding under the LRP, and the SDP was ended.

2007 Local Resources Program

In 2006, a task force comprised of member agency representatives was formed to identify and recommend program improvements to the LRP. As a result of the task force process, the 2007 LRP was established with a goal of 174,000 acre-feet per year of additional local water resource development. The new program allowed for an open application process and eliminated the previous competitive process. This program offered sliding scale incentives of up to $250 per acre-foot, calculated annually based on a member agency's actual local resource project costs exceeding Metropolitan's prevailing water rate.

2014 Local Resources Program

A series of workgroup meetings with member agencies was held to identify the reasons why there was a lack of new LRP applications coming into the program. The main constraint identified by the member agencies was that the $250 per acre-foot was not providing enough of an incentive for developing new projects due to higher construction costs to meet water quality requirements and to develop the infrastructure to reach end-use consumers located further from treatment plants. As a result, in 2014, the Board authorized an increase in the maximum incentive amount, provided alternative payment structures, included onsite retrofit costs and reimbursable services as part of the LRP, and added eligibility for seawater desalination projects. The current LRP incentive payment options are structured as follows:

- Option 1 – Sliding scale incentive up to $340/AF for a 25-year agreement term
- Option 2 – Sliding scale incentive up to $475/AF for a 15-year agreement term
- Option 3 – Fixed incentive up to $305/AF for a 25-year agreement term

On-site Retrofit Programs

In 2014, Metropolitan's Board also approved the On-site Retrofit Pilot Program which provided financial incentives to public or private entities toward the cost of small-scale improvements to their existing irrigation and industrial systems to allow connection to existing recycled water pipelines. The On-site Retrofit Pilot Program helped reduce recycled water retrofit costs to the end-use consumer which is a key constraint that limited recycled water LRP projects from reaching full production capacity. The program incentive was equal to the actual eligible costs of the on-site retrofit, or $975 per acre-foot of up-front cost, which equates to $195 per acre-foot for an estimated five years of water savings ($195/AF x 5 years) multiplied by the average annual water use in previous three years, whichever is less. The Pilot Program lasted two years and was successful in meeting its goal of accelerating the use of recycled water.

In 2016, Metropolitan's Board authorized the On-site Retrofit Program (ORP), with an additional budget of $10 million. This program encompassed lessons learned from the Pilot Program and feedback from member agencies to make the program more streamlined and improve its efficiency. As of fiscal year 2019/20, the ORP has successfully converted 440 sites, increasing the use of recycled water by 12,691 acre-feet per year.

Stormwater Pilot Programs

In 2019, Metropolitan's Board authorized both the Stormwater for Direct Use Pilot Program and a Stormwater for Recharge Pilot Program to study the feasibility of reusing stormwater to help meet regional demands in Southern California. These pilot programs are intended to encourage the development, monitoring, and study of new and existing stormwater projects by providing financial incentives for their construction/retrofit and monitoring/reporting costs. These pilot programs will help evaluate the potential benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches. Metropolitan's Board authorized a total of $12.5 million for the stormwater pilot programs ($5 million for the District Use Pilot and $7.5 million for the Recharge Pilot).

Current Status and Results of Metropolitan's Local Resource Programs

Today, nearly one-half of the total recycled water and groundwater recovery production in the region has been developed with an incentive from one or more of Metropolitan's local resource programs. During fiscal year 2020, Metropolitan provided about $13 million for production of 71,000 acre-feet of recycled water for non-potable and indirect potable uses. Metropolitan provided about $4 million to support projects that produced about 50,000 acre-feet of recovered groundwater for municipal use. Since 1982, Metropolitan has invested $680 million to fund 85 recycled water projects and 27 groundwater recovery projects that have produced a cumulative total of about 4 million acre-feet.

D.6.3.2 Conservation Programs

Metropolitan's regional conservation programs and approaches have a long history. Decades ago, Metropolitan recognized that demand management at the consumer level would be an important part of balancing regional supplies and demands. Water conservation efforts were seen as a way to reduce the need for imported supplies and offset the need to transport or store additional water into or within the Metropolitan service area. The actual conservation of water takes place at the retail consumer level. Regional conservation approaches have proven to be effective at reaching retail consumers throughout Metropolitan's service area and successfully implementing water saving devices, programs and practices. Through the pooling of funding by Metropolitan's member agencies, Metropolitan is able to engage in regional campaigns with wide-reaching impact. Regional investments in demand management programs, of which conservation is a key part along with local supply programs, benefit all member agencies regardless of project location. These programs help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Incentive-Based Conservation Programs

Conservation Credits Program

In 1988, Metropolitan's Board approved the Water Conservation Credits Program (Credits Program). The Credits Program is similar in concept to the Local Projects Program (LPP). The purpose of the Credits Program is to encourage local water agencies to implement effective water conservation projects through the use of financial incentives. The Credits Program provides financial assistance for water conservation projects that reduce demands on Metropolitan's imported water supplies and require Metropolitan's assistance to be financially feasible.

Initially, the Credits Program provided 50 percent of a member agency's program cost, up to a maximum of $75 per acre-foot of estimated water savings. The $75 Base Conservation Rate was established based Metropolitan's avoided cost of pumping SWP supplies. The Base Conservation Rate has been revisited by Metropolitan's Board and revised twice since 1988, from $75 to $154 per acre-foot in 1990 and from $154 to $195 per acre-foot in 2005.

In fiscal year 2020 Metropolitan processed more than 30,400 rebate applications totaling $18.9 million.

Member Agency Administered Program

Some member agencies also have unique programs within their service areas that provide local rebates that may differ from Metropolitan's regional program. Metropolitan continues to support these local efforts through a member agency administered funding program that adheres to the same funding guidelines as the Credits Program. The Member Agency Administered Program allows member agencies to receive funding for local conservation efforts that supplement, but do not duplicate, the rebates offered through Metropolitan's regional rebate program.

Water Savings Incentive Program

There are numerous commercial entities and industries within Metropolitan's service area that pursue unique savings opportunities that do not fall within the general rebate programs that Metropolitan provides. In 2012, Metropolitan designed the Water Savings Incentive Program (WSIP) to target these unique commercial and industrial projects. In addition to rebates for devices, under this program, Metropolitan provides financial incentives to businesses and industries that created their own custom water efficiency projects. Qualifying custom projects can receive funding for permanent water efficiency changes that result in reduced potable demand.

Non-Incentive Conservation Programs

In addition to its incentive-based conservation programs, Metropolitan also undertakes additional efforts throughout its service area that help achieve water savings without the use of rebates. Metropolitan's non-incentive conservation efforts include:

- residential and professional water efficient landscape training classes
- water audits for large landscapes
- research, development and studies of new water saving technologies
- advertising and outreach campaigns
- community outreach and education programs
- advocacy for legislation, codes, and standards that lead to increased water savings

Current Status and Results of Metropolitan's Conservation Programs

Since 1990, Metropolitan has invested $824 million in conservation rebates that have resulted in a cumulative savings of 3.27 million acre-feet of water. These investments include $450 million in turf removal and other rebates during the last drought which resulted in 175 million square feet of lawn turf removed. During fiscal year 2020, 1.06 million acre-feet of water is estimated to have been conserved. This annual total includes Metropolitan's Conservation Credits Program; code-based conservation achieved through Metropolitan-sponsored legislation; building plumbing codes and ordinances; reduced consumption resulting from changes in water pricing; and pre-1990 device retrofits.

D.6.4 Infeasibility of Accounting Regional Investments in Reduced Reliance Below the Regional Level

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual agency, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member agency's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

D.7 REFERENCES

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2017/12-Dec/Reports/064863458.pdf

http://www.mwdh2o.com/PDF_About_Your_Water/Annual_Achievement_Report.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2016/12-Dec/Reports/064845868.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2012/05%20-%20May/Letters/064774100.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2020/10%20-%20Oct/Letters/10132020%20BOD%209-3%20B-L.pdf

http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2001/10-October/Letters/003909849.pdf

APPENDIX E: SAN FERNANDO WATER RIGHTS JUDGMENT

ATTACHMENT 1

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES,
Plaintiff,
vs.
CITY OF SAN FERNANDO, et al.,
Defendants.

NO. 650079

JUDGMENT

January 26, 1979

ATTACHMENT 1

ORIGINAL FILED

JAN 26 1979

JOHN J. CORCORAN County Clerk

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES,)
)
Plaintiff,)
)
vs.)
)
CITY OF SAN FERNANDO, et al.,)
)
Defendants.)
)

No. 650079

JUDGMENT

There follows by consecutive paging a Table of Contents (pages i. to vi.), Recitals (page 1), Definitions and List of Attachments (pages 1 to 6), Designation of Parties (page 6), Declaration re Geology and Hydrology (pages 6 to 12), Declaration of Rights (pages 12 to 21), Injunctions (pages 21 to 23), Continuing Jurisdiction (page 23), Watermaster (pages 23 to 29), Physical Solution (pages 29 to 34), and Miscellaneous Provisions (pages 34 to 35), and Attachments (pages 36 to 46). Each and all of said several parts constitute a single integrated Judgment herein.

TABLE OF CONTENTS

ATTACHMENTS

ATTACHMENT 1

1. RECITALS

This matter was originally tried before the Honorable Edmund M. Moor, without jury, commencing on March 1, 1966, and concluding with entry of Findings, Conclusions and Judgment on March 14, 1968, after more than 181 trial days. Los Angeles appealed from said judgment and the California Supreme Court, by unanimous opinion, (14 Cal. 3d 199) reversed and remanded the case; after trial of some remaining issues on remand, and consistent with the opinion of the Supreme Court, and pursuant to stipulations, the Court signed and filed Findings of Fact and Conclusions of Law. Good cause thereby appearing,

IT IS ORDERED, ADJUDGED AND DECREED:

2. DEFINITIONS AND ATTACHMENTS

2.1 Definitions of Terms. As used in this Judgment, the following terms shall have the meanings herein set forth:

[1] Basin or Ground Water Basin -- A subsurface geologic formation with defined boundary conditions, containing a ground water reservoir, which is capable of yielding a significant quantity of ground water.

[2] Burbank -- Defendant City of Burbank.

[3] Crescenta Valley -- Defendant Crescenta Valley County Water District.

[4] Colorado Aqueduct -- The aqueduct facilities and system owned and operated by MWD for the importation of water from the Colorado River to its service area.

[5] Deep Rock -- Defendant Evelyn M. Pendleton, dba Deep Rock Artesian Water Company.

[6] Delivered Water -- Water utilized in a water supply distribution system, including reclaimed water.

[7] Eagle Rock Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[8] Extract or Extraction -- To produce ground water, or its production, by pumping or any other means.

[9] Fiscal Year -- July 1 through June 30 of the following calendar year.

[10] Foremost -- Defendant Foremost Foods Company, successor to defendant Sparkletts Drinking Water Corp.

[11] Forest Lawn -- Collectively, defendants Forest Lawn Cemetery Association, Forest Lawn Company, Forest Lawn Memorial-Park Association, and American Security and Fidelity Corporation.

[12] Gage F-57 -- The surface stream gaging station operated by Los Angeles County Flood Control District and situated in Los Angeles Narrows immediately upstream from the intersection of the Los Angeles River and Arroyo Seco, at which point the surface outflow from ULARA is measured.

[13] Glendale -- Defendant City of Glendale.

[14] Ground Water -- Water beneath the surface of the ground and within the zone of saturation.

[15] Hersch & Plumb -- Defendants David and Eleanor A. Hersch and Gerald B. and Lucille Plumb, successors to Wellesley and Duckworth defendants.

[16] Import Return Water -- Ground water derived from percolation attributable to delivered imported water.

[17] Imported Water -- Water used within ULARA, which

is derived from sources outside said watershed. Said term does not include inter-basin transfers wholly within ULARA.

[18] In Lieu Storage -- The act of accumulating ground water in a basin by intentional reduction of extractions of ground water which a party has a right to extract.

[19] Lockheed -- Defendant Lockheed Aircraft Corporation.

[20] Los Angeles -- Plaintiff City of Los Angeles, acting by and through its Department of Water and Power.

[21] Los Angeles Narrows -- The physiographic area northerly of Gage F-57 bounded on the east by the San Rafael and Repetto Hills and on the west by the Elysian Hills, through which all natural outflow of the San Fernando Basin and the Los Angeles River flow en route to the Pacific Ocean.

[22] MWD -- The Metropolitan Water District of Southern California, a public agency of the State of California.

[23] Native Safe Yield -- That portion of the safe yield of a basin derived from native waters.

[24] Native Waters -- Surface and ground waters derived from precipitation within ULARA.

[25] Overdraft -- A condition which exists when the total annual extractions of ground water from a basin exceed its safe yield, and when any temporary surplus has been removed.

[26] Owens-Mono Aqueduct -- The aqueduct facilities owned and operated by Los Angeles for importation to ULARA water from the Owens River and Mono Basin watersheds easterly of the Sierra-Nevada in Central California.

[27] Private Defendants -- Collectively, all of those

defendants who are parties, other than Glendale, Burbank, San Fernando and Crescenta Valley.

[28] Reclaimed Water -- Water which, as a result of processing of waste water, is made suitable for and used for a controlled beneficial use.

[29] Regulatory Storage Capacity -- The volume of storage capacity of San Fernando Basin which is required to regulate the safe yield of the basin, without significant loss, during any long-term base period of water supply.

[30] Rising Water -- The effluent from a ground water basin which appears as surface flow.

[31] Rising Water Outflow -- The quantity of rising water which occurs within a ground water basin and does not rejoin the ground water body or is not captured prior to flowing past a point of discharge from the basin.

[32] Safe Yield -- The maximum quantity of water which can be extracted annually from a ground water basin under a given set of cultural conditions and extraction patterns, based on the long-term supply, without causing a continuing reduction of water in storage.

[33] San Fernando -- Defendant City of San Fernando.

[34] San Fernando Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[35] Sportsman's Lodge -- Defendant Sportsman's Lodge Banquet Association.

[36] Stored Water -- Ground water in a basin consisting of either (1) imported or reclaimed water which is intentionally spread, or (2) safe yield water which is allowed to

accumulate by In Lieu Storage. Said ground waters are distinguished and separately accounted for in a ground water basin, notwithstanding that the same may be physically commingled with other waters in the basin.

[37] Sylmar Basin -- The separate ground water basin underlying the area indicated as such on Attachment "A".

[38] Temporary Surplus -- The amount of ground water which would be required to be removed from a basin in order to avoid waste under safe yield operation.

[39] Toluca Lake -- Defendant Toluca Lake Property Owners Association.

[40] ULARA or Upper Los Angeles River Area -- The Upper Los Angeles River watershed, being the surface drainage area of the Los Angeles River tributary to Gage F-57.

[41] Underlying Pueblo Waters -- Native ground waters in the San Fernando Basin which underlie safe yield and stored waters.

[42] Valhalla -- Collectively, Valhalla Properties, Valhalla Memorial Park, Valhalla Mausoleum Park.

[43] Van de Kamp -- Defendant Van de Kamp's Holland Dutch Bakers, Inc.

[44] Verdugo Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[45] Water Year -- October 1 through September 30 of the following calendar year.

Geographic Names, not herein specifically defined, are used to refer to the places and locations thereof as shown on Attachment "A".

2.2 List of Attachments. There are attached hereto the following documents, which are by this reference incorporated in this Judgment and specifically referred to in the text hereof:

"A" -- Map entitled "Upper Los Angeles River Area", showing Separate Basins therein.

"B" -- List of "Dismissed Parties."

"C" -- List of "Defaulted Parties."

"D" -- List of "Disclaiming Parties."

"E" -- List of "Prior Stipulated Judgments."

"F" -- List of "Stipulated Non-Consumptive or Minimal-Consumptive Use Practices."

"G" -- Map entitled "Place of Use and Service Area of Private Defendants."

"H" -- Map entitled "Public Agency Water Service Areas."

3. PARTIES

3.1 Defaulting and Disclaiming Defendants. Each of the defendants listed on Attachment "C" and Attachment "D" is without any right, title or interest in, or to any claim to extract ground water from ULARA or any of the separate ground water basins therein.

3.2 No Rights Other Than as Herein Declared. No party to this action has any rights in or to the waters of ULARA except to the extent declared herein.

4. DECLARATION RE GEOLOGY AND HYDROLOGY

4.1 Geology.

4.1.1 ULARA. ULARA (or Upper Los Angeles River Area), is the watershed or surface drainage area tributary to the Los Angeles River at Gage F-57. Said watershed contains a total of 329,000 acres, consisting of approximately 123,000 acres of valley fill area and 206,000 acres of hill and mountain area, located primarily in the County of Los Angeles, with a small portion in the County of Ventura. Its boundaries are shown on Attachment "A". The San Gabriel Mountains form the northerly portion of the watershed, and from them two major washes--the Pacoima and the Tujunga--discharge southerly Tujunga Wash traverses the valley fill in a southerly direction and joins the Los Angeles River, which follows an easterly course along the base of the Santa Monica Mountains before it turns south through the Los Angeles Narrows. The waters of Pacoima Wash as and when they flow out of Sylmar Basin are tributary to San Fernando Basin. Lesser tributary washes run from the Simi Hills and the Santa Susana Mountains in the westerly portion of the watershed. Other minor washes, including Verdugo Wash, drain the easterly portion of the watershed which consists of the Verdugo Mountains, the Elysian, San Rafael and Repetto Hills. Each of said washes is a non-perennial stream whose flood flows and rising waters are naturally tributary to the Los Angeles River. The Los Angeles River within ULARA and most of said tributary natural washes have been replaced, and in some instances relocated, by concrete-lined flood control channels. There are 85.3 miles of such channels within ULARA, 62% of which have lined concrete bottoms.

4.1.2 <u>San Fernando Basin</u>. San Fernando Basin is the major ground water basin in ULARA. It underlies 112,047 acres and is located in the area shown as such on Attachment "A".

Boundary conditions of the San Fernando Basin consist on the east and northeast of alluvial contacts with non-waterbearing series along the San Rafael Hills and Verdugo Mountains and the Santa Susana Mountains and Simi Hills on the northwest and west and the Santa Monica Mountains on the south. Water-bearing material in said basin extends to at least 1000 feet below the surface. Rising water outflow from the San Fernando Basin passes its downstream and southerly boundary in the vicinity of Gage F-57, which is located in Los Angeles Narrows about 300 feet upstream from the Figueroa Street (Dayton Street) Bridge. The San Fernando Basin is separated from the Sylmar Basin on the north by the eroded south limb of the Little Tujunga Syncline which causes a break in the ground water surface of about 40 to 50 feet.

4.1.3 Sylmar Basin. Sylmar Basin underlies 5,565 acres and is located in the area shown as such on Attachment "A". Water-bearing material in said basin extends to depths in excess of 12,000 feet below the surface. Boundary conditions of Sylmar Basin consist of the San Gabriel Mountains on the north; a topographic divide in the valley fill between the Mission Hills and San Gabriel Mountains on the west, the Mission Hills on the southwest, Upper Lopez Canyon Saugus Formation on the east, along the east bank of Pacoima Wash, and the eroded south limb of the Little Tujunga Syncline on the south.

4.1.4 Verdugo Basin. Verdugo Basin underlies 4,400 acres and is located in the area shown as such on Attachment "A". Boundary conditions of Verdugo Basin consist of the San Gabriel Mountains on the north, the Verdugo Mountains on the south and southwest, the San Rafael Hills on the southeast and the topographic divide on the east between the drainage area that is tributary to the Tujunga Wash to the west and Verdugo Wash to the east, the ground water divide on the west between Monk Hill-Raymond Basin and the Verdugo Basin on the east and a submerged dam constructed at the mouth of Verdugo Canyon on the south.

4.1.5 Eagle Rock Basin. Eagle Rock Basin underlies 807 acres and is located in the area shown as such on Attachment "A". Boundary conditions of Eagle Rock Basin consist of the San Rafael Hills on the north and west and the Repetto Hills on the east and south with a small alluvial area to the southeast consisting of a topographic divide.

4.2 Hydrology.

4.2.1 Water Supply. The water supply of ULARA consists of native waters, derived from precipitation on the valley floor and runoff from the hill and mountain areas, and of imported water from outside the watershed. The major source of imported water has been from the Owens-Mono Aqueduct, but additional supplies have been and are now being imported through MWD from its Colorado Aqueduct and the State Aqueduct.

4.2.2 Ground Water Movement. The major water-bearing formation in ULARA is the valley fill material bounded by hills and mountains which surround it. Topographically, the valley-fill area has a generally uniform grade in a southerly and easterly direction with the slope gradually decreasing from the base of the hills and mountains to the surface drainage outlet at Gage F-57. The valley fill material is a heterogeneous mixture of clays, silts, sand and gravel laid down as alluvium. The valley fill is of greatest permeability along and easterly of Pacoima and Tujunga Washes and generally throughout the eastern portion of the valley fill area, except in the vicinity of Glendale where it is of lesser permeability. Ground water occurs mainly within the valley fill, with only negligible amounts occurring in hill and mountain areas. There is no significant ground water movement from the hill and mountain formations into the valley fill. Available geologic data do not indicate that there are any sources of native ground water other than those derived from precipitation. Ground water movement in the valley fill generally follows the surface topography and drainage except where geologic or man-made impediments occur or where the natural flow has been modified by extensive pumping.

4.2.3 Separate Ground Water Basins. The physical and geologic characteristics of each of the ground water basins, Eagle Rock, Sylmar, Verdugo and San Fernando, cause impediments to inter-basin ground water flow whereby there is created separate underground reservoirs. Each of said basins contains a common source of water supply to parties extracting ground water from each of said basins. The amount of underflow from Sylmar Basin, Verdugo Basin and Eagle Rock Basin to San Fernando Basin is relatively small, and on the average has been approximately 540 acre feet per year from the Sylmar Basin; 80 acre feet per year from Verdugo Basin; and 50 acre feet per year from Eagle Rock Basin. Each has physiographic, geologic and hydrologic differences, one from the other, and each meets the hydrologic definition of "basin." The extractions of water in the respective basins affect the other water users within that basin but do not significantly or materially affect the ground water levels in any of the other basins. The underground reservoirs of Eagle Rock, Verdugo and Sylmar Basins are independent of one another and of the San Fernando Basin.

4.2.4 <u>Safe Yield and Native Safe Yield</u>. The safe yield and native safe yield, stated in acre feet, of the three largest basins for the year 1964-65 was as follows:

Basin	Safe Yield	Native Safe Yield
San Fernando	90,680	43,660
Sylmar	6,210	3,850
Verdugo	7,150	3,590

The safe yield of Eagle Rock Basin is derived from imported water delivered by Los Angeles. There is no measurable native safe yield.

4.2.5 <u>Separate Basins -- Separate Rights</u>. The rights of the parties to extract ground water within ULARA are separate and distinct as within each of the several ground water basins within said watershed.

4.2.6 <u>Hydrologic Condition of Basins</u>. The several basins within ULARA are in varying hydrologic conditions, which result in different legal consequences.

4.2.6.1 <u>San Fernando Basin</u>. The first full year of overdraft in San Fernando Basin was 1954-55. It remained in overdraft continuously until 1968, when an injunction herein became effective. Thereafter, the basin was placed on safe yield operation. There is no surplus ground water available for appropriation or overlying use from San Fernando Basin.

4.2.6.2 Sylmar Basin. Sylmar Basin is not in overdraft. There remains safe yield over and above the present reasonable beneficial overlying uses, from which safe yield the appropriative rights of Los Angeles and San Fernando may be and have been exercised.

4.2.6.3 Verdugo Basin. Verdugo Basin was in overdraft for more than five consecutive years prior to 1968. Said basin is not currently in overdraft, due to decreased extractions by Glendale and Crescenta Valley on account of poor water quality. However, the combined appropriative and prescriptive rights of Glendale and Crescenta Valley are equivalent to the safe yield of the Basin. No private overlying or appropriative rights exist in Verdugo Basin.

4.2.6.4 Eagle Rock Basin. The only measurable water supply to Eagle Rock Basin is import return water by reason of importations by Los Angeles. Extractions by Foremost and Deep Rock under the prior stipulated judgments have utilized the safe yield of Eagle Rock Basin, and have maintained hydrologic equilibrium therein.

5. DECLARATION OF RIGHTS

5.1 Right to Native Waters.

5.1.1 Los Angeles River and San Fernando Basin.

5.1.1.1 Los Angeles' Pueblo Right. Los Angeles, as the successor to all rights, claims and powers of the Spanish Pueblo de Los Angeles in regard to water rights, is the owner of a prior and paramount pueblo right to the surface waters of the Los Angeles River and the native ground waters of San Fernando Basin to meet its reasonable beneficial needs and for its inhabitants.

5.1.1.2 Extent of Pueblo Right. Pursuant to said pueblo right, Los Angeles is entitled to satisfy its needs and those of its inhabitants within its boundaries as from time to time modified. Water which is in fact used for pueblo right purposes is and shall be deemed needed for such purposes.

5.1.1.3 Pueblo Right -- Nature and Priority of Exercise. The pueblo right of Los Angeles is a prior and paramount right to all of the surface waters of the Los Angeles River, and native ground water in San Fernando Basin, to the extent of the reasonable needs and uses of Los Angeles and its inhabitants throughout the corporate area of Los Angeles, as its boundaries may exist from time to time. To the extent that the Basin contains native waters and imported waters, it is presumed that the first water extracted by Los Angeles in any water year is pursuant to its pueblo right, up to the amount of the native safe yield. The next extractions by Los Angeles in any year are deemed to be from import return water, followed by stored water, to the full extent of Los Angeles' right to such import return water and stored water. In the event of need to meet water requirements of its inhabitants, Los Angeles has the additional right, pursuant to its pueblo right, withdraw temporarily from storage Underlying Pueblo Waters, subject to an obligation to replace such water as soon as practical.

5.1.1.4 Rights of Other Parties. No other party to this action has any right in or to the surface waters of the Los Angeles River or the native safe yield of the San Fernando Basin.

5.1.2 Sylmar Basin Rights.

5.1.2.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground waters in Sylmar Basin.

5.1.2.2 Overlying Rights. Defendants Moordigian and Hersch & Plumb own lands overlying Sylmar Basin and have a prior correlative right to extract native waters from said Basin for reasonable beneficial uses on their said overlying lands. Said right is appurtenant to said overlying lands and water extracted pursuant thereto may not be exported from said lands nor can said right be transferred or assigned separate and apart from said overlying lands.

5.1.2.3 Appropriative Rights of San Fernando and Los Angeles. San Fernando and Los Angeles own appropriative rights, of equal priority, to extract and put to reasonable beneficial use for the needs of said cities and their inhabitants, native waters of the Sylmar Basin in excess of the exercised reasonable beneficial needs of overlying users. Said appropriative rights are:

San Fernando	3,580 acre feet
Los Angeles	1,560 acre feet.

5.1.2.4 <u>No Prescription</u>. The Sylmar Basin is not presently in a state of overdraft and no rights by prescription exist in said Basin against any overlying or appropriative water user.

5.1.2.5 <u>Other Parties</u>. No other party to this action owns or possesses any right to extract native ground waters from the Sylmar Basin.

5.1.3 <u>Verdugo Basin Rights</u>.

5.1.3.1 <u>No Pueblo Rights</u>. The pueblo right of Los Angeles does not extend to or include ground water in Verdugo Basin.

5.1.3.2 <u>Prescriptive Rights of Glendale and Crescenta Valley</u>. Glendale and Crescenta Valley own prescriptive rights as against each other and against all private overlying or appropriative parties in the Verdugo Basin to extract, with equal priority, the following quantities of water from the combined safe yield of native and imported waters in Verdugo Basin:

Glendale	3,856 acre feet
Crescenta Valley	3,294 acre feet.

5.1.3.3 <u>Other Parties</u>. No other party to this action owns or possesses any right to extract native ground waters from the Verdugo Basin.

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5.1.4 Eagle Rock Basin Rights.

5.1.4.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground water in Eagle Rock Basin.

5.1.4.2 No Rights in Native Waters. The Eagle Rock Basin has no significant or measurable native safe yield and no parties have or assert any right or claim to native waters in said Basin.

5.2 Rights to Imported Waters.

5.2.1 San Fernando Basin Rights.

5.2.1.1 Rights to Recapture Import Return Water. Los Angeles, Glendale, Burbank and San Fernando have each caused imported waters to be brought into ULARA and to be delivered to lands overlying the San Fernando Basin, with the result that percolation and return flow of such delivered water has caused imported waters to become a part of the safe yield of San Fernando Basin. Each of said parties has a right to extract from San Fernando Basin that portion of the safe yield of the Basin attributable to such import return waters.

5.2.1.2 Rights to Store and Recapture Stored Water. Los Angeles has heretofore spread imported water directly in San Fernando Basin. Los Angeles, Glendale, Burbank and San Fernando each have rights to store water in San Fernando Basin by direct spreading or in lieu practices. To the extent of any future spreading or in lieu storage of import water or reclaimed water by Los Angeles, Glendale, Burbank or San Fernando, the party causing said water to be so stored shall have a right to extract an equivalent amount of ground water from San Fernando Basin. The right to extract waters attributable to such storage practices is an undivided right to a quantity of water in San Fernando Basin equal to the amount of such Stored Water to the credit of any party, as reflected in Watermaster records.

5.2.1.3 Calculation of Import Return Water and Stored Water Credits. The extraction rights of Los Angeles, Glendale, Burbank and San Fernando in San Fernando Basin in any year, insofar as such rights are based upon import return water, shall only extend to the amount of any accumulated import return water credit of such party by reason of imported water delivered after September 30, 1977. The annual credit for such import return water shall be calculated by Watermaster based upon the amount of delivered water during the preceding water year, as follows:

Los Angeles:	20.8% of all delivered water (including reclaimed water) to valley fill lands of San Fernando Basin.
San Fernando:	26.3% of all imported and reclaimed water delivered to valley-fill lands of San Fernando Basin.
Burbank:	20.0% of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas.

Glendale: 20.0% of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas (i.e., total delivered water, [including reclaimed water], less 105% of total sales by Glendale in Verdugo Basin and its tributary hills).

In calculating Stored Water credit, by reason of direct spreading of imported or reclaimed water, Watermaster shall assume that 100% of such spread water reached the ground water in the year spread.

5.2.1.4 Cummulative Import Return Water Credits. Any import return water which is not extracted in a given water year shall be carried over, separately accounted for, and maintained as a cummulative credit for purposes of future extractions.

5.2.1.5 Overextractions. In addition to extractions of stored water, Glendale, Burbank or San Fernando may, in any water year, extract from San Fernando Basin an amount not exceeding 10% of such party's last annual credit for import return water, subject, however, to an obligation to replace such overextraction by reduced extractions during the next succeeding water year. Any such overextraction which is not so replaced shall constitute physical solution water, which shall be deemed to have been extracted in said subsequent water year.

5.2.1.6 Private Defendant. No private defendant is entitled to extract water from the San Fernando Basin on account of the importation of water thereto by overlying public entities.

5.2.2 Sylmar Basin Rights.

5.2.2.1 Rights to Recapture Import Return Waters. Los Angeles and San Fernando have caused imported waters to be brought into ULARA and delivered to lands overlying the Sylmar Basin with the result that percolation and return flow of such delivered water has caused imported waters to become a part of the safe yield of Sylmar Basin. Los Angeles and San Fernando are entitled to recover from Sylmar Basin such imported return waters. In calculating the annual entitlement to recapture such import return water, Los Angeles and San Fernando shall be entitled to 35.7% of the preceding water year's imported water delivered by such party to lands overlying Sylmar Basin. Thus, by way of example, in 1976-77, Los Angeles was entitled to extract 2370 acre feet of ground water from Sylmar Basin, based on delivery to lands overlying said Basin of 6640 acre feet during 1975-76. The quantity of San Fernando's imported water to, and the return flow therefrom, in the Sylmar Basin in the past has been of such minimal quantities that it has not been calculated.

5.2.2.2 Rights to Store and Recapture Stored Water. Los Angeles and San Fernando each have the right to store water in Sylmar Basin equivalent to their rights in San Fernando Basin under paragraph 5.2.1.2 hereof.

5.2.2.3 Carry Over. Said right to recapture stored water, import return water and other safe yield waters to which a party is entitled, if not exercised in a given year, can be carried over for not to exceed five years, if the underflow through Sylmar Notch does not exceed 400 acre feet per year.

5.2.2.4 Private Defendants. No private defendant is entitled to extract water from within the Sylmar Basin on account of the importation of water thereto by overlying public entities.

5.2.3 Verdugo Basin Rights.

5.2.3.1 Glendale and Crescenta Valley. Glendale and Crescenta Valley own appropriative and prescriptive rights in and to the total safe yield of Verdugo Basin, without regard as to the portions thereof derived from native water and from delivered imported waters, notwithstanding that both of said parties have caused waters to be imported and delivered on lands overlying Verdugo Basin. Said aggregate rights are as declared in Paragraph 5.1.3.2 of these Conclusions.

5.2.3.2 Los Angeles. Los Angeles may have a right to recapture its import return waters by reason of delivered import water in the Basin, based upon imports during and after water year 1977-78, upon application to Watermaster not later than the year following such import and on subsequent order after hearing by the Court.

5.2.3.3 Private Defendants. No private defendant, as such, is entitled to extract water from within the Verdugo Basin on account of the importation of water thereto by overlying public entities.

5.2.4 Eagle Rock Basin Rights.

5.2.4.1 Los Angeles. Los Angeles has caused imported water to be delivered for use on lands overlying Eagle Rock Basin and return flow from said delivered imported water constitutes the entire safe yield of Eagle Rock Basin. Los Angeles has the right to extract or cause to be extracted the entire safe yield of Eagle Rock Basin.

5.2.4.2 Private Defendants. No private defendants have a right to extract water from within Eagle Rock Basin, except pursuant to the physical solution herein.

6. INJUNCTIONS

Each of the parties named or referred to in this Part 6, its officers, agents, employees and officials is, and they are, hereby ENJOINED and RESTRAINED from doing or causing to be done any of the acts herein specified:

6.1 Each and Every Defendant -- from diverting the surface waters of the Los Angeles River or extracting the native waters of SAN FERNANDO BASIN, or in any manner interfering with the prior and paramount pueblo right of Los Angeles in and to such waters, except pursuant to the physical solution herein decreed.

6.2 Each and Every Private Defendant -- from extracting ground water from the SAN FERNANDO, VERDUGO, or EAGLE ROCK BASINS, except pursuant to physical solution provisions hereof.

6.3 Defaulting and Disclaiming Parties (listed in Attachments "C" and "D") -- from diverting or extracting water within ULARA, except pursuant to the physical solution herein decreed.

6.4 Glendale -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution; and from extracting water from VERDUGO BASIN in excess of its appropriative and prescriptive right declared herein.

6.5 Burbank -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution decreed herein.

6.6 San Fernando -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution herein decreed.

6.7 Crescenta Valley -- from extracting ground water from VERDUGO BASIN in any year in excess of its appropriative and prescriptive right declared herein.

6.8 Los Angeles -- from extracting ground water from SAN FERNANDO BASIN in any year in excess of the native safe yield, plus any import return water credit and stored water credit of said city; provided, that where the needs of Los Angeles require the extraction of Underlying Pueblo Waters, Los Angeles may extract such water subject to an obligation to replace such excess as soon as practical; and from extracting ground water from VERDUGO BASIN in excess of any credit for import return water which Los Angeles may acquire by reason of delivery of imported water for use overlying said basin, as hereinafter confirmed on application to Watermaster and by subsequent order of the Court.

6.9 Non-consumptive and Minimal Consumptive Use Parties. The parties listed in Attachment "F" are enjoined from extracting water from San Fernando Basin, except in accordance with practices specified in Attachment "F", or pursuant to the physical solution herein decreed.

7. CONTINUING JURISDICTION

7.1 Jurisdiction Reserved. Full jurisdiction, power and authority are retained by and reserved to the Court for purposes of enabling the Court upon application of any party or of the Watermaster by motion and upon at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate, for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment or to add to the provisions thereof consistent with the rights herein decreed; provided, however, that no such modification, amendment or amplification shall result in a change in the provisions of Section 5.2.1.3 or 9.2.1 hereof.

8. WATERMASTER

8.1 Designation and Appointment.

8.1.1 Watermaster Qualification and Appointment. A qualified hydrologist, acceptable to all active public agency parties hereto, will be appointed by subsequent order of the Court to assist the Court in its administration and enforcement of the provisions of this Judgment and any subsequent orders of the Court entered pursuant to the Court's continuing jurisdiction. Such Watermaster shall serve at the pleasure of the Court, but may be removed or replaced on motion of any party after hearing and showing of good cause.

8.2 Powers and Duties.

8.2.1 Scope. Subject to the continuing supervision and control of the Court, Watermaster shall exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

8.2.2 Requirement for Reports, Information and Records. Watermaster may require any party 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.

8.2.3 Requirement of Measuring Devices. Watermaster shall require all parties owning or operating any facilities for extraction of ground water from ULARA to install and maintain at all times in good working order, at such party's own expense, appropriate meters or other measuring devices satisfactory to the Watermaster.

8.2.4 Inspection by Watermaster. Watermaster shall make inspections of (a) ground water extraction facilities and measuring devices of any party, and (b) water use practices by any party under physical solution conditions, at such times and as often as may be reasonable under the circumstances to verify reported data and practices of such party. Watermaster shall also identify and report on any new or proposed new ground water extractions by any party or non-party.

8.2.5 Policies and Procedures. Watermaster shall, with the advice and consent of the Administrative Committee, adopt and amend from time to time Policies and Procedures as may be reasonably necessary to guide Watermaster in performance of its duties, powers and responsibilities under the provisions of this judgment.

8.2.6 Data Collection. Watermaster shall collect and verify data relative to conditions of ULARA and its ground water basins from the parties and one or more other governmental agencies. Where necessary, and upon approval of the Administrative Committee, Watermaster may develop supplemental data.

8.2.7 Cooperation With Other Agencies. Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts (including any party) to secure or exchange data to the end that the purpose of this Judgment, including its physical solution, may be fully and economically carried out.

8.2.8 Accounting for Non-consumptive Use. Watermaster shall calculate and report annually the non-consumptive and consumptive uses of extracted ground water by each party listed in Attachment "F."

8.2.9 Accounting for Accumulated Import Return Water and Stored Water. Watermaster shall record and verify additions, extractions and losses and maintain an annual and cummulative account of all (a) stored water and (b) import return water in San Fernando Basin. Calculation of losses attributable to Stored Water shall be approved by the Administrative Committee or by subsequent order of the Court. For purposes of such accounting, extractions in any water year by

Glendale, Burbank or San Fernando shall be assumed to be first from accumulated import return water, second from stored water, and finally pursuant to physical solution; provided, that any such city may, by written notice of intent to Watermaster, alter said priority of extractions as between import return water and stored water.

8.2.10 Recalculation of Safe Yield. Upon request of the Administrative Committee, or on motion of any party and subsequent Court order, Watermaster shall recalculate safe yield of any basin within ULARA. If there has been a material long-term change in storage over a base period (excluding any effects of stored water) in San Fernando Basin the safe yield shall be adjusted by making a corresponding change in native safe yield of the Basin.

8.2.11 Watermaster Report. Watermaster shall prepare annually and (after review and approval by Administrative Committee) cause to be served on all active parties, on or before May 1, a report of hydrologic conditions and Watermaster activities within ULARA during the preceding water year. Watermaster's annual report shall contain such information as may be requested by the Administrative Committee, required by Watermaster Policies and Procedures or specified by subsequent order of this Court.

8.2.12 Active Party List. Watermaster shall maintain at all times a current list of active parties and their addresses.

8.3 Administrative Committee.

8.3.1 Committee to be Formed. An Administrative Committee shall be formed to advise with, request or consent to, and review actions of Watermaster. Said Administrative Committee shall be composed of one representative of each party having a right to extract ground water from ULARA, apart from the physical solution. Any such party not desiring to participate in such committee shall so advise Watermaster in writing.

8.3.2 Organization and Voting. The Administrative Committee shall organize and adopt appropriate rules and regulations to be included in Watermaster Policies and Procedures. Action of the Administrative Committee shall be by unanimous vote of its members, or of the members affected in the case of an action which affects one or more basins but less than all of ULARA. In the event of inability of the Committee to reach a unanimous position, the matter may, at the request of Watermaster or any party, be referred to the Court for resolution by subsequent order after notice and hearing.

8.3.3 Function and Powers. The Administrative Committee shall be consulted by Watermaster and shall request or approve all discretionary Watermaster determinations. In the event of disagreement between Watermaster and the Administrative Committee, the matter shall be submitted to the Court for review and resolution.

8.4 Watermaster Budget and Assessments.

8.4.1 Watermaster's Proposed Budget. Watermaster shall, on or before May 1, prepare and submit to the Administrative Committee a budget for the ensuing water year. The budget shall be determined for each basin separately and allocated between the separate ground water basins. The total for each basin shall be allocated between the public agencies in proportion to their use of ground water from such basin during the preceding water year.

8.4.2 Objections and Review. Any party who objects to the proposed budget, or to such party's allocable share thereof, may apply to the Court within thirty (30) days of receipt of the proposed budget from Watermaster for review and modification. Any such objection shall be duly noticed to all interested parties and heard within thirty (30) days of notice.

8.4.3 Notice of Assessment. After thirty (30) days from delivery of Watermaster's proposed budget, or after the order of Court settling any objections thereto, Watermaster shall serve notice on all parties to be assessed of the amount of assessment and the required payment schedule.

8.4.4 Payment. All assessments for Watermaster expenses shall be payable on the dates designated in the notice of assessment.

8.5 Review of Watermaster Activities.

8.5.1 Review Procedures. All actions of Watermaster (other than budget and assessment matters, which are provided for in Paragraph 8.4.2) shall be subject to review by the Court on its own motion or on motion by any party, as follows:

8.5.1.1 Noticed Motion. Any party may, by a regularly noticed motion, apply to the Court for review of any Watermaster's action. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties.

8.5.1.2 De Novo Nature of Proceedings. Upon the filing of any such motion, the Court shall require the moving party to notify the active parties of a date for taking evidence and argument, and on the date so designated shall review de novo the question at issue. Watermaster's findings or decision, if any, may be received in evidence at said hearing, but shall not constitute presumptive or prima facie proof of any fact in issue.

8.5.1.3 Decision. The decision of the Court in such proceeding shall be an appealable supplemental order in this case. When the same is final, it shall be binding upon the Watermaster and all parties.

9. PHYSICAL SOLUTION

9.1 Circumstances Indicating Need for Physical Solution. During the period between 1913 and 1955, when there existed temporary surplus waters in the San Fernando Basin, overlying cities and private overlying landowners undertook to install and operate water extraction, storage and transmission facilities to utilize such temporary surplus waters. If the injunction against interference with the prior and paramount rights of Los Angeles to the waters of the San Fernando and Eagle Rock Basins were strictly enforced, the value and utility of those water systems and facilities would be lost or impaired. It is appropriate to allow continued limited extraction from the San Fernando and Eagle Rock Basins by parties other than Los Angeles, subject to assurance that Los Angeles will be compensated for any cost, expense or loss incurred as a result thereof.

9.2 Prior Stipulated Judgments. Several defendants heretofore entered into separate stipulated judgments herein, during the period June, 1958 to November, 1965, each of which judgments was subject to the Court's continuing jurisdiction. Without modification of the substantive terms of said prior judgments, the same are categorized and merged into this judgment and superseded hereby in the exercise of the Court's continuing jurisdiction, as follows:

9.2.1 Eagle Rock Basin Parties. Stipulating defendants Foremost and Deep Rock have extracted water from Eagle Rock Basin, whose entire safe yield consist of import return waters of Los Angeles. Said parties may continue to extract water from Eagle Rock Basin to supply their bottled drinking water requirements upon filing all required reports on said extraction with Watermaster and Los Angeles and paying Los Angeles annually an amount equal to $21.78 per acre foot for the first 200 acre feet, and $39.20 per acre foot for any additional water extracted in any water year.

9.2.2 Non-consumptive or Minimal-consumptive Operations. Certain stipulating defendants extract water from San Fernando Basin for uses which are either non-consumptive or have a minimal consumptive impact. Each of said defendants who have a minimal consumptive impact has a connection to the City of Los Angeles water system and purchases annually an amount of water at least equivalent to the consumptive loss of extracted ground water. Said defendants are:

Non-Consumptive

Walt Disney Productions
Sears, Roebuck & Co.

Minimal-Consumptive

Conrock Co., for itself and as successor to California
Materials Co.; Constance Ray White and Lee L. White;
Mary L. Akmadzich and Peter J. Akmadzich
Livingston Rock & Gravel, for itself and as successor
to Los Angeles Land & Water Co.

The nature of each said defendant's water use practices is described in Attachment "F". Subject to required reports to and inspections by Watermaster, each said defendant may continue extractions for said purposes so long as in any year such party continues such non-consumptive or minimal-consumptive use practices.

9.2.3 Abandoned Operations. The following stipulating defendants have ceased extracting water from San Fernando Basin and no further need exists for physical solution in their behalf:

Knickerbocker Plastic Company, Inc.
Carnation Company
Hidden Hills Mutual Water Company
Southern Pacific Railroad Co.
Pacific Fruit Express Co.

9.3 Private Defendants. There are private defendants who installed during the years of temporary surplus relatively substantial facilities to extract and utilize ground waters of San Fernando Basin. Said defendants may continue their extractions for consumptive use up to the indicated annual quantities upon payment of compensation to the appropriate city wherein their use of water is principally located, on the basis of the following physical solution:

9.3.1 Private Defendants and Appropriate Cities. Said private defendants and the cities to which their said extractions shall be charged and to which physical solution payment shall be made are:

			Annual Quantities (acre feet)
Los Angeles	-	Toluca Lake	100
		Sportsman's Lodge	25
		Van de Kamp	120
Glendale	-	Forest Lawn	400
		Southern Service Co.	75
Burbank	-	Valhalla	300
		Lockheed	25

Provided that said private defendants shall not develop, install or operate new wells or other facilities which will increase existing extraction capacities.

9.3.2 Reports and Accounting. All extractions pursuant to this physical solution shall be subject to such reasonable reports and inspections as may be required by Watermaster.

9.3.3 Payment. Water extracted pursuant hereto shall be compensated for by annual payment to Los Angeles, and as agreed upon pursuant to paragraph 9.3.3.2 to Glendale and Burbank, thirty days from day of notice by Watermaster, on the following basis:

9.3.3.1 Los Angeles. An amount equal to what such party would have paid had water been delivered from the distribution system of Los Angeles, less the average energy cost of extraction of ground water by Los Angeles from San Fernando.

9.3.3.2 Glendale or Burbank. An amount equal to the sum of the amount payable to Los Angeles under paragraph 9.4 hereof and any additional charges or conditions agreed upon by either such city and any private defendant.

9.4 <u>Glendale and Burbank</u>. Glendale and Burbank have each installed, during said years of temporary surplus, substantial facilities to extract and utilize waters of the San Fernando Basin. In addition to the use of such facilities to recover import return water, the distribution facilities of such cities can be most efficiently utilized by relying upon the San Fernando Basin for peaking supplies in order to reduce the need for extensive new surface storage. Glendale and Burbank may extract annual quantities of ground water from the San Fernando Basin, in addition to their rights to import return water or stored water, as heretofore declared, in quantities up to:

Glendale	5,500 acre feet
Burbank	4,200 acre feet;

provided, that said cities shall compensate Los Angeles annually for any such excess extractions over and above their declared rights at a rate per acre foot equal to the average MWD price for municipal and industrial water delivered to Los Angeles during the fiscal year, less the average energy cost of extraction of ground water by Los Angeles from San Fernando Basin during the preceding fiscal year. Provided, further, that ground water extracted by Forest Lawn and Southern Service Co. shall be included in the amount taken by Glendale, and the amount extracted by Valhalla and Lockheed shall be included in the amount taken by Burbank. All water taken by Glendale or Burbank pursuant hereto shall be charged against Los Angeles' rights in the year of such extractions.

In the event of emergency, and upon stipulation or motion and subsequent order of the Court, said quantities may be enlarged in any year.

9.5 San Fernando. San Fernando delivers imported water on lands overlying the San Fernando Basin, by reason of which said city has a right to recover import return water. San Fernando does not have water extraction facilities in the San Fernando Basin, nor would it be economically or hydrologically useful for such facilities to be installed. Both San Fernando and Los Angeles have decreed appropriative rights and extraction facilities in the Sylmar Basin. San Fernando may extract ground water from the Sylmar Basin in a quantity sufficient to utilize its San Fernando Basin import return water credit, and Los Angeles shall reduce its Sylmar Basin extractions by an equivalent amount and receive an offsetting entitlement for additional San Fernando Basin extractions.

9.6 Effective Date. This physical solution shall be effective on October 1, 1978, based upon extractions during water year 1978-79.

10. MISCELLANEOUS PROVISIONS

10.1 Designation of Address for Notice and Service. Each party shall designate the name and address to be used for purposes of all subsequent notices and service herein by a separate designation to be filed with Watermaster within thirty (30) days after Notice of Entry of Judgment has been served. Said designation may be changed from time to time by filing a written notice of such change with the Watermaster. Any party desiring to be relieved of receiving notices of Watermaster activity may file a waiver of notice on a form to be provided by Watermaster. Thereafter such party shall be removed from the Active Party list. For purposes of service on any party or active party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to such party or active party under or pursuant to the Judgment, such service shall be made personally or by deposit in the United States mail, first class, postage prepaid, addressed to the designee and at the address in the latest designation filed by such party or active party.

10.2 Notice of Change in Hydrologic Condition -- Sylmar Basin. If Sylmar Basin shall hereafter be in a condition of overdraft due to increased or concurrent appropriations by Los Angeles and San Fernando, Watermaster shall so notify the Court and parties concerned, and notice of such overdraft and the adverse effect thereof on private overlying rights shall be given by said cities as prescribed by subsequent order of the Court, after notice and hearing.

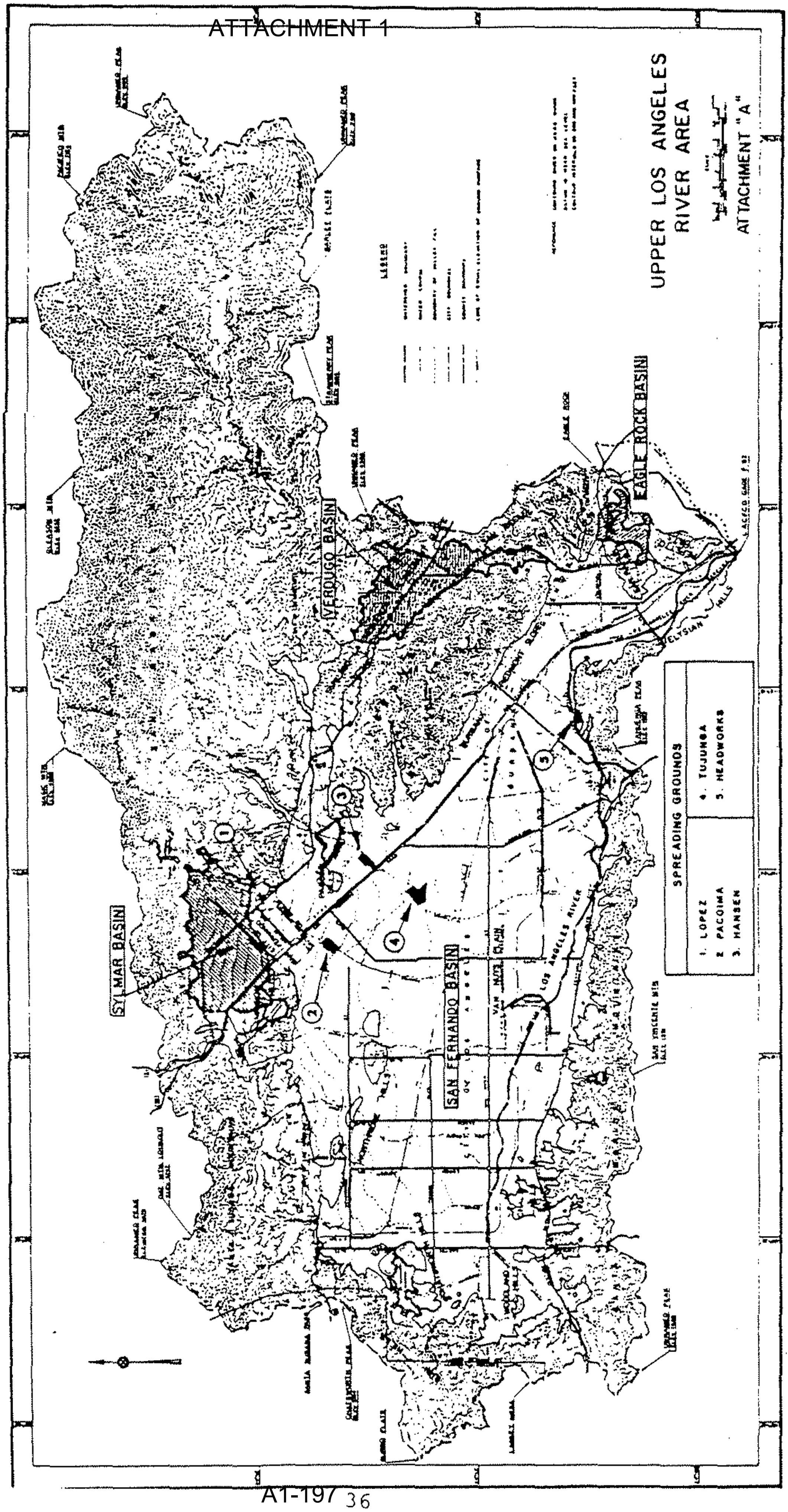
10.3 Judgment Binding on Successors. This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but also upon their respective heirs, executors, administrators, successors, assigns, lessees and licensees and upon the agents, employees and attorneys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

10.4 Costs. Ordinary court costs shall be borne by each party, and reference costs shall be borne as heretofore allocated and paid.

DATED: Jan 26, 1979.

Judge of the Superior Court

ATTACHMENT 1



ATTACHMENT "B"
LIST OF DISMISSED PARTIES

Adams, Catherine

Adair, Leo W.

Anderson, Jesse E.

Anderson, Elizabeth A.

Anderson, Leland H.

Anderson, Bessie E.

Bank of America, N.T. & S.A., (Trustee)

Becker, Barbara

Beatrice Foods Company

Becker, Bert

Bishop, Elfreda M.

Bishop, William E.

Block, Leonard W.

Block, Margery J.

Burbank C. U. School District

Busk, Rodney E.

California, State of

California Trust Company, (Trustee)

California Trust Company, Trustee for First National Bank of Glendale

Citizens N.T.S. Bank of L.A., Trustee of M. M. Crenshaw

Citizens National Trust & Savings Bank of Los Angeles

Citizens National Trust & Savings Bank of Los Angeles, Trustee, Deed of Trust 3724

Color Corporation of America

Corporation of America

Corporation of America, Trustee for Bank of America 32

Doe Corporation, 10-50

Doe 18-500

Duckworth, John W., (Estate of)

Equitable Life Assurance Society of the United States

Fidelity Federal Savings & Loan Association

Fitz-Patrick, Ada H.

Fitz-Patrick, C. C.

Frank X. Enderle, Inc., Ltd.

George, Florence H.

George, Elton

Ghiglia, Frank P.

Givan, Amelia (Deceased)

Glendale Junior College District of Los Angeles County

Glendale Unified School District

Glenhaven Memorial Park, Inc.

Griffith, Howard Barton

Handorf, August V., Heirs of

Hanna, George

Hicks, Forrest W., Executor of Estate of (California Bank)

Houston-Fearless Corp., The

Industrial Fuel Supply Co.

Intervalley Savings & Loan Association

Julius, Adenia C.

Julius, Louis A.

Kaesemeyer, Edna M.

Karagozian, Charles

Kates, Nathan as Co-Executor, Estate of Duckworth

Kelley, June

Kelley, Victor H.

Kiener, Harry, Deceased, Heirs of

Knupp, Guy, Trustee

Landes, Clara Bartlett

Lentz, Richard

Los Angeles County Flood Control District

Los Angeles Land and Water Company

Los Angeles Trust and Savings Deposit Company (Safe)

ATTACHMENT 1

Los Angeles Safe Deposit Company, Trustee for Security First National Bank of Los Angeles

Los Angeles Trust and Safe Deposit Company, Trustee for H. Kiener

Lytle, Lydia L.

Massachusetts Mutual Life Insurance Company

Mahannah, E. E.

Mahannah, Hazel E.

M.C.A., Inc.

Mangan, Blanche M.

Mangan, Nicholas

McDougal, Murray

McDougal, Marian Y.

Mellenthin, Helen Louise

Mellenthin, William

Metropolitan Life Insurance Company

Morgan, Kenneth H.

Morgan, Anne

Mulholland Orchard Company

Mutual Life Insurance Company of New York

Northwestern Mutual Life Insurance Company

Oakmont Club

Oakwood Cemetery Association

Pasadena Savings & Loan Association

Pagliai, Bruno

Pacific Lighting Corporation

Pierce Brothers Mortuary

Premier Laundry Company, Inc.

Pur-o-Spring Water Company

Renfrow, Mary Mildred

Renfrow, Pleasant Thomas

Reinert, H. C.

Reinert, Lauretta

Richardson, Helen I.

Richardson, William L.

Security First National Bank of Los Angeles, Trustee

Security First National Bank of Los Angeles, Trustee for L. Schwaiger, etc.

Smith, T. A.

Smith, Sidney, Estate of, F. Small, Administrator

Southern California Service Corp., Trustee for Verdugo Savings and Loan Association

Sylmar Properties Inc.

Title Insurance and Trust Co., Trustee for Metropolitan Life Insurance Company, I. 1570

Title Insurance and Trust Co., Trustee for Western Mortgage Company

Title Guarantee & Trustee Company, Trustee

Title Insurance & Trust Company, Trustee for C. Fitz-Patrick

Title Insurance & Trust Company, Trustee for Intervalley Savings and Loan Association, 1114

Title Insurance & Trust Company, for Fidelity Savings & Loan Association

Title Insurance & Trust Company for Equitable Life Assurance Society, U.S.

Union Bank & Trust Company of Los Angeles Trustee for B. Becker, et al.

Valliant, Grace C.

Verdugo Savings & Loan Association

Warner Brothers Pictures, Inc.

Warner Ranch Company, Inc.

Walleck, Henry L., as Executor of the Estate of A. Givan

Western Mortgage Company

Wheeland, H. W.

Wilcox, Ray C.

Wise, Constance Julia

Wise, Robert Taylor

Young, Donald M.

Young, Marcia S.

ATTACHMENT "C"
LIST OF DEFAULTED PARTIES

Aetna Life Insurance Company

American Savings & Loan Association

Babikian, Helen

Bank of America, N.T. & S.A., Trustee

Bannan, B. A.

Bannan, Clotilde R.

Berkemeyer, Henry W.

Berkemeyer, Hildur M.

Bell, William M.

Bell, Sallie C.

Borgia, Andrea, Estate of

Borgia, Frances

Brown, Stella M.

Burns, George A.

Burns, Louise J.

California Bank, Trustee re Hollywood State Bank

California Bank, Trustee

Citizens National Bank & Savings Bank of Los Angeles, Trust for W. Stavert

Citizens National Trust & Savings Bank of Los Angeles, Mort. I. 164

Citizens National Trust & Savings Bank of Los Angeles Trustee

Citizens National Trust & Savings Bank of Los Angeles, Co-Trustee for Estate of A. V. Handorf

Clauson, Emma S.

Continental Auxillary Company (Doe Corporation 1)

Cowlin, Josephine McC.

Cowlin, Donald G.

Cowlin, Dorothy N.

Corporation of America, Trustee for Bank of America, I. 54

Desco Corp.

Diller, Michael

Erratchuo, Richard

Glendale Towel and Linen Supply Company

Guyer, Irene W.

Herrmann, Emily Louise by Louis T. Herrmann, Successor In Interest

Hicks, Forrest W., Executor of Estate of (California Bank)

Hidden Hills Corporation

Holmgrin, Neva Bartlett

Hope, Lester Townes

Hope, Dolores Defina

Huston Homes (Doe Corporation 8)

Johnson, William Arthur, Sr. (Doe 11)

Johnson, Grace Luvena (Doe 12)

Jessup, Marguerite R., Trustee (for 6)

Jessup, Marguerite Rice

Jessup, Roger

La Maida, James V. (Doe 10)

La Marda, Tony (La Maida)

Lancaster, Paul E.

Lancaster, William

Land Title Insurance Company, as Trustee

Land Title Insurance Company

Los Angeles Pet Cemetary

Metropolitan Savings & Loan Association of Los Angeles

Monteria Lake Association

Mosher, Eloise V.

Mosher, W. E.

Murray, Marie

Pacific Lighting and Gas Supply Co.

Plemmons, Florence S.

Plemmons, John R.

Polar Water Company

Pryor, Charles

Rauch, Phil

Roger Jessup Farms

Rushworth, Helen

Rushworth, Lester

Schwaiger, Cecil A.

Schwaiger, Lester R.

Sealand Investment Corporation, Trustee for Metropolitan Savings & Loan Association

Sealand Investment Corporation

Smith, Florence S. (Plemmons)

Southern Service Company, Ltd.

Stavert, Walter W.

Sun Valley National Bank of Los Angeles

Title Insurance and Trust Co., Trustee T. I. Deed of Trust, I. 31, 32

Title Insurance and Trust Co., Trustee for Intervalley Savings & Loan Association I. 2509

Title Insurance & Trust Co., Trustee for Massachusetts Mutual Life Insurance Co.

Title Insurance and Trust Co.

Title Insurance and Trust Co., Trustee A.

Title Insurance and Trust Co., Trustee for Sun Valley National Bank of Los Angeles

Title Insurance and Trust Co., Trustee for J. McC. Cowlin

Title Insurance and Trust Co., Trustee for P. E. Lancaster

Title Insurance and Trust Co., Trustee T. I., Deed of Trust I. 829

Title Insurance and Trust Co., Trustee for C. R. Bannan, et al.

Wheeland, Henry R.

Wheeland, Elizabeth A.

Woodward, E. C., Co-Trustee of the Estate of A. V. Handorf

Wright, Alice M.

Wright, J. Marion

Wright, Irene Evelyn

Wright, Ralph Carver

ATTACHMENT "D"

DISCLAIMING PARTIES

Andrew Jergens Company, The

Boyar, Mark

Chace, William M. (dba V.P.L.C.)

DeMille, Cecil B., Estate of

Drewry Photocolor Corp.

Hayes, Hay B. (Hal)

Houston Color Film Laboratories, Inc.

Krown, Samuel P.

La Canada Irrigation District

Lakeside Golf Club (of Hollywood)

Lakewood Water & Power Company

Mack, Lucille

Mollin Investment Co.

Mulholland, P. & R., Trustees for R. Wood

Mulholland, Rose

Mulholland, Perry

Mulholland, Thomas

Mureau, Charles

Nathan, Julia N., Trustee

Oakmont Country Club

Platt, George E. Company

Richfield Oil Corporation

Riverwood Ranch Mutual Water Company

Smith, Benjamin B.

Southern California Edison Company

Spinks Realty Company

Sportsman's Lodge Banquet Corporation

Stetson, G. Henry

Technicolor Corporation

Valley Lawn Memorial Park

ATTACHMENT "E"

LIST OF PRIOR STIPULATED JUDGMENTS

PARTY	DATE JUDGMENT FILED
Akmadzich, Mary L.	July 24, 1959
Akmadzich, Peter J.	July 24, 1959
California Materials Company	July 24, 1959
Carnation Company	Nov. 20, 1958
Consolidated Rock Products Co.	July 24, 1959
Hidden Hills Mutual Water Company	March 11, 1965
Knickerbocker Plastic Company, Inc.	Feb. 15, 1960
Livingston Rock & Gravel Co., Inc.	July 24, 1959
Pacific Fruit Express Company	March 11, 1965
Pendleton, Evelyn M., dba Deep Rock Artesian Water Company	Nov. 1, 1965
Sears, Roebuck and Company	June 9, 1958
Southern Pacific Company	March 11, 1965
Sparkletts Drinking Water Corporation	Nov. 1, 1965
Valley Park Corporation	July 24, 1959
Walt Disney Productions	May 15, 1961
White, Constance Ray	Feb. 15, 1960
White, Leo L.	Feb. 15, 1960

ATTACHMENT 1

ATTACHMENT "F"

STIPULATED

NON-CONSUMPTIVE OR MINIMAL-CONSUMPTIVE USE PRACTICES

Non-Consumptive Uses

Disney -- extracted ground water is used for air conditioning cooling water in a closed system, which discharges to the channel of the Los Angeles River and is subsequently spread and recharges San Fernando Basin, without measurable diminution or loss.

Sears, Lockheed and Carnation -- extracted ground water, or a portion thereof, is used for air conditioning cooling in a closed system, which discharges to San Fernando Basin through an injection well.

Toluca Lake -- that portion of extracted ground water which is not consumptively used, by evaporation or otherwise, is circulated and passed through the lake to the channel of the Los Angeles River immediately upstream from Los Angeles' spreading grounds, where such water is percolated into the ground water of the Basin without measurable diminution or loss.

Sportsman's Lodge -- that portion of extracted ground water which is not consumptively used, by evaporation or otherwise, is circulated and passed through fish ponds and returned to channels tributary to Los Angeles River upstream from Los Angeles' spreading grounds, where such water is percolated into the ground water of the Basin without measurable loss.

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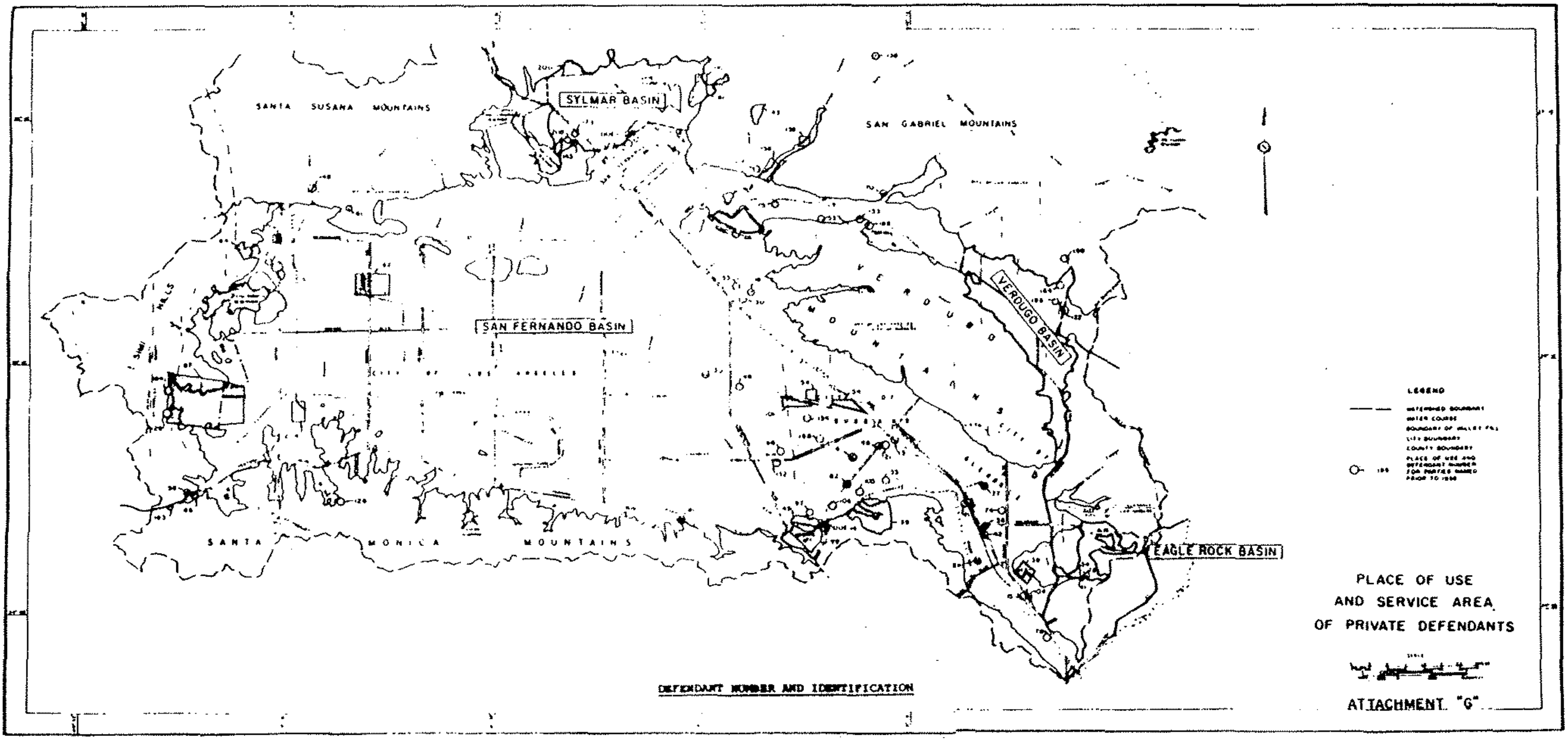
MINIMAL-CONSUMPTIVE USES

Conrock & Livingston	-- extracted ground water is used in rock, sand and gravel, and ready-mix concrete operations with net consumptive use of 10%, with the remaining 90% returning to the ground water. Each party purchases surface water from Los Angeles in amounts at least equivalent to such consumptive losses.



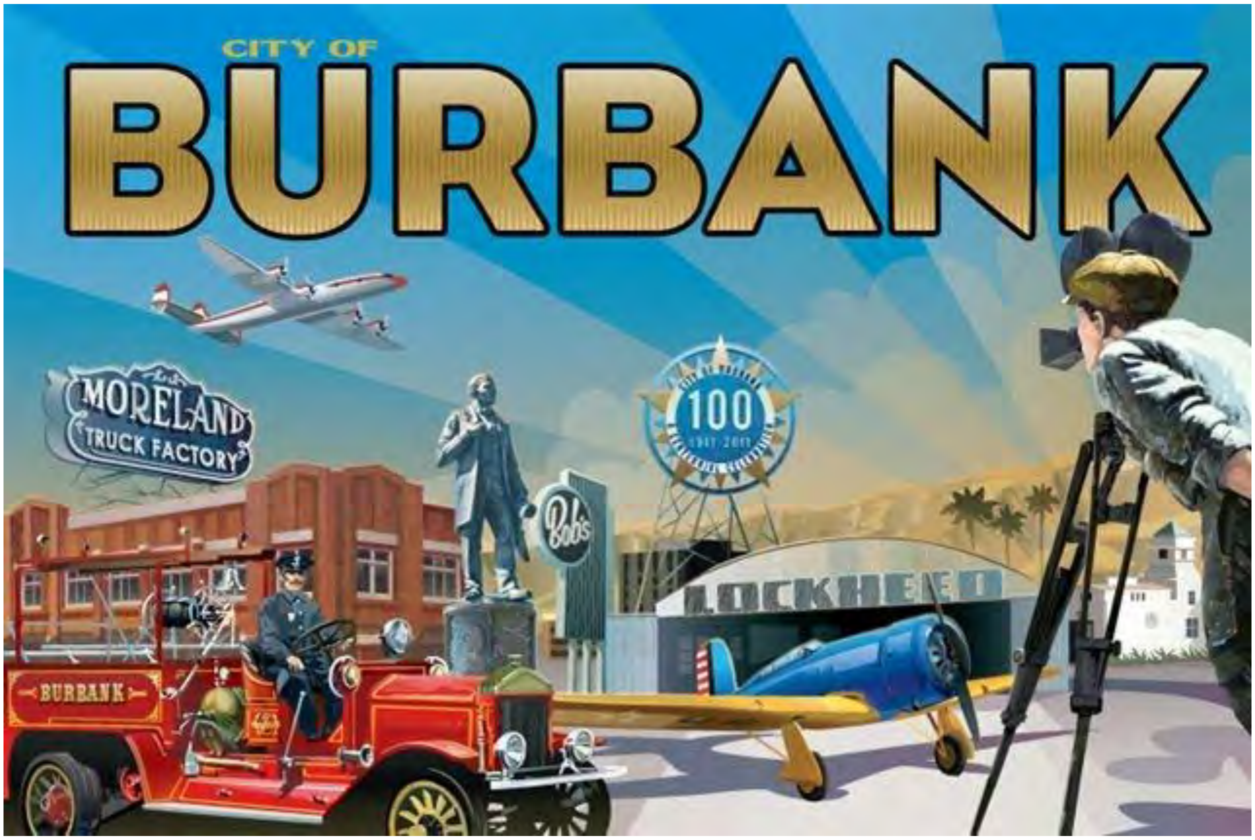
PLACE OF USE AND SERVICE AREA OF PRIVATE DEFENDANTS

ATTACHMENT "G"

DEFENDANT NUMBER AND IDENTIFICATION

4	BURBANK UNIFIED SCHOOL DIST.
6	L.A.C.F.C.D.
13	THE ANDREW JERGENS CO.
15	BEATRICE FOODS CO.
18	CALIFORNIA MATERIALS CO.
21	CARNATION CO.
30	CONSOLIDATED ROCK PROD. CO.
34	DEEP ROCK ARTESIAN WATER CO.
35	DESCO CORP.
36	DRENEY PHOTOCOLOR CORP.
39	FOREST LAWN CO.
41	FRESHPURO WATER CO.
42	GLENDALE TOWEL & LINEN SUPPLY CO.
43	GLENHAVEN MEMORIAL PARK, INC.
46	HOUSTON COLOR FILM LAB, INC.
48	KNICKERBOCKER PLASTIC CO., INC.
49	LAKESIDE GOLF CLUB OF HOLLYWOOD
53	LIVINGSTON ROCK & GRAVEL CO.
54	LOCKHEED AIRCRAFT CORP.
56	LOS ANGELES PET CEMETERY
61	MONTERIA LAKE ASSOC.
62	MULHOLLAND ORCHARD CO.
64	OAKWOOD CEMETERY ASSOC.
66	PACIFIC LIGHTING & GAS SUPPLY CO.
67	GEORGE E. PLATT CO.
68	POLAR WATER CO.
70	RIVERWOOD RANCH MUTUAL WATER CO.
71	ROGER JESSUP FARMS
74	SEARS, ROEBUCK & CO.
75	SOUTHERN CAL. EDISON CO.
76	SOUTHERN PACIFIC RAILROAD CO.
77	SOUTHERN SERVICE CO., LTD.
78	SPARKLETTS DRINKING WATER CORP.
79	SPINKS REALTY CO.
80	SPORTSMEN'S LODGE, INC.
82	TECHNICOLOR CORP.
97	TOLUCA LAKE PROP. OWNERS ASSOC.
99	UNIVERSAL PICTURES CO.
101	VALHALLA MEMORIAL PARK
104	VAN DE KAMPS DUTCH BAKERS INC.
105	WALT DISNEY PRODUCTIONS
106	WARNER BROS. PICTURES, INC.
117	WILLIAM O. BARTHOLOMAUS
120	HENRY M. BERKEMEYER
122	ELFRIEDA M. BISHOP
127	STELLA M. BROWN
126	MARK BOYAR
128	GEORGE A. BURNS
132	WILLIAM H. CHACE
134	EMMA L. CLAUSON
138	CECIL B. DEMILLE
141	MAXINE DUCKWORTH
143	RICHARD ERRATCHUO
148	HOWARD BARTON GRIFFITH
153	NEVA BARTLETT
164	E. E. MAHANNAH
168	CELESTE LOUISE McCABE
173	KISAG MOORDIGIAN
181	JOHN E. MULLIN
183	CHARLES MUREAU
188	FLORENCE S. PLEMMONS
194	LESTER RUSHWORTH
195	LESTEA R. SCHWAIGER
198	SIDNEY SMITH
200	G. HENRY STETSON
204	A. H. WARNER
205	ELIZABETH A. WEEKLAND
211	ALICE M. WRIGHT
DOE CORP 4	HOLLIN INVESTMENT CORP.
DOE 1	EMILY LOUIS HERRMANN
DOE 14	LESTER TOWNES HOPE

APPENDIX F: CITY OF BURBANK HAZARD MITIGATION PLAN



All-Hazard Mitigation Plan

April 2011

ATTACHMENT 1

City of Burbank

All-Hazard Mitigation Plan

City of Burbank
100
1911-2011
A Centennial Celebration

April 2011

ATTACHMENT 1

CITY OF BURBANK
HAZARD MITIGATION PLAN
2011

Public Review Draft:
April 8, 2011

**Cover Photo: 2005 Harvard Fire in the Verdugo Mountains,
@2005 Ross A. Benson/Firepictures.com**

The Burbank Natural Hazard Mitigation Plan is a living document which will be reviewed annually and updated periodically.

Comments, suggestions, corrections and additions are enthusiastically encouraged from all interested parties.

Please send review comments to:

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EXECUTIVE SUMMARY

This Hazard Mitigation Plan for the City of Burbank covers each of the major natural hazards that pose risks to the City. The 2011 Hazard Mitigation Plan is an update and enhancement of Burbank's original 2005 Hazard Mitigation Plan.

The primary objective of the mitigation plan is to reduce the negative impacts of future disasters on Burbank: to save lives and reduce injuries, minimize damage to buildings and infrastructure (especially critical facilities) and minimize economic losses. This Mitigation Plan is an educational and planning document, not a regulatory document.

This mitigation plan meets FEMA's planning requirements by addressing hazards, vulnerability and risk. Hazard means the frequency and severity of disaster events. Vulnerability means the value, importance, and fragility of buildings and infrastructure. Risk means the threat to people, buildings and infrastructure, taking into account the probabilities of disaster events. Adoption of a mitigation plan is required for communities to remain eligible for future FEMA mitigation grant funds.

This Hazard Mitigation Plan includes the following chapters:

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 What is a Hazard Mitigation Plan?

The City of Burbank is subject to a wide range of natural hazards including: earthquakes, wildland/urban interface fires, landslides, floods, windstorms and others. The impact of potential future hazard events on Burbank may be minor - a few inches of water in a street - or it may be major - with damages and economic losses reaching millions of dollars, with substantial numbers of injuries and deaths. Some hazard events, such as earthquakes or windstorms may affect the entire city. Most of the other hazards, including wildland/urban interface fires, landslides and floods will affect only portions of the city. The Burbank Hazard Mitigation Plan addresses each of the natural hazards that pose significant risk to the people, buildings and infrastructure of Burbank.

The hazard mitigation plan addresses hazards such as wind storms and localized storm water drainage flooding that may happen in some locations almost every year. The plan also addresses less frequent hazard events including earthquakes, wildland/urban interface fires, landslides and major floods. These types of hazards events may not occur frequently but still pose a substantial threat to Burbank because the consequences when they do occur may be severe.

The impacts of major disasters on a community can be devastating: the total damages, economic losses, casualties, disruption, hardships and suffering are often far greater than the physical damages alone. Furthermore, recovery from major disasters often takes many years and some heavily impacted communities may never fully recover. Completely eliminating the risk of future disasters in Burbank is neither technologically possible nor economically feasible. However, substantially reducing the negative impacts of future disasters is achievable with the implementation of a pragmatic Hazard Mitigation Plan.

The Burbank Hazard Mitigation Plan has several key elements.

1. Each hazard that may impact Burbank significantly is reviewed to estimate the probability (frequency) and severity of likely hazard events.

2. The vulnerability of Burbank to each hazard is evaluated to estimate the likely extent of physical damages, casualties, and economic impacts.

3. A range of mitigation alternatives are evaluated to identify those with the greatest potential to reduce future damages and losses in Burbank, to protect facilities deemed critical to the community’s well being, and that are desirable from the community’s political and economic perspectives.

1.2 Why is Hazard Mitigation Planning Important for Burbank?

Mitigation simply means actions that reduce the potential for negative impacts from future disasters. That is, mitigation actions reduce future damages, losses and casualties.

Effective hazard mitigation planning will help the residents of Burbank deal with natural and manmade hazards realistically and rationally. That is, to help identify specific locations in Burbank where the level of risk from one or more hazards may be unacceptably high and then finding cost effective ways to reduce such risk. Mitigation planning strikes a pragmatic middle ground between unwisely ignoring the potential for major hazard events on one hand and unnecessarily overreacting to the potential for disasters on the other hand.

Furthermore, the Federal Emergency Management Agency (FEMA) now requires each local government entity to adopt a hazard mitigation plan and to update the plan every five years to remain eligible for future pre- or post-disaster FEMA mitigation grant funding. Thus, an important objective in creating the Burbank Hazard Mitigation Plan is to achieve eligibility for FEMA funding and to enhance Burbank's ability to attract future FEMA mitigation funding.

The Plan is specifically designed to help Burbank gather the data necessary to compete successfully for future FEMA funding of mitigation projects. FEMA requires that all FEMA-funded hazard mitigation projects must be "cost-effective" (i.e., the benefits of a project must exceed the costs). Benefit-cost analysis is thus an important component of hazard mitigation planning, not only to meet FEMA requirements, but also to help evaluate and prioritize potential hazard mitigation projects in Burbank, regardless of whether funding is from FEMA, state or local government or from private sources.

1.3 The 2011 Update of the Burbank Hazard Mitigation Plan

The initial Burbank Hazard Mitigation Plan, adopted in 2005, considered both natural hazards and human-caused hazards. The natural hazards considered included: earthquakes, wildland/urban interface fires, severe weather, floods, drought, sinkholes and volcanic activity. The human-caused hazards considered included: transportation accidents, transportation loss, weapons of mass destruction, utility disruptions (electric power, water, wastewater), hazardous material incidents, aviation disasters, explosions, economic disruption, dam failure and special events.

During the mitigation plan update process, the Burbank Hazard Mitigation Planning Team decided to re-focus the Burbank Hazard Mitigation Plan on natural hazards. The 2011 Burbank Mitigation Plan addresses each of the natural hazards posing risk to the city, with emphasis on the hazards which pose the greatest risk, including: earthquakes, wildland/urban interface fires, landslides/ mudslides (which were not included in the 2005 hazard mitigation plan), floods, windstorms, and drought. Other natural hazards which pose very low or negligible risk are also briefly addressed, including: volcanic hazards, subsidence, expansive soils, extreme temperatures and other weather events.

The decision to focus on natural hazards for the 2011 update of the Burbank Hazard Mitigation Plan was made because human-caused hazards are predominantly or entirely addressed by emergency response planning rather than by mitigation planning. Human-caused hazards are briefly addressed in Chapter 12.

The 2011 update of the Burbank Hazard Mitigation Plan includes the following significant enhancements:

- Update the hazard information for each of the major natural hazards,
- Refine the vulnerability and risk assessments for each of the major natural hazards,
- Redefine critical facilities with more specificity,
- Refocus and reprioritize hazard mitigation goals, objectives, and action items to emphasize pragmatic, implementable measures that address the highest risk situations in Burbank and that will significantly reduce risk.
- Identify specific mitigation projects with the best likelihood of garnering FEMA mitigation project grants for implementation, and
- Improve the usability and accessibility of the Burbank Hazard Mitigation Plan by re-organizing the plan and removing materials not essential for mitigation planning.

1.4 The 2011 Burbank Hazard Mitigation Plan

This Burbank Hazard Mitigation Plan is built upon quantitative assessments, to the extent that data allows, of each of the significant natural hazards that may impact Burbank, including their frequency, severity, and areas of the City likely to be affected.

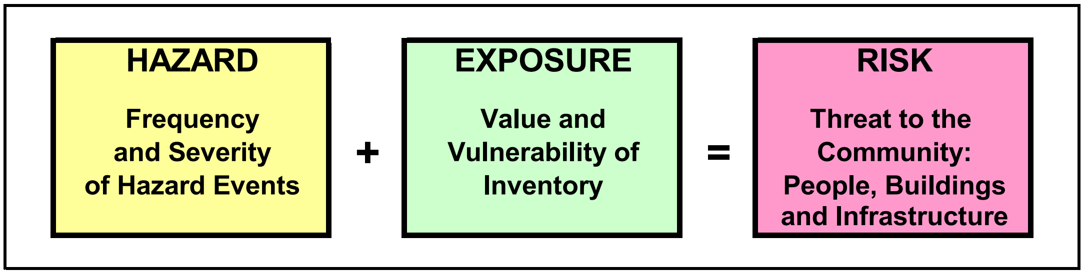
The Burbank Hazard Mitigation Plan also includes a qualitative or quantitative assessment of the vulnerability of buildings, infrastructure, and people to each of these hazards. These reviews of the hazards and the vulnerability of Burbank to these hazards are the foundation of the mitigation plan. From these assessments, specific locations where buildings, infrastructure, and/or people may be at high risk may be identified. These high risk situations then become priorities for future mitigation actions to reduce the negative impacts of future disasters on Burbank. The Burbank Hazard Mitigation Plan deals with hazards realistically and rationally and also strikes a balance between suggested physical mitigation measures to eliminate or reduce the negative impacts of future disasters and planning measures which better prepare the community to respond to and recover from disasters for which physical mitigation measures are not possible or not economically feasible.

1.5 Key Concepts and Definitions

The central concept of hazard mitigation planning is that mitigation reduces risk. **Risk** is defined as the threat to people and the built environment posed by the hazards being considered. That is, risk is the potential for damages, losses and casualties arising from the impact of hazards on the built environment. The essence of hazard mitigation planning is to identify high risk locations/situations in Burbank and to evaluate ways to mitigate (reduce) the impacts of future disasters on these high risk locations/situations.

The level of risk at a given location, building or facility depends on the combination of **hazard** and **exposure** as shown in Figure 1.1 below.

Figure 1.1
Hazard and Exposure Combine to Produce Risk



Risk is generally expressed in dollars (estimates of potential damages and other economic losses) and in terms of casualties (numbers of deaths and injuries).

There are four key concepts that govern hazard mitigation planning: hazard, exposure, risk and mitigation. Each of these key concepts is addressed in turn.

HAZARD refers to natural or manmade events that may cause damages, losses or casualties (e.g., floods, winter storms, landslides, earthquakes, hazardous material spills, etc.). Hazards are characterized by their frequency and severity and by the geographic area affected. Each hazard is characterized differently, with appropriate parameters for the specific hazard. For example, floods may be characterized by the frequency of flooding, along with flood depth and flood velocity. Winter storms may be characterized by the amount of rainfall in a 24-hour period, by the wind speed, or by the amount of snow or ice associated with a storm. Earthquakes may be characterized by the severity and duration of ground motions and so on.

A hazard event, by itself, may not result in any negative impacts on a community. For example, a flood-prone five-acre parcel may typically experience several shallow floods per year, with several feet of water expected in a 50-year flood event. However, if the parcel is wetlands, with no structures or infrastructure, then there is no risk. That is, there is no threat to people or the built environment and the frequent flooding of this parcel does not have any negative impacts on the community. Indeed, in this case, the very frequent flooding (i.e., the high hazard) may be beneficial environmentally by providing wildlife habitat and recreational opportunities.

The important point here is that hazards do not produce risk to people and property, unless there is vulnerable inventory exposed to the hazard. Risk to people, buildings and/or infrastructure results only when hazards are combined with exposure.

EXPOSURE is the quantity, value and vulnerability of the built environment (inventory of people, buildings and infrastructure) in a particular location subject to one or more hazards. Inventory is described by the number, size, type, use, and occupancy of buildings and by the infrastructure present. Infrastructure includes roads and other transportation systems, utilities (potable water, wastewater, natural gas, and electric power), telecommunications systems and so on.

Inventory varies markedly in its importance to a community and thus varies markedly in its importance for hazard mitigation planning. Some types of facilities, “critical facilities,” are especially important to a community, particularly during disaster situations. Examples of critical facilities include police and fire stations, hospitals, schools, emergency shelters, 911 centers, and other important buildings. Critical facilities may also include infrastructure elements that are important links or nodes in providing service to large numbers of people such as a potable water source, an electric power substation and so on. “Links” are elements such as water pipes, electric power lines, telephone cables that connect portions of a utility or transportation system. “Nodes” are locations with important functions, such as pumping plants, substations, or switching offices.

For hazard mitigation planning, inventory must be characterized not only by the quantity and value of buildings or infrastructure present but also by its vulnerability to each hazard under evaluation. For example, a given facility may or may not be particularly vulnerable to flood damages or earthquake damages depending on the details of its design and construction. Depending on the hazard, different measures of the vulnerability of buildings and infrastructure are often used.

RISK is the threat to people and the built environment - the potential for damages, losses and casualties arising from hazards. Risk results only from the combination of Hazard and Exposure as discussed above.

Risk is the potential for future damages, losses or casualties. A disaster event happens when a hazard event is combined with vulnerable inventory (that is when a hazard event strikes vulnerable inventory exposed to the hazard). The highest risk in a community occurs in high hazard areas (frequent and/or severe hazard events) with large inventories of vulnerable buildings or infrastructure.

However, high risk can also occur with only moderately high hazard if there is a large inventory of highly vulnerable inventory exposed to the hazard. Conversely, a high hazard area can have relatively low risk if the inventory is resistant to damages (e.g., elevated to protect against flooding or strengthened to minimize earthquake damages).

MITIGATION means actions to reduce the risk due to hazards. Mitigation actions reduce the potential for damages, losses, and casualties in future disaster events. Repair of buildings or infrastructure damaged in a disaster is not mitigation because repair simply restores a facility to its pre-disaster condition and does not reduce the potential for future damages, losses, or casualties. Hazard mitigation projects may be initiated proactively - before a disaster, or after a disaster has already occurred. In either case, the objectives of mitigation are always to reduce future damages, losses or casualties.

A few of the common types of mitigation projects are shown below in Table 1.1.

Table 1.1
Common Mitigation Projects

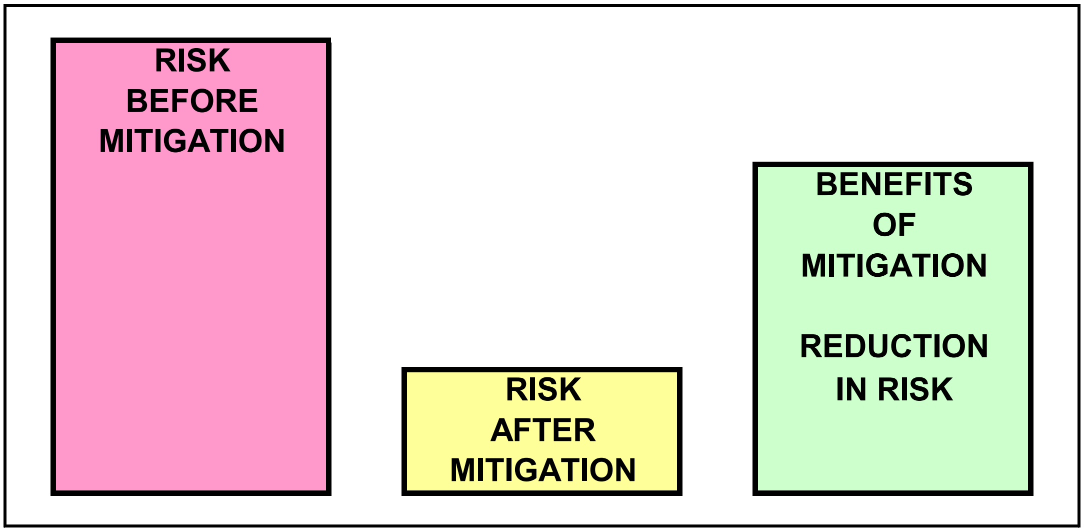
Hazard	Common Mitigation Projects
Earthquakes	Structural retrofits for buildings
	Nonstructural retrofits for contents and equipment
	Seismic upgrades for utility infrastructure
	Seismic retrofits for bridges
Wildland/Urban Interface Fires	Vegetation management - fuel reduction
	Enhance fire safe construction practices
Landslides	Remediate slide conditions
	Construct debris basins
	Relocate utility lines or critical facilities
Floods	Improve levees or channels
	Improve storm water drainage systems
	Elevate or acquire highly-flood prone structures
Windstorms	Enhance tree trimming efforts
	Add emergency generators for critical facilities
General	Increase public education programs for hazards
	Enhance emergency planning and mutual aid

The mitigation project list above is representative of common mitigation projects, not comprehensive, and mitigation projects can encompass a broad range of other actions to reduce future damages, losses, and casualties.

1.6 The Mitigation Process

The key element for all hazard mitigation projects is that they reduce risk. The benefits of a mitigation project are the reduction in risk (i.e., the avoided damages, losses, and casualties attributable to the mitigation project). In other words, benefits are simply the difference in expected damages, losses, and casualties before mitigation (as-is conditions) and after mitigation. These important concepts are illustrated below in Figure 1.2.

Figure 1.2
Mitigation Projects Reduce Risk



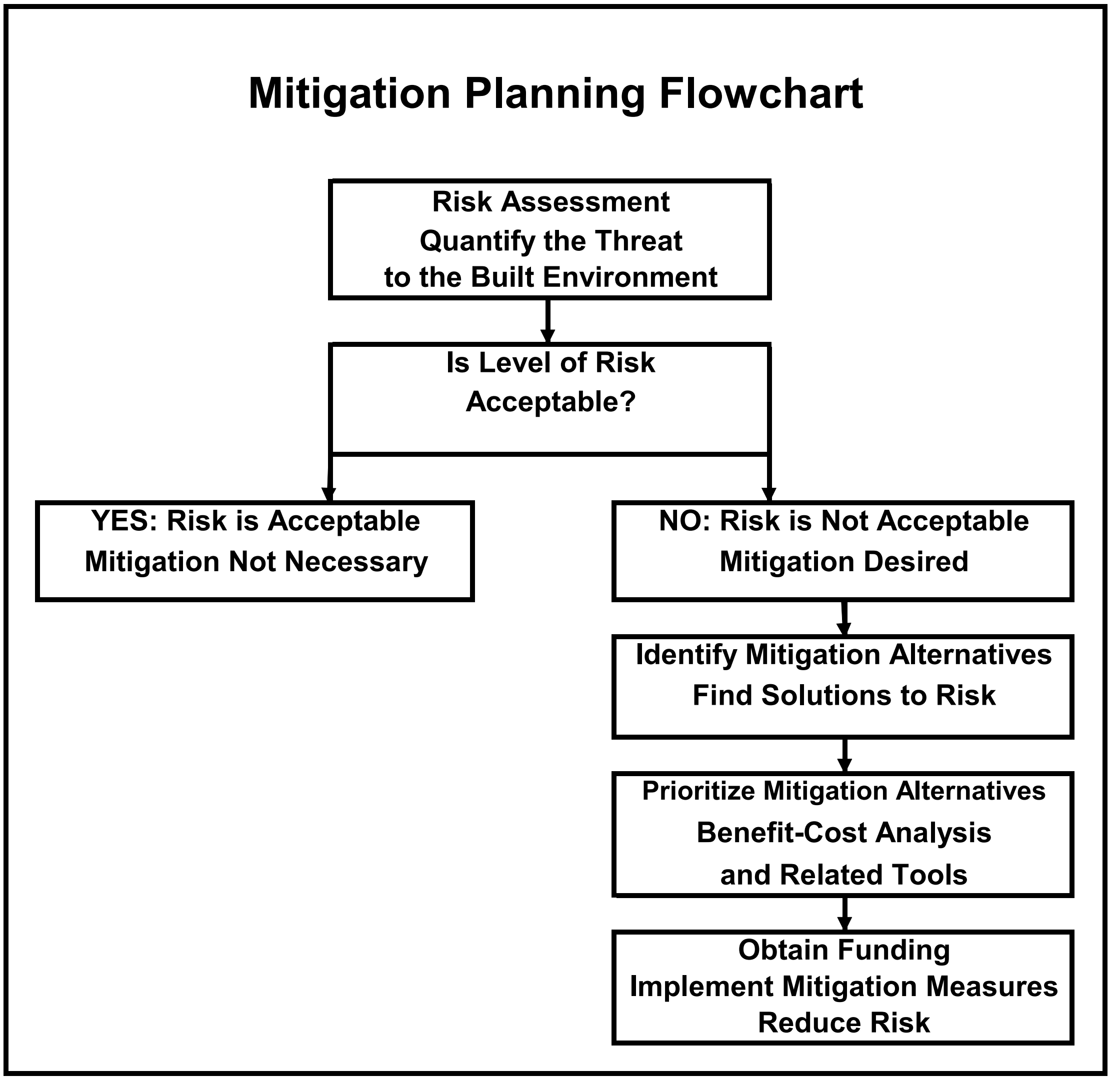
Quantifying the benefits of a proposed mitigation project is an essential step in hazard mitigation planning and implementation. Only by quantifying benefits is it possible to compare the benefits and costs of mitigation to determine whether or not a particular project is worth doing (i.e., is economically feasible). Real world hazard mitigation planning almost always involves choosing between a range of possible alternatives, often with varying costs and varying effectiveness in reducing risk.

Quantitative risk assessment is centrally important to hazard mitigation planning. When the level of risk is high, the expected levels of damages and losses are likely to be unacceptable and mitigation actions have a high priority. Simply put, the greater the risk, the greater the urgency of undertaking mitigation.

Conversely, when risk is moderate both the urgency and the benefits of undertaking mitigation are reduced. It is neither technologically possible nor economically feasible to eliminate risk completely. Therefore, when levels of risk are low and/or the cost of mitigation is high relative to the level of risk, the risk may be deemed acceptable (or at least tolerable). Therefore, proposed mitigation projects that address low levels of risk or where the cost of the mitigation project is large relative to the level of risk are generally poor candidates for implementation.

The overall hazard mitigation planning process is outlined in Figure 1.3 below.

Figure 1.3
The Hazard Mitigation Planning Process



The flow chart above outlines the major steps in hazard mitigation planning and implementation for Burbank.

The first steps are quantitative evaluation of the hazards (frequency and severity) impacting Burbank and of the inventory (people, buildings, infrastructure) exposed to these hazards. Together these hazard and exposure data determine the level of risk for specific locations, buildings or facilities in Burbank.

The next key step is to determine whether or not the level of risk posed by each of the hazards impacting Burbank is acceptable or tolerable. Only the residents of Burbank can make this determination. If the level of risk is deemed acceptable or at least tolerable, then mitigation actions are not necessary or at least not a high priority.

On the other hand, if the level of risk is deemed not acceptable or tolerable, then mitigation actions are desired. In this case, the hazard mitigation planning process moves on to more detailed evaluation of specific mitigation alternatives, prioritization, funding and implementation of mitigation measures. As with the determination of whether or not the level of risk posed by each hazard is acceptable or not, decisions about which mitigation projects to undertake can be made only by the City and residents of Burbank.

1.7 The Role of Benefit-Cost Analysis in Hazard Mitigation Planning

Communities, such as Burbank, that are considering whether or not to undertake mitigation projects must answer questions that don't always have obvious answers, such as:

What is the nature of the hazard problem?

How frequent and how severe are hazard events?

Do we want to undertake mitigation measures?

What mitigation measures are feasible, appropriate and affordable?

How do we prioritize between competing mitigation projects?

Are our mitigation projects likely to be eligible for FEMA funding?

Benefit-cost analysis is a powerful tool that can help communities provide solid, defensible answers to these difficult socio-political-economic-engineering questions. Benefit-cost analysis is required for all FEMA-funded mitigation projects, under both pre-disaster and post-disaster mitigation programs. Thus, communities seeking FEMA funding must understand benefit-cost analysis. However, regardless of whether or not FEMA funding is involved, benefit-cost analysis provides a sound basis for evaluating and prioritizing possible mitigation projects for any natural hazard.

Benefit-cost analysis software, technical manuals and a wide range of guidance documents are available from FEMA at no cost to communities. A Benefit-Cost Analysis Toolkit CD which contains all of the FEMA benefit-cost materials is available from FEMA. The FEMA publications *What is a Benefit? Guidance for Benefit-Cost Analysis* and *BCA Reference Guide* are recommended as general references for benefit-cost analysis. These publications include categories of benefits to count for mitigation projects for various types of buildings, critical facilities, and infrastructure and have simple, standard methods to quantity the full range of benefits for most types of mitigation projects. The FEMA standard values in the BCA Reference Guide are more current and should be used for analyses.

1.8 Hazard Synopsis

To set the overall context of hazard mitigation planning, we briefly review the major hazards that impact Burbank.

The entire City of Burbank is subject to the impacts of earthquakes from the numerous active nearby faults. Earthquake damage will be concentrated in especially vulnerable (mostly older) buildings and infrastructure and in soft soil areas which amplify earthquake ground motions and/or may be subject to liquefaction or lateral spreading.

The eastern portions of Burbank that are adjacent to or near the hilly wildland areas are at high risk from wildland/urban interface fires and landslides (or mudslides).

The City of Burbank has areas mapped by FEMA as being within the 100-year regulatory flood plain or within the 500-year floodplain. These floodplains include areas adjacent to Los Angeles River. Much of the city is drained via two major storm drains, the Burbank Western and Lockheed channels. Other parts of Burbank are subject to flooding during extreme events larger than the 500-year flood. Other areas outside of the mapped floodplains are also subject flooding from local storm water drainage.

The entire City of Burbank is subject to the effects of windstorms, which most commonly affect above ground utility lines, but which also may damage buildings. Much of the impact of windstorms is from secondary effects, especially, power outages. The risk of major urban or urban/wildland interface fires is also substantially increased during high wind events.

Burbank could be substantially impacted by a prolonged, severe drought which significantly reduces available water supplies.

There are several other natural hazards, including subsidence, sinkholes and volcanic activity which pose extremely low or negligible risk to Burbank. These hazards are briefly addressed in the last chapter of this mitigation plan.

The approximate level of risk posed to Burbank by each of the hazards covered in this mitigation plan is summarized below in Table 1.3. This ranking is based on quantitative/qualitative judgment about the likely long-term average annual damages and losses from each hazard, taking into account the probability of hazard events and the severity of damages and losses when such events occur.

Table 1.3
Relative Risk to Burbank from Hazards

Natural Hazard	Relative Risk to Burbank	Frequency[1]
Earthquakes	High	Moderate
Wildland/Urban Interface Fires	High	Moderate-High
Landslides/Mudslides	Moderate - High	Moderate
Floods	Moderate	Moderate
Windstorms	Moderate	Moderate-High
Drought	Moderate	Moderate
Other Natural Hazards	Very Low	Low

[1] Low frequency or low probability doesn't necessarily mean low risk - an infrequent event such as a major earthquake or major wildland/urban interface fire can pose a high level of risk because the consequences may be very high. Conversely, frequent events such as minor floods, may pose low risk because the consequences are usually very minor.

High Frequency: small events may happen every year or two, with progressively larger events having longer return periods.

Moderate Frequency: small events may happen roughly every 5 to 25 years, with progressively larger events having longer return periods.

Low Frequency: significant events likely roughly every 50 years or longer, with progressively larger events having progressively longer

The relative risk terms in Table 1.3 are defined as follows:

High: Potential impacts include all or large portions of Burbank, or may be very severe in localized areas, with significant risk of loss of life and with property damages exceeding $10 million.

Moderate: Little or no risk of loss of life and property damages typically below $10 million.

Low: Potential for loss of life is very low, property damage typically below $1 million.

Very Low: Potential impacts are almost negligible.

The remaining chapters of the Burbank Hazard Mitigation Plan include the following:

- Chapter 2 provides a brief community profile for the City of Burbank.

- Chapter 3 documents the community involvement and public process involved in developing this hazard mitigation plan.

- Chapter 4 outlines the hazard mitigation plan goals, mitigation strategies and action items.

- Chapter 5 documents the formal process of plan adoption, implementation and maintenance.

- Chapters 6 through 11 cover each of the major hazards addressed in this hazard mitigation plan, including: earthquakes, wildland/urban interface fires, landslides, floods, windstorms and drought.

- Chapter 12 briefly addresses other natural hazards which pose very low or negligible levels of risk for Burbank and comments on human-caused hazards:
    - The natural hazards which pose little risk to Burbank include volcanic hazards, subsidence, expansive soils, extreme temperatures, and other weather events.
    - This chapter also lists the human-caused hazards which were included in the 2005 Burbank Hazard Mitigation Plan. However, the consensus decision of the mitigation planning team developing the 2011 Burbank Hazard Mitigation Plan was to focus entirely on natural hazards. This decision does not diminish the importance of planning for human-caused hazards, but rather simply recognizes that such planning is best accomplished separately. Addressing human-caused hazards typically falls into the domains of emergency response planning, emergency responders, law enforcement and other agencies.

The Appendices include:

- Appendix 1: Summary of FEMA Mitigation Grant Programs.

- Appendix 2: Summary of benefit-cost analysis of mitigation projects. Benefit-cost analysis is required for almost all FEMA hazard mitigation grants.

- Appendix 3: Supplemental documentation of the public participation process during development of the Burbank Hazard Mitigation Plan.

2.0 COMMUNITY PROFILE: CITY OF BURBANK

2.1 Overview

The City of Burbank is located in the eastern part of the San Fernando Valley, in Los Angeles County, about 12 miles from downtown Los Angeles. Burbank is bordered by the cities of Los Angeles and Glendale. The location of Burbank is shown in the following map.

Figure 2.1
Burbank Location Map

The City of Burbank, which was incorporated in 1911, occupies an area of about 17.4 square miles, of which about one fourth is in the Verdugo Mountains. The latest US Census population estimate for Burbank (2009) is 103,121, an increase of about 2.8% since the 2000 census.

The City of Burbank website page on the history of Burbank notes that Burbank is a city built on people, pride and progress. These three ingredients turned a tiny, rural town into the thriving community it is today.

The City of Burbank occupies land that was once part of two Spanish- and Mexican-era colonial land grants, Rancho San Rafael and Rancho Providenica. The area that became Burbank was settled in the 1870s and 1880s, with streets aligned with what is now Olive Avenue. Important steps in the development of Burbank occurred in 1874 with the arrival of the Southern Pacific Railroad and in 1887 with establishment of a water system. However, by the time Burbank was incorporated in 1911, the town was still a small village of about 500 people. In 1920, Burbank was a small city with less than 3,000 people.

Burbank grew very rapidly from the 1920s through the 1950s, as shown in the U.S. Census data in Table 2.1.

Table 2.1
Burbank Population Data[1]

Census	Population	Percent Change
1920	2,913	n/a
1930	16,662	472.0%
1940	34,337	106.1%
1950	78,577	128.8%
1960	90,115	14.7%
1970	88,871	-1.4%
1980	84,625	-4.8%
1990	93,635	10.6%
2000	100,316	7.1%
2009 [1]	103,121	2.8%

[1] Census Data. For reporting purposes, the Burbank Water and Power Department uses California Department of Finance population data, which may differ from Census data.

Burbank's rapid growth in the 1920s to 1950s was fueled in large part by rapid expansion of the motion picture and aviation industries. Burbank's population declined in the 1960s and 1970s. However, population and economic growth were revitalized again in the 1980s. Since, the 1980s Burbank has had a thriving economy with redevelopment and revitalization of the city's economic base.

Today, Burbank is a prominent media- and entertainment-oriented city, which prides itself on a high quality of life, combining 21st century technology and innovation, with a small-town ambiance. Burbank is, indeed, a city of "people, pride and progress."

Burbank is a charter city with a City Council – City Manger form of government. The City Council serves as the elected legislative and policy-making body of the City of Burbank, enacting all laws and directing all actions necessary to provide for the general welfare of the community through appropriate programs, services, and activities. The City Council is the body which formally adopts the Burbank Hazard Mitigation Plan.

The Burbank city government has 14 departments, all of which have roles in hazard mitigation planning, community outreach efforts, and/or the implementation of mitigation action items: Management Services, Information Technology, Financial Services, Community Development, Public Works, Police, Burbank Water & Power, Library Services, Fire, and Park, Recreation and Community Services, City Attorney, City Clerk, City Treasurer and City Manager.

Departments with major roles related to hazard mitigation planning and implementation are briefly summarized below.

> The Community Development Department functions include building plan checking and inspection, building code development, land use planning and zoning, updating the General Plan, and code enforcement.
>
> The Fire Department includes the Disaster Services Division which has responsibility for developing, implementing and maintaining a comprehensive program to ensure that the City and the community are ready for various threats including natural disasters and human-caused incidents. Important elements of the program include disaster preparedness, hazard mitigation, response procedures and recovery operations.
>
> The Public Works Department functions include maintaining the wastewater collection and treatment facilities, city buildings, and streets.
>
> The Burbank Power & Water Department maintains the infrastructure providing electric power and water for Burbank.
>
> The City Manager Department has a major role in setting and overseeing city policies and practices, including those related to mitigation.

2.2 Geography and Climate

Burbank has two distinct geographic areas. Much of the city is in the San Fernando Valley, with generally flat topography and elevations around 500 feet. The northeastern part of Burbank extends from an alluvial fan into the foothills of the Verdugo Mountains with elevations reaching about 2,600 feet.

Some natural hazards, such as earthquakes and high winds, pose risk to the entire city of Burbank, although the level of risk does vary with location. Other hazards, such as landslides, mudslides and wildland/urban interface fires pose much greater risk in the foothill and mountain areas. Slopes range from less than 3 percent in the valley floor areas, from 3 percent to 10 percent in the alluvial fan areas, to greater than 10 percent in the mountain areas.

The major waterways in Burbank include the Los Angeles River Flood Control Channel, the Burbank Western Flood Control Channel, and the Lockheed Storm Drain. The 2008 FEMA Flood Insurance Study for Los Angeles County identifies the Los Angeles River as the primary flood threat for the City of Burbank. Burbank's climate is subtropical with average highs ranging from 67° in January to 90° in August. Average lows range from 41° in December to 62° in July and August. Record high and low temperatures are 113° and 22°, respectively.

Mean annual rainfall is about 16.5 inches, with more than 90% of the rainfall occurring from November to April, with about two-thirds of annual rainfall between January and March. The record low and high annual precipitation amounts are 0.57 inches (1939) and 39.77 inches (1983).

Snow is rare in Burbank, but does occur. The mean average snowfall is about 0.1 inch, although measurable snow has occurred in Burbank only six times from 1938 to 2006. The record snowfall of 4.7 inches which occurred inJanuary 1948 accounts for much of the mean average snowfall. The other recorded snowfalls were 0.5 inches in March 1950 and 0.10 inches on four occasions. The last measurable snowfall occurred in January 1966.

The historical climate data above are for the Burbank Valley Pumping Plant, with a period of record from 1938 through 2006 as compiled by the Western Regional Climate Center (www.wrcc.dri.edu).

2.3 Demographics

Selected demographic data for Burbank from the US Census Bureau are shown in Table 2.2. The age and ethnicity categories in Table 2.2 intentionally include overlapping subsets for planning purposes.

For emergency planning purposes, children, elderly adults, the disabled, people whose primary language is not English and low income residents are often considered special needs population groups. The numbers of people in these groups may also be a factor in mitigation planning, including community participation efforts and in developing and prioritizing mitigation goals, objectives and action items.

Burbank has a substantial population of children and elderly adults. As shown in Table 2.2 below, about 21% of the population is children less than 18 years old, while about 13% are adults over 65 years old. About 6% of the population between 5 and 20 years old is classified as having a disability, as is about 17% of adults between 21 and 64 years old and 43% of adults over 65 years old. About 9% of the people, 7% of families, 10% of families with children, 12% of children and 8% of people over 65 years old are below the poverty level.

About 42% of Burbank's residents speak a language other than English at home, with about 45% of these speaking Spanish and the remaining 55% speaking a wide variety of Indo-European, Asian, Pacific Island, and other languages. About 19% of Burbank's residents speak English less than very well. About 30% of the population was born outside of the United States.

Table 2.2
Burbank Population Demographics
US Census Bureau: 2006-2008 American Community Survey 3-Year Estimates

Demographic Data		
Age		
	Under 5 years	5.5%
	Under 18 years	21.0%
	18 years and over	79.0%
	18 years to 65 years	66.4%
	65 years and over	12.6%
Population with Disability[1]		
	Age: 5 to 20 years	5.7%
	Age: 21 to 64 years	17.3%
	Age: 65 years and older	42.6%
Ethnicity of Households		
	White	69.0%
	Black or African American	3.1%
	American Indian and Alaska Native	0.4%
	Asian	9.9%
	Native Hawaiian and Pacific Islander	0.2%
	Other or two or more races	2.5%
	Hispanic or Latino (of any race)	25.7%
Language Spoken at Home		
	English only	57.6%
	Language other than English	42.4%
	Speak English less than very well	18.5%
	Spanish	19.3%
	Other Indo-European languages	15.5%
	Asian and Pacific Island languages	6.0%
	Other languages	1.5%
Country of Birth		
	United States	69.8%
	Foreign-born	30.2%
	Naturalized citizen	63.5%
	Not a U.S. citizen	36.5%
Income and Poverty Data		
	Median family income	$61,072
	Families with income below $25,000	19.6%
	Below poverty level	
	People	8.7%
	Families	6.7%
	Families with children	9.7%
	Children	11.8%
	People 65 years and older	8.1%

[1] 2000 Census Data

The US Census website (www.census.gov) has a vast amount of additional demographic data for Burbank useful for planning purposes.

2.4 Housing

Selected housing data for Burbank from the U.S. Census Bureau are shown in Table 2.3.

The 2008 Census estimates for Burbank indicate that 56% of housing units are renter-occupied while 44% are owner-occupied. The overall vacancy rate was 5%. However, in 2010, given the housing crisis that has evolved over the last couple of years, including record number of foreclosures, the current vacancy rate and percentage of renter-occupied housing units may be somewhat higher than the 2008 Census estimates.

The proportion of owner- and renter-occupied housing units is significant for mitigation planning because mitigation actions for earthquakes or other hazards are predominantly undertaken by owners. The mitigation perspectives of owners for owner-occupied and renter-occupied housing units may differ.

The date of construction of housing units is also significant for mitigation planning because building codes for seismic and fire provisions have changed markedly over the decades. Less than 10% of Burbank's housing stock is post-1990 and thus built to recent codes with generally similar provisions to the current codes.

60% of Burbank's housing stock is pre-1960 and thus was built to codes with significantly different seismic and fire provisions than the current codes. Many pre-1940 and some 1940s single family and small multi-family housing units were built with cripple wall foundations (short walls typically two or three feet high, between the foundation and the main floor of the home) or with sill plates that are not bolted to the foundations. Homes with these structural characteristics have substantially greater vulnerability to earthquake damage than later structural types. Many of these homes have subsequently been voluntarily retrofitted to mitigate these seismic deficiencies. However, many such homes have not yet been retrofitted.

Table 2.3
Burbank Housing Data
US Census Bureau: 2006-2008 American Community Survey 3-Year Estimates

Housing Data		
	Number	**Percentage**
Total Housing Units	43,722	100.0%
Occupied Housing Units	41,555	95.0%
Vacant Housing Units	2,167	5.0%
Owner-Occupied	18,292	44.0%
Renter-Occupied	23,263	56.0%
Housing Type		
Single Family, Detached	19,583	44.8%
Single Family, Attached	1,689	3.9%
Apartments (2 to 9 units)	9,380	21.5%
Apartments (10 or more units)	12,998	29.7%
Mobile Home	72	0.2%
Year Structure Built		
2000 or later	1,823	4.2%
1990s	1,975	4.5%
1980s	4,565	10.4%
1970s	4,544	10.4%
1960s	4,285	9.8%
1950s	7,538	17.2%
1940s	11,499	26.3%
Before 1940	7,493	17.1%

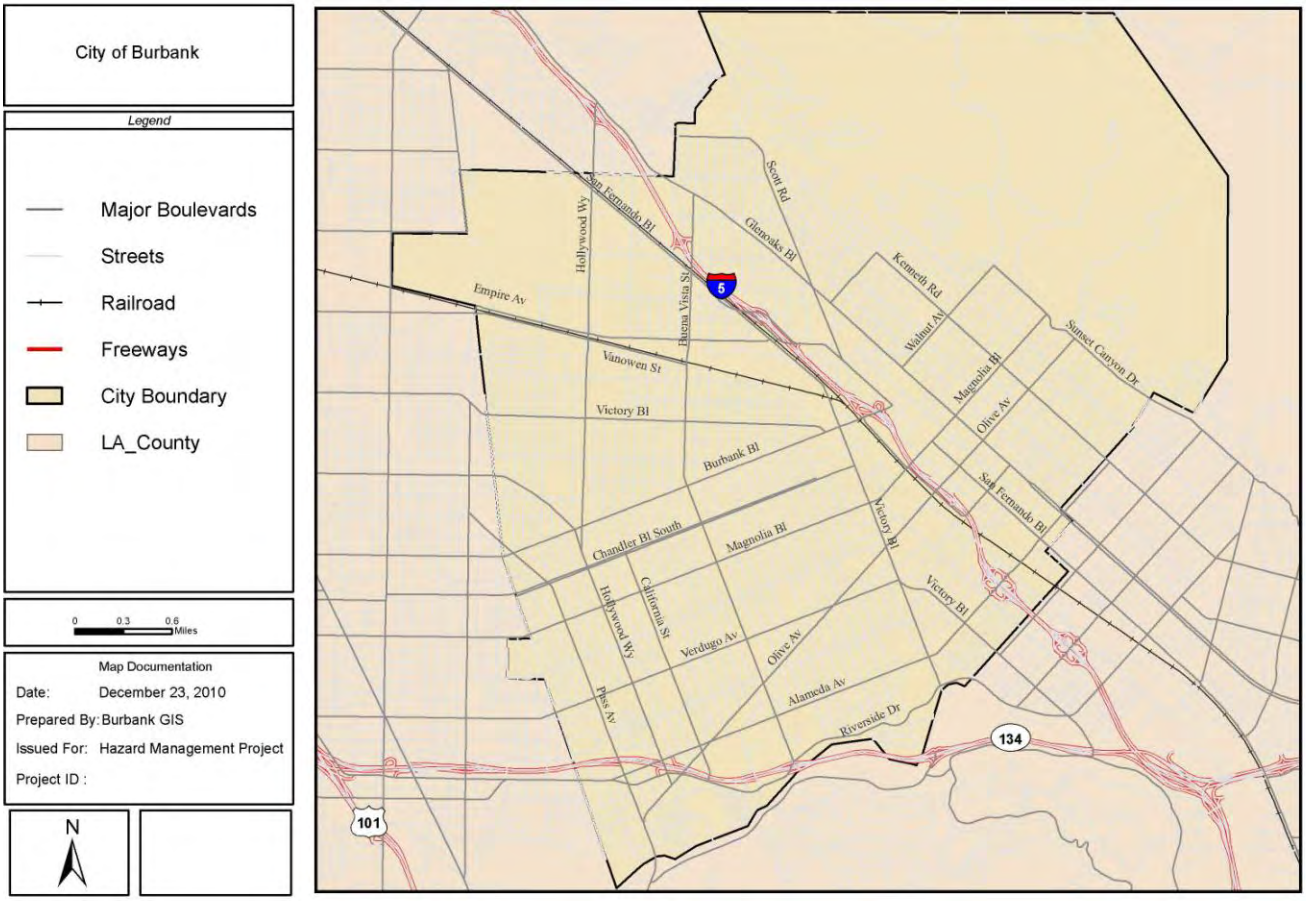
2.5 Transportation

Burbank is served by an extensive network of freeways and local streets, as shown in Figure 2.1 on the following page. Burbank is bisected by the Golden State Freeway (Interstate 5) and the Ventura Freeway (CA 134) runs across the southern part of the city. These freeways connect to the extensive network of freeways throughout the greater Los Angeles area. Major arteries within Burbank include: Glenoaks Boulevard, San Fernando Boulevard, Victory Boulevard, Magnolia Boulevard, Alameda Avenue, Olive Avenue and Hollywood Way.

Rail service through Burbank includes Union Pacific freight trains and Amtrak and Metrolink passenger trains. Burbank Bus provides fixed route, senior/disabled and youth transit within the City of Burbank. Metro Local and Rapid bus service is available from Burbank to numerous other locations in the Los Angeles area.

The Bob Hope Airport located in northwest Burbank is an important regional facility which served about 4.6 million passengers in 2009, with over 65,000 air carrier flights. Total flights including air carriers, air taxis, general aviation and military flights were over 109,000. Bob Hope Airport is served by seven passenger carriers as well as by FedEx and UPS cargo flights. For further details of the airport's facilities and operations see: www.burbankairport.com.

Figure 9.2
Burbank Surface Transportation Map



2.6 Municipal Utilities

The City of Burbank provides electric power, potable water and wastewater services to city residents.

2.6.1 Electric Power

The electric power division of Burbank Water & Power (BWP) provides electricity to all customers in Burbank.

BWP-Electric has 20 substations and about 400 miles of transmission and distribution lines. About 75% of the lines are overhead, with about 25% underground. The system also has about 6,000 distribution transformers, 12,000 poles and 52,000 meters.

BWP-Electric has about 240 megawatts on on-site generation capacity from three generation stations: Magnolia Power Plant, Olive Power Plant Units 1 and 2, and one peaking unit: Lake 1. In addition, BWP-Electric has contracts with off-site generation including Bonneville Power Administration, Hoover Dam, Palo Verde Power Plant, Intermountain Power Plant and several wind and solar plants. BWP-Electric is connected to the Western Electric Coordination Committee (WECC) grid via the Los Angeles Department of Water and Power Receiving Station E is North Hollywood and to the Glendale Water & Power at Western Station. This multiplicity of power sources minimizes the likelihood of long duration outages by providing alternative sources of power if one or more of the sources goes offline for any reason, including earthquakes or other natural disasters.

BWP-Electric reviewed and updated its seismic requirements for substations, 69 kV transmission lines and equipment after the 1994 Northridge earthquake. Mitigation measures taken to minimize the potential impact of earthquakes and other natural disasters on BWP-Electric facilities include:

- Revised seismic design requirements for substation equipment and construction to comply with the stringent requirements in IEEE-693 (Institute of Electrical and Electronics Engineers - Recommended Practice for Seismic Design of Substations).
- All five substations built since 1995 comply with the IEEE-693 guidance.
- Soil tests were conducted in different parts of the city to verify the transmission pole designs for the 69 kV transmission lines.
- BWP received a FEMA hazard mitigation grant to reinforce bolting/ anchoring of substation equipment and to replace rigid connections with flexible connections.
- BWP will continue to implement seismic and wind load design requirement for future system expansions and replacements.
- BWP will try to avoid locating new substations in areas subject to liquefaction.

2.6.2 Potable Water

BWP-Water provides potable water to all customers in Burbank.

The BWP-Water system provides water from treated local groundwater and water purchased from the Metropolitan Water District of Southern California. The potable water system has 11 pressure zones, with 3 primary pressure zones and 8 hillside pressure zones. There are thirteen booster stations with 27 booster pumps, approximately 280 miles of pipe and 1,840 fire hydrants.

Potable water storage includes 7 concrete reservoirs and 14 steel water tanks with a total capacity of 52.6 million gallons. The average daily water use is about 19.5 million gallons and the maximum daily water demand was 29.7 million gallons. In recent years, potable water demand has been reduced through a combination of conservation measures and displacement of potable water with recycled water for irrigation use.

The City's recycled water system consists of transmission and distribution facilities divided into 6 pressure zones. There are 6 storage reservoirs or tanks with a total capacity of about 2.2 million gallons. The system includes approximately 21 miles of pipe, with another 5 miles of pipe scheduled to be built in 2013. Average daily recycled water use is about 1.85 million gallons.

Mitigation measures taken to minimize the potential impact of earthquakes and other natural disasters on BWP-Water facilities include:

- Replacement of Reservoir No. 1, a 1928 earth-filled dam, with a new reservoir (construction scheduled to start in 2012).
- Seismic upgrades for many reservoirs, including installation of flexible connections on inlet and outlet pipes.
- Nonstructural seismic retrofits for equipment.

2.6.3 Wastewater

The City of Burbank owns and operates a sanitary sewer system consisting of approximately 225 miles of gravity sewer lines ranging from 8 inches to 30 inches in diameter, two pump stations, approximately 10,000 feet of force main, and the Burbank Water Reclamation Plant (BWRP). The BWRP currently treats approximately 9.0 million gallons a day (MGD) to tertiary treatment standards. As of September 2010, the design capacity of the BWRP increased to 12.5 MGD with the installation of a two million gallon Equalization Basin (EQ basin). The EQ Basin stores primary effluent during peak flow times and then introduces it to the treatment process late at night during low flow.

Approximately 50% of the City flows to the BWRP via gravity and about 40% flows to the Mariposa and Beachwood pump stations and then is pumped to the BWRP through an 18-inch force main. The remaining 10% is conveyed by gravity to the City of LA's 48-inch North Outfall Sewer (NOS) that runs along the LA River.

Key wastewater facilities include the following:

- The BWRP located at 740 N. Lake Street was constructed and treatment started in 1966.
- The Mariposa pump station located at 1030 Dincara Rd. was constructed in the late 1970s. This station pumps wastewater to the Beachwood pump station. This station has a backup generator.
- The Beachwood Pump station located at 1419 Riverside Dr. was constructed in the mid 1970s. This station pumps wastewater to the BWRP via the force main that runs down Beachwood Dr. This station does not have a backup generator.
- The BWRP does not provide bio-solids handling and therefore conveys sludge via gravity through a sludge line to the City of LA's NOS. The sludge line runs down Beachwood Dr.
- The sewer system (collection system) has a number of diversion structures capable of isolating sections of the system or, if necessary, divert all Burbank wastewater to the City of LA's NOS via gravity flow.

2.7 Parks and Recreation

The City of Burbank owns and operates a variety of parks and recreation facilities. They are managed by the Burbank Park, Recreation and Community Services Department. The facilities are listed below in Table 2.4.

Table 2.4
Burbank Park and Recreation Facilities

FACILITY	ADDRESS	ZIP	ACRES
Abraham Lincoln Park	300 North Buena Vista Street	91506	2.50
Bel Aire Park	1750 Bel Aire Drive	91504	1.75
Brace Canyon Park	2901 Haven Way	91504	20.05
Bret Harte Playlot	3200 West Jeffries Avenue	91505	---
Burbank Center Stage	555 North Third Street	91502	---
Burbank Little Theater	1100 West Clark Avenue	91506	---
Burbank Tennis Center (at McCambridge Park)	249 East Amherst Drive	91504	---
Castaway Restaurant	1250 Harvard Road	91501	
Compass Tree Park	601 South Lake Street	91502	< .10
Creative Arts Center (at Izay Park)	1100 West Clark Avenue	91506	---
DeBell Golf Course	1500 Walnut Avenue	91501	113.39
Earthwalk Park	1922 Grismer Street	91504	< .25
George Izay Park/Olive Recreation Ctr.	1111 West Olive Avenue	91506	15.36
Johnny Carson Park	400 South Bob Hope Drive	91505	17.62
Joslyn Adult Center (at Izay Park)	1301 West Olive Avenue	91506	---
Maple Street Playground	3820 West Jeffries Avenue	91505	< .25
McCambridge Park/Recreation Center	1515 North Glenoaks Blvd.	91504	17.80
McCambridge Park Pool	1515 North Glenoaks Blvd.	91504	---
Miller Park (at Miller School)	720 East Providencia Ave.	91501	1.60
Mountain View Park	751 South Griffith Park Drive	91506	2.48
Pacific Park	3715 Pacific Avenue	91505	5.29
Palm Ballfield	1125 East Orange Grove	91501	1.50
Ralph Foy Park Roller Hockey Rink	3211 West Victory Blvd.	91505	10.00
Robert Ovrom Park/Community Center	601 South San Fernando Boulevard	91502	1.40
Robert E. Gross Park	2814 West Empire Avenue	91504	4.85
Robert E. Lundigan Park	2701 Thornton Avenue	91504	1.32
Santa Anita Playlot	250 West Santa Anita Ave.	91502	.34
Starlight Bowl	1249 Lockheed View Drive	91504	---
Stough Canyon Nature Center	2300 Walnut Avenue	91504	---
Stough Park	1335 Lockheed View Drive	91504	103.57
Tuttle Adult Center (at Foy Park)	1731 North Ontario Street	91505	---
Valley Park/Skate Park	1625 North Valley Street	91505	4.44
Verdugo Park/Community Center	3201 West Verdugo Avenue	91506	8.00
Verdugo Park Pool	700 North California Street	91505	---
Vickroy Park	2300 Monterey Place	91506	1.40
Whitnall Highway Park North	2302 North Whitnall Highway	91505	4.50
Whitnall Highway Park South	610 North Whitnall Highway	91505	4.40
Wildwood Canyon Park	1701 Wildwood Canyon Road	91501	500.00

2.8 Economics and Employment

Burbank has a very broad economic and employment base: more people work in Burbank than the city's population. The following list highlights some of Burbank's top employers and their approximate number of employees.

Table 2.5
Major Employers in Burbank

Company	Employees	Industry
Walt Disney Co.	9,500	Media
Warner Bros.	8,000	Media
Providence St. Joseph Medical Center	3,500	Healthcare
NBC Universal	2,100	Media
Burbank Unified School District	2,000	Education
Yahoo!	1,800	Media
City of Burbank	1,500	Government
Bob Hope Airport	1,400	Transportation

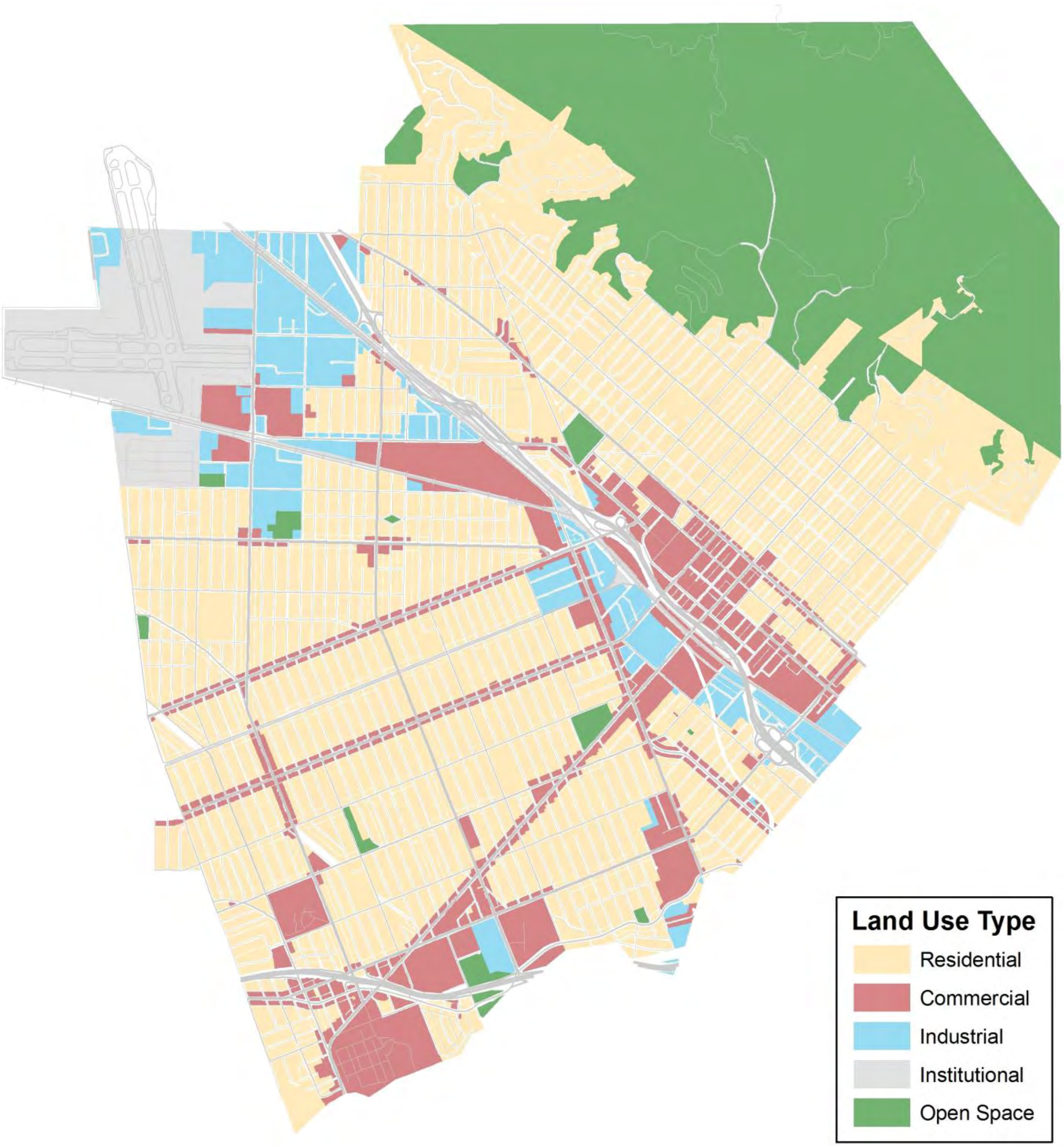
The Census website (www.census.gov) has a vast amount of other economic and related demographic data for Burbank.

2.9 Land Use and Development

The overall pattern of land use and development in Burbank is shown in Figure 2.3, a simplified version of the Burbank zoning map. The City has a balanced mix of commercial and industrial to complement its residential areas.

Burbank is a virtually a fully built-out city. The only significant areas of vacant land remaining are in the Verdugo Mountains, which are preserved as open space. This open space, along with the city's parks, comprises nearly 25 percent of Burbank's land area. By use, the largest fraction of Burbank's land area, about 30%, is occupied by single family homes. The remaining land area is devoted to a mix of types and intensities of development and transportation infrastructure including multiple family residential, commercial, light and heavy industrial, railroads, freeways, streets, and the Bob Hope Airport.

Figure 2.2
Burbank Zoning Map (Simplified)



2.9.1 Development Trends Since 2005

Burbank is an almost fully built-out city, with almost no land left for new development aside from a few individual residential parcels in the hillside area. Out of the approximately 25,000 parcels in Burbank, only about 420 are undeveloped. Most of these undeveloped parcels are owned by government agencies and used for public utilities or preserved as open space.

Nearly all development that occurs in Burbank is infill projects on previously developed lots. There has been some development in Burbank since 2005 when this plan was last updated, but the overall pattern and intensity of development has not changed. The greatest potential for additional development exists with the long term master plans for the three major studio facilities in Burbank. Since 2005, the only notable development related to these master plans was the construction of a 14-story, 485,000 square foot office building on the former NBC lot.

During the housing boom that lasted through 2007, Burbank experienced substantial redevelopment in multifamily and commercial projects. Dozens of new units in multistory apartment and condominium projects were added to the city, replacing single family homes or smaller apartment buildings. Notable commercial projects during this time included two mixed-use projects in the downtown area that included commercial space and condominiums: The Collection and Village Walk and a new Marriott Residence Inn hotel. Starting in 2008, development slowed substantially as it did throughout the country. Applications for new multiple family residential projects dropped dramatically. Most residential projects seen today are small projects with one or two new units being added to an existing single family home or duplex.

Commercial project applications have also been relatively low compared to prior years. The notable exceptions to this trend are two new office buildings completed in 2009 (one of which is on the NBC lot and noted above) and a major apartment complex with 276 units completed in 2010. All three of these projects received approvals prior to the economic decline.

2.9.2 Future Development Trends

Because Burbank is virtually fully built-out, it is not expected that the overall distribution of land uses will change significantly in the future. Rather, there will be further intensification through redevelopment of existing development in areas other than the single family residential neighborhoods.

However the rate of future redevelopment will continue to be heavily dependent upon the economy. For example, whether the housing market has bottomed out and will begin its recovery or whether it will continue to drop and similarly for the commercial real estate market. Burbank has seen some indications that developers are beginning to see a turnaround and are applying now for project approvals so that they are ready to go when financing becomes available. However, some of these project applications have subsequently been withdrawn or placed on indefinite hold.

Due to Burbank's location in the middle of the Los Angeles metropolitan area and the strong presence of the media industry, it does not face the same challenges as some outlying suburbs face in retaining its land value and attraction for redevelopment. There is little concern that Burbank will not fully recover and that demand for commercial and residential projects will return, but for now the timing is uncertain.

3.0 MITIGATION PLANNING PROCESS

3.1 Historical Overview

Burbank has always considered natural hazards as part of ongoing community planning and development programs, including building code enforcement, zoning, land use planning, environmental planning, capital improvement planning, emergency planning, post-disaster recovery planning and in the safety element of the city's general plan. Burbank has also enforced special hazard mitigation provisions for FEMA-mapped 100-year floodplains and in the Fire Severity Hazard Zone (formerly known as the Mountain Fire Zone).

Burbank has also gone beyond federal and state requirements and adopted municipal seismic retrofit ordinances for unreinforced masonry buildings, pre-1994 welded steel moment frame buildings and pre-1976 reinforced masonry buildings. The city has evaluated the seismic vulnerability of all city-owned buildings and implemented an aggressive seismic retrofit program for the most vulnerable and most important buildings.

3.2 Burbank's 2005 All-Hazard Mitigation Plan

Burbank's development of its first formal hazard mitigation plan began in 2004 with the establishment of a Hazard Mitigation Planning Steering Committee. The committee included 16 people, representing all of the Burbank Departments with significant roles in hazard mitigation and/or disaster response and recovery, along with 3 adjunct contributors from a consulting firm. The Hazard Mitigation Planning Steering Committee met 9 times between June and November 2004, with the Mitigation Plan being completed in January 2005. The formal adoption of the final FEMA-approved 2005 Burbank All-Hazard Mitigation Plan was done by the City Council on March 30, 2005.

The Steering Committee aggressively sought input from the entire Burbank community as well as from adjacent jurisdictions. The hazard mitigation planning project was introduced to the community at a meeting of the City of Burbank Community Disaster Council. Hazard mitigation survey questionnaires in English and Spanish were distributed at several public meetings and made available at several locations, including: Community Disaster Committee, Libraries, City Council Chambers, Public Works Department, Community Development Department, City Clerk's Office, the City of Burbank website and at a City Council Meeting.

The questionnaires solicited community inputs on several important hazard mitigation issues, including:

- The level of concern about each of a comprehensive list of natural and human-caused hazards,
- The most effective ways to receive disaster mitigation information,
- The extent to which households have completed disaster preparation activities,
- The relative importance of eight mitigation objectives, and
- The extent of support for eight types of mitigation strategies.

The 2005 Burbank All-Hazards Mitigation Plan included consideration of the following natural and human-caused hazards: earthquakes, transportation accident, transportation loss, wildland/urban interface fires, terrorism and weapons of mass destruction, utility loss/disruption (electric power), water/wastewater disruption, hazardous materials incidents, aviation disaster, severe weather/destructive winds, explosions, economic disruption, floods, civil unrest, dam failure, special events, sinkholes, volcanic activity and drought.

3.3 Burbank Hazard Mitigation Plan – 2011 Update

The 2011 update of the Burbank Hazard Mitigation Plan was begun in June 2009 with the establishment of a new Hazard Mitigation Planning Committee. The members of the committee were derived from recommendations by City of Burbank department managers for their personnel that possessed the knowledge and understanding to be a subject matter contributor to the mitigation plan update. The committee includes representatives from each City of Burbank Department with a significant role in hazard mitigation planning and/or disaster response and recovery. The members of the committee (December, 2010) are shown in Table 3.1 on the following page.

The Chairperson of the Planning Committee was Daryl Isozaki of the Fire Department, the City’s Emergency Manager. The Vice-Chairperson was Sean Corrigan, the City Engineer and Chief Assistant Public Works Direction. However, effective January 7, 2011, Jeff Howe of the Fire Department became Chairperson of the committee and the City’s Emergency Manager.

The hazard mitigation planning effort also included consultants under contract to the City of Burbank. From June 2009 through September 2010, the consultants were Jan Rogala and Rich Rogala of Dimensions Unlimited Inc. From September 2010 forward, the consultant was Kenneth A. Goettel of Goettel & Associates Inc. These consultants served as adjunct members of the committee.

Table 3.1
Hazard Mitigation Planning Committee Members

Department	Participant
Fire	Ray Krakowski
Fire	Daryl Isozaki[1]
Fire	Jeff Howe[1]
Fire	Sana Arakelian
Police	Armen Dermenjian
Police	Carlos Gomez
Community Development	Tom Sloan
Community Development	Tom Lim
Community Development	Michael Forbes
Public Works	Sean Corrigan[2]
Public Works	Stacey Holderbach
Water & Power	Jorge Somoano
Water & Power	Bill Mace
Water & Power	Albert Lopez
Water & Power	Devin Burns
Management Services	Allan Amico
Information Technology	Penny Forbes
Parks, Recreation & Community Services	Gwen Indermill
City Manager's Office	Krista Dietrich
Public Information Office	Cinda Cates
Public Information Office	Keith Sterling
City Attorney's Office	Carolyn Barnes
Library Services	Jody Hidey
Financial Services Department	Patrick Flynn
Burbank Unified School District	Chuck Colgan

[1] Effective January 7, 2011, Daryl Isozaki was replaced as Chairperson of the Steering Committee by Jeff Howe.

2 Vice-Chairperson.

The major roles and responsibilities of the Hazard Mitigation Planning Steering Committee, with technical support from the consultants, are to complete the 2011 update of Burbank's Hazard Mitigation, including:

- Review the 2005 Burbank Hazard Mitigation Plan to document the mitigation progress made since 2005 and to determine areas needing updates and/or improvements.
- Update the hazard, vulnerability and risk assessments.
- Update historical disaster information, especially events occurring since 2005.

- Review and update the mission statement, goals, objectives and action items.
- Meet FEMA's current requirements for mitigation plan approval.
- Coordinate hazard mitigation planning tasks and activities with the City's staff and departments.
- Encourage and facilitate continued public involvement throughout the mitigation planning process.
- Encourage and monitor the implementation of mitigation action items identified in the mitigation plan.

After FEMA approval of the 2011 update of the Burbank Hazard Mitigation Plan, the Steering Committee's continuing roles and responsibilities will include:

- Hold periodic meetings, at least annually, to review the Mitigation Plan and revise as necessary.
- Continue to encourage and facilitate public involvement in the mitigation planning process.
- Continue to encourage and monitor the implementation of mitigation action items identified in the mitigation plan.
- Initiate the FEMA-required 2016 update of the Burbank Hazard Mitigation Plan by mid-2014.

The City of Burbank Hazard Mitigation Planning Committee aggressively sought input from all City departments with a significant role in hazard mitigation and/or disaster response and recovery as well as from the broader community. Public participation is a key component of the mitigation planning process and offers citizens and stakeholders the opportunity to express their ideas and priorities for hazard mitigation activities.

The 2011 update of Burbank's hazard mitigation plan included a four phase public participation process:

- Developing the Planning Committee composed of knowledgeable individuals from the City and the community and holding numerous committee meetings,
- Distributing a public questionnaire to gather public opinions about hazard mitigation planning and priorities,
- Conducting two public workshops to identify common concerns about hazards and to discuss specific goals and action items in the mitigation plan, and
- Presenting the draft hazard mitigation plan at a City Council meeting to facilitate inputs from the council and the public.

The following sections provide a synopsis of the major elements in the mitigation planning process. Supplemental documentation of the planning process is provided in

Appendix 3, including meeting minutes and sign-in sheets, copies of the questionnaires in English and Spanish, agendas for the workshops, and a summary of the presentation to the City Council.

3.3.1 Hazard Mitigation Planning Committee Meetings

For the 2011 update of Burbank's hazard mitigation plan, the hazard mitigation planning committee met on the following dates:

- June 24, 2009
- August 26, 2009
- November 3, 2009
- February 10, 2010
- September 23, 2010
- October 5, 2010
- October 26, 2010
- November 16, 2010
- December 2, 2010
- December 14, 2010
- December 21, 2010
- February 1, 2011

Agendas and sign-in lists for the above meetings are in Appendix 3.

The gap between the February 10, 2010 and September 23, 2010 meetings corresponds to the time period when the initial draft of the updated hazard mitigation plan was submitted to the California Emergency Management Agency and FEMA for review, along with time for the committee to digest the extensive comments received.

The September 23rd meeting was particular important because major decisions were made regarding the content and layout of the 2011 Burbank Hazard Mitigation Plan. At this meeting, the Burbank Hazard Mitigation Planning Team decided to re-focus the Burbank Hazard Mitigation Plan on natural hazards.

The 2011 Burbank Mitigation Plan addresses each of the natural hazards posing risk to the city, with emphasis on the hazards which pose the greatest risk, including: earthquakes, wildland/urban interface fires, landslides/mudslides (which were not included in the 2005 hazard mitigation plan), floods, windstorms, drought and other natural hazards which pose very low or negligible risk: volcanic hazards, subsidence, expansion soils, extreme temperatures and other weather events.

The decision to focus on natural hazards for the 2011 update of the Burbank Hazard Mitigation Plan was made because human-caused hazards are predominantly or entirely addressed by emergency response planning rather than by mitigation planning. Human-caused hazards are briefly addressed in Chapter 12.

The 2011 update of the Burbank Hazard Mitigation Plan includes the following significant enhancements:

- Update the hazard information for each of the major natural hazards,
- Refine the vulnerability and risk assessments for each of the major natural hazards,
- Redefine critical facilities with more specificity,
- Refocus and reprioritize hazard mitigation goals, objectives, and action items to emphasize pragmatic, implementable measures that address the highest risk situations in Burbank and that will significantly reduce risk.
- Identify specific mitigation projects with the best likelihood of garnering FEMA mitigation project grants for implementation, and
- Improve the usability and accessibility of the Burbank Hazard Mitigation Plan by re-organizing the plan and removing materials not essential for mitigation planning.

3.3.2 Questionnaires

As was done for the 2005 mitigation plan, public inputs for the 2011 update of the mitigation plan were solicited via distribution of questionnaires. The questionnaires in English and Spanish are included in Appendix 3.

Questionnaires were posted on the City's website, on a disaster volunteer website and including in utility bill mailings to city residents. The questionnaires were also distributed at meetings of the Burbank Disaster Council and the Burbank City Council as well as made available at locations frequented by the public, including libraries, City Hall, Public Works Department, Community Development Department, City Clerk's Office and at the Burbank Unified School District.

The overall level of concern expressed by questionnaire responses are shown in Table 3.2 below, which also includes responses from the 2005 questionnaires for reference. Hazards listed as N/A were omitted from the questionnaires.

Table 3.2
Questionnaire Responses: Levels of Concern About Natural Hazards

Hazard	Level of Concern	
	2010	2005
Earthquake	Very Concerned	Very Concerned
Drought	Very Concerned	N/A
Severe Weather/Wind	Somewhat Concerned	Moderately Concerned
Wildland/Urban Fire	Somewhat Concerned	Very Concerned
Landslide/Mudslide	Not Concerned	N/A
Volcano	Not Concerned	N/A
Dam Failure	Not Concerned	Moderately Concerned
Flood	N/A	N/A

The levels of concern about natural hazards concur about being very concerned about earthquakes but differ somewhat for the other hazards. The 2010 lower level of concern for wildland/urban interface fires may reflect the time that has passed since the last major fire – the Harvard Fire in 2005. Overall, there are differences in the level of concern expressed by the public vis-à-vis the more quantitative risk assessments presented in Chapters 6 through 12. The risk assessments, as summarized in Table 1.3 in Chapter 1, rank earthquakes, wildland/urban interface fires and landslides/ mudslides as the hazards posing the greatest threats to Burbank.

The 2010 questionnaires also gathered inputs regarding priorities for mitigation activities and disaster preparedness. Summary results are shown below in Table 3.3. These results show that 7 or the 8 mitigation priorities were ranked as very important, with protecting historical and cultural landmarks ranked as somewhat important.

Table 3.3
Mitigation Priorities

Hazard Mitigation Priorities	Ranking
Protecting private property	Very important
Protecting critical facilities (hospitals, transportation networks, fire stations)	Very important
Preventing development in high hazard areas	Very important
Protecting natural environment	Very important
Protecting historical and cultural landmarks	Somewhat important
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses	Very important
Protecting and reducing damages to utilities	Very important
Strengthening emergency services (police, fire, EMS)	Very important

The 2010 questionnaires also gathered inputs regarding strategies to reduce risk. Summary results are shown below in Table 3.4

Table 3.4
Opinions on Mitigation Strategies

Opinions on Mitigation Strategies	Opinion
Support regulatory approach to reducing risk	Neutral/Not sure
Support non-regulatory approach to reducing risk	Agree
Support policies than prohibit development in areas subject to natural hazards	Agree
Support the use of tax dollars to reduce risks and losses from natural hazards	Agree
Support protecting historical and cultural resources	Neutral
Willing to make their home more disaster resistant	Agree
Support steps to safeguard economy following a disaster	Agree
Support improving disaster preparedness in schools	Agree

3.3.3 Public Workshops

The Hazard Mitigation Planning Committee held two public workshops in February 2010 to present a draft version of the updated Burbank Hazard Mitigation Plan.

The public announcement for these workshops is shown on the following page. The announcement for the workshops was distributed as flyers at City facilities, posted on the City's website, and shown as a scrolling message on local cable TV.

The intent of these workshops was to introduce the purpose, objectives and elements of the plan and to address questions or concerns about hazard mitigation and disaster preparedness. The questionnaires discussed in the previous section were also available at the workshops.

Although given amply opportunity, the public participation in these workshops was minimal, with a total of three attendees for the two workshops. The attendees' primary concerns were for earthquakes, especially as related to their own homes. Much of the discussion focused on personal preparedness and preventative measures that have been or could be implemented to lower earthquake risks for homes, especially including non-structural measures such as restraining water heaters and tall items.

The workshop comments and public questionnaire responses that were received validated the foundation and direction for the update of the Burbank Hazard Mitigation Plan.

Community Outreach

Hazard Mitigation Plan Meeting

The City of Burbank would like to invite all residents to a public presentation of the City of Burbank's Hazard Mitigation Plan. The intent of this meeting will be to introduce the purpose, objectives and elements of the plan, and to address questions or concerns about hazard mitigation and disaster preparedness.

We will also have available to all attendees a public questionnaire that contains questions about your personal preparedness, concerns about various types of natural and human caused hazards, methods of receiving disaster and preparedness information, and what community-wide mitigation strategies you would consider supporting. Responses to the questionnaire will be included in the City of Burbank Hazard Mitigation Plan 2010.

The public questionnaire survey can also be viewed and completed on-line at BurbankUSA.com:
Go to: "On-Line Survey." A printable PDF version will also be available on-line. Printed questionnaires can be picked up at City Hall, Community Services Building, Libraries, and the Fire Department. All printed versions of the questionnaire should be mailed to:

Burbank Fire Department
Emergency Services Division - HMP
311 E. Orange Grove Ave.
Burbank, CA 91502

MEETING DATES/TIMES

Please join us on February 15th and 18th, from 6:00 to 7:00 p.m., at the Burbank Fire Department Training Center, 1845 N. Ontario Street, Burbank, to learn more about the City of Burbank Hazard Mitigation Plan.

MEETING LOCATION

The meeting will take place at the Burbank Fire Training Center, 1845 N. Ontario Street.

Parking will be available along the park and Ontario Street.

To view the on-line public questionnaire, please log onto BurbankUSA.com. Go to: "On-Line Survey"
For questions, contact: 818-238-3473

ATTACHMENT 1

A final public workshop to review the draft final 2011 update of the Hazard Mitigation Plan was held on April 13, 2011. The notice for this workshop is shown below. Despite widespread publicity about the workshop, no members of the public attended the workshop.

FOR IMMEDIATE RELEASE
April 1, 2011

Contact:
Keith Sterling
Public Information
ksterling@ci.burbank.ca.us
818-238-5840, or
Captain Jeffrey F. Howe
Burbank Fire Department
Emergency Management Coordinator
jhowe@ci.burbank.ca.us
818-238-3350

Public Review of Hazard Mitigation Plan Set for April 13

Burbank Fire and other City departments have been working on updating the City's Hazard Mitigation Plan. It is now ready for public review. The plan can be viewed on the City's website, www.BurbankUSA.com under News.

The public can ask questions and get further information at a review session on Wednesday, April 13th from 5 to 8 p.m. at the Burbank Fire Training Center, 1845 Ontario. Burbank Fire Captain Jeffrey Howe, Emergency Management Coordinator, will be on hand to answer questions.

Hazard Mitigation is "any action which reduces or eliminates the long term risk to lives, property, and the environment from natural and/or human-caused hazards."

The Hazard Mitigation Plan is to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards. This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the City toward building a safer, more sustainable community.

3.3.4 Stakeholder Interviews

Stakeholder interviews were conducted with the following key stakeholders: Burbank Unified School District, Bob Hope Airport, Burbank Ministerial Association, Burbank Fire Corps Volunteer Program, Burbank Temporary Aid, Providence Saint Joseph Medical Center, Warner Bros Studios, and the Burbank Older Adult Focus Group.

Summaries of these interviews are included in Appendix 3. Interviewees were given the opportunity to participate in the 2011 update of the Burbank Hazard Mitigation Plan, if they wished. However, only a few comments from these stakeholders were received and incorporated into the 2011 update of Burbank's hazard mitigation plan, including the action items when appropriate.

3.3.5 Outreach Efforts for Other Stakeholders

The lists of other stakeholders to whom notices about the 2011 update of the Burbank Hazard Mitigation Plan were sent are included in Appendix 3. These other stakeholders include members of the Burbank Disaster Council contact list as well as a more comprehensive list of other possible stakeholders with interests in Burbank.

These stakeholders were given the opportunity to participate in the 2011 update of the Burbank Hazard Mitigation Plan, if they wished. However, no comments from these stakeholders were received.

In addition to the above efforts, copies of the draft 2011 Update of the Burbank Hazard Mitigation Plan have been posted on the City's website, along with a solicitation of comments. To date, no additional comments have been received.

4.0 MISSION STATEMENT, GOALS, OBJECTIVES AND ACTION ITEMS

4.1 Overview

The overall purpose of the Burbank Hazard Mitigation Plan is to reduce the impacts of future natural or human-caused disasters on Burbank. That is, the purpose is to make Burbank more disaster resistant and disaster resilient, by reducing the vulnerability to disasters and enhancing the capability of the city and its citizens to respond effectively to and recover quickly from future disasters.

Completely eliminating the risk of future disasters in Burbank is neither technologically possible nor economically feasible. However, substantially reducing the negative impacts of future disasters is achievable with the adoption of this pragmatic Hazard Mitigation Plan and ongoing implementation of risk reducing action items.

Incorporating risk reduction strategies and action items into Burbank's existing programs and decision making processes will facilitate moving Burbank toward a safer and more disaster resistant future. This mitigation plan provides the framework and guidance for both short- and long-term proactive steps that can be taken to:

- Protect life safety,
- Reduce property damage,
- Minimize economic losses and disruption, and
- Shorten the recovery period from future disasters.

In addition, the Burbank Hazard Mitigation Plan is intended to meet FEMA's (Federal Emergency Management Agency) mitigation planning requirements so that Burbank remains eligible for pre- and post-disaster mitigation funding from FEMA.

The Burbank Hazard Mitigation Plan is based on a four-step framework that is designed to help focus attention and action on successful mitigation strategies: Mission Statement, Goals, Objectives and Action Items.

- **Mission Statement.** The Mission Statement states the purpose and defines the primary function of the Burbank Hazard Mitigation Plan. The Mission Statement is an action-oriented summary that answers the question "Why develop a hazard mitigation plan?"
- **Goals.** Goals identify priorities and specify how Burbank intends to work toward reducing the risks from natural and human-caused hazards. The Goals represent the guiding principles toward which the community's efforts

are directed. Goals provide focus for the more specific issues, recommendations and actions addressed in Objectives and Action Items.

- **Objectives.** Each Goal has Objectives which specify the directions, methods, processes, or steps necessary to accomplish the plan's Goals. Objectives then lead directly to specific Action Items.
- **Action Items.** Action items are specific well-defined activities or projects that work to reduce risk. That is, the Action Items represent the steps necessary to achieve the Mission Statement, Goals and Objectives.

4.2 Mission Statement

The mission of the Burbank Hazard Mitigation Plan is to:

> **Proactively facilitate and support community-wide policies, practices, and programs that make Burbank more disaster resistant and disaster resilient.**

The Burbank Hazard Mitigation Plan documents Burbank's commitment to promote sound public policies designed to protect citizens, critical facilities, infrastructure, private property and the environment from natural hazards by increasing public awareness, identifying resources for risk assessment, risk reduction and loss reduction, and identifying specific activities to help make Burbank more disaster resistant and disaster resilient.

4.3 Mitigation Plan Goals and Objectives

Mitigation plan goals and objectives guide the direction of future policies and activities aimed at reducing risk and preventing loss from disaster events. The goals and objectives listed here serve as guideposts and checklists as the city, other agencies, businesses and individuals begin implementing mitigation action items within Burbank.

Burbank's mitigation plan goals and objectives are based broadly, on and consistent with, the goals established by the State of California Hazard Mitigation Plan. However, the specific priorities, emphasis and language are Burbank's. These goals were developed with extensive input and priority setting by the Burbank mitigation plan steering committee and the other stakeholders and citizens of Burbank.

Goal 1: Reduce the Threat to Life Safety

Objectives:

A. Enhance life safety by minimizing the potential for deaths and injuries in future disaster events.

B. Enhance life safety by improving public awareness of earthquakes, wildland/urban interface fires, landslides and other natural hazards posing life safety risk to the Burbank community.

Goal 2: Reduce the Threats to Burbank Buildings, Facilities and Infrastructure

Objectives:

A. Identify buildings and infrastructure at high risk from one or more hazards addressed in the Burbank Hazard Mitigation Plan.

B. Conduct risk assessments for critical buildings, facilities and infrastructure at high risk to determine cost effective mitigation actions to eliminate or reduce risk.

C. Implement mitigation measures for buildings, facilities and infrastructure which pose an unacceptable level of risk.

D. Ensure that new buildings and infrastructure in Burbank are adequately designed and located to minimize damages in future disaster events.

Goal 3: Enhance Emergency Response Capability, Emergency Planning and Post-Disaster Recovery

Objectives:

A. Ensure that critical facilities and critical infrastructure are capable of withstanding disaster events with minimal damages and loss of function.

B. Enhance emergency planning to facilitate effective response and recovery from future disaster events.

C. Increase collaboration and coordination between Burbank, nearby communities, utilities, businesses and citizens to ensure the availability of adequate emergency and essential services for the Burbank community during and after disaster events.

Goal 4: Increase Public Awareness of Natural Hazards and Enhance Education and Outreach Efforts

Objectives:

A. Develop and implement education and outreach programs to increase public awareness of the risks from natural hazards.

B. Provide information on resources, tools, partnership opportunities and funding resource sources to assist the community in implementing mitigation activities.

C. Strengthen communication and coordinate participation among and within public agencies, non-profit organizations, business, industry and the public to encourage and facilitate mitigation actions.

Goal 5: Incorporate Mitigation Planning into Natural Resource Management and Land Use Planning

Objectives:

A. Balance natural resource management, land use planning and natural hazard mitigation to protect life, property and the environment.

B. Preserve, rehabilitate and enhance natural systems to both enhance habitats and serve natural hazard mitigation functions.

Goal 6: Vigorously Seek Funding Sources for Mitigation Actions

Objectives:

A. Prioritize and fund action items with the specific objective of maximizing mitigation, response and recovery.

Explore both public (local, state and federal) funding and private sources for mitigation actions.

4.4 Critical and Essential Facilities

The buildings, utility infrastructure and transportation infrastructure listed below in Table 4.1 are deemed critical or essential for the City of Burbank. Critical facilities are defined as those necessary for emergency response and recovery operations, including fire and police facilities and medical facilities, as well as other facilities especially deemed especially important for Burbank.

Essential utility services such as electric power, water and wastewater are also extremely important to communities, especially after a disaster. Such utilities are often characterized as “lifeline” utilities because they are so important to a community for life safety (e.g., services to hospitals) and for the economic recovery after a disaster.

Similarly, bridges and other transportation infrastructure for freeways and major arteries may be deemed critical for emergency response, evacuation, and recovery operations during and after disasters.

Burbank’s critical facilities are listed in Table 4.1 on the following pages.

Table 4.1
Critical Facilities

Facility/Structure Name	Location	Date Built	Structural System	Significant Vulnerability to Hazards					Back-Up Power	Mitigation Measures Taken to Reduce Risks and Notes
				Earthquake	Wildland Interface Fire	Landslides/ Mudslides	Flood	Windstorms		
City-Owned Buildings										
City Hall	275 E. Olive Ave. 91502	1941	Concrete shear walls	X					YES	
Community Services Building	150 N. Third Street 91502	2008	Steel frame						YES	Constructed to recent seismic requirements
Administrative Services Building	301 E. Olive Ave. 91502	1962	Wood frame and masonry	X					NO	FEMA retrofit grant pending.
Field Services Admin Bldg.	124 S. Lake Street 91502	1959	Reinforced masonry, flexible diaphragm				X		YES	Seismically retrofitted in 2009
McCambridge Recreation Center[1]	1515 N. Glenoaks Blvd. 91504	1957	Reinforced masonry, flexible diaphragm						NO	Seismically retrofitted in 2010
Olive Recreation Center[1]	1111 W. Olive Ave. 91506	1943	Wood frame with some masonry walls	X					NO	
Verdugo Recreation Center[1]	3201 W. Verdugo Ave. 91506	1948	Wood frame with some masonry walls	X					NO	
Joslyn Adult Center[1]	1301 W. Olive Ave. 91506	1969/1988	Wood frame with some masonry walls	X					NO	
Central Library[1]	110 N. Glenoaks Blvd. 91502	1963	Reinforced masonry, flexible diaphragm	X					NO	
Buena Vista Library[1]	300 N. Buena Vista St. 91505	2002	Steel Frame and reinforced concrete						NO	
Northwest Library[1]	3323 W. Victory Blvd. 91505	1972	Reinforced masonry, flexible diaphragm	X					NO	
[1]These buildings are designated as shelters.										
Emergency Response Facilities										
Police/Fire Headquarters/Fire Station 11	311 E. Orange Grove Ave. 91502	1998	Steel Frame and reinforced concrete						YES	Constructed to recent seismic requirements
Fire Training Center - Emergency Operations Center	1845 N. Ontario St. 91505	1988	Reinforced masonry and wood frame with rigid diaphragm						NO	Limited back-up power: not enough for air-conditioning which is necessary for EOC computer and communication equipment
Fire Station 12	644 N. Hollywood Way 91505	1989	Reinforced masonry with rigid diaphragm						YES	Constructed to recent seismic requirements
Fire Station 13	2713 Thornton Ave. 91504	1993	Reinforced masonry with rigid diaphragm						YES	Constructed to recent seismic requirements
Fire Station 14	2305 W. Burbank Blvd. 91506	1992	Reinforced masonry with rigid diaphragm						YES	Constructed to recent seismic requirements
Fire Station 15	1420 W. Verdugo Blvd. 91506	1992	Reinforced masonry with rigid diaphragm						YES	Constructed to recent seismic requirements
Fire Station 16	1600 N Bel Aire Drive 91504	1957/1989	Reinforced masonry and tilt-up with flexible diaphragm		X	X			YES	Seismically retrofitted in 2009

Table 4.1
Critical Facilities – Continued

Facility/Structure Name	Location	Date Built	Structural System	Significant Vulnerability to Hazards					Back-Up Power	Mitigation Measures Taken to Reduce Risks
				Earthquake	Wildland Interface Fire	Landslides/ Mudslides	Flood	Windstorms		
Medical and Shelters										
Providence Saint Joseph Medical Center	501 S. Buena Vista St. 91595	1952/2003	Steel Frame or Reinforced Concrete				**?**		**YES**	All Buildings meet SB 1953 standards for current occupancy; all except East Building meet the 2030 standards. Hospital buildings may be in liquefaction area.
Providence Saint Joseph, Disney Family Cancer Center	181 S. Buena Vista St. 91505	2007	Steel Frame or Reinforced Concrete				**?**		**YES**	
David Starr Jordan Middle School - Bldg 5 & Bldg 9 - City of Burbank and Red Cross Shelter Center	420 South Mariposa St. 91506	1947/1949	Reinforced concrete	**X**			**?**		**NO**	
Luther Burbank Middle School - Bldg 5 & Bldg 7 -City of Burbank and Red Cross Shelter Center	3700 West Jefferies Ave. 91505	1947/1953	Reinforced concrete	**X**					**NO**	
John Muir Middle School - Bldg. 3 & Bldg 2 - City of Burbank and Red Cross Shelter Center	1111 North Kenneth Rd. 91504	1951	Reinforced concrete	**X**					**NO**	
Burbank High School - Bldg 1 & Bldg 3 - City of Burbank and Red Cross Shelter Center	902 North Third St. 91502	2002/2004	Steel framed structure w/ metal studs						**NO**	Constructed to current seismic requirements
John Burroughs High School - Bldg 4 & Bldg 5 - City of Burbank and Red Cross Shelter Center	1920 Clark Ave. 91506	2003/2004	Steel framed structure w/ metal studs and stucco						**NO**	Constructed to current seismic requirements

ATTACHMENT 1

Table 4.1
Critical Facilities – Continued

Facility/Structure Name	Location	Date Built	Structural System	Significant Vulnerability to Hazards					Back-Up Power	Mitigation Measures Taken to Reduce Risks
				Earthquake	Wildland Interface Fire	Landslides/ Mudslides	Flood	Windstorms		
Burbank Utility Facilities										
Water Reclamation Plant Admin Bldg	740 N. Lake Street 91502	1966	Reinforced masonry, flexible diaphragm				**X**		**Partial**	Seismically retrofitted in 2009. This site has dual grid power feeds from separate substations. Emergency generator powers control equipment only.
Water Reclamation Plant Operations Bldg	740 N. Lake Street 91502	1966	Reinforced masonry, flexible diaphragm				**X**		**Partial**	
Water Reclamation Plant Aeration Bldg	740 N. Lake Street 91502	1966	Reinforced masonry, flexible diaphragm				**X**		**Partial**	
Burbank Water & Power - Magnolia Power Unit	110 W. Magnolia Blvd. 91502	2005	Structural Steel Frame				**?**		**Partial**	Seismically constructed in 2005. Dual grid power feeds from separate substations.
Burbank Water & Power - Magnolia Power Control Building	110 W. Magnolia Blvd. 91502	2005	Combined Concrete Block Structural Steel				**?**		**Planned**	Seismically constructed in 2005. Generator under design.
Lake Street GAC	320 N. Lake Street 91502	1993	Steel and Concrete	**X**						Well water vulnerability
Burbank Water & Power Administration Buildings	164 W. Magnolia Blvd. 91502	1949	Reinforced concrete	**X**					**YES**	Scheduled for 2012
Burbank Water & Power - Lake Power Generation Unit	320 N. Lake Street 91502	2003	Steel Structure & Frame						**Yes**	Seismically constructed 2003
Burbank Water & Power - Olive 1 & 2 Generation Units	300 N. Lake Street 91502	1957	Reinforced masonry	**X**					**Minimal**	
Burbank Water & Power Olive 1 & 2 Control Room	300 N. Lake Street 91502	1957	Reinforced masonry	**X**					**Minimal**	
Burbank Water & Power - Energy Control Center	1811 N. Ontrario St. 91504	1988	Reinforced masonry						**YES**	Constructed to recent seismic requirements
Burbank Water & Power - Burbank Operable Unit	2030 N. Hollywood Way 91504	1949/1995	Reinforced masonry	**X**					**NO**	Seismically retrofitted 1995
Burbank Water & Power - Palm Reservoir No. 1	300 N. Sunset Canyon 91502	1929	Concrete	**X**					**NO**	Scheduled for replacement & reconstruction
Beachwood Pump Station	1419 Riverside Dr. 91506	1970s	Reinforced concrete	**X**					**NO**	
Mariposa Pump Station	1030 Dincara Rd. 91506	1970s	Reinforced concrete with wood framed roof	**X**					**YES**	
Bridges										
Burbank Blvd. Bridge	Between Victory Blvd and San Fernando Rd.	1958	Reinforced Concrete	**X**					**N/A**	Caltrans has scheduled demolition and replacement within a few years
Magnolia Blvd. Bridge	Between First Street and Varney Street	1959	Reinforced Concrete	**X**					**N/A**	The portion over the freeway received seismic upgrading in the 90's. The City has applied for Highway Bridge Program funding to modernize the bridge including additional seismic upgrades.
Olive Avenue Bridge	Between First Street and Flower Street	1959	Reinforced Concrete	**X**					**N/A**	Ditto

4.5 Progress Report: 2005 Burbank All-Hazard Mitigation Plan

4.5.1 Goals

The 2005 Burbank All-Hazard Mitigation Plan had five main long-term goals:

Goal 1: Promote disaster-resistant future development.

Goal 2: Increase public understanding and support for effective hazard mitigation.

Goal 3: Build local support and commitment to become less vulnerable to hazards.

Goal 4: Enhance hazard mitigation coordination and communication with federal, state and local jurisdictions.

Goal 5: Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure and City of Burbank-owned facilities from the following high risks:

- Earthquake
- Transportation Accident
- Transportation Loss
- Wildland/Urban Interface Fire in the City
- Terrorism/Weapons of Mass Destruction
- Utility Loss/Disruption/Substations
- Hazardous Materials Incidents

The 2005 Burbank All-Hazard Mitigation Plan also included four Future Goals, which largely duplicated the above Long Term Goals, with the exception of an additional goal to reduce the possibility of damage and losses to existing assets due to floods.

The City of Burbank made significant progress on many of these goals from 2005 to 2011, as evidenced by the full or partial completion of a number of action items. This progress is documented in the following section.

4.5.2 Action Items

The 2005 Burbank All-Hazard Mitigation Plan included a total of 46 action items, including 19 all-hazard action items and 27 hazard-specific action items. These items are listed in Table 4.2, along with information whether the action item has been completed, has been partially completed, or has not yet been completed.

Table 4.2
Progress Report: Action Items from 2005 Burbank All-Hazard Mitigation Plan

2005 Action Items		Progress?	Comments
All Hazards			
AH-1	GIS enhancement	**NO**	Funding unavailable
AH-2	Emergency dispatch	**NO**	Funding unavailable
AH-3	Mobile GIS	**NO**	Funding unavailable
AH-4	Emergency power for key facilities	**Partial**	Done for City Hall, CNG Fill Station and Public Works Yard
AH-5	Emergency power for field crews	**NO**	Funding unavailable
AH-6	Portable generator lights	**NO**	Funding unavailable
AH-7	Battery backup -traffic lights	**Partial**	Done for 30 intersections, 20 more needed
AH-8	Evacuation feasibility study	**NO**	Funding unavailable
AH-9	Non-traditional mutual aid	**NO**	Funding unavailable
AH-10	Redundancy - Fiber Optic-Wireless	**Partial**	Partial completion by Public Works and Burbank Water and Power
AH-11	Wireless network	**NO**	Funding unavailable
AH-12	Data base system map	**NO**	Funding unavailable
AH-13	Emergency supplies for employees	**YES**	Each City building has an emergency supply cache.
AH-14	EOC -911 center	**NO**	Funding unavailable
AH-15	Mobile command post	**NO**	Funding unavailable
AH-16	Police station continuity	**NO**	Funding unavailable
AH-17	Fuel support for emergency vehicles	**YES**	Underground fuel tanks retrofitted
AH-18	Fuel tank program	**YES**	Completed
AH-19	AEDs	**Partial**	AEDs at Recreation Centers and the Golf Course
Aviation Disaster			
AD-1	Provide emergency power for airport operations	**YES**	Not within City's jurisdiction, but airport has extensive emergency power backups
AD-2	Airport mobile command post	**NO**	Funding not available
Terrorism and Weapons of Mass Destruction			
WT-1	Security systems for city buildings	**NO**	Funding not available.
Transportation Accidents			
TA-1	Assess feasibility of grade separation for railroad crossings	**YES**	Completed
TA-2	Construct grade separations for railroad crossings	**YES**	Projects designed and funded, scheduled for construction.
Hazardous Materials			
HM-1	Hazardous materials awareness program	**YES**	Completed
HM-2	Shelter in place information program	**NO**	An in-preparation disaster preparedness publication will inform the public about shelter in place.

Table 4.2 (Continued)
Progress Report: Action Items from 2005 Burbank All-Hazard Mitigation Plan

2005 Action Items		**Progress?**	**Comments**
Earthquakes			
EQ-1	Seismic upgrades for city buildings	**Partial**	Completed for 11 buildings, others scheduled: See: Tables 6.4 and 6.5 in Chapter 6
EQ-2	CCTV for sewer storm drain inspections	**YES**	Completed
EQ-3	Bridges - state-federal data sharing	**YES**	Completed
EQ-4	Seismic risk assessments for buildings	**YES**	Completed
EQ-5	Seismic structural assessments for evacuation centers	**YES**	Completed
EQ-7	Planning for I-5 failure	**Partial**	In process.
EQ-8	Heavy rescue capability	**NO**	Funding not available.
EQ-9	Emergency escape ladders	**NO**	Funding not available.
EQ-10	Emergency shelter communication	**YES**	Completed
Severe weather - floods, winds, mudslides			
SW-1	Debris basins evaluations	**NO**	Not necessary, OK as is.
SW-2	Debris basin structural improvements	**NO**	Not necessary, OK as is.
SW-3	Vactor truck purchase	**YES**	Completed
SW-4	Maintain flood control channels-drains	**Partial**	Ongoing, with permits pending
SW-5	Protection of electronics equipment	**Partial**	
Wildland/Urban Interface Fire			
WF-1	Post-Fire Debris Flow Planning	**YES**	Completed for City and County debris basins
WF-2	Biomass Program	**NO**	Funding not available
WF-3	Improve Stough Fire Road	**NO**	Funding not available
WF-4	Hiking trails construction	**YES**	Completed
Water-wastewater loss			
WW-1	Access to Foy Park and Valley Pump Station	**NO**	Funding not available
Flooding			
FL-1	Remove debris from basins, sandbag as necessary	**Partial**	Ongoing

Note: There is no EQ-6 Action Item in the 2005 Mitigation plan.

Of the 46 action items in the 2005 Burbank All-Hazard Mitigation Plan, 24 have been completed or partially completed, while 22 have not been completed due to lack of funding availability and/or staff resources.

The action items included in the 2011 Burbank Hazard Mitigation Plan differ substantially from those in the 2005 All-Hazard Mitigation Plan, for the following reasons:

- Many of the 2005 action items have been completed,
- The 2011 hazard mitigation plan has been refocused to include only natural hazards, and
- The 2011 action items focus more on mitigation and less on emergency planning issues.
- The 2011 hazard mitigation plan includes undated hazard, vulnerability and risk assessments which have improved the understanding of risks and thus refined the priorities for mitigation actions.

4.6. Action Items 2011 Burbank Hazard Mitigation Plan

The Mission Statement, Goals and Objectives for Burbank, as outlined above, are achieved via implementation of specific mitigation action items. Action items may include refinement of policies, data collection to better characterize hazards or risk, education, outreach or partnership-building activities, as well as specific engineering or construction measures to reduce risk from one or more hazards to specific buildings, facilities, or infrastructure within the Burbank community.

Action items identified and prioritized during the development of the Burbank Hazard Mitigation Plan are summarized in the tables on the following pages. Individual action items may address a single hazard (such as floods, or earthquakes) or they may address two or more hazards concurrently. The first group of action items is for multi-hazard items that address more than one hazard, followed by groups of action items for each of the hazards considered in this plan, which are addressed in more detail in Chapters 6 to 11.

Table 4.2
City of Burbank Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Multi-Hazard Mitigation Action Items								
Short-Term #1	Install adequate back up power for emergency shelters (McCambridge Recreation Center, Verdugo Recreation Center, Joslyn Adult Center, Olive Recreation Center) and Burbank's Emergency Operations Center	Public Works	1-2 Years	X		X		
Short-Term #2	Maintain a continuing role for the Mitigation Planning Committee to develop a sustainable process to encourage, implement, monitor, and evaluate citywide mitigation actions	Emergency Management Coordinator	Ongoing	X	X	X	X	X
Short-Term #3	Enhance education and outreach programs to increase public awareness of natural hazards and emergency preparedness and to provide information on how individuals and businesses can mitigate their vulnerabilities to hazards	Emergency Management Coordinator	Ongoing	X	X	X	X	X
Long-Term #1	Integrate the Mitigation Plan findings into planning and regulatory documents and programs, including emergency planning	Emergency Management Coordinator	Ongoing	X	X	X	X	X
Long-Term #2	Create and maintain a comprehensive citywide database for tracking declared and non-declared natural disaster and other emergency events	Emergency Management Coordinator and Information Technology	Ongoing			X	X	
Long-Term #3	Create a comprehensive GIS mapping database in cooperation with other agencies to identify high hazard areas within Burbank and overlay with critical and important buildings and facilities	Emergency Management Coordinator and Information Technology	Ongoing	X	X	X	X	X
Long-Term #4	Create and maintain an electronic database of all stakeholders involved in planning for and responding to natural disasters	Emergency Management Coordinator and Information Technology	Ongoing			X	X	X

Table 4.2 - Continued
City of Burbank Action Items

Hazard	Action Item	Coordinating Organizations	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Earthquake Mitigation Action Items								
Short-Term #1	Complete the remaining seismic retrofits on the important City-owned buildings as tabulated in Chapter 6.	Public Works	5 Years	X	X	X		
Short-Term #2	Encourage owners of public and private buildings in Burbank to evaluate and implement structural and nonstructural mitigation measures when necessary to ensure adequate earthquake performance.	Building Division	Ongoing	X	X	X	X	
Short-Term #3	Develop programs to help homeowners implement nonstructural mitigation measures and structural retrofits for seismically vulnerable residential buildings.	Building Division	5 Years	X	X		X	
Short-Term #4	Disseminate FEMA pamphlets to educate homeowners and business owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	Building Division	1-2 Years	X	X	X	X	
Long-Term #1	Develop and implement a long term plan for nonstructural mitigation for City buildings and facilities	Building Division, Public Works	Ongoing	X	X	X		

Table 4.2 - Continued
City of Burbank Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Wildland/Urban Interface Fire Mitigation Action Items								
Short-Term #1	Evaluate and upgrade selected fire access roads in the Verdugo Mountains which are inadequate for emergency response vehicles and/or subject to repetitive damage	Fire, Los Angeles County	1-2 Years	X	X	X		
Short-Term #2	Develop and disseminate informational materials to residents in the Fire Hazard Severity Zone to enhance awareness and encourage fire safe practices, including fuel reduction, defensible space, and fire-safe construction	Fire	1-2 Years	X	X	X	X	
Short-Term #3	Provide periodic brush clearance around the perimeter of radio communication towers, Reservoir #3 and Mount Tom to minimize communication disruption during wildfire events	Fire, Public Works	Ongoing	X	X	X		
Short-Term #4	Identify evacuation routes and procedures for high risk areas and educate the public	Police, Fire, Emergency Management Coordinator	1-2 Years	X		X	X	
Long-Term #1	Develop financial assistance programs to aid Burbank residents with cost-effective solutions to comply with the city-wide wood roof ordinance and the Fire Hazard Reduction Program requirements for brush clearance in the Fire Hazard Severity Zone	Fire, Building Division	5 Years	X	X	X	X	
Long-Term #2	Implement fuel reduction/management including demonstration projects in the Fire Hazard Severity Zone	Fire	5 Years	X	X	X	X	X

Table 4.2 - Continued
City of Burbank Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Landslide/Mudslide Mitigation Action Items								
Short-Term #1	Enhance emergency notification and evacuation procedures	Public Information Officer, Emergency Management Coordinator, Police	1-2 Years	X	X	X	X	
Long-Term #1	Implement landslide mitigation actions for slides seriously threatening buildings or infrastructure	Community Development	5 Years	X	X	X		X

Table 4.2 - Continued
City of Burbank Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Flood Mitigation Action Items								
Short-Term #1	Complete detailed inventory of buildings and infrastructure in FEMA-mapped floodplains	Public Works, Community Development, Information Technology	5 years	X	X	X	X	X
Short-Term #2	Increase public awareness of flood-prone areas, encourage mitigation and flood insurance	Community Development, Public Works, Emergency Management Coordinator	5 years	X	X	X	X	X
Short-Term #3	Identify locations where stormwater drainage are needed and implement mitigation measures	Public Works	5 Years	X	X		X	
Short-Term #4	Continue to enforce fully all of the NFIP requirements to ensure full compliance.	Public Works	Ongoing	X	X	X	X	X

Table 4.2 - Continued
City of Burbank Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Windstorm Mitigation Action Items								
Short-Term #1	Ensure that all City and non-City critical facilities in Burbank have backup power.	Public Works, Burbank Water & Power	3 Years	X	X	X	X	
Short-Term #2	Maintain tree trimming efforts especially for transmission lines and trunk distribution lines.	Burbank Water & Power, Parks Recreation and Community Services	Ongoing	X	X	X		
Short-Term #3	Encourage property owners to trim trees near service drops to individual customers	Burbank Water & Power	Ongoing	X	X	X	X	

Table 4.2 - Continued
City of Burbank Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Drought Mitigation Action Items								
Short-Term #1	Continue and enhance water conservation measures	Burbank Water & Power				X	X	X
Long-Term #1	Expand recycled water capacity and use commensurate with demand and funding availability	Burbank Water & Power, Public Works				X	X	X

5.0 PLAN ADOPTION, MAINTENANCE and IMPLEMENTATION

5.1 Overview

For a hazard mitigation plan to be effective, it has to be implemented gradually over time, as resources become available, continually evaluated and periodically updated. Only through developing a system which routinely incorporates logical thinking about hazards and cost-effective mitigation measures into ongoing public- and private-sector decision making will the mitigation action items in this document be accomplished effectively. The following sections depict how Burbank has adopted and will implement and maintain the vitality of the Burbank Hazard Mitigation Plan.

5.2 Plan Adoption

FEMA approval of the 2011 Burbank Hazard Mitigation Plan was received on **….TBD…..** FEMA approval means that Burbank's Hazard Mitigation Plan meets national standards and that the City will continue to be eligible for hazard mitigation funding from FEMA's mitigation grant programs.

The Burbank Hazard Mitigation Plan was adopted by the Burbank City Council on **….TBD……**, making this the effective date of the plan. The adoption resolution is included in the appendix at the end of this chapter.

Burbank has the necessary human resources to ensure the Plan continues to be an active planning document. City staff from many departments have been active in the preparation of the plan and have gained an understanding of the process and the desire to keep it up to date and useful.

Recent major high-profile disasters and the growing understanding of the threats posed to Burbank from natural hazards, have kept the interest in hazard mitigation planning and implementation alive at the City Council level, at the city staff level, among private sector entities and among the citizens of Burbank.

5.3 Implementation

5.3.1 Coordinating Body

The Burbank Hazard Mitigation Steering Committee will coordinate the implementation of the plan and be responsible for periodic monitoring, evaluating and updating the plan. The committee chair will continue to be the Fire Department's emergency management coordinator. The city will continue to provide staffing to accomplish the mitigation plan monitoring, evaluating, and updating. Consistent staffing allows for well-organized meetings and will help to ensure that the right people are involved at the meetings. The existing active interest in mitigation and emergency planning that exists within Burbank will help to ensure the successful implementation of the plan over the coming years.

5.3.2 Integration of the Hazard Mitigation Plan into Ongoing Programs, Policies and Practices

The mission statement, objectives, goals and action items outlined in Chapter 4 of the Burbank Hazard Mitigation Plan provide a strong framework and guidance for the identified mitigation priorities for Burbank. However, the Mitigation Plan is a guidance document, not a regulatory document; and thus implementation of the objectives, goals and action items can be accomplished most effectively by fully integrating this guidance into ongoing city-wide programs, policies and practices.

The updated hazard, vulnerability and risk assessments and the updated and re-prioritized mitigation action items in the 2011 Burbank Hazard Mitigation Plan provide a solid foundation for incorporating mitigation planning and implementation into ongoing programs, policies and practices, as listed below with the responsible City of Burbank Departments:

- Building code enforcement, especially seismic and fire provisions - Community Development and Fire.
- Burbank's seismic retrofit ordinances for pre-1994 welded steel moment frame buildings and pre-1976 reinforced masonry and tilt-up concrete buildings - Community Development.
- Enforcement of special provisions in:
    - The Fire Severity Hazard Zone (formerly known as the Mountain Fire Zone) – Fire, and
    - FEMA-mapped 100-year flood plains, per the National Flood Insurance Program (NFIP) requirements – Public Works.
- The City's ongoing systematic program of seismic retrofits for city-owned buildings – Public Works and Burbank Water & Power (for their buildings).
- The update of the Safety Element in Burbank's General Plan, which is in-process as of January 2011 – Community Development.
- Emergency response planning and post-disaster recovery planning – Fire, Police, Community Development, Public Works, Burbank Water & Power.
- Ongoing comprehensive land use planning, zoning and environmental planning for new construction and redevelopment projects – Community Development.
- Capital improvement planning for city buildings, utility infrastructure and transportation infrastructure – Community Development, Public Works, City Manager, Finance, Burbank Water & Power, Parks, Recreation & Community Services.

All of the above ongoing programs, policies and practice mesh with and support the Hazard Mitigation Plan's primary goals of protecting life and property from natural disasters. An important contribution from the 2011 update of the Burbank Hazard Mitigation Plan is the updated hazard information, which will be incorporated into the plans referenced above to provide a more accurate basis for emergency planning, post-disaster recovery planning, the Safety Element of the General Plan, and Burbank's other related planning efforts.

Information in the above plans was incorporated into the 2011 update of the Burbank Hazard Mitigation Plan, including:

- Burbank's seismic retrofit and flood ordinances,
- Burbank's Fire Severity Zone and FEMA-mapped floodplains,
- Seismic data in the Safety Element of Burbank's General plan,
- Land use planning and zoning, and
- Capital improvement planning for many departments.

5.3.3 Cost Effectiveness of Mitigation Projects

As Burbank and other entities, public or private, within the City consider whether or not to undertake specific mitigation projects or evaluate how to decide between competing mitigation projects, they must answer questions that don't always have obvious answers, such as:

What is the nature of the hazard problem?

How frequent and how severe are hazard events?

Do we want to undertake mitigation measures?

What mitigation measures are feasible, appropriate and affordable?

How do we prioritize between competing mitigation projects?

Are our mitigation projects likely to be eligible for FEMA funding?

Burbank recognizes that benefit-cost analysis is a powerful tool that can help communities provide solid, defensible answers to these difficult socio-political-economic-engineering questions. Benefit-cost analysis is required for all FEMA-funded mitigation projects, under both pre-disaster and post-disaster mitigation programs. Thus, communities seeking FEMA funding must understand benefit-cost analysis. However, regardless of whether or not FEMA funding is involved, benefit-cost analysis provides a sound basis for evaluating and prioritizing possible mitigation projects for any natural hazard. Thus, Burbank will use benefit-cost analysis and related economic tools, such as cost-effectiveness evaluation, to the extent practicable in prioritizing and implementing mitigation actions. See Appendix 2 Principles of Benefit-Cost Analysis for further details on the benefit-cost analysis process.

Burbank has used and will continue to use benefit-cost analysis in two important ways:

- To help prioritize mitigation actions, once specific projects are defined in sufficient detail, including at least conceptual designs and preliminary cost estimates.
- To support applications for FEMA mitigation grants.

5.3. 4 STAPLE/E Approach

Burbank has used and will continue to use the STAPLE/E approach to help evaluate potential mitigation actions. Using STAPLE/E criteria, mitigation activities can be evaluated quickly in a systematic fashion based on the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE/E) considerations and opportunities for implementing particular mitigation action items in Burbank. The STAPLE/E approach is very helpful for assessing the viability of mitigation projects and supplements the risk and economic results from benefit-cost analyses.

The following synopsis outlines each of the elements of the STAPLE/E Approach

Social: Planning Department staff, local non-profit organizations, or local planning groups can help answer these questions.

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean one segment of the community is treated unfairly? (Or one segment more favorably?)
- Will the action cause social disruption?

Technical: Public Works, Engineering and Building Department staff can help answer these questions.

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other goals?

Administrative: Elected officials can help answer these questions.

- Is the action implementable?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political: City Council members and planning officials can help answer these questions.

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Legal: Include legal counsel, land use planners and risk managers in this discussion.

- Who is authorized to implement the proposed action?
- Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?
- Will the City be liable for action or lack of action?
- Will the activity be challenged?

Economic: City Economic Development staff, Public Works, Building Department, and the County Assessment and Taxation office can help answer these questions.

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
- How will this action affect the fiscal capability of the City?
- What burden will this action place on the tax base or economy?
- What are the budget and revenue effects of this activity?
- Does the action contribute to other goals, such as capital improvements or economic development?
- What benefits will the action provide? (This can include dollar amount of damages prevented, number of homes protected, credit under the CRS, potential for funding under the HMGP or the FMA program, etc.)

Environmental: Environmental groups, land use planners, Engineering, and natural resource managers can help answer these questions.

- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

5.4 Prioritization of Mitigation Actions

Implementation of any of the mitigation actions listed in the 2011 Burbank Hazard Mitigation Plan is contingent upon resource availability, including both staff and financial resources. Thus, it is impossible to prioritize the mitigation action items exactly. The following multi-faceted approach has been used to prioritize the mitigation action items:

- The highest priority action items address the highest priority goals – including Reduce the Threats to Life Safety and Reduce the Threats to Buildings, Facilities and Infrastructure.
- The highest priority action items thus are for the hazards which pose the greatest threats to Burbank: earthquakes, wildland/urban interface fires, and landslides/mudslides.
- Within the groups of action items – multi-hazard and hazard-specific, the relative priority has been determined by consensus of the Hazard Mitigation Planning Team, including the STAPLE/E approach and benefit-cost analysis as noted below.
- The STAPLE/E approach was used as a screening tool to ensure that each proposed mitigation action item was feasible for each of the STAPLE/E criteria.
- The City of Burbank recognizes the importance of benefit-cost analysis not only for FEMA grant applications, but also to help prioritize between competing mitigation projects regardless of the funding source. Benefit-cost analysis is predominantly applicable to physical mitigation measures such as seismic retrofits, flood mitigation projects, fuel reduction measures for wildland/urban interface fires and so on. Benefit-cost analysis is generally not applicable to mapping, risk assessments, code enhancement and other types of measures. The importance of benefit-cost analysis is recognized not only in this section but also elsewhere in the 2011 Burbank Hazard Mitigation Plan including:
    - Chapter 1, Section 1.7 – The Role of Benefit-Cost Analysis in Mitigation Planning,
    - Chapter 5, Section 5.3.3 – Cost Effectiveness of Mitigation Projects, and
    - Appendix 2 – Principles of Benefit-Cost Analysis.

The above multi-faced approach to prioritize mitigation action items is a good faith effort to establish priorities. However, the principal constraint for the implementation of each of these action items is the availability of resources – both staff time and financial resources – as necessary for implementation. Thus, Burbank's prioritization of action items is necessarily flexible. If resources become available for a lower priority mitigation item before funds are available for a higher priority action item, then the lower priority mitigation item will be implemented.

This realistic, flexible approach is necessary to achieve the paramount reason for mitigation planning - to gradually reduce risk in Burbank over time as resourcess to implement mitigation actions become available.

5.5 Plan Maintenance

5.5.1 Periodic Monitoring, Evaluation and Updating

The City of Burbank has developed a process for regularly reviewing and updating the Hazard Mitigation Plan. The Mitigation Planning Committee will hold meetings every six months from the date that the 2011 plan is effective as well as after significant disaster events affecting Burbank. Committee members will be responsible for overseeing the progress of the mitigation actions in the Plan. These meetings will provide opportunities to incorporate new information into the Plan and remove outdated items and completed actions. This will also be the time to recognize the success of the community in implementation of action items

The Planning Team will assess whether and to what extent:

1. Do the plans goals, objectives and action items still address current and future expected conditions?
2. Do the mitigation action items accurately reflect Burbank's current conditions and mitigation priorities?
3. Have the technical hazard, vulnerability and risk data been updated or changed?
4. Are current resources adequate for implanting Burbank's Hazard Mitigation Plan? If not are their other resources that may be available?
5. Are there any problems or impediments to implementation? If so, what are the solutions?
6. Have other agencies, partners, and the public participated as anticipated? If no, what measures can be taken to facilitate participation?
7. Have there been changes in federal and/or state laws pertaining to hazard mitigation in Burbank?
8. Have the FEMA requirements for the maintenance and updating of hazard mitigation plans changed?
9. What can Burbank learn from declared federal and/or state hazard events in communities that share similar characteristics to Burbank, such as population, geographical area, land use mix, and hazard vulnerability?
10. How have previously implemented mitigation measures performed in recent hazard events? This may include assessment of mitigation action items similar to those contained in this Plan, but where hazard events occurred outside of Burbank.

The Mitigation Planning Committee will review the results of these Mitigation Plan assessments, identify corrective actions and make recommendations, if necessary, to the City Council for actions that may be necessary to bring the Mitigation Plan back into conformance with the stated goals and objectives.

The Steering Committee will also have lead responsibility for the formal updates of the plan every five years. The formal update process will be initiated at least twp years before the five-year anniversary of FEMA approval of the Burbank Mitigation Plan, to allow ample time for robust participation by stakeholders and the public and for updating data, maps, goals, objectives and action items. All revisions of the Plan will be taken to the City Council for formal acknowledgement as part of Burbank's Plan maintenance and implementation program.

5.5.2 Continued Public Involvement and Participation

Implementation of the mitigation actions identified in the Plan must continue to engage not only city staff but also the entire community. The City of Burbank is committed to involving the public directly in the ongoing review and updating of the Hazard Mitigation Plan.

This public involvement process will include public participation in the monitoring, evaluation and updated process outlined in the previous section and intensify as the 2016 update process is begun and completed.

The 2011 Burbank Hazard Mitigation Plan will be available on the City's website and hard copies will be placed in all City libraries. The existence and locations of these hard copies will be posted on the City's website along with contact information so that people can direct comments, suggestions and concerns to the Hazard Mitigation Planning team.

A press release requesting public comments will be issued after each evaluation and also whenever additional public inputs are deemed necessary. The press release will direct people to the website and other locations where the public can review proposed updated versions of the plan. This process will provide the public with accessible and effective means to express their concerns, opinions, ideas about any updates/changes that are proposed to the mitigation plan.

The Burbank Disaster Council and adjacent jurisdictions will be notified by e-mail to provide an opportunity for stakeholders and other entities to engage in the ongoing review and updating of the mitigation plan. This outreach effort will include all cities in Disaster Management Area C.

The Hazard Mitigation Planning Team members will ensure that the resources are available to publicize the press releases and maintain public participation through web pages, public access channels and newspapers as deemed appropriate.

APPENDIX

Burbank Mitigation Plan: Adoption Resolution – INSERT scan of adoption resolution when available (after FEMA's Final Approval).

6.0 EARTHQUAKES

6.1 Overview

Historically, awareness of seismic risk in California has been fairly high, among both the public at large and public officials. This high level of awareness reflects the high level of seismic activity in California over the past 100+ years, including the 1989 Loma Prieta and 1994 Northridge earthquake. Nevertheless, despite the general awareness of seismic risk, the level of understanding of the nature and extent of seismic risk among both the public at large and public officials is often less than robust.

Before reviewing the levels of seismic hazard and seismic risk in Burbank, we first present a brief earthquake "primer" to review earthquake concepts and terms.

6.2 Earthquake Primer

6.2.1 Earthquake Magnitudes

Earthquakes are most often described by their magnitude (M), which is a measure of the total energy released by an earthquake. The most common magnitude is the "moment magnitude" which is calculated by seismologists from the amount of slip (movement) on the fault causing the earthquake and the area of fault surface. Moment magnitudes are similar to the Richter magnitude, which was used for many decades but has now been replaced by the moment magnitude.

Moment magnitudes use a numerical scale which ranges from 0 to 9+. The magnitudes for the three largest earthquakes recorded worldwide and selected California earthquakes are shown below in Table 6.1. The 1857 Fort Tejon and 1906 San Francisco earthquakes, on the southern and northern portions of the San Andreas Fault are the largest earthquakes recorded to date in California.

Table 6.1
Earthquake Magnitudes

Earthquake	Magnitude
Largest Earthquakes Worldwide	
1960 Chile	9.5
1964 Prince William Sound, Alaska	9.2
2004 Sumatra, Indonesia	9.1
Selected California Earthquakes	
1857 Fort Tejon	7.9
1906 San Francicso	7.8
1992 Landers	7.3
1989 Loma Prieta	6.9
1994 Northridge	6.7

In evaluating earthquakes, it is important to recognize that the earthquake magnitude scale is not linear, but rather logarithmic. Each one step increase in magnitude, for example from M7 to M8, corresponds to an increase of a about a factor of 30 increase in the amount of energy released by the earthquake, because of the mathematics of the magnitude scale.

Thus, a M7 earthquake releases about 30 times more energy that a M6, while a M8 releases about 30 times more energy than a M7 and so on. Thus, a great M8 earthquake releases nearly 1,000 times as much energy as a moderate earthquake of M6 and nearly 30,000 times as much energy as a M5 earthquake.

The public often assumes that the larger the magnitude of an earthquake, the "worse" the earthquake. Thus, the "big one" is the M8 earthquake and smaller earthquakes such as M6 or M7 are not the "big one". However, this is true only in very general terms. Larger magnitude earthquakes affect larger geographic areas, with much more widespread damage than smaller magnitude earthquakes. However, for a given site, the magnitude of an earthquake is <u>not</u> a good measure of the severity of the earthquake at that site.

Rather, for any earthquake, the intensity of ground shaking at a given site depends on four main factors:

- Earthquake magnitude,
- Earthquake epicenter, which is the location on the earth's surface directly above the point of origin of an earthquake,
- Earthquake depth, and
- Soil or rock conditions at the site, which may amplify or deamplify earthquake ground motions.

An earthquake will generally produce the strongest ground motions near the earthquake with the intensity of ground motions diminishing with increasing distance from the epicenter.

Thus, for Burbank, a smaller earthquake on a nearby fault, such as a M6.7 on the Verdugo Fault, would result in stronger ground motions and more damage than a much larger earthquake further away, such as a M7.5 or M8 earthquake on the San Andreas Fault. Thus, for Burbank, the "big one" is not a great earthquake on the San Andreas Fault, but rather a smaller earthquake in or very near Burbank.

However, earthquakes at or below M5 are not likely to cause significant damage, even locally very near the epicenter. Earthquakes between about M5 and M6 are likely to cause relatively minor damage very near the epicenter. Earthquakes of about M6.5 or greater (e.g., the Northridge earthquake) or greater can cause major damage, with damage usually concentrated fairly near the epicenter. Larger earthquakes of M7+ cause damage over increasingly wider geographic areas with the potential for very high levels of damage near the epicenter. Great earthquakes with M8+ can cause major damage over wide geographic areas.

6.2.2 Intensity of Ground Shaking

There are many different measures of the severity or intensity of earthquake ground motions. A very old, obsolete, but sometimes used scale is the Modified Mercalli Intensity scale (MMI), which is a purely descriptive, qualitative scale that relates severity of ground motions to the approximate levels of damage experienced. MMIs range from I to XII. The MMI scale is not particularly useful, because it is qualitative and because the level of damage occurring for a given severity of ground motions depends strongly on the level of seismic design of buildings and infrastructure.

More useful, modern intensity scales for earthquake ground motions use terms that can be physically measured quantitatively with seismometers, such as the acceleration, velocity, or displacement (movement) of the ground. The most common physical measure, and the one used in this mitigation plan, is Peak Ground Acceleration or PGA.

PGA is a measure of the intensity of shaking, relative to the acceleration of gravity (g). For example, a PGA of 1.0 g in an earthquake (an extremely strong ground motion) means that objects accelerate sideways at the same rate as if they had been dropped from the ceiling. A PGA of 10% g means that the ground acceleration is 10% that of gravity and so on.

Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures. Typical relationships between the level of ground motions and the approximate extent of damage are:

- Ground motions of only 1 or 2% g are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are minimal.
- Ground motions below about 10% g usually cause only slight damage.
- Ground motions between about 10% g and 30% g may cause minor to moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings are subject to potential collapse.
- Ground motions above about 30% g may cause significant damage in well-designed buildings and very high levels of damage (including collapse) in poorly designed buildings.
- Ground motions above about 50% g may cause high levels of damage in many buildings, even those designed to resist seismic forces.

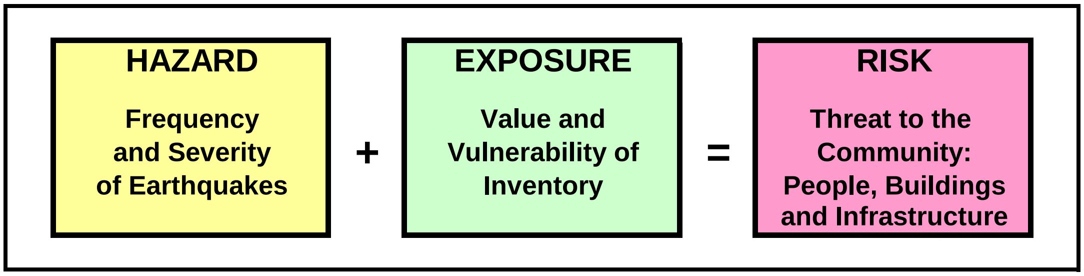
6.2.3 Seismic Hazard and Seismic Risk

The level of earthquake hazard in Burbank is characterized by the frequency and severity of earthquakes likely to affect Burbank and also by the geographic area affected. The entire city of Burbank is subject to earthquake hazards, but the level of hazard varies somewhat because of differences in soil types in different areas of the city. These soil type differences result in varying extents of amplification or deamplification from site to site, for any given earthquake.

The level of earthquake risk – the threat to buildings, infrastructure and people – varies substantially within Burbank not only because the level of earthquake hazard varies somewhat within the city, but more importantly because the vulnerability of buildings and infrastructure varies markedly from building to building and infrastructure component to component. The level of risk to people also varies markedly because of the substantial variation in the seismic vulnerability of buildings and infrastructure.

Risk arises from the combination of hazard and vulnerability, as illustrated in Figure 6.1 below.

Figure 6.1
Earthquake Risk in Burbank



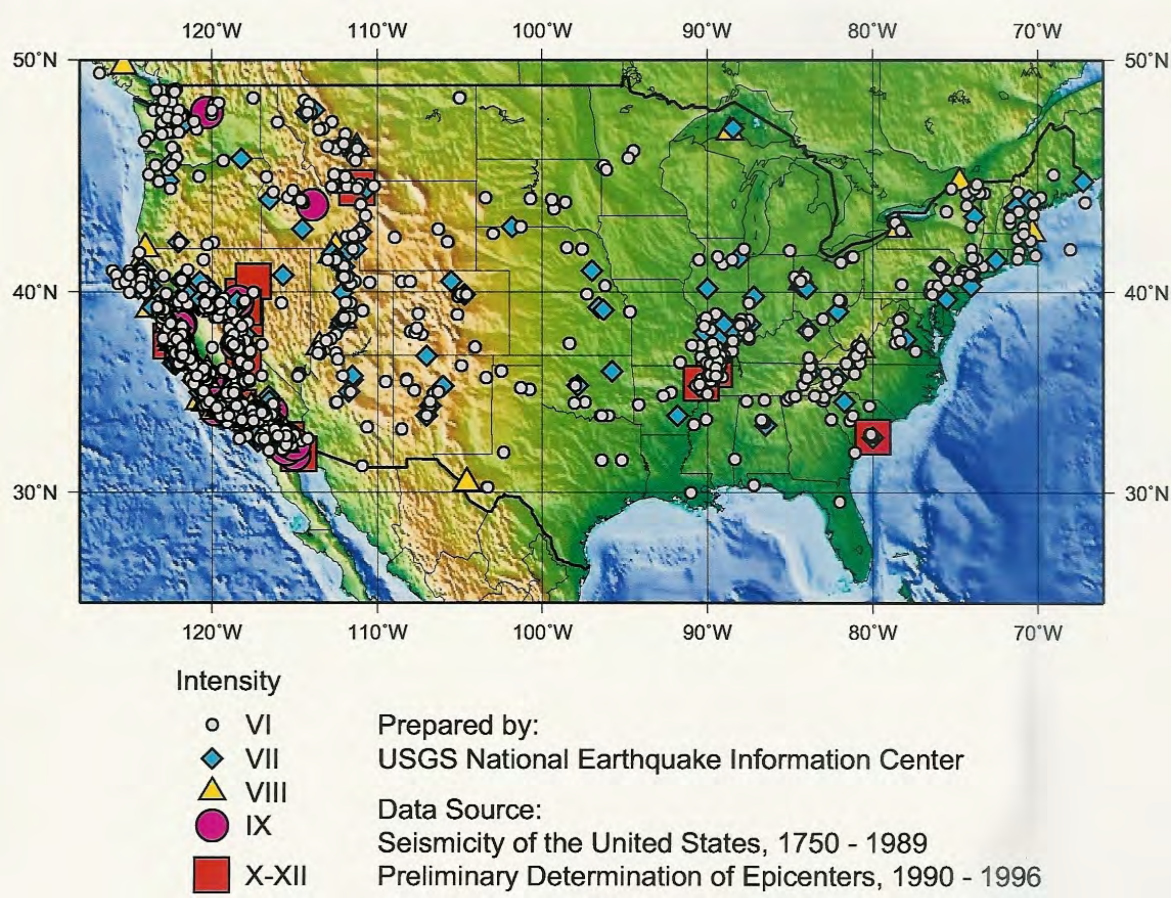
Thus, rather than being uniformly distributed throughout the city, the earthquake risk for Burbank is concentrated in the most vulnerable buildings and infrastructure components. The most vulnerable types of buildings and infrastructure in Burbank include the following:

- Unreinforced masonry buildings,
- Pre-1940s residential buildings with cripple wall foundations or with sill plates not bolted to the foundation,
- Buildings with soft first stories,
- Nonductile concrete frame buildings with inadequate or no steel reinforcing,
- Mobile homes, and
- Older infrastructure built to seismic design standards significantly lower than recent or current-code infrastructure.

6.3 California Earthquakes

In simple terms, California is earthquake country. That is, earthquakes are a relatively common occurrence throughout California, especially in areas fairly near the San Andreas Fault system. Figure 6.2 shows the epicenters of damaging earthquakes in California over the past 100 years. Higher intensities indicate larger, more damaging earthquakes. Smaller earthquakes are far too numerous to show on a map of this scale.

Figure 6.2
California Earthquakes[1]



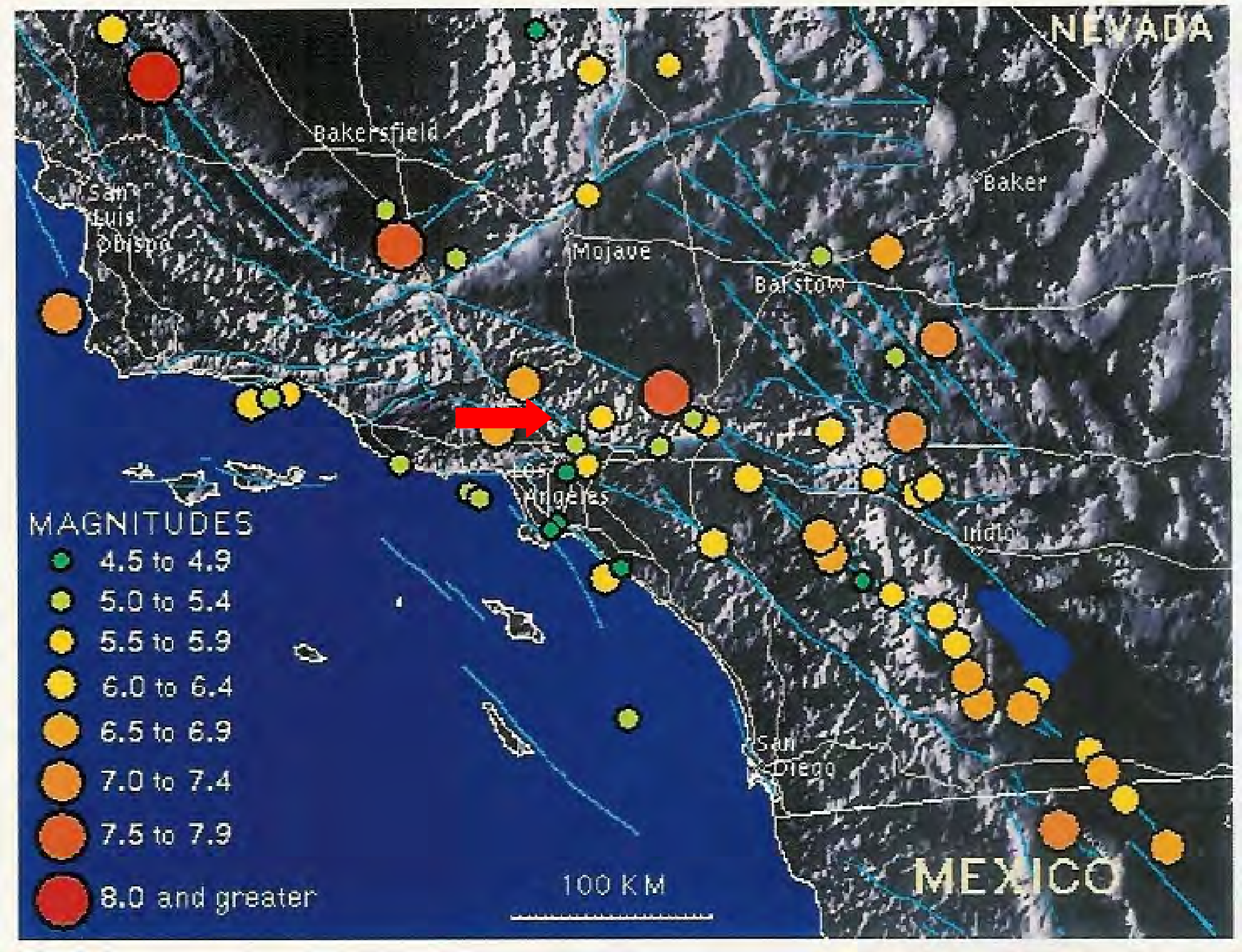
Prepared by:
USGS National Earthquake Information Center

Data Source:
Seismicity of the United States, 1750 - 1989
Preliminary Determination of Epicenters, 1990 - 1996

[1] United States Geological Survey: http://earthquake.usgs.gov/earthquakes/

Epicenters of large earthquakes in southern California are shown below in Figure 6.3. In this figure, Burbank is located northwest of Los Angeles, just left of the center of the map.

Figure 6.3
Southern California Earthquakes[1]



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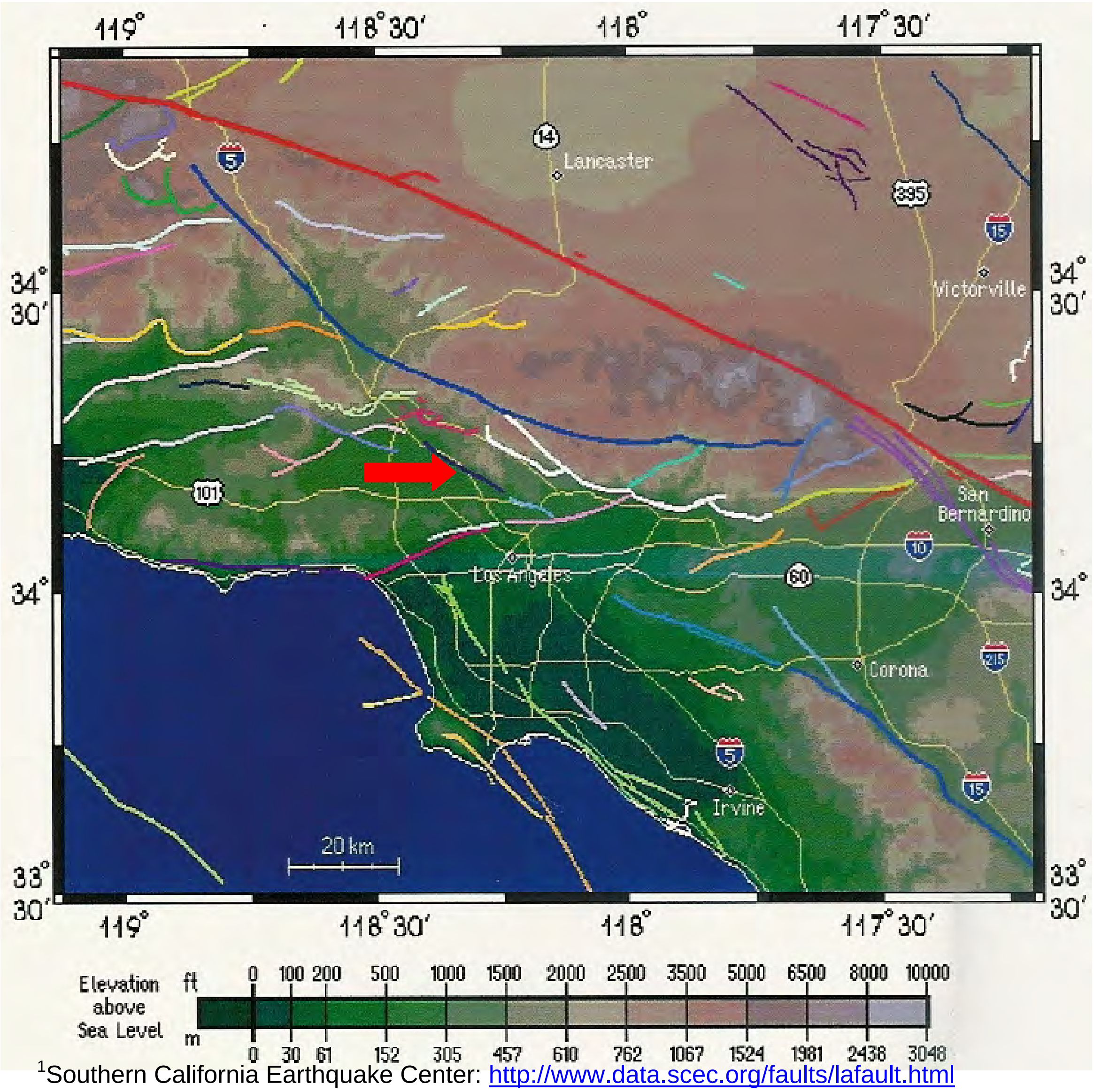
[1] Southern California Earthquake Center: http://www.data.scec.org/clickmap.html

Following the above link leads to an interactive version of this map. Clicking on an earthquake symbol brings up a description of the earthquake. The location of Burbank is shown by the red arrow.

The seismicity of southern California is also illustrated by the Figure 6.4 below which shows some of the active earthquake faults in southern California.

Figure 6.4
Active Faults in Southern California[1]



[1] Southern California Earthquake Center: http://www.data.scec.org/faults/lafault.html

Following the above link leads to an interactive version of this map. Clicking on a fault brings up a description of the fault. The location of Burbank is shown by the red arrow.

The red fault running diagonally across the map in the upper right corner, northwest from San Bernardino, is the San Andreas Fault. Numerous other faults are shown much closer to Burbank.

6.4 Seismic Hazards for Burbank

Earthquake faults in the vicinity of Burbank are shown on the following figure.

Figure 6.5
Earthquake Faults Near Burbank[1]

[1] United States Geological Survey: http://geohazards.usgs.gov/qfaults/ca/California.php

The faults shown above include the following:

- San Andreas Fault: red line near Palmdale,
- Verdugo Fault: green/yellow line southeast of the Interstate 5 symbol,
- Sierra Madre – San Fernando Fault: red lines near Interstate 210 symbol,
- San Gabriel Fault: green lines near Santa Clarita.

Information about these faults can also be obtained from the web link below Figure 6.4.

The current scientific understanding of earthquakes is insufficient to predict exactly where and when the next earthquake will occur, even on the best-understood faults, such as the San Andreas Fault. However, it is possible for seismologists to estimate the probabilities of earthquakes of various magnitudes occurring on faults, or equivalently, the average return periods between earthquakes on a fault.

The current consensus estimates for earthquake hazards in the United States are incorporated into the 2008 USGS National Seismic Hazard Maps. These maps are the basis of the levels of ground motions incorporated into building code seismic design requirements for new construction.

For example, in southern California, the probabilities of an earthquake of M6.7 or greater within the next 30 years are shown below for selected faults:

- Southern San Andreas Fault: 59%
- San Jacinto Fault: 31%
- Elsinore Fault: 11%

For faults nearer to Burbank, the probabilities of earthquakes with the specified magnitudes within the next 30 years are show below:

- Verdugo Fault, M6.7 to M6.9: 1.40%
- San Gabriel Fault, M7.0 to M7.2: 1.77%
- Northridge Fault, M6.9 to M7.0: 3.08%
- Sierra Madre – San Fernando Fault, M6.7: 4.65%

The above estimates are from the fault database used for the 2002 USGS National Seismic Hazard Maps; corresponding data for the 2008 Maps is not available on the USGS website.

For a given location, such as a specific location within Burbank, the total level of earthquake hazard is estimated from:

- Estimated return periods and earthquake magnitudes for earthquakes on all know faults close enough to affect the specific location,
- An allowance for the possibility of earthquakes on not-yet-discovered unknown faults,
- Attenuation relationships which model the decrease in ground shaking intensity with distance from the epicenters of earthquakes, and
- Soil/rock data for the specific locations.

Seismic hazard levels are expressed in probabilistic terms, such as the probability of various levels of earthquake ground motions at a given site over a given time period, such as 30- or 50-years.

For Burbank, representative 2008 USGS seismic hazard estimates are summarized in the following table.

Table 6.2
USGS Seismic Hazard Data for Burbank
From FEMA Version 4.5.5 Benefit-Cost Analysis Software

Probabilistic Earthquake Ground Motions	PGA (g)
10% in 50 Years	0.518
5% in 50 Years	0.693
2% in 50 Years	0.948
2/3rds of 2% in 50 Years	0.632

These data are for a representative site in Burbank located at approximately the intersection of East Olive Avenue and San Fernando Boulevard. The level of seismic hazard varies somewhat with location in Burbank, but the differences aren't large. More importantly, the level of seismic hazard varies with soil type.

Any of these levels of ground shaking are high enough to cause significant to substantial damage in vulnerable buildings. The 2/3rds of the 2% in 50 year ground motion is the level of ground motion required for the design of new buildings in the International Building Code.

The above data represent the levels of earthquake ground motions with varying probabilities of being exceeded over the next 50 years. For example, there is a 10% chance that earthquake ground motions in Burbank will be 0.518 g or higher and a 2% chance that ground motions will be 0.948 g or higher. These values are for rock, very firm or firm soil sites (International Building Code soil types B, C, or D). For soft soil sites, values are 80% of these values, per the soil amplification factors shown below in Table 6.3.

Table 6.3
Soil Amplification Factors

Ground Motion		Soil/Rock Amplification Factors				
Short Period S_{AS} (g)	PGA (g)[1]	A Hard Rock	B Rock	C Very Firm Soil	D Firm Soil	E Soft Soil
$\leq$0.25	$\leq$0.10	0.8	1.0	1.2	1.6	2.5
0.50	0.20	0.8	1.0	1.2	1.4	1.7
0.75	0.30	0.8	1.0	1.1	1.2	1.1
1.00	0.40	0.8	1.0	1.0	1.1	0.9
$\geq$1.25	$\geq$0.50	0.8	1.0	1.0	1.0	0.8

[1] PGA values = 0.4 times the S_{AS} values, per the usual convention and direct guidance from the FEMA BCHelpline (October 7, 2010).

Sites with soil types C, D, and E experience amplification of earthquake ground motions at lower PGA values as shown in Table 6.3. However, for PGAs above 0.5 g, there is no amplification for soil types C and D, and deamplification for soil type E. Furthermore, some soft soil (E) locations may be subject to liquefaction, lateral spreading or settlement, as discussed in the following section.

6.5 Other Aspects of Seismic Hazards in Burbank

Most of the damage in earthquakes occurs directly because of ground shaking which affects buildings and infrastructure. However, there are several other aspects of earthquakes that can result in very high levels of damage in localized sites, including surface rupture, liquefaction, lateral spreading, settlement, landslides, dam failures and tsunamis/seiches.

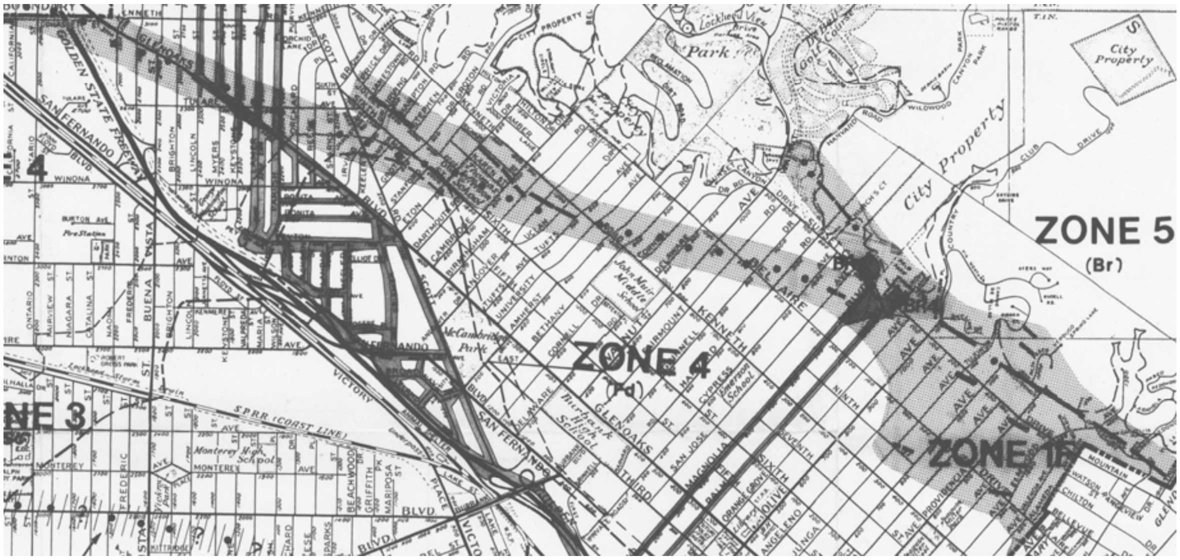
6.5.1 Surface Rupture

Surface rupture occurs during an earthquake when the fault plane on which movement occurs extends to the surface. For example, if an earthquake with 6 feet of offset between the two sides of the fault and surface rupture occurs the ground is displaced by 6 feet along the fault trace. A building sitting across the fault would have parts of the building offset by 6 feet, which would result in destruction of the building and a high potential for casualties.

Facilities located within fault zones subject to surface rupture are vulnerable to extensive damage from vertical or horizontal offsets. The Alquist Priolo Special Study Zone Act of 1972 requires identification of areas subject surface ruptures, with restrictions on development in such areas. Several faults in Los Angeles County are designated as Special Study Zones, but none of these faults are located within Burbank. However, surface rupture may be possible on the Verdugo Fault which runs through Burbank.

The 1991 seismic hazard map included in Burbank's 1997 Safety Element component of the general plan shows potential surface rupture along the Verdugo Fault, as shown by the shaded Zone 1F in the following excerpt from this map.

Figure 6.6
Possible Surface Rupture Zones Along the Verdugo Fault.

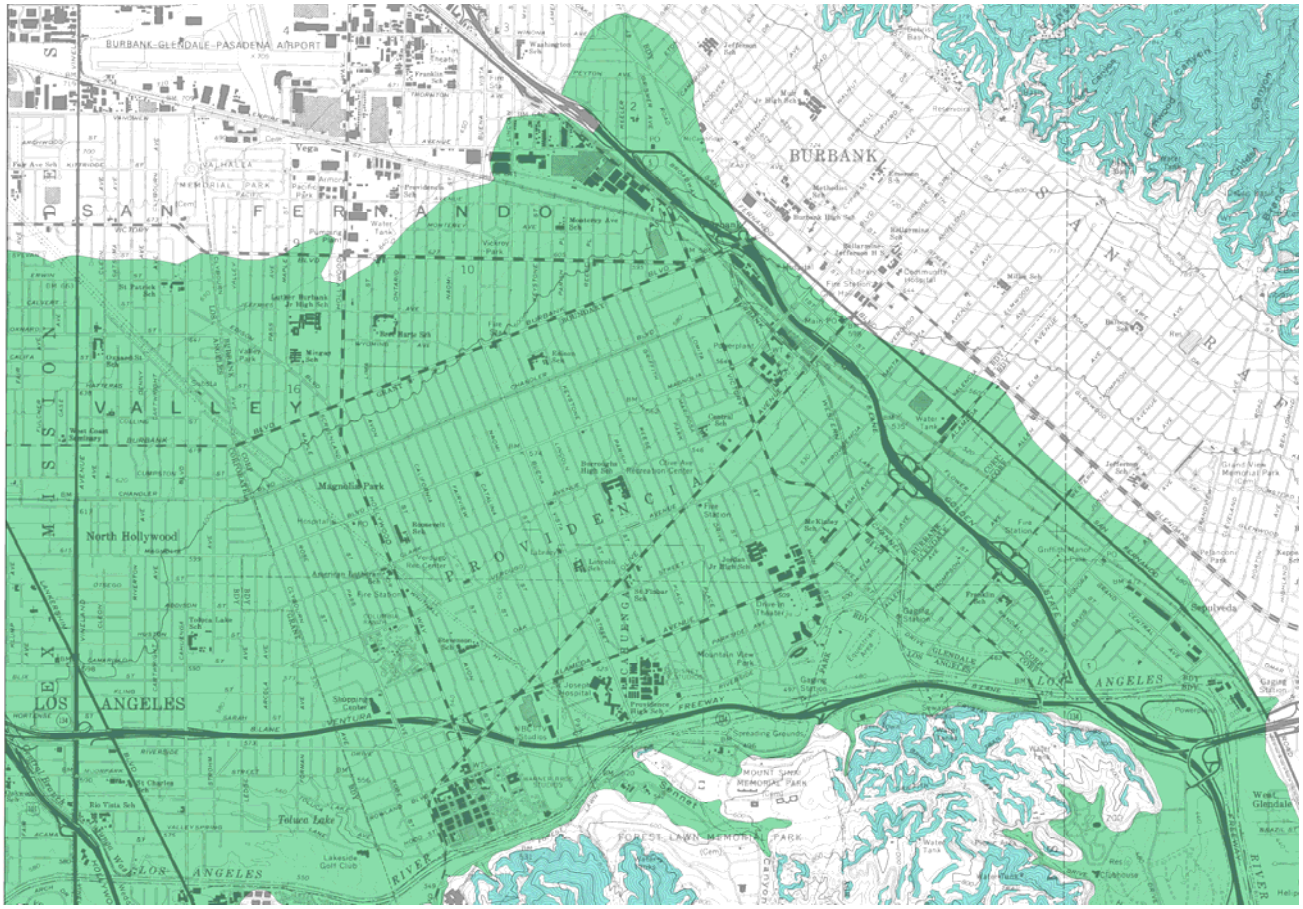


6.5.2 Liquefaction, Lateral Spreading and Settlement

Liquefaction is a process where loose, wet sediments lose strength during an earthquake and behave similarly to a liquid. Once a soil liquefies, it will tend to settle and/or spread laterally. With even slight slopes, liquefied soils tend to move sideways downhill (lateral spreading). Settling or lateral spreading can cause major damage to buildings and to buried infrastructure such as pipes and cables.

Figure 6.7 shows areas with liquefaction potential: green-shaded areas.

Figure 6.7
Liquefaction Potential Areas[1]



[1]California Department of Conservation, Division of Mines and Geology, Seismic Hazard Zones, Burbank Quadrangle (Excerpt), March 25, 1999.

Even in areas mapped as having liquefaction potential, liquefaction does not occur in all such areas or in all earthquakes. However, in larger earthquakes with strong ground shaking and long duration shaking, liquefaction is likely in some of the liquefaction potential areas. Settlements of a few inches or more and lateral spreads of a few inches to several feet are possible. Even a few inches of settlement or lateral spreading are likely to cause significant to major damage to affected buildings or infrastructure.

The mapping of large parts of Burbank as potentially subject to liquefaction, as shown above is Figure 6.7 is probably very conservative. That is, not all of these areas may actually be subject to liquefaction. Recent ground water maps for April when ground water is typically near its annual high show that for most of the potential liquefaction area shown above in Figure 6.6 the water table is more than 100 feet deep (Upper Los Angeles River Area Watermaster Report, 2008-2009 Water Year, 2009). Thus, the potential for liquefaction is low.

However, there are two areas where water tables maybe less than 50 feet deep for at least part of the years. These areas may have higher potential for liquefaction:

- An area of about 200 acres along the Los Angeles River in the southern part of Burbank in the general location of the Providence Saint Joseph Medical Center, Warner Brothers Studio, Disney Studio and several mid-rise commercial buildings, and
- An area of about 140 acres parallel to Interstate 5 which is used predominantly for general manufacturing, industrial and commercial purposes.

Given this ground water data, the areas in Burbank with high potential for liquefaction appear largely limited to the two areas noted above

6.5.3 Earthquake-Induced Landslides

Earthquakes can also induce landslides, especially if an earthquake occurs during the rainy season and soils are saturated with water. The areas prone to earthquake-induced landslides are largely the same as those areas prone to landslides in general. As with all landslides, areas of steep slopes with loose rock or soils are most prone to earthquake-induced landslides**.**

Figure 6.8 shows areas with potential for earthquake-induced landslides: blue-shaded areas in the upper right hand corner of the map.

Figure 6.8
Earthquake-Induced Landslides[1]

[1] California Department of Conservation, Division of Mines and Geology, Seismic Hazard Zones, Burbank Quadrangle (Excerpt), March 25, 1999.

6.5.4 Earthquake-Induced Dam Failures

Earthquakes can cause dam failures in several ways. The most common mode of earthquake-induced dam failure is slumping or settlement of earthfill dams where the fill has not been properly compacted. If the slumping occurs when the dam is full, then overtopping of the dam, with rapid erosion leading to dam failure is possible. Dam failure is also possible if strong ground motions heavily damage concrete dams. Earthquake induced landslides into reservoirs have also caused dam failures.

However, for Burbank, the risk posed by earthquake-induced dam failures is low. Chapter 9, Floods, includes a brief section on dam failures that could affect Burbank. Burbank is not subject to inundation from dam failures. However, failure of the Devil’s Gate Dam could result in disruption of major transportation routes to/from Burbank, including the 210 Freeway, Oak Grove Drive and Highland Drive. Devil’s Gate Dam is a flood control dam and thus is not filled with water except during times of high inflows. The probability of failure of this dam from earthquake or flood events is low, but not zero.

In addition, Burbank Reservoirs 1, 4, and 5 are deemed dams under the California Department of Water Resources, Division of Safety of Dams regulations because they impound more than 50 acre-feet of water. Reservoir 1 is an earth-filled dam constructed in 1928 which is currently going through replacement with construction of a new reservoir scheduled to start in 2012. The new reservoir with a storage capacity will not fall under the dam safety regulations. Reservoirs 4 and 5 are reinforced concrete structures built in 1956 and 1946 with storage capacities of 11 million and 25 million gallons, respectively.

6.5.5 Tsunamis and Seiches

Tsunamis, which are often incorrectly referred to as "tidal waves," result from earthquakes which cause a sudden rise or fall of part of the ocean floor. Such movements may produce tsunami waves, which have nothing to do with the ordinary ocean tides.

In the open ocean, far from land, in deep water, tsunami waves may be only a few inches high and thus be virtually undetectable, except by special monitoring instruments. These waves travel across the ocean at speeds of several hundred miles per hour. When such waves reach shallow water near the coastline, they slow down and can gain great heights. Tsunamis affecting the California coast can be produced from very distant earthquakes off the coast of Alaska or elsewhere in the Pacific Ocean.

The City of Burbank, which is not located on the coast, has no risk from tsunamis.

However, Burbank does have some risk from another earthquake related phenomenon: "seiches" which are waves from sloshing of inland bodies of waters such as lakes, reservoirs, or rivers. In some cases, seiches have caused damages to shorefront structures and to dams. For Burbank, seiches could cause localized damages to water reservoirs/tanks, with roof damage especially likely.

6.6 Historical Earthquake Events Affecting Burbank

In a typical year, residents of Burbank feel several or more earthquakes, typically with little or no damage. Most of these earthquakes are low magnitude earthquakes (M4 or lower) which cause negligible damage even very near epicenter. Larger earthquake up to about M5.5 to M6 typically result in low levels of damage near the epicenter, with little or no damage further away.

Larger earthquakes from about M6.5 and higher result in significant damages near the epicenter with some damage over wider areas.

Over the approximately 200 years of recorded history in Burbank, the city has, in effect, dodged the earthquake bullet. During this time period there have been dozens of earthquakes large enough to cause localized or widespread damage in

Southern California. However, very fortunately, none of these earthquakes have resulted in major damage to Burbank because of the combined effects of earthquake magnitudes, distance from Burbank and soil conditions in Burbank. Furthermore, because of gradual enhancements to building codes over the decades, the seismic vulnerability of Burbank's inventory of buildings and infrastructure has significantly decreased over the decades. Seismic vulnerability decreases as older, more vulnerable buildings and infrastructure are gradually replaced with newer less vulnerable replacements or seismically retrofitted.

Historical records of earthquake damage in Burbank are sparse for historical earthquakes Southern California, especially for all but the most recent events.

Earthquake damages were negligible, low or moderate in Burbank for all of the following significant earthquake events in Southern California, even though all resulted in locally heavy damages near the epicenters and most also resulted in deaths. These earthquakes are listed by decreasing magnitudes:

- 1857 Fort Tejon M7.8
- 1992 Landers M7.3
- 1994 Northridge M6.7
- 1987 Superstition Hills M6.7
- 1971 San Fernando, M6.6
- 1992 Big Bear, M6.5
- 1933 Long Beach, M6.4 and
- 1987 Whittier Narrows, M5.8.

The most recent earthquakes with significant impacts in Burbank were the 1971 San Fernando (Sylmar) M 6.6 and the 1994 Northridge M6.7 events, although damage levels in Burbank were relatively low for both earthquakes.

Damage noted in Burbank from the 1971 San Fernando M6.6 earthquake included:

- Fairly widespread, but generally minor damage to buildings and contents, especially damage to masonry chimneys,
- Major damage to the Pacific Manor care facility, which resulted in evacuation of residents,
- Minor fires, especially at electrical distribution substations,
- Hazardous material spills at Lockheed and other industrial facilities, and
- Building flooding from broken fire sprinkler pipes and risers.

Damage noted in Burbank from the 1994 Northridge M6.7 earthquake was more extensive than for the San Fernando earthquake, but still relatively moderate, including:

- 13 buildings were uninhabitable (red-tagged by post-earthquake inspectors) including four commercial, six single family and three multi-family.
- 31 buildings had limited access (yellow-tagged by post-earthquake inspectors) including one school and one airport building.
- The Burbank Fire Department responded to 292 calls on the day of the earthquake for damage inspections and reports of natural gas leaks.
- There was one significant fire at an apartment complex, following an aftershock on the day after the earthquake, with damages estimated at about $190,000.
- Total damages to Burbank's public facilities was estimated at about $3.8 million with approximately $58,000,000 in damages to private facilities.
- The Burbank electric system had some damage, mostly limited to substations, with damage to power transformer bushings, reactors and rigid connection busses, with scattered damage to distribution lines and service drop wires.
- However, power was lost for about 50,000 customers because the Burbank electric power system lost connection with the regional grid (Western Electric Council) and two local generating plants, Olive 1 and Olive 2, tripped offline due to overload and ground shaking. After a preliminary assessment of damage, the Olive 3, Olive 4 and Magnolia 5 generating plants were restarted about two hours after the earthquake. However, power to all customers was not restored until about 18 hours after the earthquake.
- The Burbank water system experienced a small number of pipe breaks in the water distribution system with localized disruptions of potable water service.
- The Burbank wastewater system experienced a small number of pipe breaks in sewer lines along with minor damage to the chlorine contact tank at the water reclamation plant. Although the plant had damage it remained in service after the earthquake.

6.7 Scenario Earthquake Loss Estimates for Burbank

6.7.1 HAZUS Scenario Earthquake Loss Calculations

There are a wide range of possible earthquakes that may affect Burbank, including:

- Large earthquakes on the Southern San Andreas Fault,
- Smaller earthquakes on the numerous faults closer to Burbank, and
- Smaller earthquakes on unknown faults very close to or within Burbank.

As discussed previously, the “big one” for Burbank is not a very large earthquake on the San Andreas Fault, which is located about 30 miles from the center of Burbank. Rather, the earthquakes which pose the greatest risk for Burbank are fairly large earthquakes, approximately M6.5 to M7.0+ on faults much closer to Burbank. The worst case scenario would be an earthquake in this magnitude range on the Verdugo Fault or on an unknown fault within Burbank.

However, earthquakes on the several other faults near Burbank could also result in substantial damage in Burbank, including the following: Newport-Inglewood Fault, Sierre Madre – San Fernando Fault System, Sierra Madre Fault, San Gabriel Fault, Hollywood Fault and the Raymond Fault.

To explore the range of possible earthquakes affecting Burbank, we use the latest version of FEMA’s HAZUS loss estimation software: HAZUS-MH MR4 (2009). HAZUS loss estimates for specified scenario earthquakes are intended for regional planning purposes and provide general indications of the extent of damages, economic losses and casualties.

The HAZUS loss estimates presented in the following sections use the “Level One” national inventory data built into HAZUS. More accurate loss estimates can be made by developing more detailed Burbank inventory data for buildings and infrastructure. However, the effort required to do this is large and, for mitigation planning purposes, the results would probably not be substantially different.

HAZUS loss estimates have two primary purposes:

- Enhance awareness of the level of earthquake risk to Burbank among public officials and the public at large,
- Provide realistic earthquake scenarios to enhance emergency planning and response planning.

For Burbank, we evaluate two scenario earthquakes:

- M7.8 earthquake on the San Andreas Fault and
- M6.7 earthquake on the Verdugo Fault.

The damages and losses from the M6.7 earthquake on the Verdugo Fault are similar to those expected for a similar size earthquake on unknown faults within Burbank. Thus, these results approximate the worst-case scenario for earthquakes affecting Burbank.

The HAZUS results presented below use United States Geological Survey shakemaps which are the best available estimates of the level of ground shaking expected from these scenario earthquakes.

6.7.2 M7.8 Earthquake on the San Andreas Fault

Although a large magnitude earthquake on the San Andreas Fault is often assumed to be the “big one” for Southern California, the HAZUS estimates of damages and casualties for Burbank are rather low because the San Andreas Fault is located a considerable distance from Burbank.

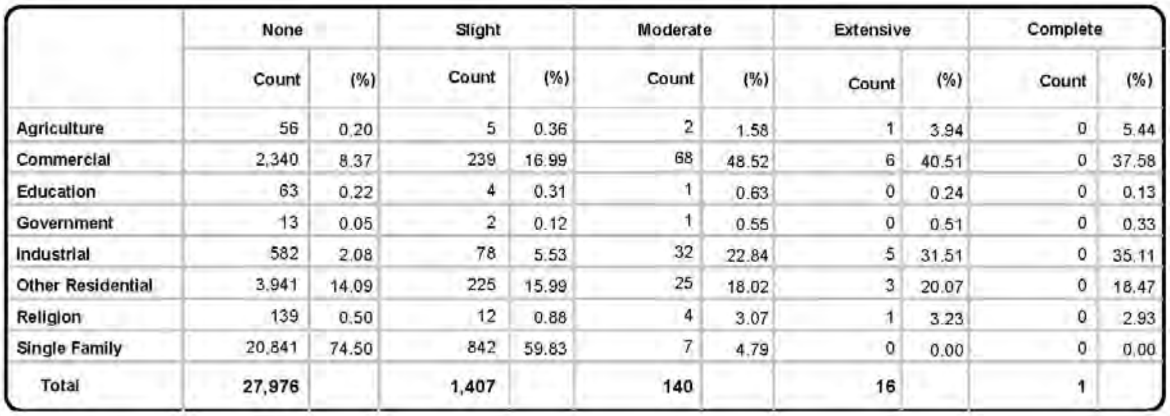
The HAZUS results summarized below should not be interpreted verbatim as the exact consequences of this earthquake. Rather, they should be interpreted as reasonable estimates of the approximate levels of damages, economic losses, and casualties expected if this earthquake occurs.

Table 6.4
Summary Impacts: M7.8 San Andreas Fault Scenario Earthquake

Category	Burbank
Damages and Losses	
Number of Damaged Buildings - Total	1,564
Number of Damaged Buildings - Slight damage	1,407
Number of Damaged Buildings - Moderate damage	140
Number of Damaged Buildings - Extensive Damage	16
Number of Damaged Buildings - Complete Damage	1
Building-Related Damages and Economic Losses	$76,800,000
Transportation Systems Damages and Economic Losses	$3,400,000
Utility Systems Damages and Economic Losses	$0
Total Damages and Losses	$80,200,000
Casualties	
Injuries (2 pm)	11
Injuries (2 am)	3
Deaths (2 pm)	0
Deaths (2 am)	0

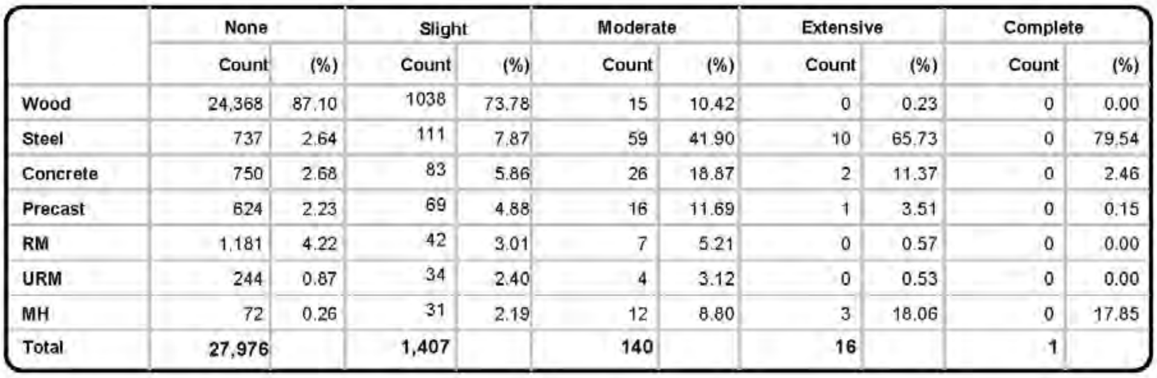
The results above show relatively low levels of damage to buildings and infrastructure, with only a few injuries and no deaths. The casualty rates are lower at night because most people are in wood-frame residential buildings which generally result in fewer casualties. The zero damage estimate for utility infrastructure, with no disruption of service, is probably somewhat optimistic – at least minor damage and localized short duration outages may occur.

Table 6.5
Building Damage by Occupancy
M7.8 San Andreas Fault Scenario Earthquake



	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	56	0.20	5	0.36	2	1.58	1	3.94	0	5.44
Commercial	2,340	8.37	239	16.99	68	48.52	6	40.51	0	37.58
Education	63	0.22	4	0.31	1	0.63	0	0.24	0	0.13
Government	13	0.05	2	0.12	1	0.55	0	0.51	0	0.33
Industrial	582	2.08	78	5.53	32	22.84	5	31.51	0	35.11
Other Residential	3,941	14.09	225	15.99	25	18.02	3	20.07	0	18.47
Religion	139	0.50	12	0.88	4	3.07	1	3.23	0	2.93
Single Family	20,841	74.50	842	59.83	7	4.79	0	0.00	0	0.00
Total	**27,976**		**1,407**		**140**		**16**		**1**	

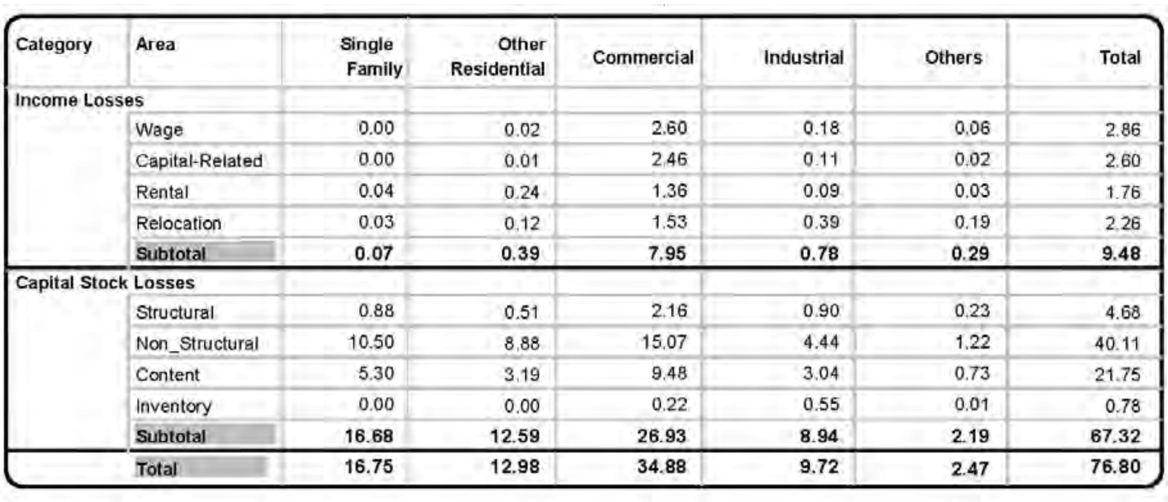
Table 6.6
Building Damage by Building Type
M7.8 San Andreas Fault Scenario Earthquake



	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	24,368	87.10	1038	73.78	15	10.42	0	0.23	0	0.00
Steel	737	2.64	111	7.87	59	41.90	10	65.73	0	79.54
Concrete	750	2.68	83	5.86	26	18.87	2	11.37	0	2.46
Precast	624	2.23	69	4.88	16	11.69	1	3.51	0	0.15
RM	1,181	4.22	42	3.01	7	5.21	0	0.57	0	0.00
URM	244	0.87	34	2.40	4	3.12	0	0.53	0	0.00
MH	72	0.26	31	2.19	12	8.80	3	18.06	0	17.85
Total	**27,976**		**1,407**		**140**		**16**		**1**	

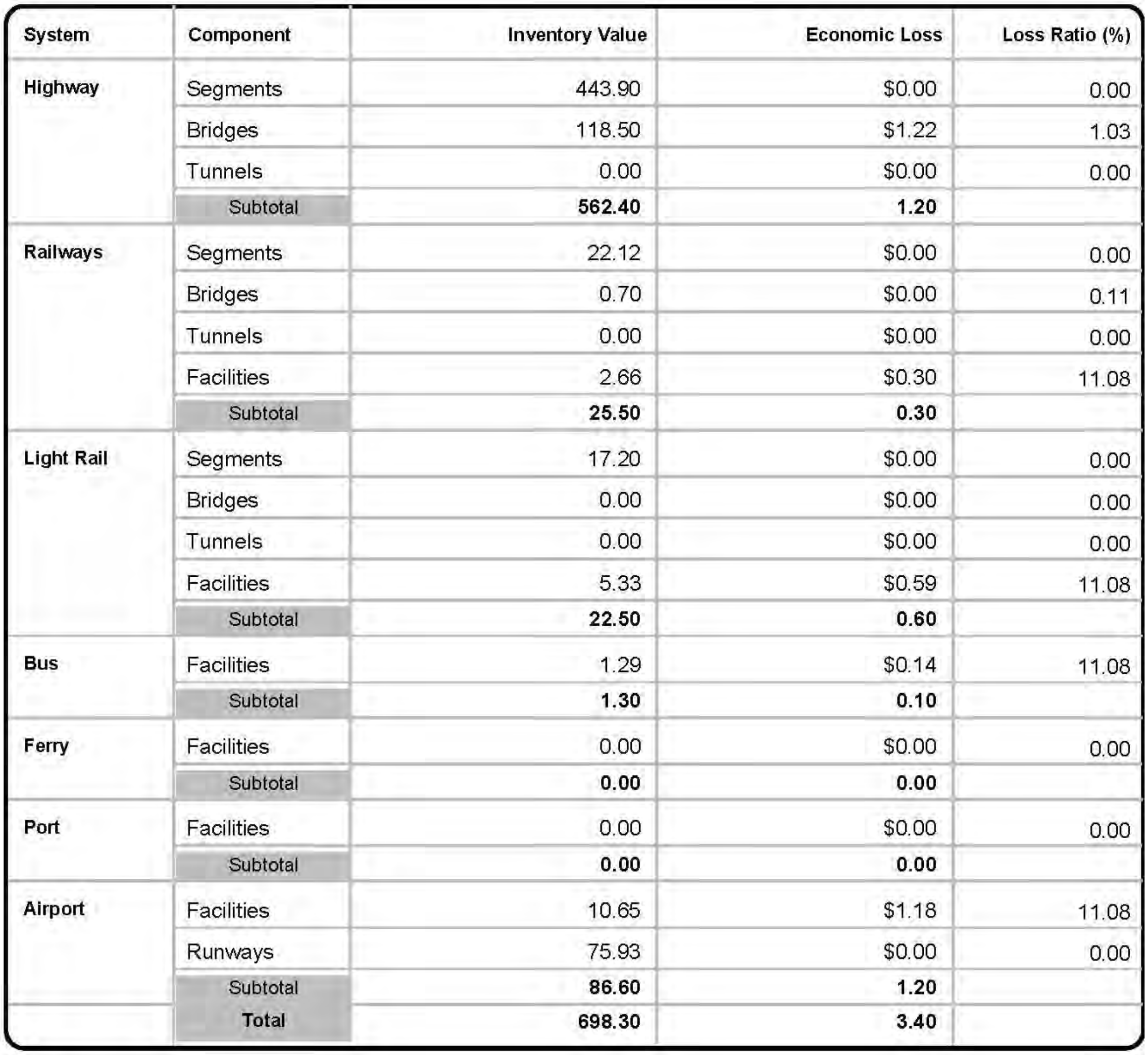
Note: RM is reinforced masonry; URM is unreinforced masonry and MH is manufactured home.

Table 6.7
Building-Related Economic Losses (Millions of Dollars)
M7.8 San Andreas Scenario Fault Earthquake



Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.02	2.60	0.18	0.06	2.86
	Capital-Related	0.00	0.01	2.46	0.11	0.02	2.60
	Rental	0.04	0.24	1.36	0.09	0.03	1.76
	Relocation	0.03	0.12	1.53	0.39	0.19	2.26
	Subtotal	**0.07**	**0.39**	**7.95**	**0.78**	**0.29**	**9.48**
Capital Stock Losses							
	Structural	0.88	0.51	2.16	0.90	0.23	4.68
	Non_Structural	10.50	8.88	15.07	4.44	1.22	40.11
	Content	5.30	3.19	9.48	3.04	0.73	21.75
	Inventory	0.00	0.00	0.22	0.55	0.01	0.78
	Subtotal	**16.68**	**12.59**	**26.93**	**8.94**	**2.19**	**67.32**
	Total	**16.75**	**12.98**	**34.88**	**9.72**	**2.47**	**76.80**

Table 6.8
Transportation System Economic Losses (Millions of Dollars)



System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	443.90	$0.00	0.00
	Bridges	118.50	$1.22	1.03
	Tunnels	0.00	$0.00	0.00
	Subtotal	**562.40**	**1.20**	
Railways	Segments	22.12	$0.00	0.00
	Bridges	0.70	$0.00	0.11
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.30	11.08
	Subtotal	**25.50**	**0.30**	
Light Rail	Segments	17.20	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	5.33	$0.59	11.08
	Subtotal	**22.50**	**0.60**	
Bus	Facilities	1.29	$0.14	11.08
	Subtotal	**1.30**	**0.10**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	10.65	$1.18	11.08
	Runways	75.93	$0.00	0.00
	Subtotal	**86.60**	**1.20**	
	Total	**698.30**	**3.40**	

As with the building damage and casualty estimates shown previously, the estimated damages for transportation infrastructure should not be interpreted verbatim as the exact consequences of this earthquake, but rather as reasonable estimates of the approximate level of damage expected.

6.7.3 M6.7 Earthquake on the Verdugo Fault

This scenario earthquake on the Verdugo Fault is a lower magnitude (M6.7) earthquake than the San Andreas scenario discussed above. However, the HAZUS estimates of damages and casualties are higher for the Verdugo scenario than for the San Andreas scenario because the Verdugo Fault is located within Burbank and thus the severity of ground shaking is considerably higher.

The HAZUS results summarized below should not be interpreted verbatim as the exact consequences of this earthquake. Rather, they should be interpreted as reasonable estimates of the approximate levels of damages, economic losses, and casualties expected if this earthquake occurs.

Table 6.9
Summary Impacts: M6.7 Verdugo Fault Scenario Earthquake

Category	Burbank
Damages and Losses	
Number of Damaged Buildings - Total	22,109
Number of Damaged Buildings - Slight damage	16,192
Number of Damaged Buildings - Moderate damage	4,938
Number of Damaged Buildings - Extensive Damage	844
Number of Damaged Buildings - Complete Damage	135
Building-Related Damages and Economic Losses	$1,080,950,000
Transportation Systems Damages and Economic Losses	$21,300,000
Utility Systems Damages and Economic Losses	$0
Total Damages and Losses	$1,102,250,000
Casualties	
Injuries (2 pm)	473
Injuries (2 am)	154
Deaths (2 pm)	19
Deaths (2 am)	5

The above estimate shows over $1 billion in building damage and economic losses, along with significant numbers of expected injuries and deaths. The casualty rates are lower at night because most people are in wood-frame residential buildings which generally result in fewer casualties.

The zero damage estimate for utility infrastructure, with no disruption of service, appears unrealistically optimistic – significant damages and outages are likely for this earthquake scenario.

Table 6.10
Building Damage by Occupancy
M6.7 Verdugo Fault Scenario Earthquake

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	11	0.15	24	0.15	19	0.39	7	0.88	2	1.32
Commercial	343	4.62	786	4.86	1,046	21.18	411	48.75	67	49.64
Education	15	0.20	27	0.17	19	0.39	6	0.74	1	0.57
Government	2	0.03	4	0.03	6	0.12	3	0.38	1	0.56
Industrial	63	0.85	177	1.10	292	5.90	137	16.18	28	20.71
Other Residential	1,035	13.93	2,153	13.29	757	15.33	217	25.75	32	23.89
Religion	24	0.33	53	0.33	52	1.05	22	2.66	4	3.07
Single Family	5,936	79.90	12,967	80.08	2,747	55.63	39	4.65	0	0.24
Total	**7,429**		**16,192**		**4,938**		**844**		**135**	

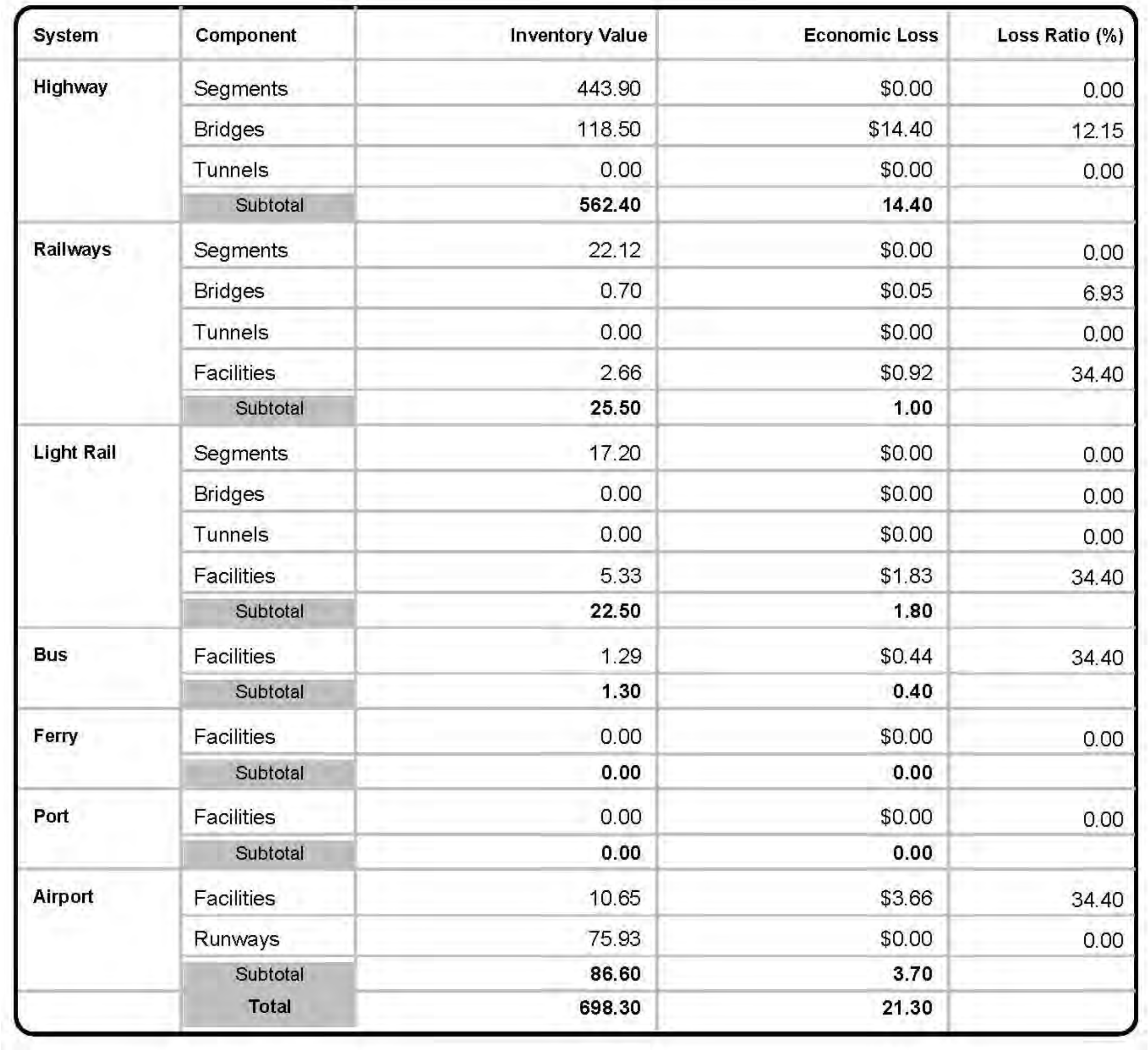
Table 6.11
Building Damage by Building Type
M6.7 Verdugo Fault Scenario Earthquake

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6,923	93.19	15145	93.53	3,277	66.36	70	8.32	4	3.09
Steel	63	0.84	176	1.09	419	8.49	222	26.33	37	27.31
Concrete	119	1.60	279	1.72	297	6.02	136	16.16	29	21.63
Precast	51	0.69	166	1.03	338	6.85	135	16.05	18	13.11
RM	259	3.49	367	2.27	441	8.93	148	17.55	15	11.33
URM	13	0.18	55	0.34	118	2.39	74	8.74	22	16.36
MH	0	0.00	4	0.02	47	0.95	58	6.85	10	7.18
Total	**7,429**		**16,192**		**4,938**		**844**		**135**	

Table 6.12
Building-Related Economic Losses (Millions of Dollars)
M6.7 Verdugo Fault Scenario Earthquake

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	1.79	51.71	2.54	1.03	57.07
	Capital-Related	0.00	0.77	49.56	1.57	0.31	52.20
	Rental	3.54	12.78	31.58	1.18	0.61	49.69
	Relocation	12.91	8.75	47.29	5.70	4.85	79.50
	Subtotal	**16.46**	**24.08**	**180.14**	**10.98**	**6.80**	**238.46**
Capital Stock Losses							
	Structural	27.63	18.72	61.85	14.39	5.09	127.68
	Non_Structural	161.16	123.34	168.82	41.61	14.23	509.16
	Content	60.27	32.39	72.96	26.92	6.32	198.87
	Inventory	0.00	0.00	1.82	4.90	0.07	6.79
	Subtotal	**249.07**	**174.45**	**305.44**	**87.83**	**25.71**	**842.49**
	Total	**265.52**	**198.53**	**485.58**	**98.80**	**32.51**	**1,080.95**

Table 6.13
Transportation System Economic Loss (Millions of Dollars)



System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	443.90	$0.00	0.00
	Bridges	118.50	$14.40	12.15
	Tunnels	0.00	$0.00	0.00
	Subtotal	**562.40**	**14.40**	
Railways	Segments	22.12	$0.00	0.00
	Bridges	0.70	$0.05	6.93
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.92	34.40
	Subtotal	**25.50**	**1.00**	
Light Rail	Segments	17.20	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	5.33	$1.83	34.40
	Subtotal	**22.50**	**1.80**	
Bus	Facilities	1.29	$0.44	34.40
	Subtotal	**1.30**	**0.40**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	10.65	$3.66	34.40
	Runways	75.93	$0.00	0.00
	Subtotal	**86.60**	**3.70**	
	Total	**698.30**	**21.30**	

As with the building damage and casualty estimates shown previously, the estimated damages for transportation infrastructure should not be interpreted verbatim as the exact consequences of this earthquake, but rather as reasonable estimates of the approximate level of damage expected.

6.8 Earthquake Regulatory Issues

6.8.1 Buildings

The seismic design requirements for new buildings are contained in the California Building Code, which is the International Building Code with California-specific amendments. Seismic design requirements for specialized facilities are included by references to numerous other codes, standards, and guidelines developed by specialty organizations.

For retrofits of existing buildings, there are regulatory requirements only for specific classes of buildings and/or types of occupancies, as summarized below. For ordinary buildings, the level of retrofit and the desired level of performance are largely up to the owner's discretion. However, there are guidelines in the International Existing Building Code and the California Historical Building Code. For evaluation and retrofit of existing buildings, the two most commonly used references are American Society of Civil Engineers monograph: ASCE31-03 Seismic Evaluation of Existing Buildings and ASCE 41-06 Seismic Rehabilitation of Existing Buildings.

6.8.2 Unreinforced Masonry Buildings

Unreinforced masonry (URM) buildings in California subject to special requirements. A 1986 unreinforced masonry building law required all 365 local governments in Seismic Zone 4, which includes all of Los Angeles County, to do three things:

- Inventory URM buildings within each jurisdiction,
- Establish loss reduction programs for URM buildings by 1990, and
- Report progress to the California Seismic Safety Commission.

The law also including requirements for owners of URMs to post warning placards on their buildings.

In addition, the law recommends that local governments:

- Establish seismic retrofit standards,
- Adopt mandatory strengthening programs, and
- Enact measures to reduce the number of occupants in URM buildings.

The Seismic Safety Commission's 2006 progress report to the legislature included in following Burbank information:

- Number of historic URMs in Burbank: 0,
- Number of non-historic URMs in Burbank: 53,
- Mitigation program established: YES,

- Mitigation program type: Mandatory strengthening,
- Technical Mitigation standard: 1982 Edition of Division 88 Los Angeles City Code,
- Buildings in compliance with the mitigation program: 31, and
- Buildings demolished: 22.

Based on the above report, it appears that all of the URMs in Burbank have been either retrofitted or demolished.

6.8.3 Municipal Buildings

In 1998, Burbank adopted an ordinance that required seismic evaluation and, when necessary, retrofit of all general municipal buildings. In 2001, these municipal buildings were evaluated by the structural engineering firm of Brandow and Johnston. Of a total of 66 buildings, 20 were excluded from further consideration because they were built after 1980 with seismic design criteria close enough to current requirements to pose a minimal level of seismic risk or were scheduled to be demolished.

Of the remaining 46 buildings, 9 were small masonry restrooms which were determined to pose minimal risk and 7 other buildings were determined to pose minimal seismic risk because none of the ordinances apply, they were wood frame buildings constructed after 1939 (without cripple walls) or they were buildings with masonry walls that had been recently retrofitted with wall anchors. With these revisions, a total of 30 municipal buildings were deemed to require evaluation and possible seismic retrofit.

Tables 6.14 and 6.15 on the following page list the buildings that have already been seismically retrofitted and the schedule for retrofits of the remaining buildings.

The 10 buildings where retrofits are noted as “voluntary” don’t meet the ordinance’s criteria for mandatory retrofit. However, retrofits are still desired for these buildings to increase the level of life safety and minimize damages in future earthquakes. Seismic retrofits for all of the buildings on the scheduled list are contingent on the availability of funding.

Table 6.14
Municipal Buildings Already Seismically Retrofitted

Buildings Seismically Retroffited	Year Completed
Public Works Field Services Administration	2009
Refuse Locker Room	2009
Park Maintenance Supervisor’s Office	2009
Water Reclamation Admin Building	2009
Water Reclamation Operations Building	2009
Water Reclamation Aeration Building	2009
Valley Park Restroom	2009
Johnny Carson Park Restroom	2009
Police Pistol Range	2008
Fire Station 16	2008
Starlight Bowl	2008

Table 6.15
Municipal Buildings Scheduled to be Seismically Retrofitted

Fiscal Year	Building Name
10-11	Administrative Services Building
10-11	Wells Fargo Building (unoccupied)
10-11	NW Library
10-11	Street Supervisors Office
10-11	Building Maintenance & Parks Storage
10-11	Police Evidence
12-13	DeBell Cart Storage Building
12-13	DeBell Golf Maintenance Shed
12-13	DeBell Driving Range
11-12	Verdugo Recreation Center (Voluntary)
11-12	Olive Rec (Voluntary)
11-12	Fire Station 16 (Voluntary)
12-13	Police Evidence (Voluntary)
12-13	Izay Park Theater (Voluntary)
12-13	McCambridge Lower Assembly Building (Voluntary)
12-13	Starlight Room Trellis (Voluntary)
12-13	Amphitheater Snack Bar (Voluntary)
13-14	City Hall (Voluntary)
13-14	Central Library (Voluntary)

Table 6.16 contains a summary of the nearly $5 million dollars in FEMA mitigation grants pending or received for the seismic retrofit of municipal buildings in Burbank.

Table 6.16
FEMA Grants for Seismic Retrofit of Burbank Buildings

Pending Grant Funds for Seismic Retrofit Projects				
Agency	**Contract**	**Year**	**Project**	**Amount**
FEMA	PENDING	2008	NW Library & Street Supervisor's Office	$463,217
FEMA	PENDING	2008	Administrative Services Building	$1,550,429
FEMA	PENDING	2010	Building Maintenance & Parks Storage	$225,000
			Total:	**$2,238,646**

Grant Funding Received for Seismic Retrofit Projects				
Agency	**Contract**	**Year**	**Amount**	**Project**
FEMA	2005-0011, PJ46	2005	Starlight Bowl, Police Pistol Range, Field Services Admin. Bldg., Water Rec Plant Admin. Bldg., Refuse Locker Room	$1,439,791
FEMA	2007-1004, PJ21	2007	Fire 16	$362,950
FEMA	2007-1004, PJ17	2007	McCambridge Rec Center[1]	$671,605
			Total:	**$2,474,346**

[1] Pending final payment of $67,160 after audit of McCambridge Rec Ctr grant project

6.8.4 Other Buildings

Burbank also adopted retrofit ordinances in 1999 and 2001 for pre-1994 welded steel moment frame and pre-1976 reinforced concrete wall, reinforced masonry and concrete tilt-up buildings, respectively. These ordinances required structural evaluations and seismic retrofits if necessary. As of 2009, all 10 welded steel moment frame buildings were in compliance with the seismic standards in the ordinance. As of 2009, about half of the 850 reinforced concrete wall, reinforced masonry or concrete tilt-up buildings in Burbank were in compliance with seismic safety standards. Per the ordinance, owners of non-complying buildings are required to post a conspicuous notice that the City of Burbank has ordered the owner to bring the building into compliance with the retrofit ordinance.

6.8.5 Schools

The Field Act requiring earthquake-resistant design for K-12 schools was enacted in 1933, shortly after the March 10, 1933 Long Beach earthquake (M6.4). More than 230 school buildings were destroyed, suffered major damage or were judged unsafe to occupy after the earthquake. Fortunately, schools were closed at the time of the earthquake and a major disaster with large numbers of deaths and injuries to school children was narrowly averted.

For construction of new schools, the Field Act requires the State Architect to write design standards for public schools and also has specific requirements for preparation of construction plans, plan checking, inspections and reporting to ensure construction in accord with codes and standards.

School buildings constructed under the Field Act have performed well in earthquakes. No Field Act building has either partially or completely collapsed and no school children have been killed or injured in Field Act-compliant buildings.
In 2006, Assembly Bill 127 was passed which gave community colleges the option of choosing to design and construct new buildings either under local building departments or under the Field Act.

6.8.6 Hospitals

The Alquist Hospital Seismic Safety Act (Hospital Act) was enacted in 1973 in response to the M6.6 San Fernando (Slymar) earthquake in 1971 in which four major hospital campus were severely damaged and evacuated. Two hospital buildings collapsed killing 47 people. Three others were killed in another hospital which nearly collapsed.

The Hospital Act required than hospital buildings housing patients be designed and constructed to resist, insofar as practical, the forces generated by earthquakes, gravity and wind. When the Hospital Act was passed, the State anticipated that the majority of hospital buildings would be replaced with newer buildings in compliance with the Act. However, a 2001 report by the Seismic Safety Commission found that buildings had not been and were not being replaced at the anticipated rate. Rather, the great majority of the State’s urgent care facilities were more than 40 years old.

The 1994 M6 Northridge earthquake caused about $3 billion in hospital damages and losses. 12 hospital buildings built before the Hospital Act were red-tagged as unsafe for occupancy. Post-Act hospital buildings were very successful in resisting structural damage, but had widespread non-structural damage, which in some cases resulted in hospital closures for extended time periods.

In 1994, Senate Bill 1953 expanded the scope of the Hospital Act to require all hospitals to survive earthquakes without collapsing or posing the threat of significant loss of life by January 1, 2008. The 1994 Act further mandated that all existing hospitals must be seismically evaluated and retrofitted, if needed, by 2030 to be reasonably capable of providing services to the public after disasters.

However, in 2001, a report to the Office of Statewide Health Planning and Development found that 40% of the state’s hospitals were in the highest risk category for collapse.

The Providence Medical Center, the only hospital in Burbank, meets the Senate Bill 1953 requirement that hospitals will survive earthquake without collapsing or posing the threat of significant loss of life. The hospital buildings also meeting the 2030 requirement to be reasonably capable of providing services to the public after disasters with the exception of the East Building.

6.8.7 Alquist-Priolo Surface Rupture Zones

Facilities located within fault zones subject to surface rupture are vulnerable to extensive damage from vertical or horizontal offsets. The Alquist Priolo Special Study Zone Act of 1972 requires identification of areas subject surface ruptures, with restrictions on development in such areas. Several faults in Los Angeles County are designated as Special Study Zones, but none of these faults are located within Burbank. However, as noted previously, surface rupture may be possible on the Verdugo Fault which runs through Burbank.

6.9 Mitigation Strategies and Action Items for Earthquakes

The primary objectives of earthquake mitigation measures are:

- Protect life safety,
- Reduce damages, and
- Reduce losses from loss of function.

For buildings, life safety is often the predominant driving force for mitigation measures. However, for specialized, high-value facilities such as data centers or high-technology manufacturing facilities, damage reduction may be the primary motivation. For critical facilities, including emergency response facilities and medical facilities, preserving the function of the facility after earthquakes is typically a major factor in mitigation decisions.

For utility and transportation infrastructure, life safety may also be the predominant driving force for mitigation. However, in many cases the primary motivation is avoiding the large economic impacts that may result from loss of critical utility services or loss of key transportation components such as bridges. In many cases, the benefits of avoiding loss of function economic impacts are much larger than the benefits of avoiding direct damage.

For buildings as well as utility and transportation infrastructure, the best seismic mitigation projects don’t address typical facilities but rather focus on facilities which have high seismic vulnerability and high importance. Common seismic mitigation projects include the following:

- Structural retrofits of buildings,
- Non-structural retrofits of building equipment and contents,
- Structural retrofits of major utility and transportation infrastructure, including reservoirs, water and wastewater treatment plants, and bridges, and
- Non-structural retrofits for utility control equipment, pumps, generators, battery racks, substation components and so on.

The following table contains earthquake mitigation action items from the master Action Items table in Chapter 4.

Table 6.17
Earthquake Action Items

Hazard	Action Item	Coordinating Organizations	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Earthquake Mitigation Action Items								
Short-Term #1	Complete the remaining seismic retrofits on the important City-owned buildings as tabulated in Chapter 6.	Public Works	5 Years	X	X	X		
Short-Term #2	Encourage owners of public and private buildings in Burbank to evaluate and implement structural and nonstructural mitigation measures when necessary to ensure adequate earthquake performance.	Building Division	Ongoing	X	X	X	X	
Short-Term #3	Develop programs to help homeowners implement nonstructural mitigation measures and structural retrofits for seismically vulnerable residential buildings.	Building Division	5 Years	X	X		X	
Short-Term #4	Disseminate FEMA pamphlets to educate homeowners and business owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	Building Division	1-2 Years	X	X	X	X	
Long-Term #1	Develop and implement a long term plan for nonstructural mitigation for City buildings and facilities	Building Division, Public Works	Ongoing	X	X	X		

7.0 WILDLAND/URBAN INTERFACE FIRES

7.1 Overview

Fire has posed a threat to mankind since the dawn of civilization. Fires often cause substantial damage to property and may also result in deaths and injuries. For the purposes of mitigation planning, we define three types of fires:

- Structure fires and other localized fires,
- Wildland fires, and
- Wildland/urban interface fires.

Structure fires are fires where structures and contents are the primary fire fuel. . In dealing with structure fires, fire departments typically have three primary objectives: first, minimize casualties; second, prevent a single structure fire from spreading to other structures; and third, minimize damage to the structure and contents. The Burbank Fire Department has primary responsibility for responding to structure fires, as well at to other common types of fires including vehicle fires, trash fires, and small debris or vegetation fires. Structure fires and the other common types of fire are most often confined to a single structure or location, although in some cases they may spread to adjacent structures.

Wildland fires are fires where vegetation (grass, brush, trees) is the primary fire fuel and thus involve very few or no structures. For wildland fires, the most common suppression strategy is to contain the fire at its boundaries, to stop the spread of the fire and then to let the fire burn itself out. Fire containment typically relies heavily on natural or manmade fire breaks. Water and chemical fire suppressants are used primarily to help make or defend a fire break, rather than to put out an entire fire, as would be the case with a structure fire. For wildland fires, fire suppression responsibility is shared by local and state fire agencies.

Wildland/urban interface fires are fires where the fire fuel includes both structures and vegetation. The defining characteristic of the wildland/urban interface area is that structures are built in or immediately adjacent to areas with essentially continuous (and often high) vegetative fuel loads. In other words, structures are built in areas subject to wildland fires. When wildland fires occur in such areas, they often spread quickly and structures in these areas may, unfortunately, become little more than additional fuel sources for wildland fires.

In Burbank, as elsewhere in California, recent patterns of development have lead to increasing numbers of homes being built in areas subject to wildland/urban interface fires. Fires in these areas pose high levels of life safety risk for occupants as well as high levels of fire risk for homes and other structures.

The Burbank Hazard Mitigation plan addresses natural hazards. This chapter focuses on wildland/urban interface fires which pose a substantial threat to parts of Burbank.

7.2 Wildland/Urban Interface Fires

Many urban or suburban areas have a significant amount of landscaping and other vegetation. However, in most areas the fuel load of flammable vegetation is not continuous, but rather is broken by paved areas, open space and areas of mowed, often irrigated, grassy areas with low fuel loads. In these areas, most fires are single structure fires. The combination of separations between buildings, various types of fire breaks, and generally low total vegetative fuel loads make the risk of fire spreading much lower than in wildland areas.

Furthermore, most developed areas in urban and suburban areas have water systems with good capacities to provide water for fire suppression and fire departments that respond quickly to fires, with sufficient personnel and apparatus to control fires effectively. Thus, the risk of a single structure fire spreading to involve multiple structures is generally quite low.

Areas subject to wildland/urban interface fires have very different fire hazard characteristics which are very similar to those for wildland fires. The level of fire hazard for wildland/urban interface fires depends on:

- Vegetative fuel load,
- Weather,
- Topography,
- Fire suppression resources and
- Fire-safe construction and defensible space practices.

The level of fire hazard in wildland/urban interface areas is often high not only because of high vegetative fuel loads, but also because of topography. Many of these areas are hilly or mountainous and steeper slopes exacerbate fire spreading and impede fire suppression efforts. Water resources for fire suppression are typically lower in these areas which are predominantly residential and served by pumped pressure zones. Fire department response times may also be longer because of distance and/or narrow streets. These reduced fire suppression resources make it more likely that a small wildland fire or a single structure fire in an urban/wildland interface area will spread before it can be extinguished. Fire suppression efforts for wildland/urban interface fires focus on savings lives and on protecting structures to the extent possible.

Another important factor in the level of risk for individual structures or neighborhoods is the extent to which fire-safe construction practices and vegetation management practices such as weed abatement and maintenance of defensible space around structures are or are not implemented. Effective implementation of fire-safe construction practices and defensible space around structures substantially reduces the risk of a fire destroying structures when a fire occurs.

The level of fire hazard in areas prone to wildland/urban interface fires is also greatly increased during periods when weather conditions of high temperatures, low humidity, and high winds may greatly accelerate the spread of a wildland fire and make containment difficult or impossible

Life safety risk in interface areas is often exacerbated by homeowners' reluctance to evacuate homes quickly. Instead, homeowners often try to protect their homes with whatever fire suppression resources are available. Such efforts generally have very little effectiveness. For example, the water flow from a garden hose is too small to meaningfully impact even a single structure fire (once the structure is significantly engulfed by flames) and is profoundly too small to have any impact on a wildland/urban interface fire. Unfortunately, home owners who delay evacuation in well meant but misguided attempts to save their homes may place their lives in jeopardy by delaying evacuation until it may be impossible.

Major fires in the urban/wildland interface have the potential for enormous destruction and high casualties. For example, the October 20, 1991 East Bay Fire in Oakland California burned about 1,600 acres with 25 fatalities, 150 injuries, and over 3,300 single-family homes and 450 apartment units destroyed. Total property damages were over $1.5 billion. This fire was fueled by high vegetative fuel loads and occurred on an unusually hot, dry, windy day. The fire spread extremely quickly, with over 800 homes engulfed by fire within the first hour, and the rapid fire spreading completely overwhelmed initial fire suppression efforts.

7.3 Historical Data for Wildland Fires In or Near Burbank

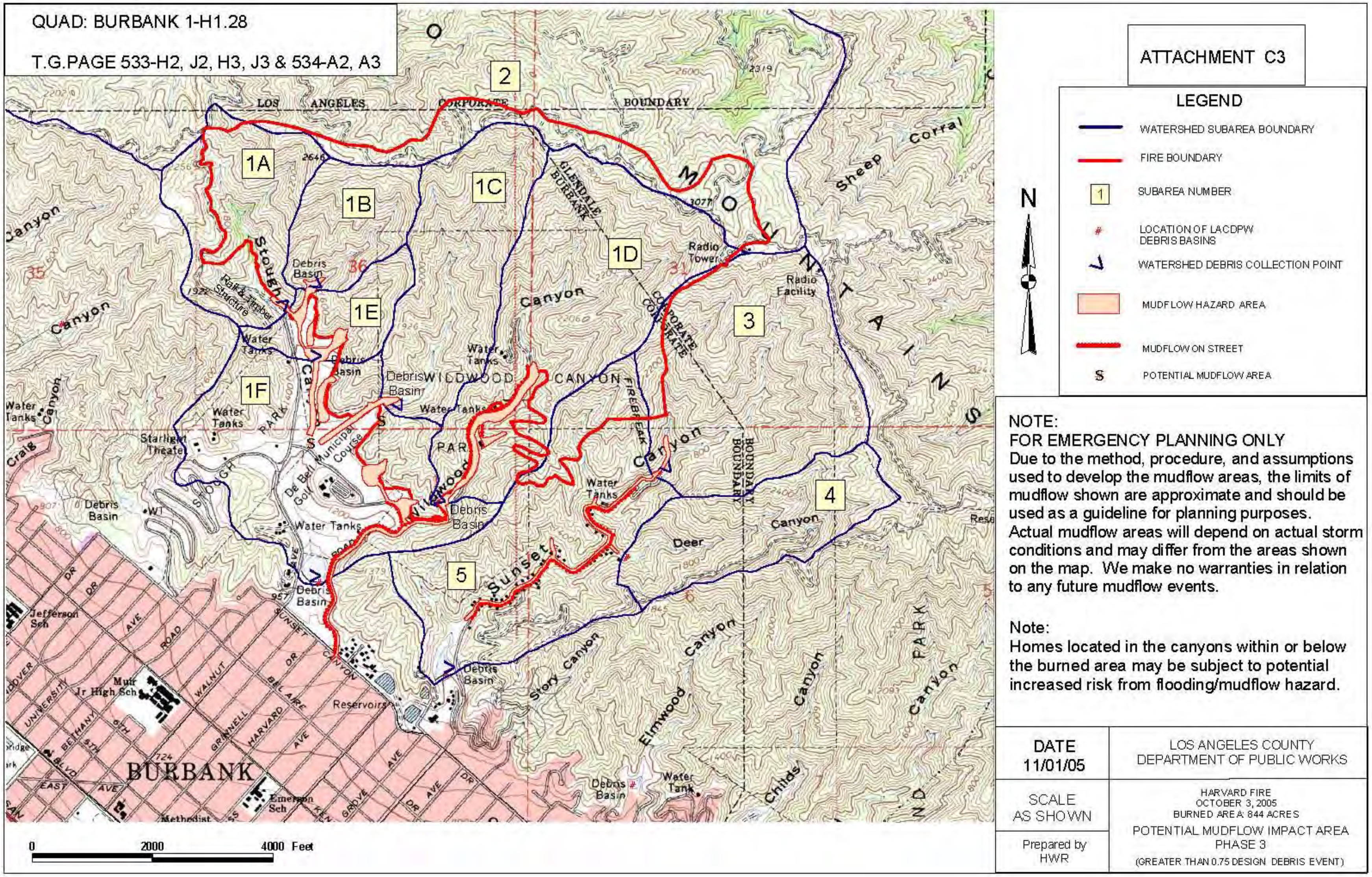
Small wildland fires are relatively common in the Verdugo Mountains above Burbank. The major historical fire events are summarized below for fires that burned into the wildland/urban interface, in or near Burbank.

- 1927 Brush Fire. This fire started in La Crescenta when a resident burning grape trimmings lost control of the fire which jumped Foothill Boulevard into the Verdugo Mountains. On the fire's second day, the fire came over the ridge and burned into Sunset Canyon, destroying about 100 homes.
- 1964 Verdugo Brush Fire. This fire occurred on a very windy day when power lines fell into brush in the Whiting Woods area. The fire quickly spread into the Sunset Canyon area and then into Scott Canyon and Cabrini Canyon. This fire was contained to mainly the undeveloped wildland area, with only minor damage to structures.
- 1980 Verdugo Brush Fire. This fire was also started by downed power lines in the La Tuna Canyon area. The City of Burbank suffered about $1.5 million in damage to a water reservoir and to electrical transmission facilities located outside of city limits. There was also minor damage to several residential buildings and one restaurant.
- 1993 Fire Storms. For a 10 day period in October and November there were strong Santa Ana winds, with numerous brush fires throughout Southern California. The Burbank Fire Department responded to several fires, along with other fire departments from around the state, including fires in the Thousand Oaks area and Altadena. There were two major fires in Orange County and major fire in Calabasas that burned through Topanga Canyon to the Pacific Ocean at Malibu. Overall, these fires burned over 1,000 structures and about 220,000 acres of brush. There were also three fatalities.

- 2003 Wildfires. There were numerous fires in October ranging from Ventura County to the Mexico border. In one week, a total of over 750,000 acres were burned, with over 4,800 structures destroyed. There were 22 deaths about over 200 injuries.
- 2005 Harvard Fire. On September 29th, a brush fire started on Harvard Rd. in Burbank, near the Castaway Restaurant on the De Bell Golf Course. The fire quickly burned into steep terrain, which impeded fire suppression efforts. The fire was contained that night, but jumped fire lines the next morning. The fire ultimately burned about 1,000 acres of brush with fire suppression costs of about $2,000,000. No structures were burned, but Country Club Drive was evacuated during the fire.
- 2009 Station Fire (Angeles National Forest Fire). This fire started on August 26th on Angeles Crest Highway. Before it was contained this fire burned over 160,000 acres of brush and was the largest single fire in the history of Los Angeles County. The fire burned about 90 homes and about 100 other structures. There were two firefighter deaths and 22 firefighter injuries.
- There have been no significant wildland/urban interface fires in Burbank since the 2005 Harvard Fire. There have been several very small arson-related fires, all of which were quickly extinguished.

The burn area for the 2005 Harvard Fire and areas which subsequently experienced mudflows are shown in Figure 7.1 on the following page. With somewhat worse fire conditions – fuel load, temperature, humidity, wind speed and wind direction – this fire could easily have burned numerous structures. In the worst case scenarios fires such as this one in the Verdugo Mountains area could burn well into the heavily developed areas of Burbank.

Figure 7.1
2005 Hazard Fire Burn Area



NOTE:
FOR EMERGENCY PLANNING ONLY
Due to the method, procedure, and assumptions used to develop the mudflow areas, the limits of mudflow shown are approximate and should be used as a guideline for planning purposes. Actual mudflow areas will depend on actual storm conditions and may differ from the areas shown on the map. We make no warranties in relation to any future mudflow events.

Note:
Homes located in the canyons within or below the burned area may be subject to potential increased risk from flooding/mudflow hazard.

7.4 Wildland/Urban Interface Fire Hazards for Burbank

Wildland/urban fire hazard zones in Burbank have been mapped by the California Department of Forestry and Fire Protection (Cal Fire) under the Fire and Resource Assessment Program (FRAP). These maps are shown in Figures 7.2 and 7.3 .

The Cal Fire identified high and very high fire hazard areas cover about 30% of Burbank's area, with additional areas of high and moderate fire hazard on the borders of the very high hazard areas The largest very high hazard area is in northeastern Burbank, east of Interstate 5. Much of this area is in the Verdugo Mountains with a very limited amount of development. However, there are also a large number of homes in the foothills region.

There is also a much smaller area in the southernmost part of Burbank, south of the Ventura Freeway and north of the Los Angeles River, adjacent to Griffith Park (City of Los Angeles). This area includes studio buildings as well as a residential area.

The Cal Fire – FRAP fire hazard zones are based on complex fire models which include evaluations of: fuels, topography, dwelling density, weather, infrastructure, building materials, brush clearance and fire history. The FRAP hazard levels of very high, high and moderate are interpreted as the best available estimates of the relative levels of wildland/urban interface fire hazards.

The FEMA Version 4.5.5 Benefit-Cost Software for wildland/urban interface fires provides estimates for the level of fire risk. For the northeastern part of Burbank, in the Verdugo Mountains and foothills, the FEMA estimated return period for fires is 175 years, which corresponds to about a 16% chance of fire at a given location over the next 30 years.

Figure 7.2
Cal Fire: Burbank Fire Hazard Map – Tile 1

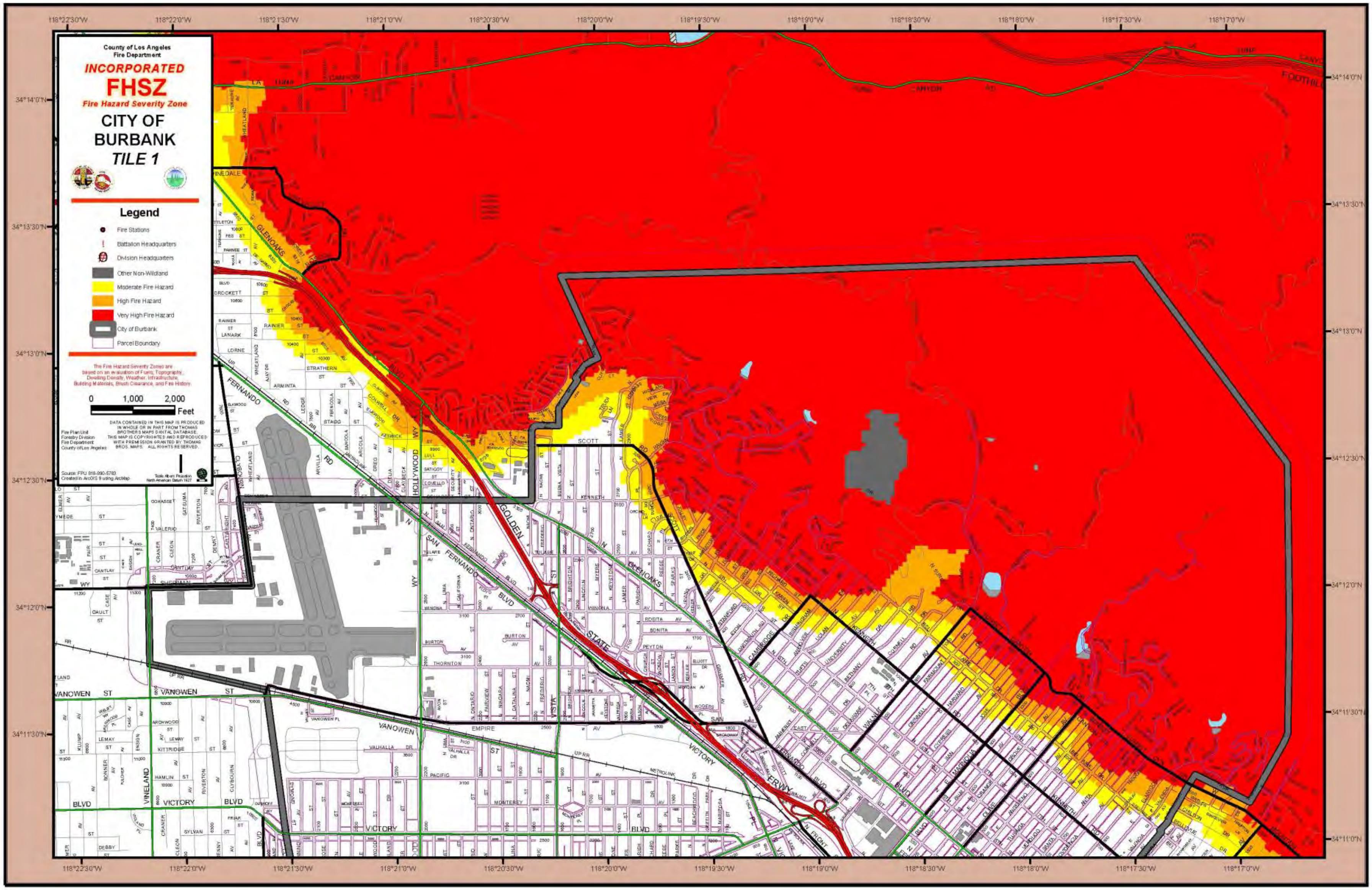
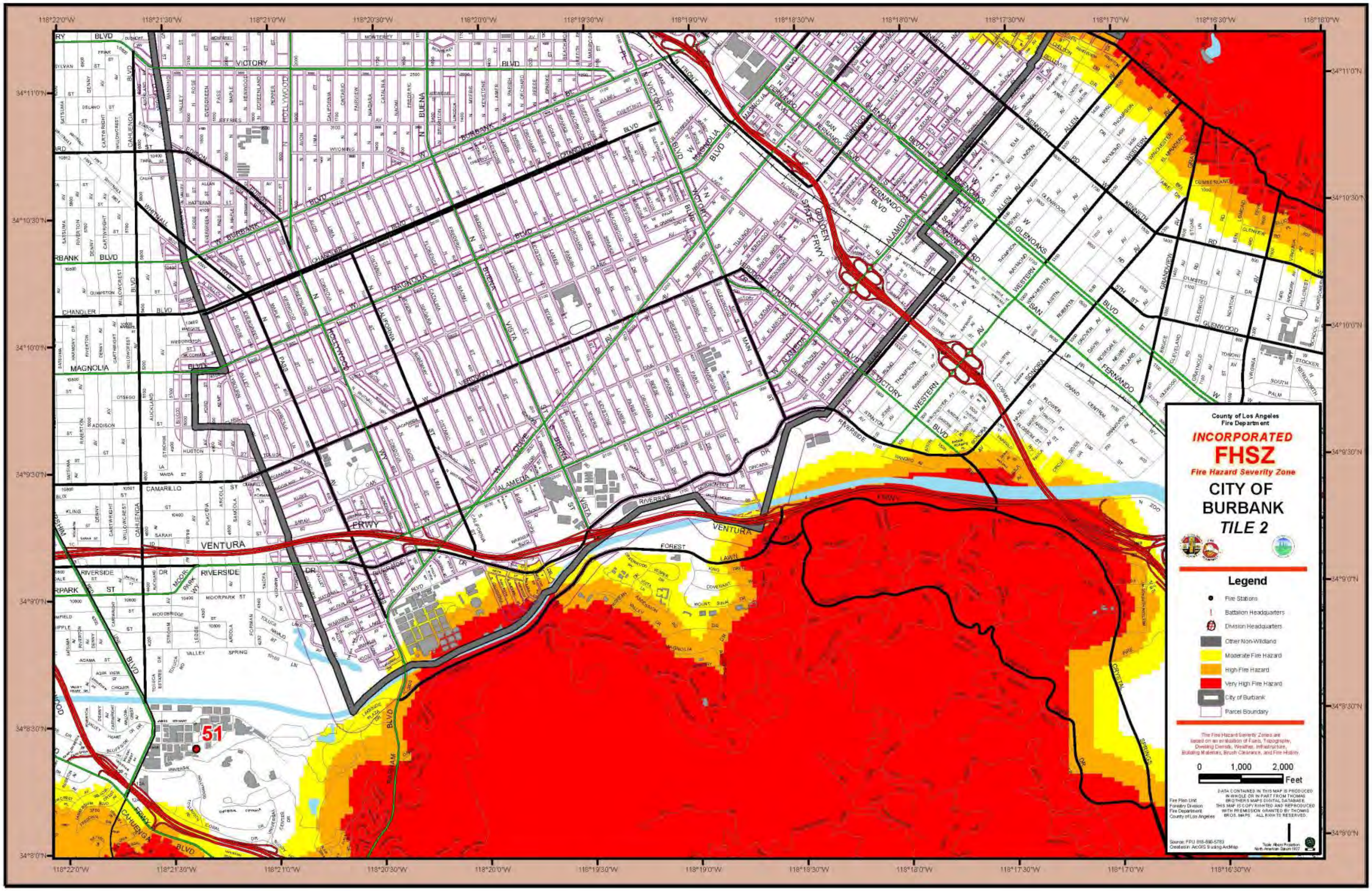


Figure 7.3
Cal Fire: Burbank Fire Hazard Map – Tile 2



The hazard level for wildland/urban interface fires, and the corresponding risk to structures and people, is very high in the areas mapped above in Figures 7.2 and 7.3 because of the following characteristics:

- High fuel loads in the mountainous and hilly areas,
- Weather conditions, which include many months of hot dry days,
- Steep mountainous and moderately steep foothill areas which exacerbate fire spreading and impeded fire suppression efforts, and
- All of the other factors considered in the Cal-Fire FRAP mapping of fire hazards.

These identified high risk areas of Burbank face potential wildland/urban interface fires during much of the year, but especially on hot, dry windy days and during periods of drought.

An important caveat for interpreting the fire hazard maps shown above is that they don't reflect the worst case scenario. In the worst case scenario, with a major fire burning into the developed portions of Burbank, it is possible for the fire to burn as much as a mile or more beyond the mapped very high or high hazard areas.

The numbers of structures in the Cal Fire – FRAP hazard areas shown previously in Figures 7.2 and 7.3 is calculated from GIS overlays of assessor's data with the fire hazard areas. These results are shown below in Table 7.1.

Table 7.1
Numbers of Structures in Cal Fire – FRAP Hazard Areas

Cal Fire - FRAP Hazard Zone	Structure Count
Very High	2,638
High	1,372
Moderate	1,316
Total	5,326

The 5,226 structures located within the Cal Fire – FRAP hazard areas although there are as small number of commercial and public buildings in this area. These structures represent approximately 12% of the number of housing units in Burbank.

7.5 Wildland/Urban Fire Risk Assessment and Potential Loss Estimates.

The identified high risk areas for wildland/urban interface fires have high risk because of the many factors discussed above. FEMA's estimate of a return period of about 175 years for fire at a given location in these areas corresponds to about a 16% chance over a 30 year period, which is a very high level of risk.

Potential losses from wildland/urban fires impacting Burbank vary over a very wide range. Fires may result only minor damage to structures, result in the destruction of a few structures, a few dozen structures or hundreds of structures. In extreme events, such as the 1991 Oakland Hills fire, loss of several thousand structures.

The following table has rough estimates of the order of magnitude of potential losses to structures and infrastructure, based on the following parameters per structure:

- Average structure replacement value: $400,000,
- Average contents replacement value: $120,000,
- Landscaping damages: $5,000
- Displacement costs for temporary quarters: $25,000,
- Other damages, including vehicles and infrastructure: $50,000
- Total damages per structure burned: $600,000.

Table 7.2
Potential Losses from Wildland/Urban Interface Fires in Burbank

Structures Burned	Approximate Losses
1	$600,000
10	$6,000,000
100	$60,000,000
1000	$600,000,000

In addition to the potential for property damage, wildland/urban interface fires in Burbank pose substantial risk of deaths and injuries to both residents and firefighters. For a major wildland/urban interface fire in Burbank the number of deaths could none or as high as several dozen or more, with several times as many injuries as deaths.

Furthermore, high levels of smoke from major fires pose health risks, especially for vulnerable populations, including: individuals with asthma and other respiratory diseases or cardiovascular disease, the elderly, and children.

7.6 Mitigation Strategies for Wildland/Urban Interface Fires

7.6.1 Synopsis of Common Strategies

This section summarizes common strategies for reducing the level of fire risk to both property and life safety in wildland/urban interface areas. The common strategies have four elements:

1) reduce the probability of fire ignitions,
2) reduce the probability that small fires will spread,
3) minimize property damage, and
4) minimize the life safety risk.

Reduce the probability of fire ignitions

Efforts to reduce the probability of fire ignitions focus on manmade causes of ignition through a combination of fire prevention education, enforcement and other actions. Fire prevention education actions include efforts to heighten public awareness of fire dangers, especially during high danger time periods and better education about fire safe practices, such as careful disposal of smoking materials, and adhering to restrictions on burning of rubbish and debris. Fire prevention enforcement actions include strict enforcement of burning restrictions and vigorous investigation and prosecution of arson cases. One physical action to reduce the probability of ignitions is to maintain or upgrade tree-trimming operations around power lines to minimize fires starting by sparking from lines to vegetative fuels as well as vigorous enforcement of overgrown vegetation and tall grass ordinances.

Reduce the probability that small fires will spread

Possible mitigation actions to reduce the probability that small fires will spread include enhancement of water supply and fire suppression capabilities for high risk areas, expansion of existing firebreaks, creation of new firebreaks and expanding defensible spaces around structures in wildland/urban interface areas.

Minimize Property Damage

The education and action items discussed above may help to reduce future property damages by reducing the number of fire ignitions and by reducing the probability that a small fire will spread. In addition, specific fire safe building practices can be implemented (if not yet implemented) or enforced vigorously (if not yet vigorously enforced). Fire safe building practices have two main elements:

- Fire safe design and construction of structures, and
- Maintenance of defensible spaces around structures.

ATTACHMENT 1

The National Fire Protection Association (NFPA) has an excellent "Firewise" communities program with an excellent, highly informative website (www.firewise.org). The firewise website can also be reached from the main NFPA website (www.nfpa.org). The Firewise website has very informative publications and videos for local officials and homeowners to help understand, evaluate, and improve the fire safety of structures at risk from wildland/urban interface fires. The firewise construction and firewise landscaping checklists are particularly recommended as concise summaries of the primary fire-safe designs and practices for homeowners at risk from wildland/urban interface fires.

The NFPA's Firewise Construction Checklist, makes the following main recommendations (among others):

1) site homes on as level terrain as possible, at least 30 feet back from cliffs or ridge lines,

2) build homes with fire-resistant roofing materials, such as Class-A asphalt shingles, slate or clay tiles, concrete or cement products, or metal,`

3) build homes with fire-resistant exterior wall cladding, such as masonry or stucco,

4) consider the size and materials for windows; smaller panes hold up better than larger ones, double pane and tempered glass windows are more fire resistant than single pane windows; plastic skylights can melt and allow access for burning embers,

5) prevent sparks and embers from entering vents by covering vents with wire mesh no larger than 1/8", box eaves, and minimize places to trap embers on decks and other attached structures, and

6) keep roofs, eaves, and gutters free of flammable debris.

The NFPA's Firewise Landscaping Checklist includes the following main recommendations (among others), based on a four-zone planning concept around the house:

1) Zone 1 should be well irrigated area of closely mowed grass or non-flammable landscaping materials such as decorative stone, at least 30' in all directions around the home,

2) Zone 2 should be a further irrigated buffer zone with only a limited number of low-growing, fire-resistant plants,

3) Zone 3, further from the house, can include low growing plants and well-spaced, well-pruned trees, keeping the total vegetative fuel load as low as possible, and

4) Zone 4 is the natural area around the above three landscaped zones. This area should be thinned selectively, with removal of highly flammable vegetation and removal of ladder fuels that can spread a grass fire upwards into tree tops.

Minimize Life Safety Risk

The mitigation actions above may help to minimize life safety risk by helping to reduce the number of ignitions, by reducing the probability that small fires will spread, and by encouraging more fire-safe practices of building construction and fire-safe landscaping. These practices are meritorious for reducing the fire hazards to structures. However, they may also give homeowners a false sense of life safety security. A false sense of security may encourage people to stay in homes at risk during wildfires, rather than evacuating immediately at the first fire warning.

The most important action to minimize life safety risk during wildland/urban interface fires is immediate evacuation. Thus, reducing life safety risk requires public education and emergency planning to encourage and expedite warnings and evacuations (voluntary or mandatory).

Burbank Fire Ordinances and Policies

The large high-risk area in northeastern Burbank is designed as the Fire Hazard Severity Zone (FHSZ), which was formerly known as the Mountain Fire Zone (MFZ). This area contains nearly 3,000 acres, including: 2,257 acres of undeveloped “mountain reserve” land owned by the City of Burbank, 228 acres of developed parklands, and 471 acres of developed residential areas.

Within the FHSZ, there are specific requirements for brush clearance and vegetation reduction as per the “Fire Hazard Reduction Guidelines.” Detailed requirements are in the Burbank Municipal Code Section 9-2-304.1.2.1

Each spring, the Burbank Fire Department mails and informational letter to property owners in the FHSZ, notifying them of the City’s brush clearance policies and code requirements. Property owners are given a reasonable time period to remove hazardous vegetation before notices of violation are sent out. Most residents comply voluntarily, but the City may also high contractors to remove hazardous vegetation on properties where the owner has failed to comply. In addition, Burbank removes hazardous vegetation from city-owned properties. In 2009, $70,000 was spent on this effort.

Burbank enforces the 2010 California Fire Code, including the Wildand-Urban Interface Chapter 47, and historically enforced previous versions of the Code. In addition, a Burbank ordinance mandated that al wood shake or shingle roofs in the FHSZ (MFZ) had to be removed by August 14, 2005 and removed city-wide by August 14, 2012. The Burbank Redevelopment Agency provides homeowner assistance for wood roof replacements through the Residential Rehabilitation Loans and Grants Programs. The Burbank City Employees Credit Union also offers fixed-rate low interest loans fire upgrades for roofs.

7.6.2 FEMA Mitigation Actions for Wildland/Urban Interface Fires

The various FEMA mitigation grant programs (see: Appendix 1) include mitigation projects to reduce the risks from wildland/urban interface fires. Mitigation measures that FEMA commonly funds include:

- Defensible space activities,
- Hazardous fuel reduction activities, and
- Ignition resistant construction activities.

FEMA mitigation grants may also be available for some other wildand/urban interface fire mitigation activities. However, FEMA mitigation grants do not typically fund water system capacity enhancements, equipment or apparatus purchases or emergency planning activities.

7.6.3 Mitigation Action Items for Wildland/Urban Interface Fires

The following table contains wildland/urban interface fire mitigation action items from the master Action Items table in Chapter 4.

Table 7.2
Wildland/Urban Interface Fire Mitigation Action Items:

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Wildland/Urban Interface Fire Mitigation Action Items								
Short-Term #1	Evaluate and upgrade selected fire access roads in the Verdugo Mountains which are inadequate for emergency response vehicles and/or subject to repetitive damage	Fire, Los Angeles County	1-2 Years	X	X	X		
Short-Term #2	Develop and disseminate informational materials to residents in the Fire Hazard Severity Zone to enhance awareness and encourage fire safe practices, including fuel reduction, defensible space, and fire-safe construction	Fire	1-2 Years	X	X	X	X	
Short-Term #3	Provide periodic brush clearance around the perimeter of radio communication towers, Reservoir #3 and Mount Tom to minimize communication disruption during wildfire events	Fire, Public Works	Ongoing	X	X	X		
Short-Term #4	Identify evacuation routes and procedures for high risk areas and educate the public	Police, Fire, Emergency Management Coordinator	1-2 Years	X		X	X	
Long-Term #1	Develop financial assistance programs to aid Burbank residents with cost-effective solutions to comply with the city-wide wood roof ordinance and the Fire Hazard Reduction Program requirements for brush clearance in the Fire Hazard Severity Zone	Fire, Building Division	5 Years	X	X	X	X	
Long-Term #2	Implement fuel reduction/management including demonstration projects in the Fire Hazard Severity Zone	Fire	5 Years	X	X	X	X	X

8.0 LANDSLIDES AND MUDSLIDES

8.1 Landslide Overview and Definitions

The term “landslide” refers to a variety of slope instabilities that result in the downward and outward movement of slope-forming materials, including rocks, soils and artificial fill. Four types of landslides are distinguished based on the types of materials involved and on the mode of movement. These four types of landslides are illustrated in Figures 8.1 to 8.4 on the following page.

> **Rockfalls** are abrupt movements of masses of geologic materials (rocks and soils) that become detached from steep slopes or cliffs. Movement occurs by free-fall, bouncing and rolling. Falls are strongly influenced by gravity, weathering, undercutting or erosion.
>
> **Rotational Slides** are those in which the rupture surface is curved concavely upwards and the slide movement is rotational about an axis parallel to the slope. Rotational slides usually have a steep scarp at the upslope end and a bulging “toe” of the slid material at the bottom of the slide. Roads constructed by cut and fill along the side of a slope are prone to slumping on the fill side of the road. Rotational slides may creep slowly or move large distances suddenly.
>
> **Translational Slides** are those in which the moving material slides along a more or less flat surface. Translational slides occur on surfaces of weaknesses, such as faults and bedding planes or at the contact between firm rock and overlying loose soils. Translational slides may creep slowly or move large distances rather suddenly.
>
> **Debris Flows/Mudflows** are movements in which loose soils, rocks and organic matter combine with entrained water to form slurries that flow rapidly downslope.

All of these types of landslides may cause road blockages by dumping debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are highly prone to break in slide areas. Buildings impacted by slides may suffer minor damage from small settlements or be completely destroyed by large ground displacements or by burial in slide debris. Furthermore, landslides may also result in deaths or injuries.

There are three main factors that determine susceptibility (potential) for landslides:

1) slope,
2) soil/rock characteristics, and
3) water content.

Steeper slopes are more prone to all types of landslides. Loose, weak rock or soil is more prone to landslides than is more competent rock or dense, firm soils. Finally, water saturated soils or rock with a high water table are much more prone to landslides because the water pore pressure decreases the shear strength of the soil and thus increases the probability of sliding.

Figures 8.1 to 8.4
Major Types of Landslides

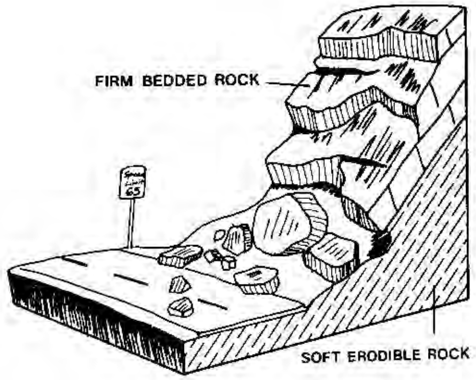


Fig. 8-1. Rockfall

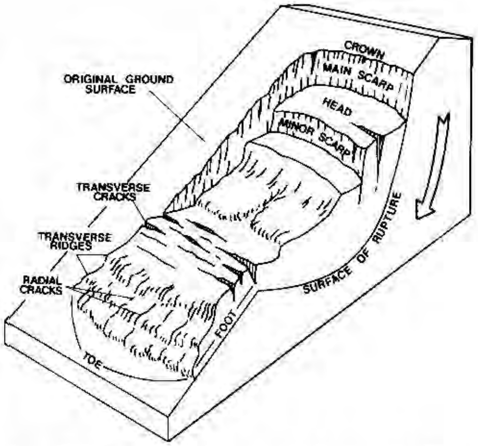


Fig. 8-2. Rotational Landslide

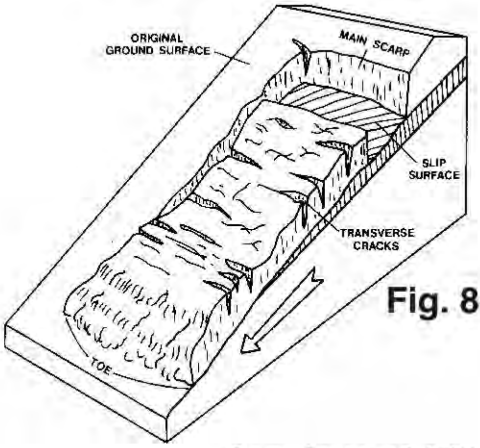


Fig. 8-3. Translational Landslide

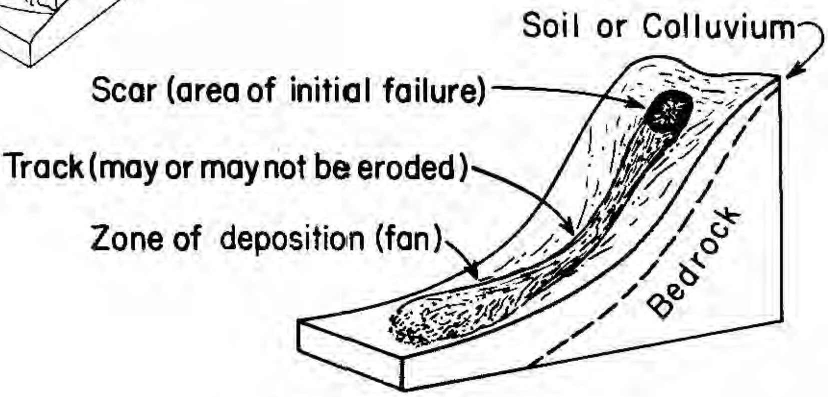


Fig. 8-4. Debris Flow

As noted above, the water content of soils/rock is a major factor in determining the likelihood of sliding for any given slide-prone location. Thus, most landslides happen during rainy months when soils are saturated with water. However, landslides may happen at any time of the year.

In addition to landslides triggered by a combination of slope stability and water content, landslides may also be triggered by earthquakes. Areas prone to seismically triggered landslides are generally similar to those prone to non-seismic landslides. As with ordinary landslides, seismically triggered landslides are more likely for earthquakes that occur when soils are saturated with water.

8.2 Historical Landslides and Mudslides in Burbank

Debris flows (mudslides) are the predominant landslide hazard for Burbank. Other types of landslides are also possible, but almost entirely only within the largely undeveloped areas in the Verdugo Mountains.

Debris flows (mudslides) are addressed in this chapter, although debris flows (mudslides) grade into floods, depending on the proportions of debris and water in the slide mass. In some cases mudslides are perhaps better characterized as flood events. Two historical debris flows (mudslides) in Burbank are shown below.

Figure 8.5
Burbank Mudslide – February 12, 1962.

The mudslide above inundated the home, with mud rising to within a couple feet of the ceiling. The family was evacuated only five minutes before the slide hit the home.

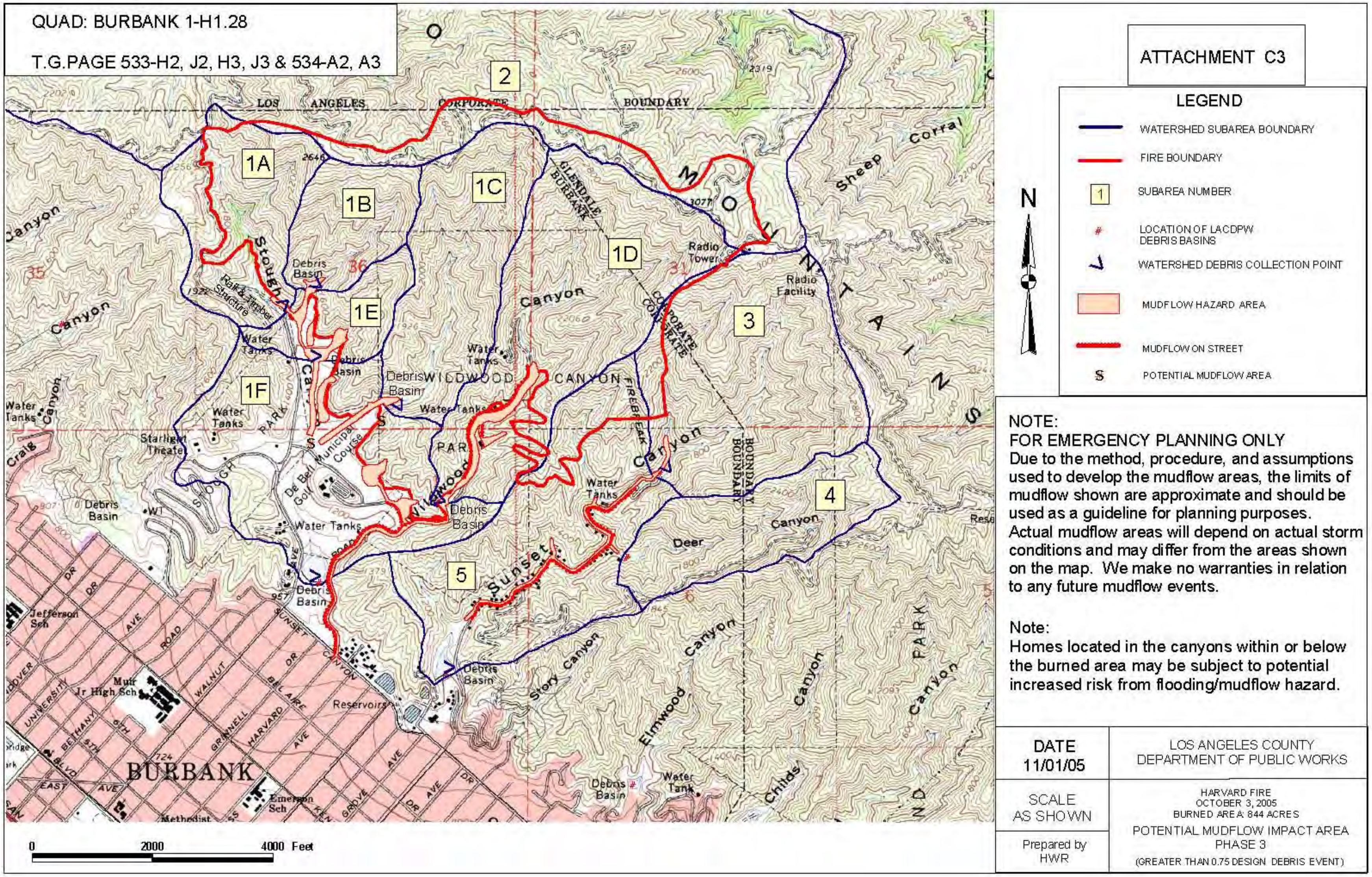
Figure 8.6
Burbank Mudslide – Winter of 1962-1963

Mudslides are a very frequent occurrence in Burbank in the foothills of the Verdugo Mountains. Minor mudslides occur almost every year, with larger mudslides occurring every few years, most commonly during periods of intense winter rainstorms. Larger mudslides are especially common downhill from areas that have had wildland or wildland/urban fires. The loss of vegetation cover in fires greatly increases the potential for mudflows in subsequent rainstorms. Typically, it takes at least five years for the vegetation to recover enough to reduce the potential for mudslides after a fire.

The 2005 Harvard Fire burned a large area in the Verdugo Mountains section of Burbank, as shown in Figure 8.7. This figure also shows the areas that experienced mudflows in the following winter. Figure 8.8 is a photograph which shows the complete loss of vegetation in areas burned in the Harvard Fire. Lack of vegetation greatly exacerbates runoff, erosion, and the potential for major mudslides for about five years. After about five years, regrowth of vegetation generally returns the level of mudslide risk to normal, pre-fire conditions.

Since the mudslides following the Harvard fire, there have not been any significant mudslides in Burbank. The December 2010 rainstorms resulted in small slides on several streets in the hillside area, but there was no damage: Thurber Place, Via Alta, Via Carmelita, Via La Paz and Country Club Drive.

Figure 8.7
2005 Hazard Fire Burn Area and Subsequent Mudslides



NOTE:
FOR EMERGENCY PLANNING ONLY
Due to the method, procedure, and assumptions used to develop the mudflow areas, the limits of mudflow shown are approximate and should be used as a guideline for planning purposes. Actual mudflow areas will depend on actual storm conditions and may differ from the areas shown on the map. We make no warranties in relation to any future mudflow events.

Note:
Homes located in the canyons within or below the burned area may be subject to potential increased risk from flooding/mudflow hazard.

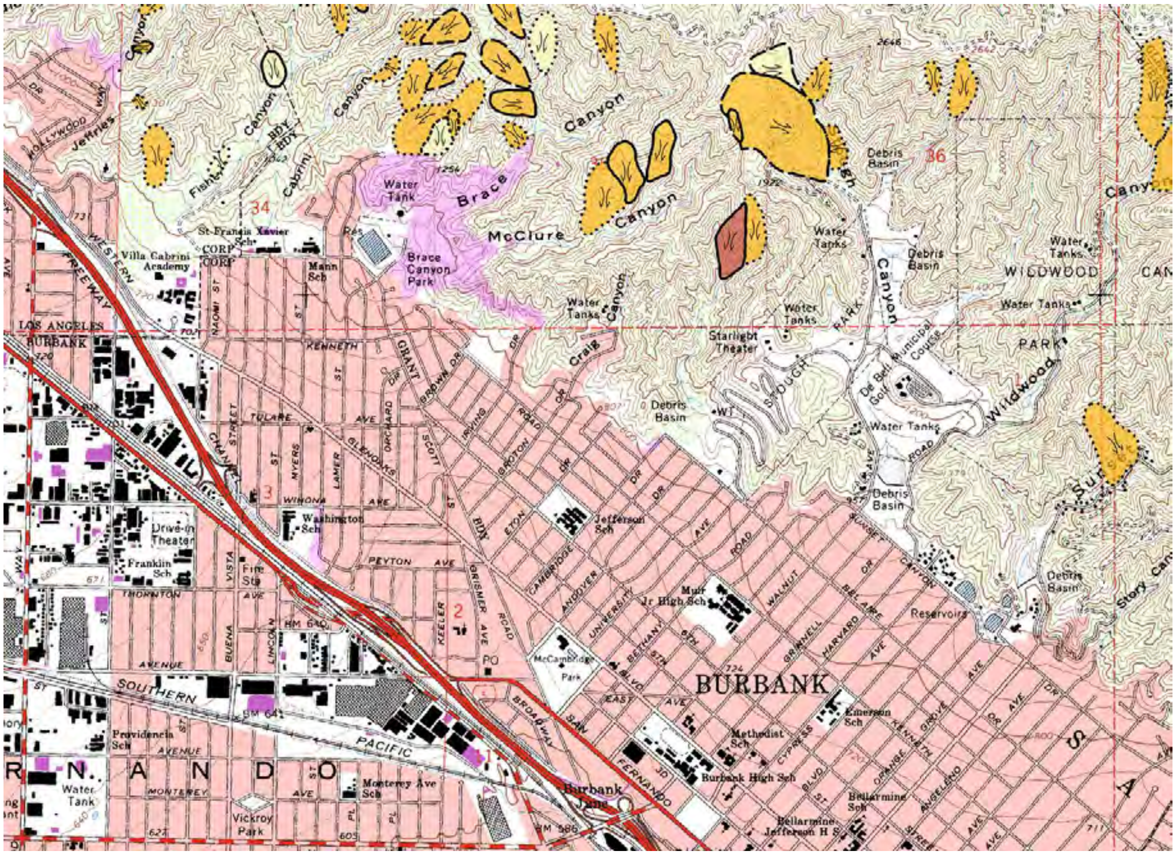
DATE 11/01/05	LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
SCALE AS SHOWN	HARVARD FIRE OCTOBER 3, 2005 BURNED AREA: 844 ACRES POTENTIAL MUDFLOW IMPACT AREA PHASE 3 (GREATER THAN 0.75 DESIGN DEBRIS EVENT)
Prepared by HWR	

Figure 8.8
Photograph of Vegetation Loss in the 2005 Harvard Fire Burn Area

8.3 Landslide and Mudslide Hazard Assessment for Burbank

Areas with documented historical landslides and mapped active landslides, excluding mudslides, are shown in Figure 8.9. Nearly all of these landslide locations are inn undeveloped or very lightly developed areas in the Verdugo Mountains, although some of these landslide areas may impact roads, utility infrastructure and structures.

Figure 8.9
Historical and Active Landslides (Excluding Mudslides)[1,2]



[1] California Department of Conservation, California Geological Survey, Division of Mines and Geology, Landslide Inventory Map of the Burbank Quadrangle Los Angeles County, California. December 2007.

[2] The orange shaded and red shaded areas are historical and active landslide areas, respectively.

Although not mapped in Figure 8-9, debris flows (mudslides) are possible throughout the mountain and foothill areas. Debris flows are possible within and downstream of the major canyons, including Brace Canyon, Stough Canyon, Wildwood Canyon, and Sunset Canyon as well as within and downstream of the numerous smaller canyons.

Many, but not all of the canyons have debris basis to trap debris and prevent large debris flows (mudslides) from progressing downslope. However, debris basins are subject to failures and/or overtopping in large debris flow (mudslide) events.

Thus, much of the mountain/foothill portion of Burbank is at risk for debris flows (mudslides). Very large mudslides could extend several blocks, or more, into the rectangular grid streets between the foothills and Interstate 5, following the natural contours shown in Figure 8.9.

Figure 8.10 shows area mapped by the California Division of Mines and Geology (now the California Geological Survey) as having high potential for earthquake-induced-landslides: the blue-shaded areas in the upper right hand corner of the above map. This hazard maps corresponds closely to area with high potential for non-earthquake landslides, as well. However, this map does not consider debris flows (mudslides). The high hazard area for debris flows (mudslides) includes all areas within and downstream of canyons and extends into the rectangular grid streets.

Figure 8.10
Hazard Map – Earthquake Induced Landslides[1]

[1] California Department of Conservation, Division of Mines and Geology, Seismic Hazard Zones, Burbank Quadrangle (Excerpt), March 25, 1999.

For reference, the green-shaded area in the lower left corner of the above map shows areas potentially subject to liquefaction in earthquakes (see: Chapter 6).

More detailed landslide hazard assessment requires a site-specific analysis of the slope, soil/rock and groundwater characteristics at specific sites. Such assessments are conducted prior to development projects in areas with landslide potential, as part of the environmental review process, to evaluate whether any design changes or other mitigation measures are warranted because of the landslide risk.

The specific number of structures in Burbank at risk from landslides/mudslides is not currently known. The mapped landslide areas include a relatively few structures. However, the areas subject to mudslides have not been accurately mapped and thus quantitative estimates of the number of structures at risk are not available.

Very roughly, the number of structures at risk from landslides/mudslides may be from 10% to 25% of the structures in the Fire Hazard Areas (see Table 7.1 in Chapter 7), or approximately 500 to 1,500 structures.

8.4 Landslide Risk Assessment and Potential Loss Estimates

A fully quantitative risk assessment for landslides in Burbank, including estimates of the probabilities or return periods of landslides in specific locations, requires far more detailed data than is currently available. Therefore, we address landslide risks only in semi-quantitative terms.

As noted previously, small debris flows (mudslides) occur almost every year and there may be numerous small events in a single major rainstorm. Progressively larger debris flows (mudslides) occur with lower frequencies.

The following table has rough estimates of the order of magnitude of potential losses to homes and infrastructure, based on the following parameters per structure:

- Average home replacement value: $400,000,
- Average contents replacement value: $120,000,
- Landscaping damages: $5,000
- Displacement costs for temporary quarters: $25,000,
- Other damages, including vehicles and infrastructure: $50,000
- Total damages per home destroyed: $600,000.

Table 8.1
Potential Losses from Debris Flows (Mudslides) in Burbank

Homes Destroyed	Approximate Losses
1	$600,000
10	$6,000,000
100	$60,000,000

Potential losses from debris flow (mudslide) events can range from minimal amounts for very small events resulting in only minor damages to landscaping and homes to losses in the hundreds of thousands or millions of dollars for larger events. Very large events could result in losses in the tens of millions of dollars.

8.5 Mitigation Strategies for Landslides

8.5.1 Synopsis of Common Strategies

This section summarizes common strategies for reducing the level of risk from landslides, focusing predominantly on debris flows (mudslides) which are the type of landslide posing the greatest risk to Burbank.

Possible mitigation strategies include:

- Construct additional debris basins and/or improve existing debris basins,
- Construct berms or other diversion structures to protect critical facilities,
- Relocate critical buildings and infrastructure out of high hazard areas,
- Stabilize slopes by construction of retaining walls, other types of geotechnical remediation measures, and addition of drainage to reduce power water pressure.

Mitigation of landslide risk can also be accomplished by effective land use planning to prohibit or minimize development in slide-prone areas and to ensure that new construction is designed appropriately for landslide hazards. Generally, such land use planning requires rather detailed geotechnical mapping of slide potential so that high hazard areas can be demarcated without unnecessarily including other areas of low slide potential.

Mitigation of landslide risk by prohibiting building in landslide areas is difficult because people often desire to live in areas subject to landslides because of the views or other amenities. Even after major landslide damage, people commonly rebuild in the same location, despite the ongoing risk. The following excerpt illustrates this tendency:

> “*If you go up Country Club Drive in Sunset Canyon, Burbank, you note a thick rind of defenses. With shored timbers, with six-foot walls of*

> *reinforced concrete or piled stone, properties are presented to the narrow street like medieval facades to an open sewer. There are three debris basins along Country Club Drive. There were two in 1964. The upper one failed. The slug that came down the street and invaded houses killed Aimee Miller, the wife of Frank Sinatra‟s piano accompanist. Her home was knocked off the foundation. Her husband was swept downhill and into a debris basin. He survived by hanging on to a Volkswagen that was part of the debris. One of their neighbors said: „When you live in a drainage ditch, you come to expect these things.‟ Another said, „People often ask why we continue to live here. We have a fire nearly every year and the floods follow. There isn‟t a prettier, more secluded canyon in Southern California – when it isn‟t on fire or being washed away. Each time we have a disaster, only one or two families move out, but there are hundreds standing in line to move in. People live here, come hell or high water. Both come, and we still stay.‟ "*
>
> *"…Despite the recurrence of events in which the debris-basin system fails in its struggle to contain the falling mountains, people who live on the front line are for the most part calm and complacent. It appears that no amount of front-page or prime-time attention will ever prevent such people from masking out the problem."*[1]

[1] John McPhee, The Control of Nature, 1989, pp. 244-245.

8.5.2 FEMA Mitigation Grants for Landslides

The various FEMA mitigation grant programs (see: Appendix 2) include mitigation projects to reduce the risks from landslides, including debris flows (mudflows). Mitigation measures than FEMA may fund include all four of the possible mitigation strategies listed above.

8.5.3 Burbank Mitigation Action Items: Landslides

The following table includes landslide mitigation action items from the master Action Items table in Chapter 4.

Table 8.2
Landslide Mitigation Action Items:

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Landslide/Mudslide Mitigation Action Items								
Short-Term #1	Enhance emergency notification and evacuation procedures	Public Information Officer, Emergency Management Coordinator, Police	1-2 Years	X	X	X	X	
Long-Term #1	Implement landslide mitigation actions for slides seriously threatening buildings or infrastructure	Community Development	5 Years	X	X	X		X

9.0 FLOOD HAZARDS

9.1 Overview

The City of Burbank is subject to flooding from several distinct flood sources, including:

- Overbank flooding from the Los Angeles River Flood Control Channel, the Burbank Western Channel, Lockheed Drain Channel and several smaller waterways.
- Local storm water drainage flooding, and
- Potential floods from dam failures.

Flooding events from the above possible flood sources have very different characteristics.

Floods in Burbank occur primarily between December and March from major storms that typically last one to four days each. Snow fall, which is common in the mountains at elevations above 5,000 feet, may contribute to flood events through the occurrence of warm weather during or after a major storm.

In addition to overbank flooding from the above waterways, portions of Burbank are also subject to localized storm water drainage. Storm water drainage flooding occurs when inflows of storm water exceed the conveyance capacity of the local storm water drainage system. See Section 9.4 for further discussion of localized storm water drainage flooding.

Burbank is not subject to inundation from failures of large dams – there are no large water storage dams upstream from Burbank. However, three of Burbank's large water reservoirs – Reservoirs 1, 4 and 5 – are considered dams by the California Department of Water Resources, because they impound more than 50 acre-feet of water.

Mudflows, which are especially prevalent after brush fires in the mountains, were addressed in Chapter 8.

9.2 Historical Floods in Burbank

Historically, flooding has occurred in the Burbank area throughout the recorded history of the area. However, most of the major floods occurred before the construction of the many flood control systems built in Los Angeles County or before the flood control systems were upgraded to provide higher levels of flood protection.

Notable historical flood events in Burbank include:

- Flooding in 1933 was the worst in the Burbank's history. The flood destroyed about 400 homes, 34 people were killed, and property damage was about $5,000,000. In 2010 dollars, the level of property damage would be over $80 million.
- Flooding in 1938, from the Los Angeles River inundated portions of the city, as shown in the photographs below.
- Flooding in 1941 resulted in damage to Lockheed's factory buildings.

Figure 9.1
1938 Flood in Burbank (Victory Boulevard Vicinity)

The level of flood risk in Burbank was gradually reduced as improvements were made to the flood control systems, especially from the 1940s through the 1960s, with additional improvements in later decades. The current flood control system, including the Los Angeles River, is part of a network of dams, reservoirs, debris collection basins and spreading grounds built by the Los Angeles County Flood Control District and the United States Army Corps of Engineers to minimize flooding in Los Angeles County.

9.3 Flood Hazards and Flood Risk: Within FEMA-Mapped Floodplains

9.3.1 Overview

The FEMA Flood Insurance Rate Maps (FIRMs) map the regulatory (100-year) floodplain areas. The latest flood maps for Burbank and the FEMA Flood Insurance Study for Los Angeles County (including Burbank) are dated September 26, 2008.

The FEMA floodplain maps for Burbank include several different types of flood hazard zones, including: Zone A, Zone AE, Zone AH, Zone AO, Zone AR, Zone A99, Zone X and Zone D. The definitions for these flood hazard zones are given below.

HIGH RISK AREAS

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

MODERATE TO LOW RISK AREAS

ZONE	DESCRIPTION
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

UNDETERMINED RISK AREAS

ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

In communities, including Burbank, that participate in the National Flood Insurance Program (NFIP), flood insurance purchase requirements apply only in the High Risk Areas. Flood insurance is also available, but not required, in the Moderate to Low Risk Areas and in the Undetermined Risk areas.

The FEMA floodplain maps delineate the 100-year floodplain boundaries and other potentially flood-prone areas as defined above. The 100-year flood is the flood with a 1% chance of being exceeded in any given year. A 1% annual chance of flooding corresponds to about a 26% chance of flooding in a 30-year time period. Detailed floodplain boundaries are shown on the Flood Insurance Rate Maps.

The FEMA Flood Insurance Study and Flood Insurance Rate Maps include a large number of terms of art and acronyms. A good summary of the terms used in flood hazard mapping is available on the FEMA website at:

http://www.fema.gov/pdf/floodplain/nfip_sg_appendix_d.pdf

According to the 2008 floodplain maps for Burbank, the areas within the city which are within the FEMA-mapped 100-year floodplain include:

- A narrow area along the Lockheed Drain Channel in the vicinity of Empire Avenue and W. Vanowen Street from near the Burbank Airport eastwards towards Interstate 5, then southward in the vicinity of Victory Boulevard.
- A narrow area west of Victory Boulveard in the vicinity of South Main Street, and

- Several small areas south of Highway 134 near Burbank's southern boundary.

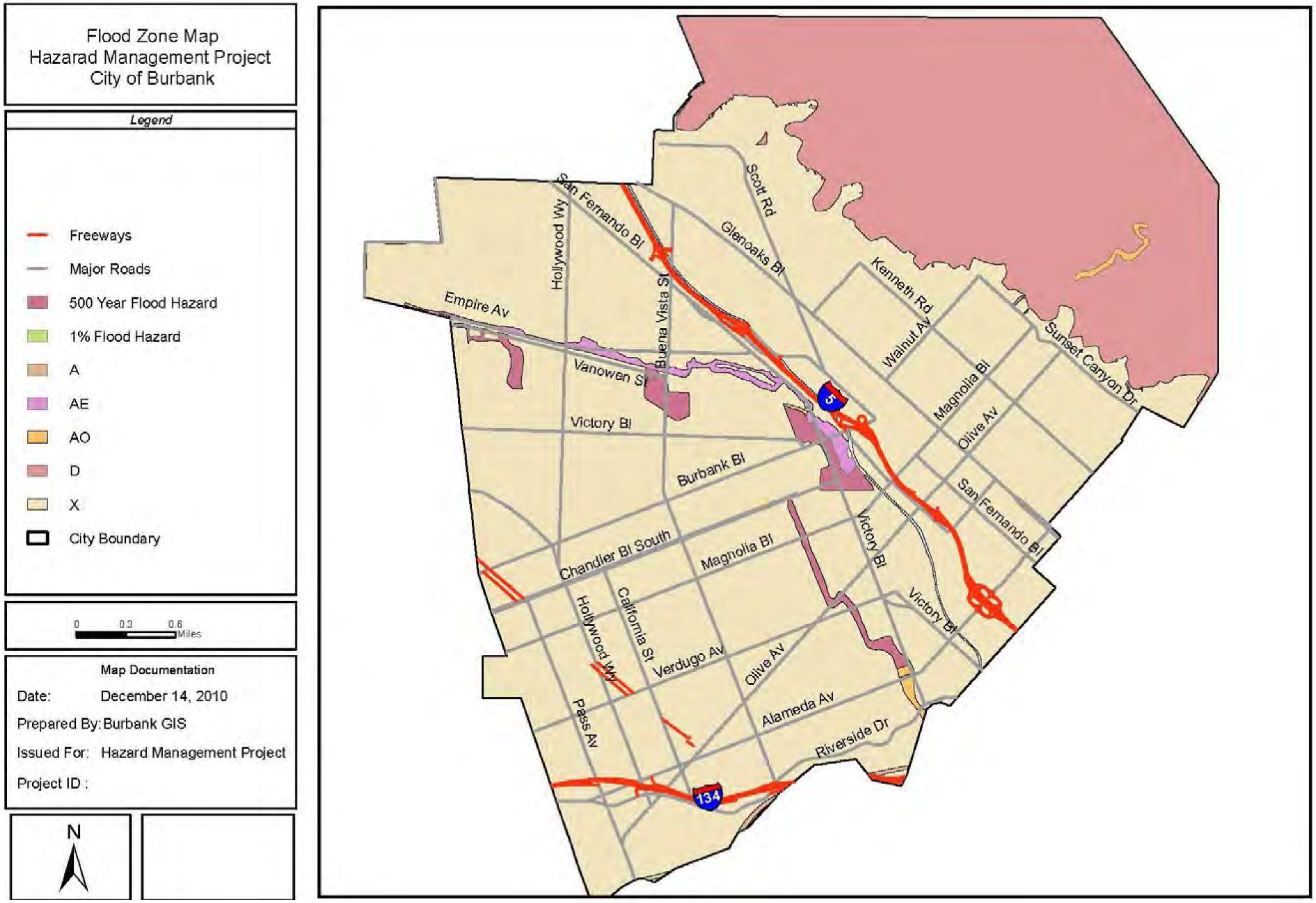
Most of the above areas within the FEMA-mapped 100-year floodplains have much larger adjacent areas mapped as Zone X. Much of Burbank is within the Zone X; these areas may be subject to flooding in flood events greater than the 500-year flood.

In addition to the above areas, which are within FEMA's mapped 100-year floodplains, there is a large area in northeastern Burbank mapped as Zone D – with possible flood risk which is not quantified. This area also includes a narrow band mapped as Zone X.

These FEMA-mapped floodplains are shown in Figure 9.2 on the following page. See the FEMA Flood Insurance Rate Maps for more detailed floodplain mapping.

Areas of Burbank which are outside of the FEMA mapped floodplains do not necessarily have zero flood risk. Rather, much such areas of Burbank may be subject to flooding in events larger than the 500-year event and/or from localized storm water drainage flooding.

Figure 9.2
FEMA-Mapped Floodplains (2008 Flood Insurance Rate Map Boundaries)



9.3.2 Flood Hazard Data

For mapped 100-year floodplain areas (AE Zones), the flood hazard data typically included in the Flood Insurance Study (FIS) allow quantitative calculation of the frequency and severity of flooding for any property within the floodplain. The data necessary for such quantitative flood hazard calculations include four pairs of stream discharge and flood elevation data, typically for the 10-, 50-, 100- and 500-year floods and the stream bottom elevation. The discharge data are obtained from tables in FIS and the elevation data are obtained from flood profile graphs for the flood source. A typical example is given below in Table 9.1

Table 9.1
Flood Hazard Data
Typical Example

Flood Frequency (years)	Discharge (cfs)	Elevation (feet)
Stream Bottom	0	18.5
10	48,000	32.2
50	72,000	35.8
100	82,800	37.0
500	129,200	41.7

Unfortunately, the FEMA-published flood hazard data for Burbank don’t include a full set of flood hazard data. Rather, the flood data for the Lockheed Drain Channel and the other FEMA-mapped flood sources in Burbank contain only the 100-year discharge and the 100-year flood elevations. An example flood profile graph, for the Lockheed Drain Channel is shown in Figure 9.3 on the next page.

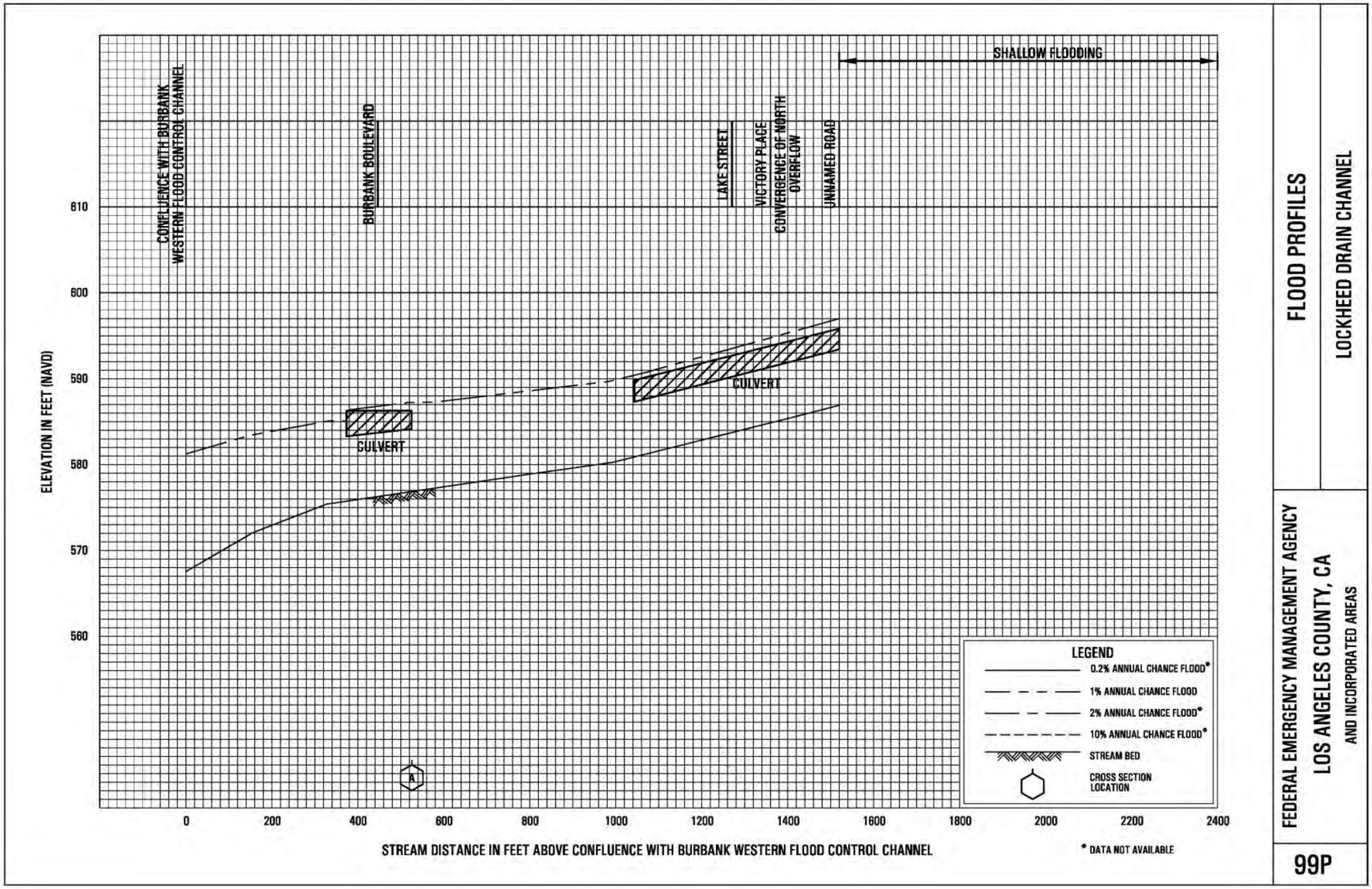
Given this data, the level of flood risk for buildings or infrastructure within FEMA-mapped floodplains in Burbank can be evaluated semi-quantitatively by comparing the first floor elevations of buildings or the elevations of infrastructure with the 100-year flood elevations from the flood profile graph. Elevations on the flood profile graph are read at the location nearest to the facility of interest.

9.3.3 Caveats for the Burbank Flood Insurance Study

The Flood Insurance Study (FIS) for Burbank and vicinity is current as of 2008. However, flood hazards may change over time because of increasing development upstream, changes in stream channels, improvements (or degradation) of flood protection measures over time and so on. Simply because an FIS is old, does not necessarily mean that a FIS is outdated or inaccurate. However, the older a study is, the more likely it is that conditions have changed.

Another caveat is that flood studies are inevitably less than perfect, due to incomplete data and modeling uncertainties. Thus, in some cases, mapped floodplain boundaries may underestimate or overestimate the actual level of flood risk at a given location.

Figure 9.3
FEMA Flood Profile Graph: Lockheed Drain Channel



9.4 Flood Hazards: Outside of Mapped Floodplains

The previous section applies only to the areas of Burbank that are within the FEMA-mapped floodplains. In addition, other areas of Burbank may also be at relatively high risk from over bank flooding from streams too small to be mapped by FEMA and/or from local stormwater drainage problem areas.

Many areas of the United States outside of mapped floodplains are subject to repetitive, damaging floods from local stormwater drainage. Nationwide, more than 25% of flood damage occurs outside of FEMA-mapped floodplains.

In most cities, stormwater drainage systems are designed to handle only small to moderate size rainfall events. Stormwater systems are sometimes designed to handle only 2-year or 5-year flood events, and are rarely designed to handle rainfall events greater than 10-year or 15-year events.

For local rainfall events that exceed the collection and conveyance capacities of the stormwater drainage system, some level of flooding inevitably occurs. Local storm water drainage systems are generally designed to allow minor street flooding to carry off stormwater that exceeds the capacity of the stormwater system. In larger rainfall events, flooding may extend beyond streets to include yards. In extreme cases, local stormwater drainage flooding can sometimes result in several feet of water in buildings, with correspondingly high damage levels.

The most common stormwater drainage effect is flooding of streets, intersections and underpasses. For Burbank, locations with a history of repetitive stormwater drainage flood problems are listed below:

- The intersection of Burbank Boulevard, Victory Boulevard and Victory Place—known as Five Points—is commonly an area of flooding during times of heavy precipitation. This flooding occurs because the Lockheed Storm Drain, which runs adjacent this area, is unable to accommodate the run-off in this area from heavy rains. The Lockheed channel is only 12-feet wide and has the capacity to handle no more than a 10-year flood.
- Other areas of the City which are especially susceptible to flooding include properties adjacent the Burbank Channel and the Los Angeles River; Buena Vista Street in the flat-lands; Griffith Park Drive between Chandler Boulevard and Olive Avenue; Virginia Avenue between Olive Avenue and Oak Street; Oak Street between Virginia Avenue and Glenwood Place; the intersection of Lake Street and Chestnut Street; Empire Avenue in the vicinity of the airport; Lincoln Avenue near the I-5 Freeway; and the properties on Oak Street and Glenwood Place south of the City boundary. Not all of the above cited flood-prone areas appear on FEMA's Flood Insurance Rate Map; many of these areas flood because of storm water drainage problems.
- Country Club Drive and Harvard Canyon above the golf course.

Burbank has six locations where stormwater pumps have been installed in locations previously subject to frequent stormwater drainage flooding:

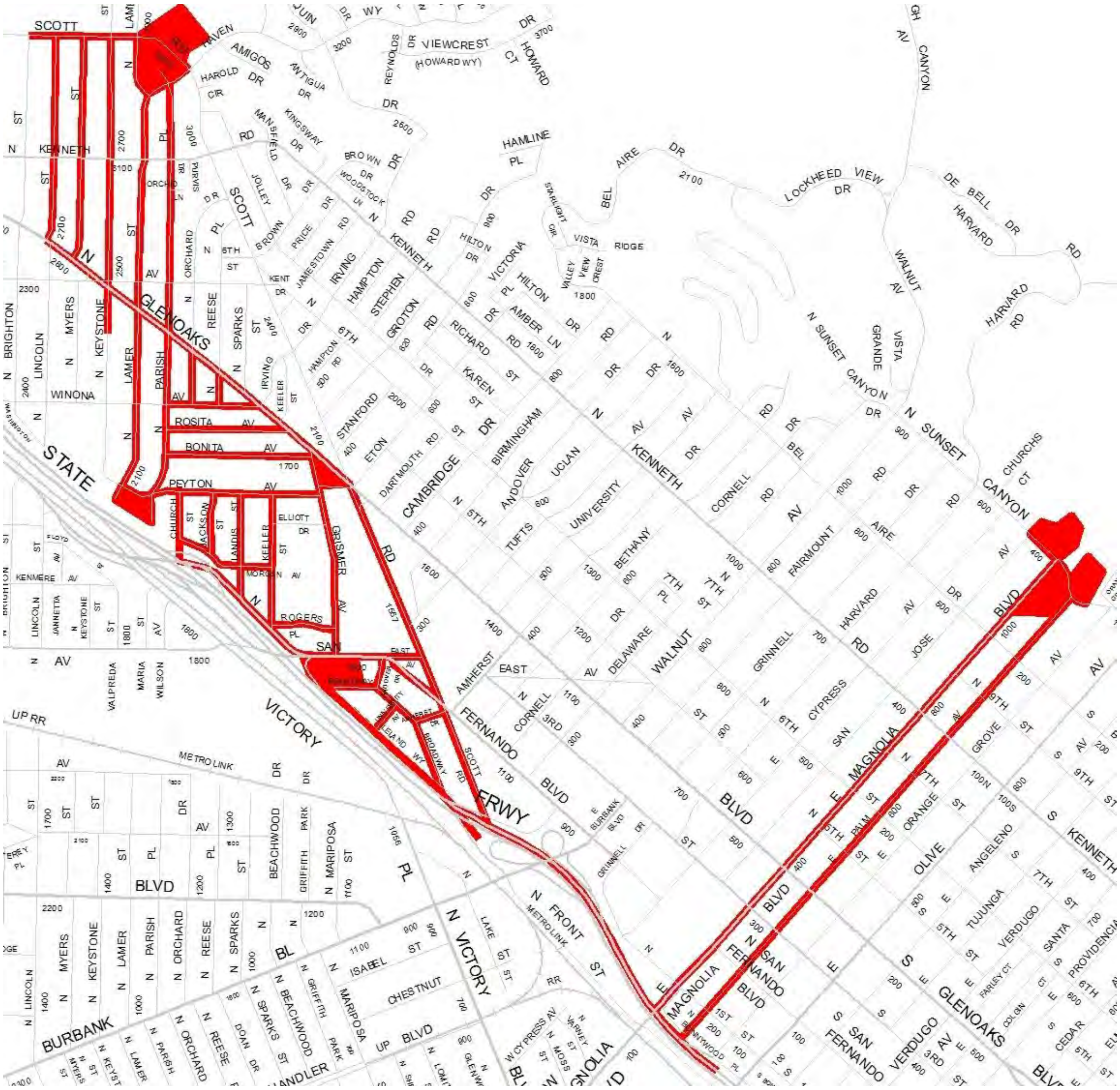
- Railroad above Hollywood Way at Empire,
- Railroad above Hollywood Way at San Fernando,
- Railroad – San Fernando pedestrian tunnel,
- Railroad above Victory Place,
- Railroad above Alameda, and
- Lincoln – Interstate 5 off ramp.

9.5 Dam Failures

Burbank is not subject to inundation from failures of large dams – there are no large water storage dams upstream of Burbank. However, failure of the Devil's Gate Dam flood control dam could result in disruption of major transportation routes to/from Burbank, including the 210 Freeway, Oak Grove Drive and Highland Drive. As a flood control dam, the Devil's Gate Dam is not filled with water except during times of high inflows. The probability of failure of this dam from earthquake or flood events is very low, but not zero. Furthermore, the consequences of failure of this dam for Burbank are relatively minor.

In addition, three of Burbank's large water reservoirs – Reservoirs 1, 4 and 5 – are considered dams by the California Department of Water Resources, because they impound more than 50 acre-feet of water. The potential inundation areas from failure of these reservoirs are largely confined to streets, as shown in Figure 9.4 on the following page. However, there are small areas where flooding extends beyond the streets, as shown by the shaded areas in Figure 9.4.

Figure 9.4
Potential Inundation Areas from Failures of Burbank Reservoirs 1, 4 and 5



9.6 Inventory Exposed to Flood Hazards in Burbank

Based on the 2008 Flood Insurance Rate Map for Burbank, relatively little of Burbank's built environment is located within the mapped 100-year floodplains. The 100-year floodplain areas were shown previously in Figure 9.2.

The inventory of buildings and other facilities in Burbank within each of the FEMA-mapped flood zones is shown below in Table 9.3. These data were compiled by Burbank GIS staff by overlaying parcel data with the FEMA floodplain maps.

Table 9.3
Numbers of Buildings and Other Facilities Within FEMA-Mapped Flood Zones

Building Type	FEMA Flood Zones (2008)[1]						
	A	AE	AO	All A-Zones	D	500-Year Flood	All Flood Zones
Industrial	0	11	0	11	0	36	47
Commercial	2	25	5	32	0	25	57
Public	4	22	11	37	34	10	81
Multi-Family Residential	0	0	0	0	1	7	8
Single-Family Residential	1	0	109	110	768	185	1063
Totals	**7**	**58**	**125**	**190**	**803**	**263**	**1256**

[1] See definitions of FEMA flood zones on page 9-3 and 9-4.

As shown above in Table 9.2, there are a total of 190 buildings and other facilities within the FEMA-mapped 100-year floodplain (FEMA Zones: A, AE and AO), including 109 single family residential buildings. There are additional 803 buildings and other facilities in Zone D (areas with possible, but undetermined flood risks) and another 263 buildings and other facilities within the 500-year flood zone. The numbers shown in Table 9.3 are buildings, except for public ―buildings" which also includes utility tanks and other utility system infrastructure.

9.7 National Flood Insurance Compliance

FEMA's National Flood Insurance Program (NFIP) maintains nationwide databases of flood insurance policies and repetitive loss properties.

9.7.1 National Flood Insurance Program Participation

Insurance Summary

NFIP information (current as of September 30, 2010) shows the following policy information for Burbank:

- Number of polices: 123,
- Annual premiums: $129,264
- Insurance in force: $35,308,300
- NFIP claims paid: 15
- Number of substantial damage claims: None
- Total claims amount: $26,598, from January 1, 1978 to September 30, 2010
- Number of repetitive loss buildings: None
- Number of structures exposed to flood risk: 109 buildings in FEMA-mapped 100-year flood zones (A, AE, and A0) and 803 buildings in FEMA-mapped Zone D.
- Areas with significant flood risk with limited NFIP coverage: None

Staff Resources

- Does the community have a dedicated Floodplain Manager or NFIP dedicated floodplain manager? No.
- Is floodplain management an auxiliary duty? Yes, Public Works Director.
- NFIP administration services: The areas of Burbank within the FEMA 100-yearfloodplain have long been built out. Redevelopment projects within the 100-year floodplain are evaluated by the Community Development and Public Works Departments, with technical support from consulting engineers, if necessary.
- Barriers to effective floodplain management: None.

Compliance History

- Burbank is in good standing with the NFIP.
- Current violations: NONE
- Community Assistance Visit (CAV) or Community Assistance Contact (CAC): February 1, 2011.
- Is a CAV or CAC scheduled or needed: None needed – last visit was 2011.

Regulation

- Burbank entered the NFIP in 1998.
- Effective date of the current Flood Insurance Rate Maps (FIRMs): September 26, 2008.
- Are FIRMs digital or paper? Digital.
- Does the Floodplain Ordinance meet or exceed FEMA or state minimum requirements? Yes. Burbank's floodplain ordinance meets NFIP requirements and the California Building Code Section 1612 and Appendix G (Flood Resistant Construction).
- The permitting process requires at least a Type 1 Flood Hazard Permit. The permit evaluates the topography of the site in relationship to the flood profiles and requires that the applicant provide a topographic survey of the site and elevation certificates for any existing (including pre-FIRM) buildings.

Community Rating System (CRS)

- Does the community participate in CRS? No.
- What is the community's CRS Class Ranking? Not applicable.
- What categories and activities provide CRS points and how can the class be improved? Not applicable.

- Does the plan include CRS planning requirements? Not applicable.

9.7.2 NFIP Continued Compliance Actions

Staff Resources

- Identify needs for additional staff: None at this time.
- Identify training needs for existing staff: training opportunities from FEMA are taken advantage of when resources and staff work loads permit.

Compliance

- Next Community Assistance Visit anticipated: None scheduled – last visit was February 1, 2011.
- Need for CAV or CAC assistance: None required because the last visit was very recent.

Regulation

- Are there potential ordinance changes to consider to strengthen requirements? None needed at this time.
- Are there potential improvements to permitting process or other administrative aspects of the community's NFIP program? None needed at this time.
- Could the community enhance its floodplain services? None needed at this time.

Flood Risk Maps

- Are there flood prone areas that need new flood studies? None at this time; the current 2008 FIRMs appear OK.
- Does the community have new data that can be included in future flood map updates? None at this time.

Community Outreach Activities

- Consider outreach and education to provide in the community. The updated FIRM information and the other information in this chapter will help the community better understand flood risk in Burbank.

Community Rating System (CRS)

- Does the community want to participate in the CRS program? Not at this time.
- Does the community want to improve its current CRS class rating? Not applicable.

- Identify activities the community is or will be pursuing to gain CRS points: Not applicable.

9.8 Flood Damage Estimates – Limitations and Approaches

To quantify the level of flood hazard for buildings or infrastructure within flood prone areas it is necessary to determine the elevations of these structures. Only by determining (or estimating) the first floor elevations of potentially flood-prone structures can the level of flood losses be estimated reasonably accurately for any particular flood event.

The best structure elevations (first floor elevations) are those determined accurately by surveying. Flood insurance certificates include surveyed elevation data. Absent survey data, however, useful estimates of elevations for structures can often be made by reference to elevations of nearby structures or public infrastructure with surveyed elevation data.

In addition to elevation data, quantifying the level of risk faced by these structures requires basic data about each structure, including building data (square footage, number of stories, with or without basement), and information on the type and importance of function (residential, commercial, public). With this data, FEMA depth-damage relationships included in the FEMA benefit-cost analysis software can be used to make semi-quantitative estimates of flood losses for various scenario flood events.

As noted above, some areas of Burbank, outside of the mapped floodplains, are also subject to relatively high levels of flood risk from localized storm water drainage flooding. To quantify the level of flood risk posed by these areas, historical data should be compiled to include: frequency and severity of flooding. Severity of flooding can include estimates of past damages, if available, and/or simple narratives reporting whether the flooding in a given area is limited to street flooding only, or affects yards or buildings as well.

At present, detailed inventory and elevation data for the buildings in Burbank within the FEMA-mapped floodplains is not available. For mitigation planning purposes, we estimate potential flood losses, based on limited data.

Within the FEMA mapped 100-year floodplains in Burbank (Zones A, AE, and AO), there are 110 single family residential buildings, 11 industrial buildings, 32 commercial buildings, and 37 public buildings (and other facilities), as shown previously in Table 9.3. Within Burbank's 100-year floodplain areas, the topography is generally flat; thus, overbank floods will spread out over a fairly wide area with shallow depths. Given these conditions, many buildings within the footprint of the 100-year flood will likely not have water reaching the first floor, depending on the extent to which the first floor is higher than surrounding grade. Typically, first floors are one foot or more above grade.

For the 110 single family residential buildings, a rough estimate of the potential flood damages is based on the following assumptions:

- One-third of the homes have no damage, flooding to the first floor, and flooding 1 foot above the first floor.
- Average building replacement value is $300,000.
- The FEMA Version 4.5.5 Benefit-Cost Analysis software depth-damage functions for a one-story home without basement are used to estimate building damages, contents damages and displacement costs for temporary housing.

The average residential building in the within the floodplain areas is smaller than typical residential buildings in the hillside areas. This difference is reflected in a lower average building replacement value for flood loss estimates than for landslide/mudslide wildland/urban interface fire loss estimates presented in Chapters 8 and 9, respectively.

With these assumptions the total estimated flood damages and losses for single family homes in a 100-year flood which affects all of the 100-year floodplains in Burbank are about $6.5 million. In more likely 100-year flood events which don't affect all of the floodplains in Burbank, the damages would be lower.
Per the inventory data in Table 9.3, there are 80 industrial, commercial and public buildings within Burbank's mapped 100-year floodplains. The average size of these buildings is larger than the single family residential buildings. As a rough estimate, the total damages and losses for these buildings may be about twice those for the single-family residential buildings or roughly $13 million. Thus, total potential flood damages in a 100-year flood which affects all of Burbank's 100-year floodplain could be approximately $20 million.

Depending on the actual building first floor elevations vs. the 100-year flood elevations and the geographic areas subjected to a 100-year flood in a given event, the actual flood damages could be considerably less than these rough estimates.

9.9 Flood Mitigation Strategies

9.9.1 Synopsis of Common Flood Mitigation Strategies

Potential mitigation projects to reduce the potential for future flood losses cover a wide range of possibilities.

For areas of Burbank subject to storm water drainage, various storm water drainage system improvements may be desirable. Typical improvements include channel improvements to increase conveyance capacity, upgrades to the size of drainage ditches or storm water drainage pipes and upgrades to pumping capacity (for pumped portions of drainage systems). Another possibility for some areas may be construction of local detention ponds. In addition, for at-risk buildings, various small scale flood loss reduction measures such as elevation of furnaces and utilities may be desirable.

Elevation and acquisition (especially), are expensive mitigation options that are generally not cost-effective unless the levels of flood hazard and flood risk are rather high. That is, these mitigation options are most attractive for structures deep in the flood plain (i.e., with first floors below the 10-, or 20-, or 30-year flood elevations). For structures outside of mapped floodplains, elevation or acquisition would likely be cost-effective only for structures with a strong history of major, repetitive flood losses. For Burbank, there appear to be few, if any, structures at high enough flood risk to warrant elevation or acquisition.

For buildings small-scale measures such as elevating utility components such as furnaces and air conditioners reduces future damages. Similarly, for many utility system components, elevation of critical components, especially those most prone to flood damage, is a common strategy.

For industrial, commercial and public buildings, flood measures such as floodproofing walls and adding flood gates for openings is a common measure. However, such measures require human intervention to install the flood gates properly before flood events.

For critical facilities such as water or wastewater treatment plants or electric substations, building flood barriers (berms or flood walls) may be necessary to provide the desired level of flood protection.

9.9.2 FEMA Mitigation Grants for Floods

All of the FEMA mitigation grant programs (see: Appendix 1) include mitigation measures for floods. Nationwide, flood mitigation measures are the most common FEMA-funded mitigation projects.

All of the common types of flood mitigation measures summarized above in Sectin 9.7.1 are eligible for FEMA mitigation grants.

9.9.3 Burbank Mitigation Action Items for Floods

The following table includes flood mitigation action items from the master Action Items table in Chapter 4.

Table 9.4
Flood Mitigation Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Flood Mitigation Action Items								
Short-Term #1	Complete detailed inventory of buildings and infrastructure in FEMA-mapped floodplains	Public Works, Community Development, Information Technology	5 years	X	X	X	X	X
Short-Term #2	Increase public awareness of flood-prone areas, encourage mitigation and flood insurance	Community Development, Public Works, Emergency Management Coordinator	5 years	X	X	X	X	X
Short-Term #3	Identify locations where stormwater drainage are needed and implement mitigation measures	Public Works	5 Years	X	X		X	
Short-Term #4	Continue to enforce fully all of the NFIP requirements to ensure full compliance.	Public Works	Ongoing	X	X	X	X	X

10.0 WINDSTORMS

The City of Burbank is subject to several types of damaging windstorms, especially Santa Ana Winds, but also including severe thunderstorms, tornadoes, and tropical storms. The most common effects of windstorm events in southern California and in Burbank are tree falls, which may result in damage to above ground utility lines as well as damage to buildings and vehicles. Some windstorm events may also damage utility lines, roofs, and unusually vulnerable buildings from direct wind forces. Deaths and injuries in windstorms are not common, but do occur, most commonly from tree falls.

In addition to windstorms, Burbank may experience damage from other types of severe weather, such as extreme temperatures, snow or ice storms, but the level of risk posed by such hazards is very low. These hazards are briefly addressed in Chapter 12.

10.1 Wind Hazards for Burbank

Burbank uses the California Building Code for determining wind loads for buildings and other structures. The Building Code references ASCE 7-05 (American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures) Chapter 6 which specifies the minimum wind speed (3-second gust) for most areas of the United States as 85 miles per hour.

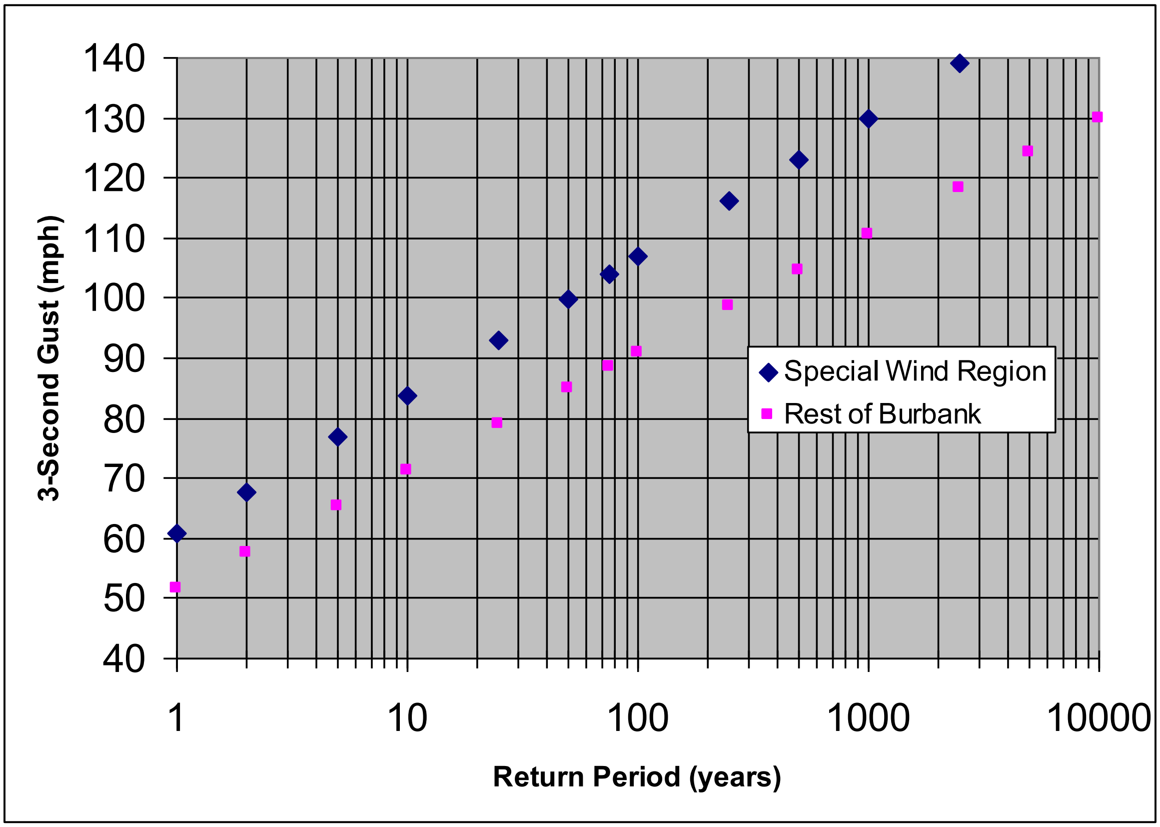
However, the portion of Los Angeles County generally known as the Los Angeles Basin, is designated as a “special wind region.” This area is south of the Santa Monica and San Gabriel Mountains, and west of the Santa Ana Mountains. The Los Angeles Basin often experiences higher winds than elsewhere, due to the occurrence of Santa Ana winds. This special wind region specifies a wind speed (three-second gust) as 100 miles per hour, unless a site-specific wind study by a wind engineer or meteorologist is performed to justify a lower wind speed

Most of Burbank is located adjacent to, but just outside of the special wind region for Los Angeles County. However, the small portion of Burbank south of the 134 Freeway is within the special wind region.

The wind hazard curves for Burbank, based on the normal and special wind region design wind speeds of 85 mph and 100 mph, respectively and the consensus probability relationships used in ASCE 7-05, is shown below in Figure 10.1. The design wind speeds are for a 50-year return period, which means that there is a 2% chance a year that winds will reach this speed or higher.

In the special wind region, the 10-year and 100-year return period wind speeds are approximately 84 mph and 108 mph, respectively. In the rest of Burbank, the 10-year and 100-year return periods are approximately 71 mph and 91 mph, respectively. All of these winds speeds are three-second gusts which are typically about 30% higher than sustained wind speeds. Thus, for example, a three-second gust of 100 mph corresponds to a sustained wind speed of about 77 mph.

Figure 10.1
Wind Hazard Curves for Burbank



10.2 Santa Ana Winds

Many of the most significant windstorm events in the greater Los Angeles area are from Santa Ana winds. Santa Ana winds are an offshore wind that results from high pressure in the high-altitude Great Basin between the Sierra Nevada and the Rocky Mountains. When upper level winds are favorable, the air mass spills out of the Great Basin and is accelerated gravitationally towards the southern California coast generally as a northeast wind. The National Weather Service typically uses the term Santa Ana winds only for wind speeds in excess of 25 knots (about 30 mph). Gusts of 50 to 60 knots (about 57 to 70 mph) are common, and wind speeds may exceed 100 mph in narrow canyons, especially the Santa Ana Canyon, for which the winds are named.

Santa Ana winds may occur during autumn or early spring. However, the strongest Santa Ana winds typically occur in the autumn and are characterized by very hot, dry conditions. Many of the most serious wildfires in Southern California occur during periods of Santa Ana winds.

To some extent Santa Ana winds occur every year. The NOAA National Climatic Data Center lists 134 Thunderstorm and High Wind events for Los Angeles County for the period from 1950 through 20010. About 80 of these events are characterized as "high wind" events. The remaining events are classified as thunderstorms with the exception of one event which is classified as a "dry microburst." Most of these 80 high wind events are associated with Santa Ana winds.

The NOAA records are evidently incomplete, because only 18 events are recorded between 1950 and 1989, while 114 events are recorded from 1990 to 20010. The post-1990 data include all 80 "high wind" events, an average of four events per year.

There are no specific areas of Burbank that are especially prone to high wind events. High wind events, including Santa Ana winds may affect any location within the city.

10.3 Thunderstorms

Thunderstorms typically occur on several times a year in Burbank. The Western Regional Climate Center collects data on the average number of days of thunderstorms per year for three locations near Burbank; Long Beach, Los Angeles, and the Los Angeles International Airport. The data shows four, six, and four days of thunderstorms per year respectively.

Thunderstorms may include locally heavy rains and high winds. Winds associated with severe thunderstorms may be high enough to result in tree falls resulting damage to above ground utility lines and other property.

Thunderstorms may also include downbursts, which are downward moving air near the core of thunderstorms. Downbursts are further characterized as "microbursts" or "macrobursts" depending on the scale of the downbursts. Downbursts are defined as straightline winds in excess of 39 mph, which are caused by small-scale strong downdrafts from the base of convective thunderstorms. Downbursts have been blamed for airline crashes and locally heavy damage; sometimes mimicking the damages caused by small tornadoes.

10.4 Tornadoes

Tornadoes are not common in California. The annual average is approximately five tornadoes reported each year. Tornado data compiled by the NOAA National Climatic Data Center lists 43 tornadoes in Los Angeles County from 1950 to 2009, which is less than one tornado per year. The actual number of tornadoes might be somewhat lower than suggested by NOAA data. Some historical events characterized as small tornadoes may have been intense microburst events rather than tornadoes.

The intensity and wind speed of tornadoes is measured using the Fujita Scale, which was recently revised and is now known as the Enhanced Fujita Scale. The estimated wind speeds for the Fujita Scale and the Enhanced Fujita Scale are shown in Table 8-1.

The wind speeds shown in Table 10.1 are consensus estimates, based on engineering analysis, rather than direct measurements. Revisions to the Fujita Scale lowered the estimated wind speeds indicated in the original Fujita Scale, for most tornadoes.

Table 10.1
Fujita and Enhanced Fujita Scales for Tornadoes [1,2]

Fujita Scale (1971)			Enhanced Fujita Scale (2004)	
F Number	Fastest 1/4 Mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85
1	73-112	70-117	1	86-110
2	113-157	118-161	2	111-135
3	158-207	162-209	3	136-165
4	208-260	210-261	4	166-200
5	261-318	262-317	5	>200

[1] Fujita, T.T. (1971), Proposed Characterization of Tornadoes and Hurricanes by Area and Intensity, SMRP Research Paper No. 91, The University of Chicago.

[2] Texas Tech University (2004), Wind Science and Engineering Center, Enhanced Fujita Scale (EF-Scale).

About 90% of the reported tornadoes in Los Angeles County are categorized as small F0 or F1 tornadoes. Only about 10% of the tornadoes in Los Angeles County are classified as F2 tornadoes. There have been no reported F3 or greater tornadoes in Los Angeles County.

There have been no reported tornadoes in Burbank. Given the above historical data on the number of tornadoes for Los Angeles County, the relative areas of Los Angeles County and Burbank, and the average size of the impact area for small tornadoes (much less than 1 square mile), the return period for even a small tornado anywhere in Burbank is probably several thousand years.

10.5 Tropical Storms

There are no recorded hurricanes that have hit California, although an 1858 hurricane evidently passed offshore, bringing hurricane force and gale winds to an area stretching from San Diego to Los Angeles: (http://en.wikipedia.org/wiki/List_of_California_hurricanes).

Hurricanes rarely occur north of Central Baja because water temperatures are usually too cold to support hurricanes. The cold waters are caused by the north to south moving California current. Furthermore, upper level winds typically move hurricanes off Mexico to the west or northwest away from California.

However, remnants of tropical storms or hurricanes do reach southern California. These storms may result in significant rainfalls, but only rarely include substantial winds. However, since 1900 there have been four tropical cyclones which brought gale force winds (39 mph or higher) to southern California: an unnamed tropical storm that made landfall near San Pedro in 1930, the remnants of Hurricane Joanne in 1972, the remnants of Hurricane Kathleen in 1976 and the remnants of Hurricane Nora in 1997. Some of these tropical cyclone events included heavy rains with flooding that caused significant damages and some casualties. The 1930 tropical storm had wind speeds of approximately 50 mph, and nearly 12" of rain. It resulted in 48 deaths at sea and 45 deaths from flooding on land.

The impacts of tropical cyclones on Burbank would most likely be limited to localized flooding from heavy rains, along with mudslides.

10.6 Historical Wind Events in Burbank

Historical significant wind events in Burbank have been predominantly from Santa Ana wind events and winter storms. The most common wind damage has been tree falls, with collateral damage to utility lines and sometimes damage to buildings and vehicles. The extent of tree falls has varied from minor to widespread depending on wind speeds, seasonal variations in leaf load, and whether or not rain accompanied the wind events.

Historically, none of the windstorm events have resulted in major damages within Burbank.

10.7 Windstorm Risk Assessment

The level of risk to Burbank from windstorms is low to moderate. The most likely consequences of wind events (Santa Ana winds, thunderstorms (including downbursts), tornadoes, or tropical cyclones) are predominantly to above ground utility systems, especially electric power. Most such impacts arise from tree falls; however, in severe events, direct failures of utility lines/poles may also occur. In an unusually severe windstorm event, large portions of Burbank could lose electric power for several days or more.

In addition, tree falls also may damage vehicles or buildings, with some such events resulting in casualties (injuries or deaths), as well as property damage. Modern well built structures typically have little or no damage for wind speeds up to about 100 mph.

Mobile homes and light steel industrial buildings may suffer significant damage at much lower wind speeds. According to US Census Bureau data (2006-2008

American Community Survey 3-Year Estimates) Burbank's there are 72 mobile homes within the city, which accounts for 0.2% of Burbank's housing units. There are also probably a few light steel industrial buildings in the City.

Thus, windstorms affecting Burbank are most likely to result in localized or widespread power outages, with generally isolated damages to a few buildings and or vehicles, from either tree falls or direct wind forces. Deaths or injuries are unlikely, but are possible, especially in more severe windstorm events with large numbers of tree falls.

Dollar loss estimates are difficult to make for windstorms. Roughly, damages might range from a few thousand dollars to $100,000 in smaller events to perhaps several million dollars in major windstorm events. Damages higher than several million dollars appear unlikely even for very large windstorm events.

For Burbank, the greatest risk from windstorms is a greatly increased threat of wildland/urban interface fires, which are much more difficult to control during periods of high winds, especially the hot, dry winds which are characteristic of Santa Ana winds.

10.8 Windstorm Mitigation Strategies and Action Items

10.8.1 Synopsis of Common Mitigation Strategies

The common mitigation measures for windstorms include:

- Enhancing tree trimming efforts to reduce future damage to above ground utility lines.
- Upgrading utility poles and lines to improve resistance against wind and tree falls,
- Underground utility lines,
- Tiedowns for mobile homes, and
- Ensuring that all critical facilities have backup power to preserve function during wind storm events that result in loss of grid power.

Undergrounding of utility lines provides nearly complete protection against windstorms, although there is a potential for damage caused by uprooting of trees. There are two drawbacks to undergrounding; 1) costs and 2) serviceability. Utility industry data indicate that failures of underground lines are typically much less common than for above ground lines, but repair time and repair costs are typically much higher. Over the lifetime of utility lines, underground lines may or may not have lower total costs and total outage times depending on local conditions and circumstances.

Localized or widespread power outages are the most comment effect of windstorm damage. Adequate backup power supplies for all critical facilities is an important mitigation measure for windstorms and for other natural hazards or human-caused events that result in the loss of grid power.

10.8.2 FEMA Mitigation Grants for Windstorms

FEMA does not generally fund routine tree trimming programs, because such efforts are deemed maintenance, not mitigation. However, FEMA does sometimes fund undergrounding of power lines, especially for critical links in the grid with a history of repetitive outages from wind events. There may or may not be any such potential mitigation projects in Burbank. There are no specific locations in Burbank with a history of repetitive wind damages.

FEMA also funds emergency generators for critical facilities, but only when the generators are part of a larger mitigation project, such as a seismic retrofit, not as a stand-alone mitigation project.

FEMA has also funded tiedowns for mobile homes, especially in coastal hurricane-prone areas. The level of risk in Burbank is probably not high enough to support such projects. However, FEMA might fund a multi-hazard mitigation project for mobile homes that including upgrading foundations/supports for a combination of seismic and wind resistance.

10.8.3 Burbank Mitigation Actions for Windstorms

Burbank’s mitigation action items for windstorms are summarized in Table 10.2.

Table 10.2
Windstorm Mitigation Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Windstorm Mitigation Action Items								
Short-Term #1	Ensure that all City and non-City critical facilities in Burbank have backup power.	Public Works, Burbank Water & Power	3 Years	X	X	X	X	
Short-Term #2	Maintain tree trimming efforts especially for transmission lines and trunk distribution lines.	Burbank Water & Power, Parks Recreation and Community Services	Ongoing	X	X	X		
Short-Term #3	Encourage property owners to trim trees near service drops to individual customers	Burbank Water & Power	Ongoing	X	X	X	X	

11.0 DROUGHT

11.1 Overview of Burbank's Water System

The City of Burbank's potable water supply system relies on a combination of local groundwater and surface water purchased from the Metropolitan Water District (MWD). For fiscal years 2006 to 2010, the proportion of potable water supplied by groundwater ranged from 35% to 53%, with the balance of 47% to 65% supplied by MWD.

Burbank's potable water system has seven concrete reservoirs and fourteen steel tanks, with a total storage capacity of 52.6 million gallons. The average daily water demand over the past five years was about 19.7 million gallons, with a maximum daily demand of 29.7 million gallons. On average, the water stored in these reservoirs provides about a two-day supply. This storage is designed to buffer against short-term disruptions of water supply and does not protect the city from long term disruptions of water supply as may occur during severe droughts.

For short term disruptions of water supply, Burbank also has two emergency interconnections with the Glendale water system. These interties are gravity fed to Glendale and pumped feed to Burbank with capacities of 800 and 2500 gallons per minute. However, historically these interties have been used only to provide water from Burbank to Glendale.

Burbank's water supply is supplemented by a recycled water supply system providing water for all non-potable uses, including irrigation and cooling water for the Magnolia Power Project. In the last fiscal year, average daily recycled water use was about 1.85 million gallons, or about 10% of potable water use.

Water supplies from both groundwater and surface water are subject to reduction during periods of prolonged droughts. Water supplies from both groundwater and surface sources are governed by very complex combinations of local, state and federal water regulations and agreements. Most models of climate change suggest that California may be drier in the future, which may significantly increase the potential for severe droughts with impacts on the availability of both groundwater and surface water.

11.2 Variability and Long Term Changes in Water Supply

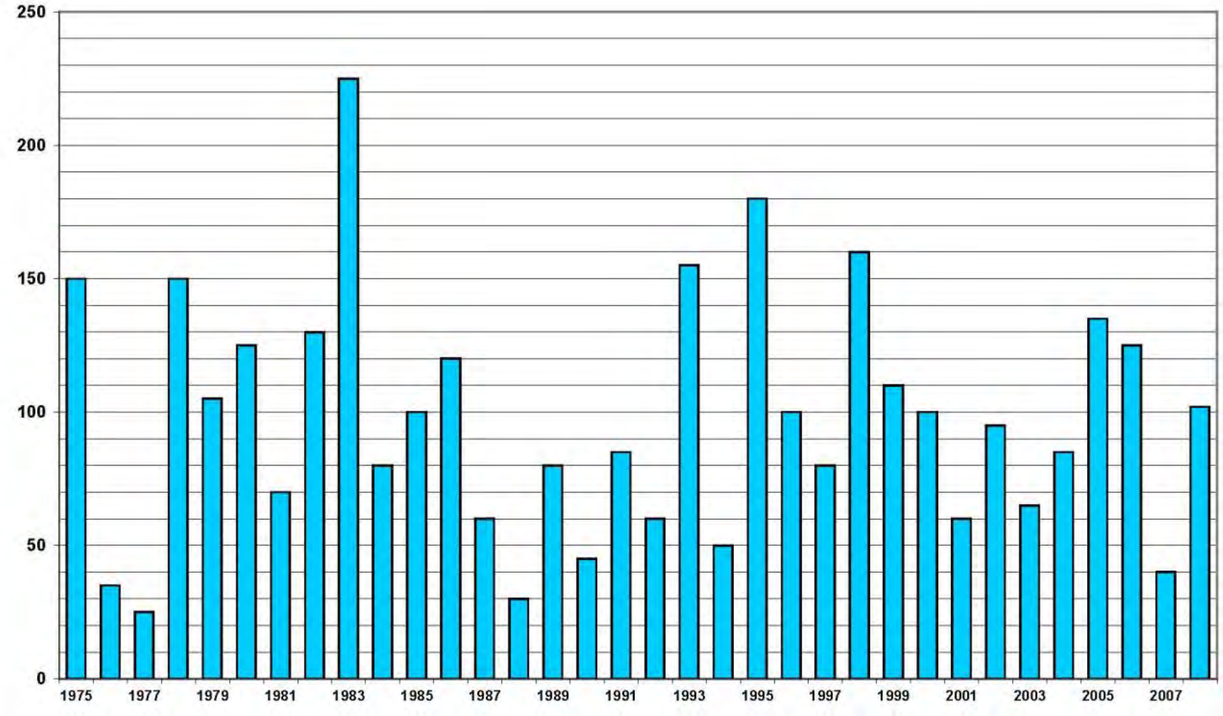
Prolonged droughts would affect Burbank's water supplies from both groundwater and surface water sources. The complex details of Burbank's water rights and the regulatory control of water supplies are beyond the scope of content for the Burbank Hazard Mitigation Plan. A 2010 summary of the Burbank Water System, "The Water System", provides further details.

The availability of groundwater varies from year to year, depending on regional precipitation over a period of several years, the amount of ground water extracted by all users and on contractual water rights. Similarly, the availability of surface water governed by precipitation and snow pack depth in California and in the Colorado River watershed. MWD's surface water supply is provided by water from Northern California via the State Water Project (California Aqueduct) and from the Colorado River via the Colorado River Aqueduct.

The Metropolitan Water District's annual allocation of Colorado River Water is 550,000 acre-feet. Until a few years ago, the District had access to 1,200,000 acre-feet annually, because Nevada and Arizona had not been using their full entitlement and the Colorado River flow was often adequate to yield surplus water. In recent years, the quantity of available water has been reduced due to a prolonged drought and water available to California has been reduced because other states have increased their usage in accord with their authorized entitlements.

The annual variability of surface water within California is illustrated in Figure 11.1 which shows annual snowpack water content over the past 35 years, relative to 100%, the estimated long term average. The pattern in total precipitation and thus total available surface water follows a similar pattern. The Colorado River watershed is subject to similar fluctuations from year to year.

Figure 11.1
April One Snowpack Water Content – Statewide Percent of Average[1]



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[1] California Department of Water Resources.

As shown above, snowpack water content has varied from a low of about 25% of normal in 1977 to about 225% of normal in 1983.

In addition to the historical fluctuations in water supply. Climate change is also expected to affect the water supply statewide through changes in precipitation and volume of surface runoff. The likely effects of global climate change as summarized in the California Department of Water Resources California Water Plan Update 2009 (Volume 3 Regional Reports, Chapter 5 South Coast Hydrologic Region), include the following:

- Increasing temperatures, especially in the summer,
- Changes in surface runoff timing, volume and form, and
- Declining Sierra Nevada snowpack, with reduced spring snowmelt and increased winter runoff.

In addition to the above direct effects on water supply, there are several other factors which may compound the effects including:

- Increased agricultural demand for water from higher evapotranspiration, and
- Increased water storage to maintain habitat for aquatic species during the dry season.

Climate change appears likely to exacerbate the effects of future droughts and result in reductions in total water supply for California. The extent to which future droughts and climate change might impact Burbank's water supply is difficult to estimate quantitatively. However, the California Department of Water Resources recently published The California Drought Contingency Plan (November 2010) which lists five levels of potential actions by water agencies, including Burbank, in response to droughts of varying severity. These five levels are summarized below with further details in the Contingency Plan referenced above:

- Level 1 – Abnormally Dry: Raising Awareness of Drought,
- Level 2 – First Stage Drought: Voluntary Conservation, Heightened Awareness, Increased Preparation,
- Level 3 – Severe Drought: Mandatory Conservation, Emergency Actions,
- Level 4 – Extreme Drought: Maximum Mandatory Conservation, and
- Level 5 – Exceptional Drought: Water Supplies Cut Off, Maximum Response.

11.3 Historical Droughts in Burbank

Historically, Burbank has experienced few water supply deficiency or water emergency in the past. The two most recent drought periods were 1976-1977 and 1987-1992.

In the 1976-1977 drought period there was no shortage of water in Burbank. However, customers were encouraged to voluntarily conserve water. These voluntary efforts resulted in about a 16% reduction in water usage which mitigated the possible effects of the drought on Burbank.

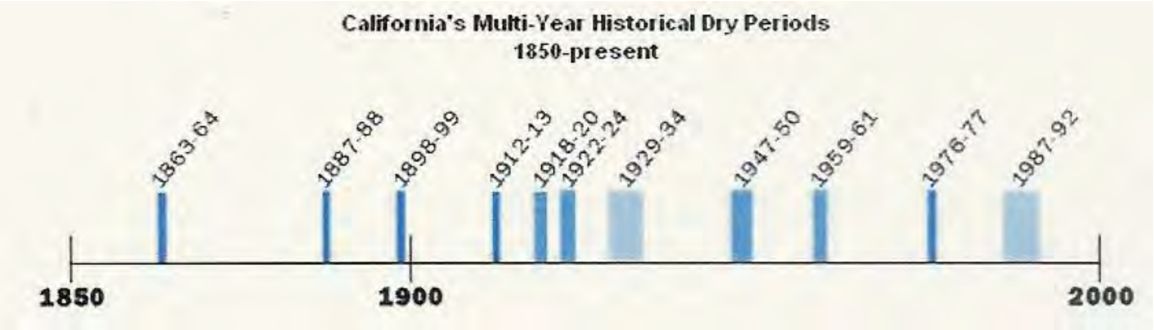
During the 1987-1992 drought period, Burbank initiated several water conservation measures. The initial measure was voluntary conservation, which achieved about a 10% reduction in water usage. In April 1991, conservation ordinance required a mandatory 20% reduction, with a drought surcharge for customers who failed to comply. For the 12 months after this ordinance, a 25% reduction in water usage was achieved. However, some of this reduction resulted from the fact that Lockheed had vacated most if its plant in Burbank. By April 1992, the water situation had improved and Burbank went back to the voluntary conservation program.

11.4 Probability of Future Droughts

The probability of future droughts can be estimated only approximately, based on historical droughts. As shown in Figure 11.1 and the accompanying narrative, there have been two significant drought periods in California in the past 35 years: 1976-1977 and 1987-1992.

Over the longer time period since 1850, California has experienced eleven periods of significant drought, as shown below in Figure 11.2. This history corresponds to about one drought period every 15 years, on average.

Figure 11.2
Historical Drought Periods in California



Roughly speaking, California might expect significant drought periods in the future approximately every years, with the return period for more severe droughts being longer. As discussed in Section 11.2, climate change is likely to make droughts more frequent and more severe. Nevertheless, the impacts of future droughts are likely to be substantially mitigated by enhanced water storage, better water management (especially regionally integrated water management) and enhanced water conservation, including the use of recycled water to reduce demand for potable water.

11.5 Vulnerability Analysis

Overall, Burbank's vulnerability to drought is moderate. The potential impacts of these two most recent drought periods on Burbank were effectively mitigated because of the conservation measures implemented in Burbank and because of the huge investments in water infrastructure storage and conveyance made over the 20th century.

Severe droughts could result in damage and loss to irrigated landscaping due to water restrictions or prohibitions. Otherwise, droughts are unlikely to result in physical damages. Rather, the impact of severe droughts could be disruptions and possible economic loss due to restricted water supplies. In very severe droughts, closures of some industrial and commercial facilities are perhaps possible.

For the most severe imaginable drought, there would almost certainly be enough water for domestic use (excluding irrigation) and critical facilities such as hospitals and other care facilities. Thus, no impacts to vulnerable populations are expected.

11.6 Mitigation Strategies and Action Items for Droughts

11.6.1 Strategies

The California Department of Water Resources California Water Plan Update 2009 (Volume 3 Regional Reports, Chapter 5 South Coast Hydrologic Region) lists six emerging strategies for meeting future water demands, all of which enhance a water utility's ability to reduce the impacts of future droughts on water supplies:

1) **Water transfers**. Water transfer is the development of water transfer and exchange agreements between neighboring water agencies. Water transfer does not increase total water supply, but does provide for the efficient use of existing supplies.
2) **Water conservation**. Water conservation is a fundamental component of water management. Reducing demand minimizes the need for the development of new water supply sources.

3) **Conjunctive management and groundwater storage**. Conjunctive management recognizes the connections between surface water supplies and ground water supplies, and tries to utilize the overall water supply more efficiently. Conjunctive management including enhanced groundwater storage can help even out seasonal or annual fluctuations in water supply and demand, but does not increase total water supply.

4) **Recycled municipal water**. Expansion of recycled water for irrigation or other potable water uses requires additional treatment, and has the potential to increase the total water supply and may provide water at a lower cost than other alternatives.

5) **Desalination - brackish and seawater**. The desalination of brackish or seawater has the potential to provide essentially unlimited water supply, albeit at high unit costs. A study by the California Coastal Commission (http://www.coastal.ca.gov/desalrpt/dchap1.html), indicates that the cost for desalination generally range from $1,000 to $4,000 per acre-foot. However, the Metropolitan Water District has estimated costs for a proposed project at $700 per acre-foot, which is similar to MWD's current prices for surface water.

6) **Urban runoff managemen**t. Urban runoff management primarily addresses management of runoff quantity and water quality, but enhanced management could also increase groundwater recharge and thus increase water supplies.

In 2010, California has a significant water shortage as a result of recent below average snowpack and precipitation and because of judicial decisions regarding allocation of water from the Sacramento-San Joaquin delta, which affects the State Water Project providing water to Southern California. Statewide conservation is in effect under the State's Drought Declaration on June 4, 2008 and the State of Emergency Proclamation on Water supply issued on February 27, 2009. These actions are intended to reduce the need for water rationing and to promote efficient use of water.

The drought mitigation strategies listed above are potentially available to Burbank. Some of these strategies are possible for Burbank to implement directly (e.g., conservation or water transfers). However, implementation of many of these strategies would require multi-jurisdictional cooperation.
Burbank has made several water initiatives in recent years, consistent with the above strategies and with the state mandates, including:

- Effective September 1, 2009, the City enacted a limit on landscape irrigation to no more than three days per week for no more than 15 minutes per station.
- Burbank achieved a reduction of 154.55 gallons per capita per day for the Fiscal Year ending June 30, 2010. State law requires a 20% reduction in

per capita water use by 20% by 2020. For Burbank, this corresponds to a reduction of 155 gallons per capita per day; thus, Burbank essentially met this requirement in 2010.

- Burbank has recognized the long-term benefits of utilizing recycled water as an alternative source of water to increase the overall water supply reliability. The Recycled Water Master Plan approved by the City Council in October 2007 outlines an expansion of the existing recycled water system to add many potential major users, including parks, cemetery, schools and business districts.
- Since 2009, the City has been exploring an option with the Los Angeles Department of Water and Power to exchange its excess recycled water for groundwater credits, which will reduce the number of groundwater credits the City will need purchase.

11.6.2 FEMA Mitigation Grants for Drought

FEMA's mitigation grant programs are focused on acute high risk situations where natural hazards pose an immediate threat to buildings, infrastructure or people. Thus, the eligibility requirements for these grant programs typically exclude capacity enhancements and similar measures that would reduce the City's vulnerability to droughts.

However, some storm water drainage improvement projects to reduce flood risks, which are FEMA-eligible, may have additional benefits in enhancing ground water recharge.

11.6.3 Burbank Mitigation Action Items: Drought

Burbank's mitigation action items for drought are summarized in Table 11.1.

Table 11.1
Drought Mitigation Action Items

Hazard	Action Item	Coordinating Departments	Timeline	Plan Goals Addressed				
				Life Safety	Protect Property Minimize Losses	Enhance Disaster Response-Recovery	Public Awareness & Education	Land Use Planning
Drought Mitigation Action Items								
Short-Term #1	Continue and enhance water conservation measures	Burbank Water & Power	Ongoing			X	X	X
Long-Term #1	Expand recycled water capacity and use commensurate with demand and funding availability	Burbank Water & Power, Public Works	Ongoing			X	X	X

12.0 OTHER HAZARDS – NATURAL AND HUMAN-CAUSED

The previous five chapters addressed the natural hazards which pose the greatest risks for Burbank: earthquakes, wildland/urban interface fires, landslides/ mudslides, floods and drought.

This chapter briefly addresses the many other types of natural hazards which could also pose risk to Burbank. However, the level of risk posed by these other hazards is much lower than for the five major hazards and in most cases the level of risk is nearly negligible.

This chapter also briefly addresses the major human-caused hazards, which were included in the 2005 Burbank Hazard Mitigation Plan. However, in developing the 2011 Burbank Hazard Mitigation Plan the consensus decision of the mitigation planning team was to focus on natural hazards. Although some of the human-caused hazards are significant, most actions to reduce risks are entirely or predominantly in the bailiwick of emergency response planning or law enforcement. Such activities are deemed almost entirely outside the scope of Burbank's hazard mitigation planning.

12.1 Other Natural Hazards

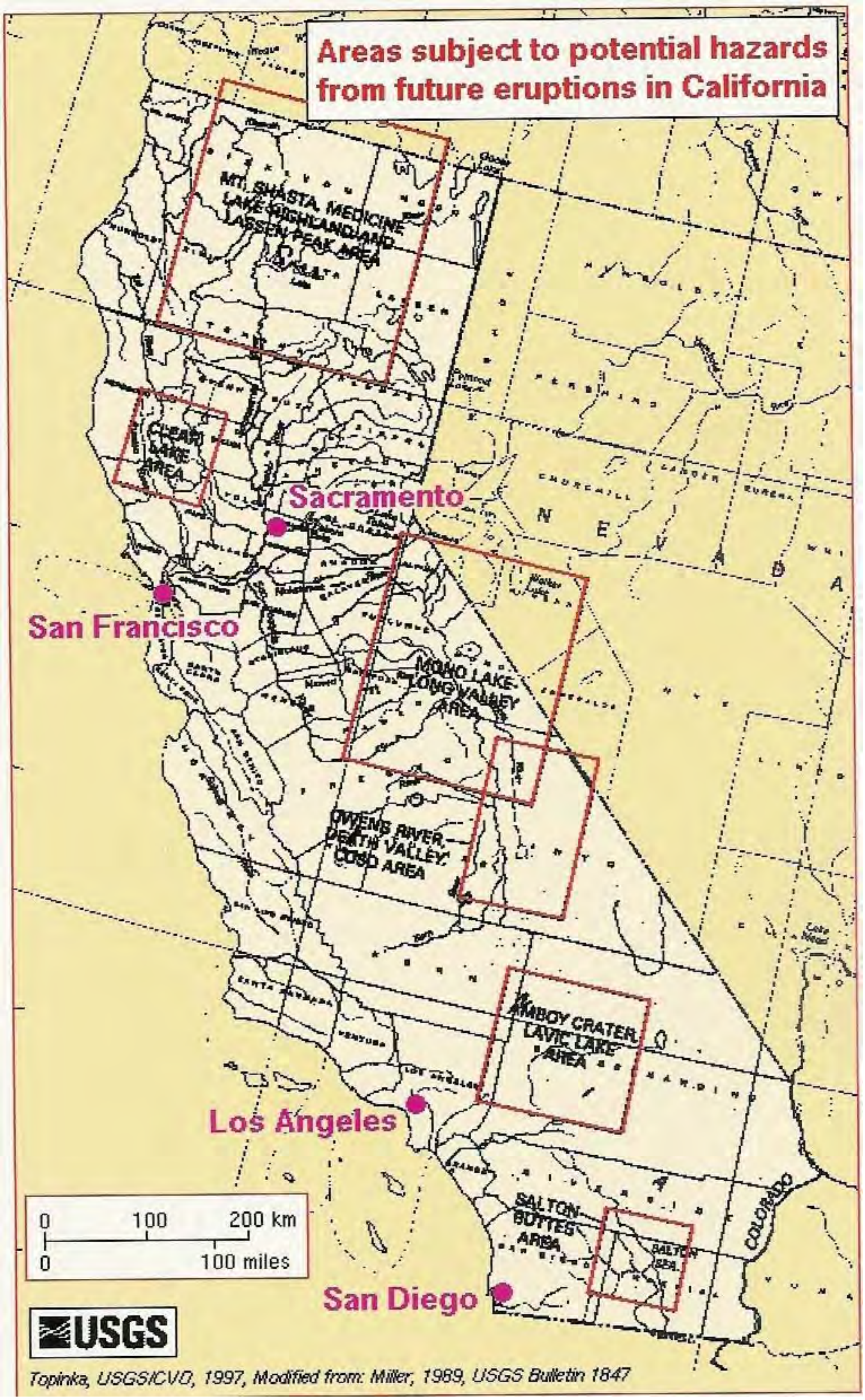
12.1.1 Volcanic Hazards

There are no active volcanic areas in or in immediate proximity to Burbank. However, there are active or potentially active volcanic areas which, although some distance from Burbank, could possibly result in minor effects in Burbank such as ash falls. Figure 12.1 shows potential hazard areas in California for volcanic activity.

The nearest hazard areas to Burbank are: Salton Buttes, Amboy Crater – Lavic Lake, Owens Valley – Death Valley – Coso, and Mono Lake – Long Valley. These areas are more than 100 miles from Burbank. The time intervals since the last volcanic activity in these areas range from about 250 years (Mono Lake – Long Valley), to about 10,000 years (Amboy Crater – Lavic Lake), to about 16,000 years (Salton Buttes) and to about one million years (Owens Valley – Death Valley).

The Mono Lake – Long Valley area is the most active area, but this area is located about 300 miles from Burbank. The most recent (within the last few hundred or few thousand years) volcanic activity in this area was minor. However, the Long Valley area had a massive eruption about 160,000 years ago with an estimated volume of about 600 cubic kilometers, about 250 times larger than the 1980 Mount Saint Helens eruption in Oregon. Such massive eruptions could occur again, albeit with an extremely low annual probability. The average return period for such a major eruption is probably several hundred thousand years.

Figure 12.1
Volcanic Hazard Areas in California



Topinka, USGS/CVO, 1997, Modified from: Miller, 1989, USGS Bulletin 1847

The only possible impacts on Burbank from eruptions in any of these areas would be a chance of small amounts of ash fall. However, given the prevailing westerly winds for most of the year, most events would not result in any ash reaching Burbank. Small eruptions in any of these volcanic hazard areas would have essentially zero impacts on Burbank.

Even a repeat of the massive Long Valley eruption would probably result in minimal impacts on Burbank. In a worst case scenario, there could be small amounts of ash fall in Burbank. Overall, the risk from volcanic events in Burbank is limited to possible ash falls with an extremely low probability and nearly negligible risk.

12.1.2 Subsidence

The term "subsidence" refers to lowering of ground elevations, which typically occurs from ground water pumping or petroleum extraction. Subsidence can result in substantial damage to buildings, especially foundations, and to buried utility infrastructure. Subsidence damage may be severe, especially at soil type boundaries where there are discontinuities in the rate of subsidence.

In parts of California, most notably in parts of the Santa Clara and San Joaquin Valleys and in the Sacramento – San Joaquin Delta, ground subsidence has been significant. In most cases, subsidence arises from excessive water extraction from compressible aquifer layers. As water is extracted and not replenished naturally or by recharge, layers settle and permanent ground subsidence occurs.

Parts of Los Angeles County have experienced subsidence from ground water pumping and/or from petroleum extraction.

In Burbank, there are no known areas where significant damage due to subsidence has or is occurring. Thus, subsidence risk in Burbank appears negligible.

12.1.3 Expansive Soils

The term "expansive soils" refers to soils, typically clay-rich, that undergo significant expansion and contraction cycles from seasonal variations in water content. Such cyclic changes can result in substantial damage to buildings, especially foundations, and to buried utility infrastructure.

In Burbank, there are no known areas where significant damage due to expansive soils has or is occurring. Thus, expansive soils risk in Burbank appears negligible.

12.1.4 Extreme Temperatures

Prolong periods of extreme temperatures – either unusually cold or unusually hot – can pose life safety risks, particularly for elderly and other at risk populations, especially if power outages are concurrent with extreme temperatures. The greatest risk is to lower income residents without air conditioning or those who have lost air conditioning due to power outages.

Extreme temperatures can also result in property damage, especially to cold-sensitive crops. Extreme cold may also result in freezing and rupturing of water pipes, including irrigation systems and pipes within buildings with inadequate insulation.

Burbank's climate is generally mild; below freezing temperatures are not common but do occur. Average low temperatures range from 41° in December to 62° in July and August. The record low temperature in Burbank is 22°. Extreme cold with temperatures approaching zero or below zero have never occurred in Burbank. Unusually cold weather in Burbank would result in damage to cold sensitive landscaping, with the possibility of water damages from pipe breakages.

Extreme heat often results in localized power outages. Demand for electricity may exceed capacity resulting in brownouts or blackouts. The combination of very high demand and high temperatures results in an increased number of equipment failures (especially lines and transformers), which increase the number of service outages. The record high temperature for Burbank is 113° and periods with temperatures above 100° are fairly common.

Overall, the level of risk posed to Burbank by extreme temperatures is low.

Burbank is subject to extreme heat periods. However, public response to extreme heat situations is for emergency responders and public health staff. There are no obvious mitigation action items to reduce the impacts of extreme heat on the residents of Burbank. Mitigation measures considered under previous hazard chapters to ensure back-up power supplies for critical facilities under disaster or other emergency conditions would also be beneficial during extreme heat conditions, which often include localized or widespread power outages.

Burbank is only marginally susceptible to extreme cold periods. Sub-freezing temperatures may result in generally minor water damage, but given Burbank's climate extreme events appear nearly impossible. There are no obvious mitigation action items to reduce the impacts of extreme cold on the residents of Burbank.

12.1.5 Other Severe Weather Events

Windstorms were addressed in Chapter 10; extreme temperatures were addressed above. Other severe weather events such as snow or ice storms and hail pose a very low risk to Burbank.

The mean annual snowfall in Burbank is about 0.1 inch, although measurable snow has occurred only six times since 1938. The record snowfall of 4.7 inches, which occurred in January 1948, accounts for nearly all of the mean annual snowfall. The most likely consequences of snow events are disruptions to transportation, with minor damages from tree falls on utility lines, vehicles and buildings possible in extreme events.

Ice storm (freezing rain) events are perhaps possible, although there is no history of such events affecting Burbank. The consequences of ice storms are similar to those for snow storms.

The level of risk posed to Burbank by snow or ice storms is very low and there are no feasible mitigation measures for such events. However, tree-trimming efforts for windstorms would also provide reductions in damages from snow or ice storms.

12.2 Human-Caused Hazards

The 2005 Burbank Hazard Mitigation Plan included brief sections on many of the most common human-caused hazards. The questionnaires used for the present update of the mitigation plan also included numerous human-caused hazards:

- Health alert/epidemic
- Weapons of mass destruction
- Utilities disruption/loss
- Special events
- Explosions
- Civil unrest
- Transportation accident
- Water/wastewater disruption
- Hazardous materials
- Economic disruption
- Transportation loss
- Information disruption/loss
- Aviation disaster
- Sinkholes (from failures of water or wastewater systems).

The results of the public questionnaires were summarized by the typical level of concern expressed by respondents. Of these human-caused hazards, respondents were “very concerned” about only aviation disasters and “not concerned” about explosions and special events. Respondents were “somewhat” or “moderately” concerned about all of the other human-caused hazards.

All of the above types of human-caused events have the potential for damages, economic losses, and/or deaths and injuries. Although many of the above types of human-caused hazards do pose some level of risk to Burbank, addressing such hazards is well outside the typical scope of FEMA local hazard mitigation planning. Rather, addressing such hazards typically falls into the domains of:

- Emergency response planning,
- Emergency responders (fire, police and medical),
- Law enforcement,
- Other agencies ,including:
    - The Federal Aviation Administration for the Bob Hope Airport,
    - Environmental agencies for hazardous material incidents, and
    - Public health agencies for public health/epidemics.

Furthermore, consideration of human-caused hazards is not required by FEMA's guidance and requirements for local hazard mitigation plans.

Given these considerations, and the limited local resources to focus on hazard mitigation for natural hazards, the consensus decision of the mitigation planning team developing the 2011 Burbank Hazard Mitigation plan was to focus entirely on natural hazards.

This decision does not diminish the importance of planning for human-caused hazards, but rather simply recognizes that such planning is best accomplished separately from the 2011 Burbank Hazard Mitigation Plan.

12.3 Mitigation Strategies and Action Items

There are no mitigation strategies or action items included in this mitigation plan for the other natural hazards considered above because the level of risk is very low and/or there are no feasible mitigation measures. However, to some extent, mitigation measures for more important hazards, such as windstorms, also help reduce losses for some of these minor natural hazards, such as snow or ice storms.

Similarly, there are no mitigation strategies or action items included in this mitigation plan for the human-caused hazards considered above. Planning for and responding to such events are best accomplished separately from the 2011 Burbank Hazard Mitigation Plan.

APPENDIX 1

FEMA MITIGATION GRANT PROGRAMS

January 8, 2011

FEMA FUNDING POSSIBILITIES FOR BURBANK

Overview

For public entities, such as the City of Burbank, FEMA funding possibilities fall into two main categories:

- The post-disaster Public Assistance Program which covers not less than 75% of eligible emergency response and restoration (repair) costs for public entities whose facilities suffer damages in a presidentially-declared disaster. The Public Assistance Program also may fund mitigation projects for facilities damaged in the declared event.
- Mitigation grant programs (either pre-disaster or post-disaster) which typically cover up to 75% of mitigation costs.

FEMA Public Assistance Program

The objective of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Grant Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.

Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

For Burbank, PA assistance would be available only for future presidentially-declared disaster events which result in damage to Burbank facilities. Further details of FEMA's PA programs are available at:

http://www.fema.gov/government/grant/pa/index.shtm

FEMA Mitigation Funding Sources

The Federal Emergency Management Agency (FEMA) has several mitigation grant programs which provide federal funds to supplement local funds for specified types of mitigation activities. The FEMA grant programs typically provide 75% funding with 25% local match required; in very limited cases, FEMA grant programs may provide 90% or 100% funding.

The five primary FEMA mitigation grant programs are summarized below:

Grant Program	Frequency	Hazard Mitigation Planning	Risk Assessments	Mitigation Projects	Hazards
Hazard Mitigation Grant Program	Post-Disaster	YES	YES	YES	ALL
Pre-Disaster Mitigation	Annual	YES	NO	YES	ALL
Flood Mitigation Assistance	Annual	YES	NO	YES	Flood
Repetitive Flood Claims Program	Annual	NO	NO	YES	Flood
Severe Repetitive Loss Program	Annual	NO	NO	YES	Flood

These FEMA grant programs have specific eligibility requirements and application deadlines. All of these grant programs have specific requirements including definitions of ineligible projects which are excluded from the grant programs. All mitigation projects (but not planning projects or risk assessments) must be cost-effective, which means that a benefit-cost analysis using FEMA software and following FEMA guidance must demonstrate a benefit-cost ratio >1.0.

These grant programs are not entitlement programs, but rather are competitive grant programs which require strict adherence to the eligibility and application requirements and robust documentation. Robust documentation is especially critical for the PDM grant program which is nationally competitive.

The Hazard Mitigation Grant Program is initiated within a given state only after a Presidential Declaration of Disaster; thus, there is no fixed schedule. A given state may have several declarations in a given year or go several years without any declarations. Specific application deadlines are established for HMGP funds generated by each disaster declaration.

The other four mitigation grant programs are annual programs with specific deadlines, which vary from year to year. For FY 2011 grants, the application deadline for all four programs is December 3, 2010. However, these applications are reviewed and ranked by California Emergency Management Agency (Cal-EMA) staff before they go to FEMA for review. Cal-EMA deadlines are typically about two moths before the FEMA deadlines. For later years, deadlines are subject to change, but would likely be similar to the FY 2011 deadlines.

The three flood-only grant programs – Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) – are narrowly defined grant programs which apply only to properties insured under the National Flood Insurance Program (NFIP). Thus, Burbank would be eligible for these grants only for properties with NFIP coverage and, for the RFC and SRL programs, only if the properties also meet the repetitive loss requirements.

For Burbank, the most likely FEMA funding sources for mitigation projects are the Hazard Mitigation Grant Program, the Pre-Disaster Mitigation Program and the Flood Mitigation Assistance Program, as well as the Public Assistance Program if Burbank suffers damage in a future presidentially-declared disaster event.

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) is a post-disaster grant program. HMGP funds are generated following a Presidential Disaster Declaration for a given state, with the amount of funding being a percentage of total FEMA spending for various other FEMA programs such as the Individual and Family Assistance and Public Assistance programs.

FEMA regulations allow HMGP funds to be spent on any mitigation project in the state, for any hazard, regardless of whether or not an applicant was located in a declared county for a specific presidentially-declared disaster. Historically, CAL-EMA has often given priority to the declared counties and to the hazard (e.g., winter storms) that resulted in the presidential declaration. However, mitigation projects outside of the declared counties and for other hazards have also been considered.

HMGP funds are limited to a given state. Each state manages the HMGP process, including setting state priorities and selection of projects for funding. FEMA reviews applications only to ensure that selected projects meet all of FEMA's eligibility requirements. HMGP is the most flexible grant program: grants are possible for any natural hazard and may include hazard mitigation planning and risk assessments as well as physical mitigation projects. However, states have wide latitude in setting priorities and may restrict grant eligibility to specific counties to which the disaster declaration applies and/or to specific hazards or types of mitigation activities. Thus, Cal-EMA has great influence over HMGP grants within California, subject to the requirement that all grants must meet FEMA's minimum eligibility requirements.

HMGP grant applications are competitive only within each state. The amount of HMGP funding in a given disaster can range from less than $100,000 to more than $1 billion for large disasters (e.g., the Northridge earthquake or Hurricane Katrina).

For California, declared disasters are relatively common, often with one or more declarations in a given year for winter storms, floods, fires or other disasters. Thus, the total amount of HMGP mitigation funds available within the state and the funds likely available for mitigation projects will vary from year to year and disaster event to disaster event. HMGP mitigation grants do not have pre-set maximums on grant sizes.

Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) grant program is a broad program which includes mitigation projects for any natural hazard as well as mitigation planning grants which must result in the development of a Local Hazard Mitigation Plan. PDM is a nationally-competitive annual program. The annual amount of grant funds available has ranged from about $50 million to about $250 million. Funding levels in future years will depend on congressional appropriations.

PDM grants cover 75% of the costs of mitigation projects up to a maximum federal share of $3,000,000 per project.

Flood Mitigation Grant Programs

The three flood-only mitigation grant programs have annual appropriations specific to each state. As noted above, these programs are applicable only to NFIP insured properties. Furthermore, the RFC and SRL programs are applicable only to properties which also meet the repetitive flood loss criteria.

Each of these programs has their specific guidance, outlined in the Hazard Mitigation Assistance unified guidance discussed below. However, the overall grant requirements are similar to those for the HMGP discussed above.

For Burbank, the likelihood of getting a Flood Mitigation Assistance grant appears modest; however, there may be a few homes or other buildings at sufficient flood risk such that elevation or acquisition projects might be potentially eligible for FEMA grant funding. Absent any properties on FEMA's national repetitive loss list, Burbank would not be eligible for either of FEMA's repetitive flood loss grant program.

Mitigation Grant Guidance and Requirements

FEMA's detailed program guidance and the specific requirements for each grant program are posted on the FEMA website (www.fema.gov). The guidance and requirements for the four annual grant programs have recently been combined into a uniform hazard mitigation guide (Hazard Mitigation Assistance Program Guidance, June 1, 2010). Guidance and requirements for the HMGP are also posted on the FEMA website. New uniform hazard mitigation guidance is expected in mid-2011 and in subsequent years.

The FEMA website contains downloadable detailed guidance for each of the five grant programs summarized above.

http://www.fema.gov/government/grant/fs_mit_grant_prog.shtm

Mitigation Project Grant Applications

All of FEMA's mitigation grant programs are competitive, either within a given state or nationally. Thus, successful grant applications must be complete, robust and very well documented. The key elements for successful mitigation project grant applications include:

- Project locations within high hazard areas.

- Project facilities which have major vulnerabilities which pose substantial risk of damages, economic impacts, and (especially for seismic projects) deaths or injuries.
- For utility mitigation projects, the majority of benefits often accrue from reductions in the calculated economic impacts (using FEMA standard methodologies) of the loss of utility services.
- Mitigation project scope and budget are well documented.
- The benefits of the project are carefully documented using FEMA benefit-cost software, with all inputs meticulously meeting FEMA's guidance and expectations. A benefit-cost analysis meeting FEMA's requirements is very often the most critical step in determining a mitigation project's eligibility and competitiveness for FEMA grants.

A further eligibility requirement for mitigation project grants is that the local applicant must have a FEMA approved local hazard mitigation plan. Burbank will be eligible to apply for FEMA mitigation grants, once FEMA approves the Burbank Hazard Mitigation Plan.

APPENDIX 2

PRINCIPLES OF BENEFIT-COST ANALYSIS

January 8, 2011

Introduction

Benefit-cost analysis is required for nearly all FEMA mitigation project grant applications and is often a key determinant of mitigation project eligibility. Overall, benefit-cost analysis is a tool that provides answers to a central question for hazard mitigation projects: **"Is it worth it?"**

If hazard mitigation were free, individuals and communities would undertake mitigation with robust enthusiasm and the risks from hazards would soon be greatly reduced. Unfortunately, mitigation is not free, but often rather expensive. For a given situation, is the investment in mitigation justified? Is the owner (public or private) better off economically to accept the risk or invest now in mitigation to reduce future damages? These are hard questions to answer! Benefit-cost analysis can help a community answer these difficult questions.

In the complicated real world of mitigation projects, there are many factors which determine whether or not a mitigation project is worth doing or which of two or more mitigation projects should have the highest priority. Consider a town which has two flood prone neighborhoods and each neighborhood desires a mitigation project. The two neighborhoods have different numbers of houses, different value of houses, different frequencies and severity of flooding. The first neighborhood proposes storm water drainage improvements at a cost of $3.0 million. The second neighborhood wants to elevate houses at a cost of $3.0 million. Which of these projects should be completed? Both? One or the Other? Neither? Which project should be completed first if there is only funding for one? Are there alternative mitigation projects which are more sensible or more cost-effective than the proposed projects?

Such complex socio-political-economic-engineering questions are nearly impossible to answer without completing the type of quantitative flood risk assessment and benefit-cost analysis discussed below.

Risk Assessment for Benefit-Cost Analysis

In determining whether or not a given mitigation project is worth doing, the level of risk exposure without mitigation is critical. Consider a hypothetical $1,000,000 mitigation project. Whether or not the project is worth doing depends on the level of risk before mitigation and on the effectiveness of the project in reducing risk. For example, if the before mitigation risk is low (a subdivision street has a few inches of water on the street every couple of years or a soccer field in a city park floods every five years or so) the answer is different than if the before mitigation risk is high (100 or more houses are expected to have flooding above the first floor every 10 years or a critical facility is expected to be shut down because of flood damages once every five years).

All well-designed mitigation projects reduce risk (badly designed projects can increase risk or simply transfer risk from one community to another). However, just because a mitigation project reduces risk does not make it a good project. A $1,000,000 project that avoids an average of $100 per year in flood damages is not worth doing, while the same project that avoids an average of $200,000 per year in flood damages is worth doing.

The principles of benefit-cost analysis are briefly summarized here. The benefits of a hazard mitigation project are the reduction in future damages and losses, that is, the avoided damages and losses that are attributable to a mitigation project. To conduct benefit-cost analysis of a specific mitigation project, the risk of damages and losses must be evaluated twice: before mitigation and after mitigation, with the benefits being the difference.

The benefits of a hazard mitigation project are thus simply future damages and losses which are avoided because a mitigation action was implemented.

Because the benefits of a hazard mitigation project accrue in the future, it is impossible to know exactly what they will be. For example, we do not know when future floods or other natural hazards will occur or how severe they will be. We do know, however, the probability of future floods or other natural hazards (if we have appropriate hazard data). Therefore, the benefits of mitigation projects must be evaluated probabilistically and expressed as the difference between annualized damages before and after mitigation.

To illustrate the principles of benefit-cost analysis, we consider a hypothetical single family home in the town of Acorn, with the home located on the banks of Squirrel Creek. The home is a one story building, about 1500 square feet on a post foundation, with a replacement value of $60/square foot (total $90,000). We have flood hazard data for Squirrel Creek (stream discharge and flood elevation data) and elevation data for the first floor of the house. Therefore, we can calculate the annual probability of flooding in one-foot increments, as shown below.

Table A2.1
Damages Before Mitigation

Flood Depth (feet)	Annual Probability of Flooding	Scenario Damages and Losses Per Flood Event	Annualized Flood Damages and Losses
0	0.2050	$6,400	$1,312
1	0.1234	$14,300	$1,765
2	0.0867	$24,500	$2,124
3	0.0223	$28,900	$673
4	0.0098	$32,100	$315
5	0.0036	$36,300	$123
Total Expected Annual (Annualized) Damages and Losses			**$6,312**

Flood depths shown above in Table A2.1 are in one foot increments of water depth above the lowest floor elevation. Thus, a “3" foot flood means all floods between 2.5 feet and 3.5 feet of water depth above the floor. We note that a “0" foot flood has, on average, damages because this flood depth means water plus or minus 6" above or below the top of the floor. Even if the flood level is a few inches below the first floor, there may be damage to flooring and other building elements because of wicking of water.

The Scenario (per flood event) damages and losses include expected damages to the building, content, and displacement costs if occupants have to move to temporary quarters while flood damage is repaired.

The Annualized (expected annual) damages and losses are calculated as the product of the flood probability times the scenario damages. For example, a 4 foot flood has slightly less than a 1% chance per year of occurring. If it does occur, we expect about $32,100 in damages and losses. Averaged over a long time, 4 foot floods are thus expected to cause an average of about $315 per year in flood damages. Note that the smaller floods, which cause less damage per flood event, actually cause higher average annual damages because the probability of smaller floods is so much higher than that for larger floods. With these data, the house is expected to average $6,312 per year in flood damages. This expected annual or “annualized” damage estimate does not mean that the house has this much damage every year. Rather, in most years there will be no floods, but over time the cumulative damages and losses from a mix of relatively frequent smaller floods and less frequent larger floods is calculated to average $6,312 per year.

The calculated results in Table A2.1 are the flood risk assessment for this house for the as-is, before mitigation situation. The table shows the expected levels of damages and losses for scenario floods of various depths and also the annualized damages and losses.

The risk assessment shown in Table A2.2 shows a high flood risk, with frequent severe flooding which the owner deems unacceptable. He explores mitigation alternatives to reduce the risk: the example below is to elevate the house 4 feet.

Table A2.2
Damages After Mitigation

Flood Depth (feet)	Annual Probability of Flooding	Scenario Damages and Losses Per Flood Event	Annualized Flood Damages and Losses
0	0.2050	$0	$0
1	0.1234	$0	$0
2	0.0867	$0	$0
3	0.0223	$0	$0
4	0.0098	$6,400	$63
5	0.0036	$14,300	$49
Total Expected Annual (Annualized) Damages and Losses			**$112**

By elevating the house 4 feet, the owner has reduced his expected annual (annualized) damages from $6,312 to $112 (98% reduction) and greatly reduced the probability or frequency of flooding affecting his house. The annualized benefits are the difference in the annualized damages and losses before and after mitigation or $6,312 - $112 = $6,200.

Is this mitigation project worth doing? Common sense says yes, because the flood risk appears high: the annualized damages before mitigation are high ($6,312). To answer this question more quantitatively, we complete our benefit-cost analysis of this project. One key factor is the cost of mitigation. A mitigation project that is worth doing at one cost may not be worth doing at a higher cost. Let’s assume that the elevation costs $20,000. This $20,000 cost occurs once, up front, in the year that the elevation project is completed.

The benefits, however, accrue statistically over the lifetime of the mitigation project. Following FEMA convention, we assume that a residential mitigation project has a useful lifetime of 30 years. Money (benefits) received in the future has less value than money received today because of the time value of money. The time value of money is taken into account with present value calculation. We compare the present value of the anticipated stream of benefits over 30 years in the future to the up-front out-of-pocket cost of the mitigation project.

A present value calculation depends on the lifetime of the mitigation project and on what is known as the discount rate. The discount rate may be viewed simply as the interest rate you might earn on the cost of the project if you didn’t spend the money on the mitigation project. Let’s assume that this mitigation project is to be funded by FEMA, which uses a 7% discount rate to evaluate hazard mitigation projects. With a 30-year lifetime and a 7% discount rate, the "present value coefficient" which is the value today of $1.00 per year in benefits over the lifetime of the mitigation project is 12.41. That is, each $1.00 per year in benefits over 30 years is worth $12.41 now. The benefit-cost results are now as follows.

Table A2.3
Benefit-Cost Results

Annualized Benefits	$6,200
Present Value Coefficient	12.41
Net Present Value of Future Benefits	$76,942
Mitigation Project Cost	$20,000
Benefit-Cost Ratio	3.85

These results indicate a benefit-cost ratio of 3.85. Thus, in FEMA's terms the mitigation project is cost-effective and eligible for FEMA funding. Taking into account the time value of money, which is essential for a correct economic calculation, results in lower benefits than if we simply multiplied the annual benefits times the 30 year project useful lifetime. Economically, simply multiplying the annual benefits times the lifetime would ignore the time value of money and thus gives an incorrect result.

Summary

The above discussion of benefit-cost analysis of a flood hazard mitigation project illustrates the basic concepts. Similar principles apply to mitigation projects for earthquakes or any other natural hazards. However, for earthquake mitigation projects, one of the major benefits is life safety. For purposes of benefit-cost analysis, the statistical values for deaths and injuries must be included in the benefit-cost analysis. For reference, the current FEMA statistical value for human life is $5.8 million. Given this high value, many seismic mitigation projects are deemed cost-effective and thus eligible for FEMA hazard mitigation grant funding.

The role of benefit-cost analysis in prioritizing and implementing mitigation projects in Burbank is addressed in Chapter 5 (Plan Adoption, Maintenance and Implementation). Although benefit-cost analysis is a powerful tool for helping to evaluate and prioritize mitigation projects, and a requirement for all FEMA hazard mitigation grants, benefit-cost analysis should not be considered the sole determinant for mitigation actions. In some cases, the potential for negative effects from a particular natural hazard may simply be deemed unacceptable, such as the potential for deaths and injuries, and thus mitigation may be undertaken without benefit-cost analysis.

APPENDIX 3

SUPPLEMENTAL DOCUMENTATION
OF THE
MITIGATION PLANNING PROCESS:
2011 UPDATE OF THE
BURBANK HAZARD MITIGATION PLAN

April 21, 2011

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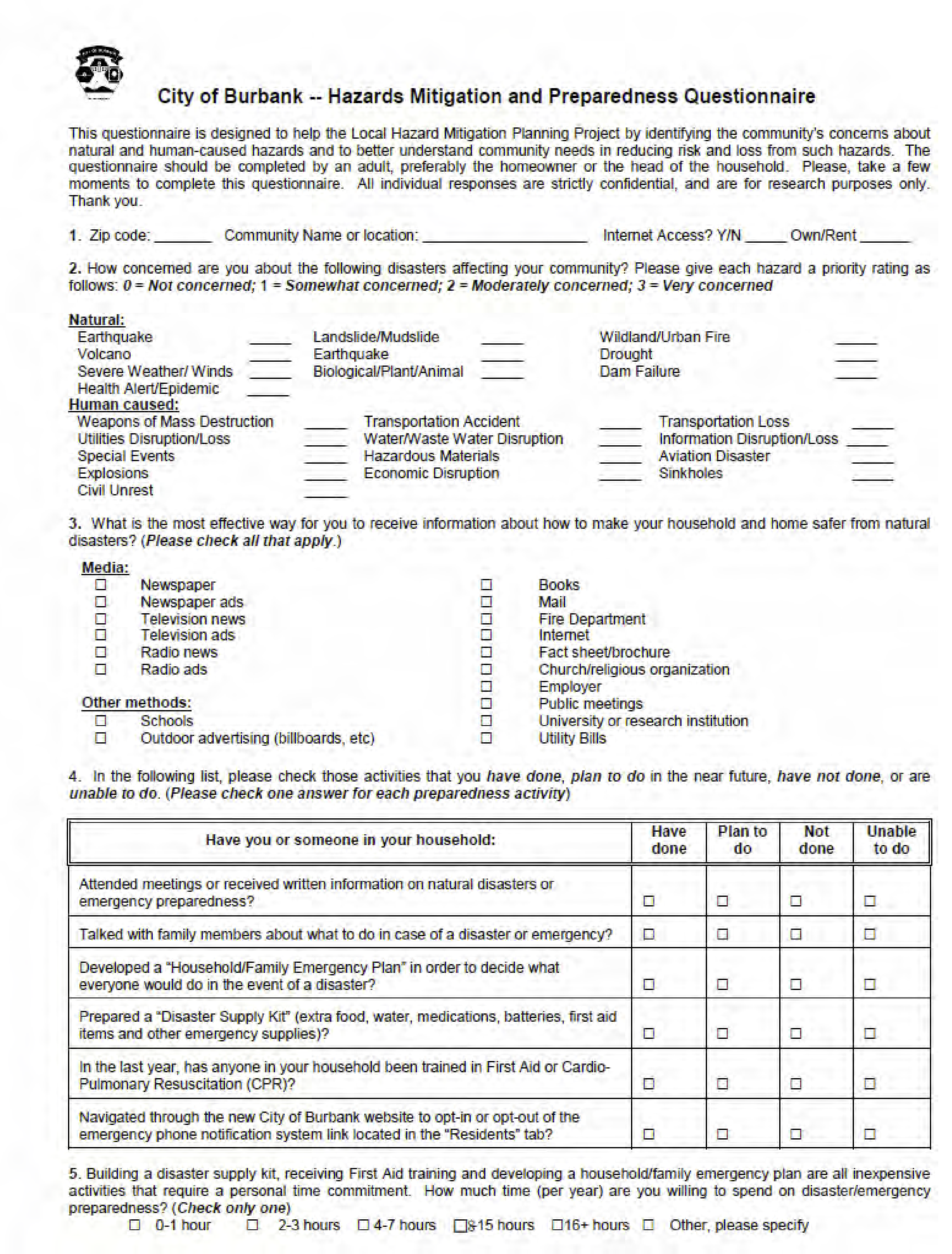
ATTACHMENT 1

2010 QUESTIONNAIRES

2010 Questionnaire: English Version



City of Burbank -- Hazards Mitigation and Preparedness Questionnaire

This questionnaire is designed to help the Local Hazard Mitigation Planning Project by identifying the community's concerns about natural and human-caused hazards and to better understand community needs in reducing risk and loss from such hazards. The questionnaire should be completed by an adult, preferably the homeowner or the head of the household. Please, take a few moments to complete this questionnaire. All individual responses are strictly confidential, and are for research purposes only. Thank you.

1. Zip code: _______ Community Name or location: ____________________ Internet Access? Y/N _____ Own/Rent ______

2. How concerned are you about the following disasters affecting your community? Please give each hazard a priority rating as follows: *0 = Not concerned; 1 = Somewhat concerned; 2 = Moderately concerned; 3 = Very concerned*

Natural:

Earthquake _____
Volcano _____
Severe Weather/ Winds _____
Health Alert/Epidemic _____
Landslide/Mudslide _____
Earthquake _____
Biological/Plant/Animal _____
Wildland/Urban Fire _____
Drought _____
Dam Failure _____

Human caused:

Weapons of Mass Destruction _____
Utilities Disruption/Loss _____
Special Events _____
Explosions _____
Civil Unrest _____
Transportation Accident _____
Water/Waste Water Disruption _____
Hazardous Materials _____
Economic Disruption _____
Transportation Loss _____
Information Disruption/Loss _____
Aviation Disaster _____
Sinkholes _____

3. What is the most effective way for you to receive information about how to make your household and home safer from natural disasters? (*Please check all that apply.*)

Media:

☐ Newspaper
☐ Newspaper ads
☐ Television news
☐ Television ads
☐ Radio news
☐ Radio ads

Other methods:

☐ Schools
☐ Outdoor advertising (billboards, etc)

☐ Books
☐ Mail
☐ Fire Department
☐ Internet
☐ Fact sheet/brochure
☐ Church/religious organization
☐ Employer
☐ Public meetings
☐ University or research institution
☐ Utility Bills

4. In the following list, please check those activities that you ***have done***, ***plan to do*** in the near future, ***have not done***, or are ***unable to do***. (***Please check one answer for each preparedness activity***)

Have you or someone in your household:	**Have done**	**Plan to do**	**Not done**	**Unable to do**
Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
Talked with family members about what to do in case of a disaster or emergency?	☐	☐	☐	☐
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	☐	☐	☐	☐
Prepared a "Disaster Supply Kit" (extra food, water, medications, batteries, first aid items and other emergency supplies)?	☐	☐	☐	☐
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	☐	☐	☐	☐
Navigated through the new City of Burbank website to opt-in or opt-out of the emergency phone notification system link located in the "Residents" tab?	☐	☐	☐	☐

5. Building a disaster supply kit, receiving First Aid training and developing a household/family emergency plan are all inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on disaster/emergency preparedness? (*Check only one*)

☐ 0-1 hour ☐ 2-3 hours ☐ 4-7 hours ☐ 8-15 hours ☐ 16+ hours ☐ Other, please specify

6. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?
☐ Yes ☐ No

7. Would you be willing to spend more money on a home that has features that make it more disaster resistant?
☐Yes ☐ No ☐ Don't know

8. Do you carry flood insurance? If so what is the annual cost? ____________________
☐Yes ☐ No

9. What nonstructural or structural modifications for earthquakes and floods have you made to your home?
(*Please check all that apply*)

10a. Nonstructural
☐ Anchor bookcases, cabinets to wall
☐ Secure water heater to wall
☐ Install latches on drawers/cabinets
☐ Fit gas appliances with flexible connections
☐ Others (please explain
☐ None

10b. Structural
☐ Secure home to foundation
☐ Brace inside of cripple wall with sheathing
☐ Brace unreinforced chimney
☐ Brace unreinforced masonry and concrete walls and foundations

10. Natural and human-caused disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statement will help us determine community priorities for planning for those hazards. Please tell us how important each one is to you.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐
Protecting critical facilities (hospitals, transportation networks, fire stations)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting natural environment	☐	☐	☐	☐	☐
Protecting historical and cultural landmarks	☐	☐	☐	☐	☐
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities	☐	☐	☐	☐	☐
Strengthening emergency services (police, fire, ambulance)	☐	☐	☐	☐	☐

11. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

Communitywide Strategies	Agree	Neutral	Disagree	Not Sure
I support a regulatory approach to reducing risk.	☐	☐	☐	☐
I support a non-regulatory approach to reducing risk.	☐	☐	☐	☐
I support policies to prohibit development in areas subject to natural hazards.	☐	☐	☐	☐
I support the use of local tax dollars to reduce risks and losses from natural disasters.	☐	☐	☐	☐
I support protecting historical and cultural structures.	☐	☐	☐	☐
I would be willing to make my home more disaster-resistant.	☐	☐	☐	☐
I support steps to safeguard the local economy following a disaster event	☐	☐	☐	☐
I support improving the disaster preparedness of schools.	☐	☐	☐	☐

Mail to: Burbank Fire Department
Emergency Services Division – HMP
311 E. Orange Grove Avenue
Burbank, CA 91502

2010 Questionnaire: Spanish Version

B U R B A N K – Cuestionario de Preparacion y Disminucion de Peligros en Casos de Emergencia

Este cuestionario fue diseñado para asistir a un Proyecto Local con el fin de Disminuir y Planear Estrategias para en casos de Emergencias, identificando inquietudes acerca de peligros/emergencias ya sean causados por la naturaleza o por personas. También para considerar las necesidades de la comunidad, reduciendo riesgos y pérdidas debido a tales peligros. Un adulto, de preferencia el propietario o quien esté a cargo del hogar, debe contestar este cuestionario. Favor de utilizar unos momentos para contestar las preguntas. Todas las respuestas son estrictamente confidenciales y su único propósito es para investigación. Gracias.

1. Código Postal______ Domicilio_______ ¿Tiene acceso al Internet?___Si____No____ Propietario o Inquilino __________

2. ¿Que tanto le preocupa que los siguientes desastres ocurran en su comunidad? Favor de categorizar cada peligro de la manera siguiente:

0= No me preocupa 1= Me preocupa algo 2= Me preocupa con frecuencia 3= Me preocupa bastante

Causas Naturales:

Terremoto	Derrumbes	Incendios Urbanos y forestales
Volcan	Temblores	Sequias
Clima severo/Vientos	Biologico/Planta/Animal	Inundacion por fallas de presas
Epidemias/Salubridad		

Causado por Humanos:

Armas, causando masacres	Accidentes de transporte	Pérdida de transporte
Interrupción o pérdida de Utilidades(gas, electricidad)	Interrupción al acceso de agua /Desperdicio de agua	Pérdida e interrupción de comunicaciones
Eventos Especiales	Objetos nocivos	Desastre aereo
Explosiones	Problemas de economía	Derrumbe de pozo
Desorden civil		

3. ¿Cual es la manera más eficáz para que Ud. reciba información acerca de cómo hacer de su hogar un lugar seguro y a salvo de desastres naturales? **(Favor de marcar todas las respuesta que apliquen.)**

Medios de Comunicacion:	**Otros métodos:**	
Periódicos	Escuelas	
Anuncios en periódicos	Anuncios Públicos (carteles, etc.)	En el trabajo
Noticias televisadas	Libros	Asambleas públicas
Anuncios en televisión	Correspondencia	Universidad o Institución de Investigaciones
Noticias por radio	Departamento de Bomberos	Facturas de gas ó electricidad
Anuncios en radio	Internet	
	Folletos	
	Iglesia/Organización religiosa	

4. En la lista siguiente, favor de marcar las actividades que ya efectuó, las que planea llevar a cabo en un futuro cercano, las que no a hecho, o no puede hacer. **(Favor de marcar una respuesta para cada actividad de preparación)**

Usted o alguien en su hogar:	**Lo hice**	**Planeo hacerlo**	**No lo hice**	**No puedo hacerlo**
¿Asistió a reuniones o recibió información escrita acerca de desastres naturales o preparación para casos de emergencia?				
¿Habló con miembros de su familia acerca de que hacer en casos de desastre o emergencia?				
¿Implementó un "Plan Familiar de Emergencia" con el fin de decidir que harian en caso de un desastre?				
¿Preparó un "Paquete con Provisión" (comestibles extras, agua, medicinas, baterias, artículos de primeros auxilios y otros objetos para emergencias?				
¿Alguien en su familia ha recibido instrucción en Primeros Auxilios o Resucitación Cardio-Pulmonar durante este año?				
¿Navegó el sitio electrónico de La Ciudad de Burbank donde puede optar por aceptar o no, unirse al Sistema de notificación telefónica localizada en "Residents"?				

5. Preparar un "paquete para emergencias", recibir entrenamiento en Primeros Auxilios e implementar un plan de emergencia en el hogar son actividades que, aunque no cuestan caro, requieren tiempo y compromiso personal. ¿Cuanto tiempo (por año) está usted dispuesto/a a dedicarle a la preparación para desastres/emergencias? (**Marque solamente uno)**

__0-1 hora	__2-3 horas	__4-7 horas	__8-15 horas	__16+ horas	__Más, especifique

6. ¿Consideró usted la posibilidad de que ocurriera un desastre natural cuando compró/ o se mudó a su domicilio presente? **Si___** **No___**

7. ¿ Estaría dispuesto/a a pagar más por una residencia con cualidades que la hicieran más resistentes a un desastre? **Si___** **No___** **No se ___**

8. ¿Compró usted seguro contra inundación? **Si___** **No___**
Si su respuesta es afirmativa, ¿Cuanto es el costo annual?

9. ¿Que modificaciones estructurales o no, ha hecho usted a su residencia para en caso de terremoto o inundación **?** **(Favor de marcar todas las respuestas apropiadas)**

10a. **No structural**	**10b.** **Estructural**

__Atornillar gabinetes a la pared
__Asegurar calentador de agua a la pared
__Instalar aldabas en los cajones y gabinetes
__Equipar o adaptar utensilios de gas con conexiones flexibles
__Otras (explique)
__Ninguna

__Restructurar cimientos de la casa
__Reforzar paredes interiores
__Reforzar chimeneas
__Reforzar paredes y cimientos de concreto y albañileria

10. Desastres naturales y aquellos causados por humanos pueden impactar de manera significativa a una comunidad pero si se está preparado, puede ser menos el impacto. Las observaciones siguientes nos ayudarán a determinar las prioridades de la comunidad para planear preparación en caso de que ocurran esos desastres. Favor de indicar la importancia que usted le da a cada una.

OBSERVACION	**Muy importante**	**Algo importante**	**Neutral**	**No muy importante**	**Nada importante**
Protección de la propiedad privada					
Protección de Servicios críticos, como (hospitales, transporte, estaciones de bomberos)					
Prevención de urbanización en areas de peligro					
Protección del ambiente natural					
Protección de sitios de interés histórico y cultural					
Fomentar cooperación entre agencias públicas, ciudadanos, organizaciones no comerciales y empresas.					
Protección y reducción de daños a las utilidades (gas, electricidad, etc.)					

11. Favor de marcar lo que representa su opinion entre las siguients estrategias para reducir el riesgo y pérdida relacionada con desastres naturales.

Estrategias para toda la Comunidad	**De acuerdo**	**Neutral**	**Desacuerdo**	**Inseguro**
Apoyo un método regulatorio para reducir riesgos.				
Apoyo un método sin regulaciones para reducir riesgos.				
Apoyo pólizas que prohiben urbanización en areas sujetas a peligros naturales.				
Apoyo el uso de impuestos locales para reducir riesgos y pérdidas debido a desastres naturales.				
Apoyo la pretección de estructuras				

históricas y culturales.				
Estaría dispuesto/a a reforzar mi residencia para hacerla más resistente a desastres.				
Apoyo los pasos necesarios para salvaguardar la economía local despues de ocurrido un desastre.				
Apoyo el mejoramiento de preparación para desastres en las escuelas.				

Favor de enviar este cuestionario a: Burbank Fire Department
Emergency Services Division – HMP
311 E. Orange Grove Avenue
Burbank, CA 91502

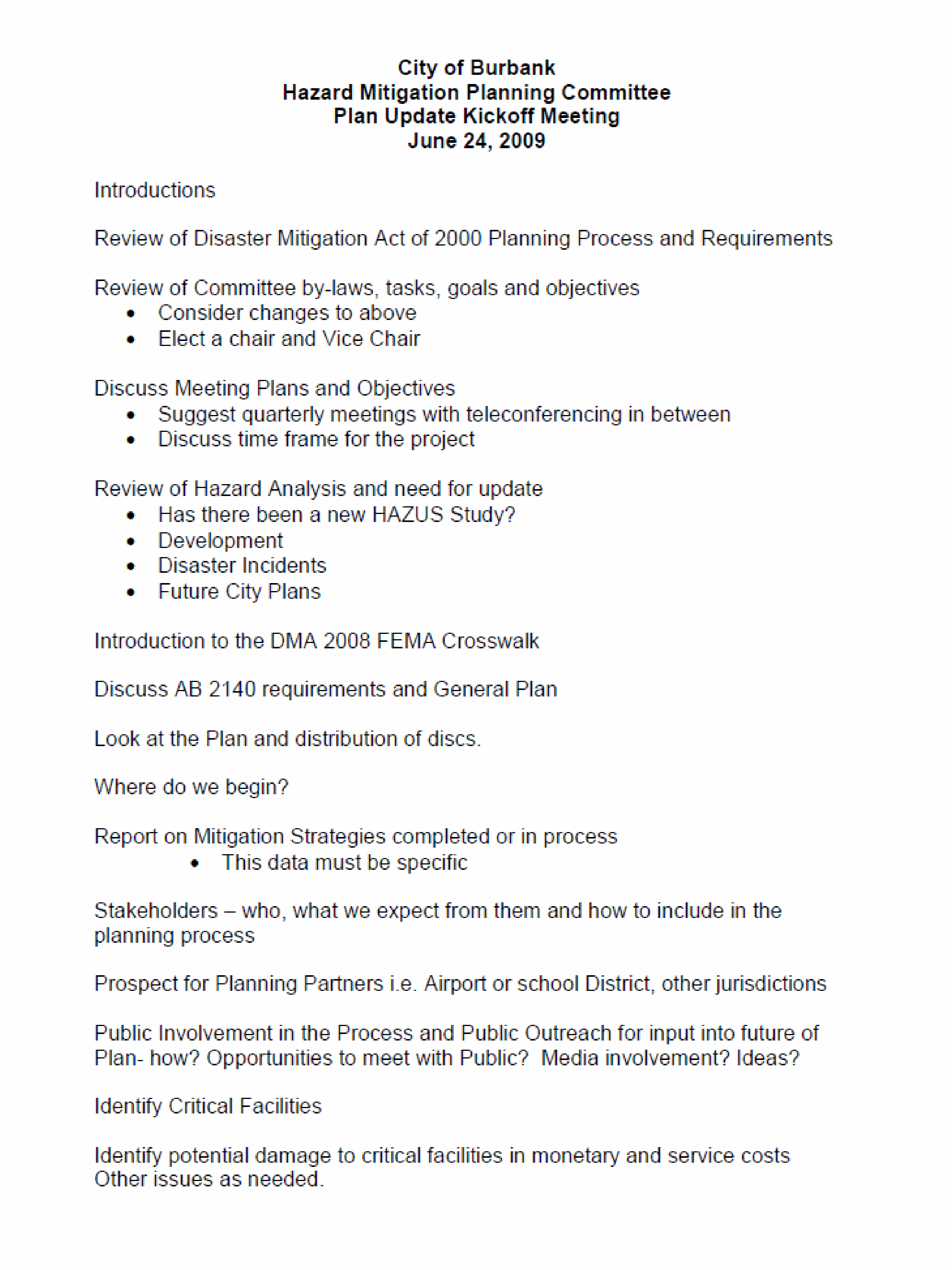
HAZARD MITIGATION PLANNING TEAM MEETINGS

Mitigation Planning Team meetings for the 2011 Update of the Burbank Hazard Mitigation Plan were held on the following dates:

June 24, 2009
August 26, 2009
November 8, 2009
February 10, 2010
September 23, 2010
October 5, 2010
October 26, 2010
November 16, 2010
December 2, 2010
December 14, 2010
December 21, 2010
February 1, 2011

Meeting agendas, sign-in lists and meeting summaries for these meetings are provided on the following pages.

ATTACHMENT 1



City of Burbank
Hazard Mitigation Planning Committee
Plan Update Kickoff Meeting
June 24, 2009

Introductions

Review of Disaster Mitigation Act of 2000 Planning Process and Requirements

Review of Committee by-laws, tasks, goals and objectives
- Consider changes to above
- Elect a chair and Vice Chair

Discuss Meeting Plans and Objectives
- Suggest quarterly meetings with teleconferencing in between
- Discuss time frame for the project

Review of Hazard Analysis and need for update
- Has there been a new HAZUS Study?
- Development
- Disaster Incidents
- Future City Plans

Introduction to the DMA 2008 FEMA Crosswalk

Discuss AB 2140 requirements and General Plan

Look at the Plan and distribution of discs.

Where do we begin?

Report on Mitigation Strategies completed or in process
  - This data must be specific

Stakeholders – who, what we expect from them and how to include in the planning process

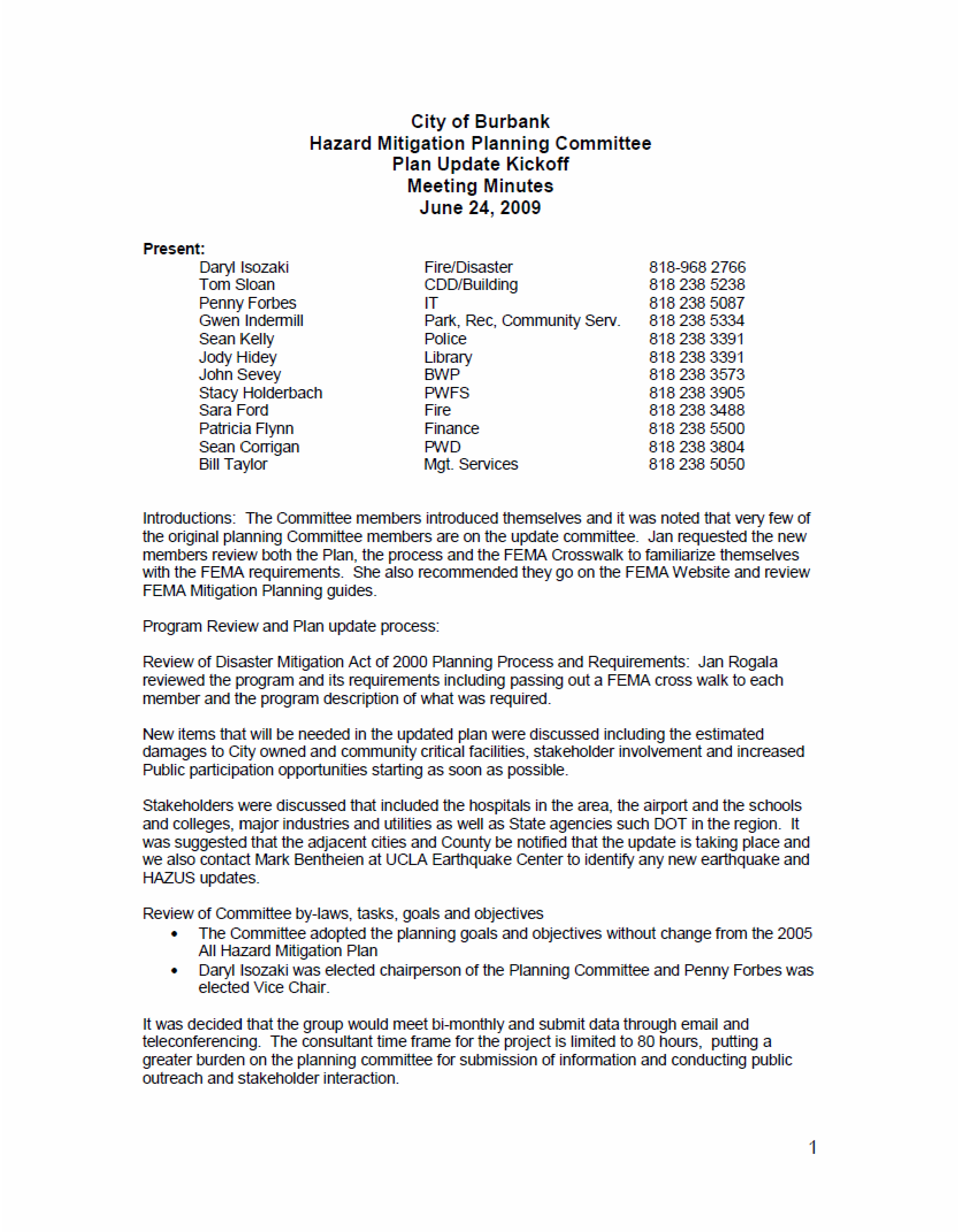
Prospect for Planning Partners i.e. Airport or school District, other jurisdictions

Public Involvement in the Process and Public Outreach for input into future of Plan- how? Opportunities to meet with Public? Media involvement? Ideas?

Identify Critical Facilities

Identify potential damage to critical facilities in monetary and service costs
Other issues as needed.

ATTACHMENT 1



City of Burbank
Hazard Mitigation Planning Committee
Plan Update Kickoff
Meeting Minutes
June 24, 2009

Present:

Daryl Isozaki	Fire/Disaster	818-968 2766
Tom Sloan	CDD/Building	818 238 5238
Penny Forbes	IT	818 238 5087
Gwen Indermill	Park, Rec, Community Serv.	818 238 5334
Sean Kelly	Police	818 238 3391
Jody Hidey	Library	818 238 3391
John Sevey	BWP	818 238 3573
Stacy Holderbach	PWFS	818 238 3905
Sara Ford	Fire	818 238 3488
Patricia Flynn	Finance	818 238 5500
Sean Corrigan	PWD	818 238 3804
Bill Taylor	Mgt. Services	818 238 5050

Introductions: The Committee members introduced themselves and it was noted that very few of the original planning Committee members are on the update committee. Jan requested the new members review both the Plan, the process and the FEMA Crosswalk to familiarize themselves with the FEMA requirements. She also recommended they go on the FEMA Website and review FEMA Mitigation Planning guides.

Program Review and Plan update process:

Review of Disaster Mitigation Act of 2000 Planning Process and Requirements: Jan Rogala reviewed the program and its requirements including passing out a FEMA cross walk to each member and the program description of what was required.

New items that will be needed in the updated plan were discussed including the estimated damages to City owned and community critical facilities, stakeholder involvement and increased Public participation opportunities starting as soon as possible.

Stakeholders were discussed that included the hospitals in the area, the airport and the schools and colleges, major industries and utilities as well as State agencies such DOT in the region. It was suggested that the adjacent cities and County be notified that the update is taking place and we also contact Mark Bentheien at UCLA Earthquake Center to identify any new earthquake and HAZUS updates.

Review of Committee by-laws, tasks, goals and objectives

- The Committee adopted the planning goals and objectives without change from the 2005 All Hazard Mitigation Plan
- Daryl Isozaki was elected chairperson of the Planning Committee and Penny Forbes was elected Vice Chair.

It was decided that the group would meet bi-monthly and submit data through email and teleconferencing. The consultant time frame for the project is limited to 80 hours, putting a greater burden on the planning committee for submission of information and conducting public outreach and stakeholder interaction.

Review of Hazard Analysis: The ratings of the Hazards in the plan were reviewed and it was decided to combine

Combine Drought with:
  Wildland Urban Fire Interface
  Water Distribution

The rating of the risks will stay the same for the time being.

Discussion was held on the power interruptions from the past fires.

Discussion was held on the gas lines and their route through the City on the extent of the risk they posed to the City. More information needs to be considered before deciding if they are a standalone risk or tied to earthquake, landslide and flood risks.

Discussion was held on the status of the fire roads in the hills and the damage caused by heavy rains to the roads. A mitigation strategy would be to improve the access and have a ongoing maintenance program for the roads. The erosion also was identified to be a risk to the access to radio towers.

A new Water Ordinance was passed by the City and it will be provided to Jan to be included in the Planning update.

The following information needs were discussed

- Has there been a new HAZUS Study
- Extent of new development in the City
- Disaster Incidents-
- Status of future City Plans and City General Plan.

Discussion was held on recent FERC imposition of greater security measures for Cyber Security basics and new rules issued.

Introduction to the DMA 2008 FEMA Crosswalk:

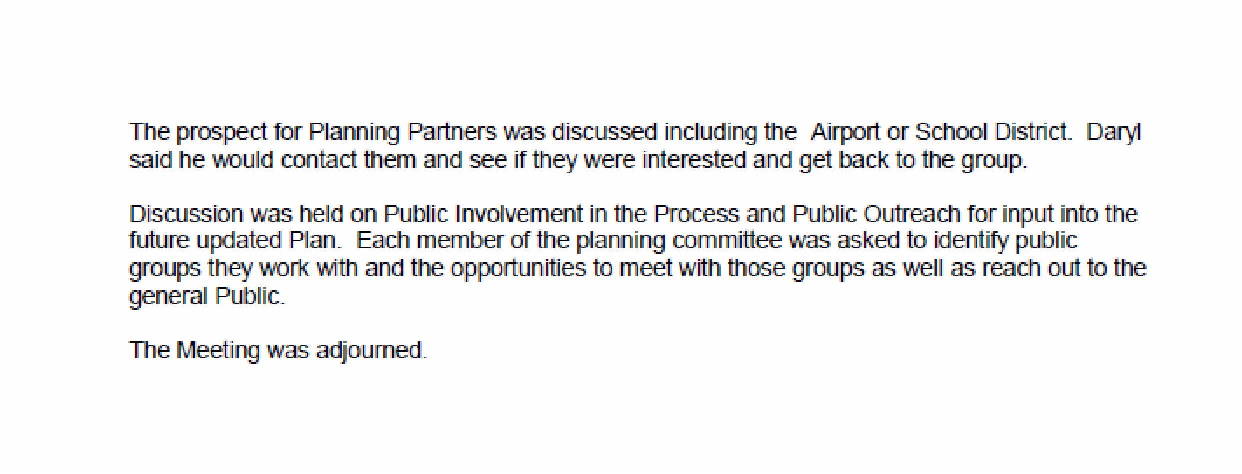
The sections of the new FEMA Crosswalk were discussed on the depth of information FEMA is now requiring including estimated losses, Public Input, and stakeholder outreach and input.

Discussion was held on the requirement of AB 2140 to tie the Hazard Mitigation Plan to the City's General Plan.

The group was asked to review the Plan before the August Meeting and CD Rom of the Plan was given to each planning member for review. Note pages for updates and changes including new Hazard Mitigation Strategies and new development and City assets.

A copy of all the City's Mitigation Strategies were distributed and each person was requested to review those strategies and make a report on Mitigation Strategies completed or in process. Jan explained the report needs to be detailed on if the strategy was started, completed, and what the current status is. If the strategy is not going to be implemented the City needs to explain why. I.E. Economic reasons or needs have changed.

A discussion was held on who the Stakeholders are and how to include them in the process. It was decided to write to the identified organization introduce the plan in meetings that are held with other organizations. It was not definitely decided who to include in the process, what we expect from them and how to include in the planning process

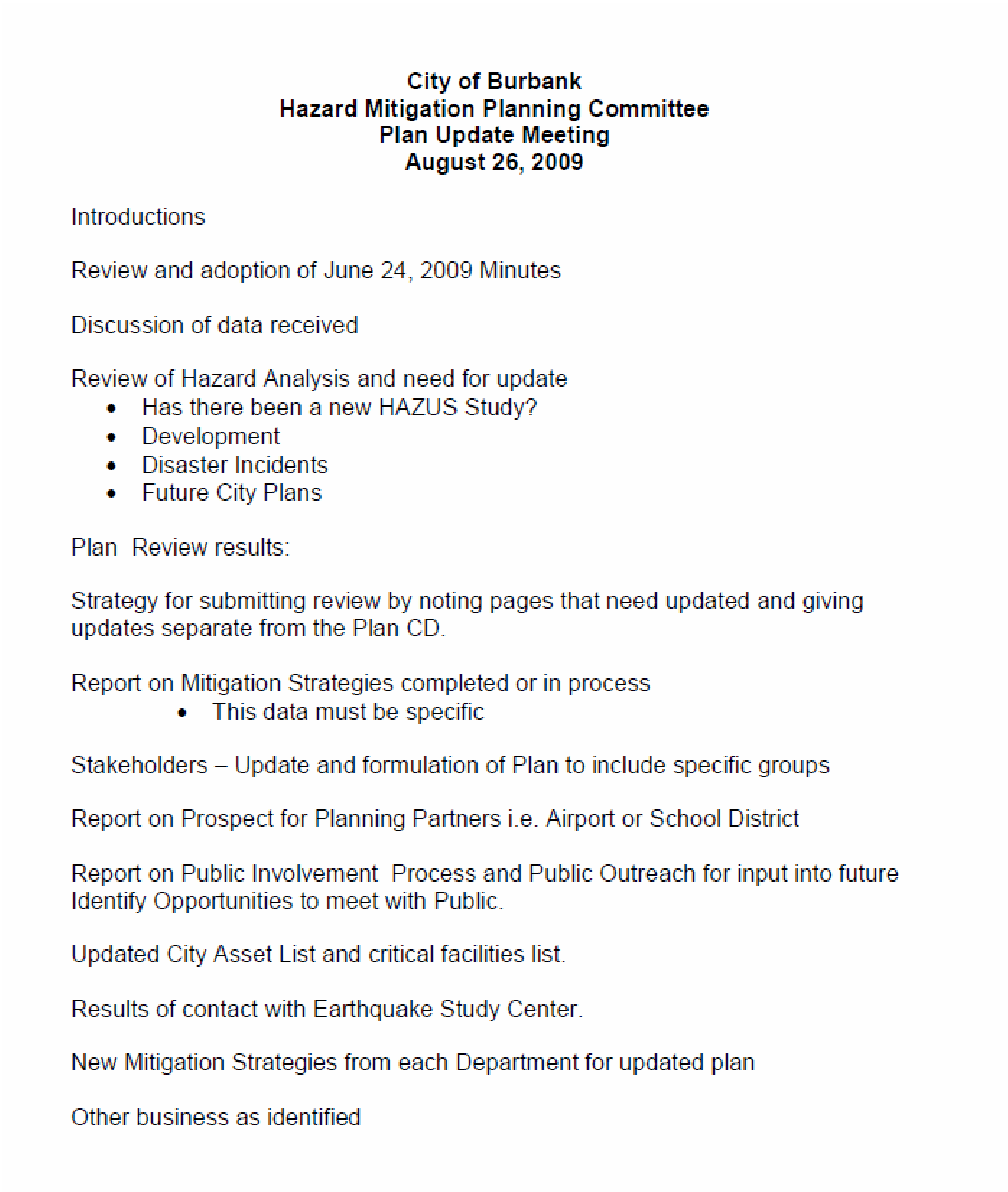


The prospect for Planning Partners was discussed including the Airport or School District. Daryl said he would contact them and see if they were interested and get back to the group.

Discussion was held on Public Involvement in the Process and Public Outreach for input into the future updated Plan. Each member of the planning committee was asked to identify public groups they work with and the opportunities to meet with those groups as well as reach out to the general Public.

The Meeting was adjourned.

ATTACHMENT 1



City of Burbank
Hazard Mitigation Planning Committee
Plan Update Meeting
August 26, 2009

Introductions

Review and adoption of June 24, 2009 Minutes

Discussion of data received

Review of Hazard Analysis and need for update
- Has there been a new HAZUS Study?
- Development
- Disaster Incidents
- Future City Plans

Plan Review results:

Strategy for submitting review by noting pages that need updated and giving updates separate from the Plan CD.

Report on Mitigation Strategies completed or in process
    - This data must be specific

Stakeholders – Update and formulation of Plan to include specific groups

Report on Prospect for Planning Partners i.e. Airport or School District

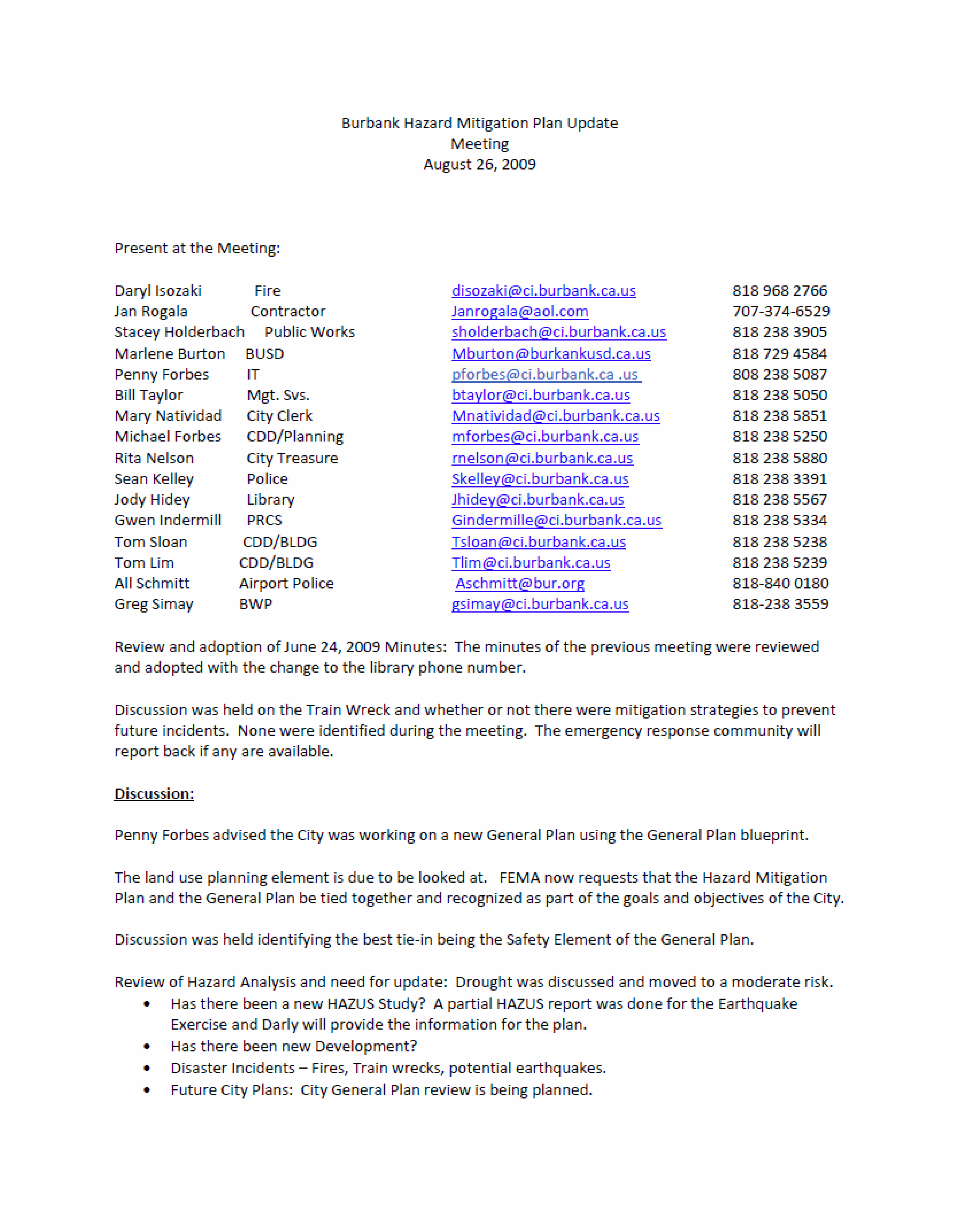
Report on Public Involvement Process and Public Outreach for input into future Identify Opportunities to meet with Public.

Updated City Asset List and critical facilities list.

Results of contact with Earthquake Study Center.

New Mitigation Strategies from each Department for updated plan

Other business as identified



Burbank Hazard Mitigation Plan Update
Meeting
August 26, 2009

Present at the Meeting:

Daryl Isozaki	Fire	disozaki@ci.burbank.ca.us	818 968 2766
Jan Rogala	Contractor	Janrogala@aol.com	707-374-6529
Stacey Holderbach	Public Works	sholderbach@ci.burbank.ca.us	818 238 3905
Marlene Burton	BUSD	Mburton@burkankusd.ca.us	818 729 4584
Penny Forbes	IT	pforbes@ci.burbank.ca .us	808 238 5087
Bill Taylor	Mgt. Svs.	btaylor@ci.burbank.ca.us	818 238 5050
Mary Natividad	City Clerk	Mnatividad@ci.burbank.ca.us	818 238 5851
Michael Forbes	CDD/Planning	mforbes@ci.burbank.ca.us	818 238 5250
Rita Nelson	City Treasure	rnelson@ci.burbank.ca.us	818 238 5880
Sean Kelley	Police	Skelley@ci.burbank.ca.us	818 238 3391
Jody Hidey	Library	Jhidey@ci.burbank.ca.us	818 238 5567
Gwen Indermill	PRCS	Gindermille@ci.burbank.ca.us	818 238 5334
Tom Sloan	CDD/BLDG	Tsloan@ci.burbank.ca.us	818 238 5238
Tom Lim	CDD/BLDG	Tlim@ci.burbank.ca.us	818 238 5239
All Schmitt	Airport Police	Aschmitt@bur.org	818-840 0180
Greg Simay	BWP	gsimay@ci.burbank.ca.us	818-238 3559

Review and adoption of June 24, 2009 Minutes: The minutes of the previous meeting were reviewed and adopted with the change to the library phone number.

Discussion was held on the Train Wreck and whether or not there were mitigation strategies to prevent future incidents. None were identified during the meeting. The emergency response community will report back if any are available.

Discussion:

Penny Forbes advised the City was working on a new General Plan using the General Plan blueprint.

The land use planning element is due to be looked at. FEMA now requests that the Hazard Mitigation Plan and the General Plan be tied together and recognized as part of the goals and objectives of the City.

Discussion was held identifying the best tie-in being the Safety Element of the General Plan.

Review of Hazard Analysis and need for update: Drought was discussed and moved to a moderate risk.

- Has there been a new HAZUS Study? A partial HAZUS report was done for the Earthquake Exercise and Darly will provide the information for the plan.
- Has there been new Development?
- Disaster Incidents – Fires, Train wrecks, potential earthquakes.
- Future City Plans: City General Plan review is being planned.

The City PIO said he was willing to help with the public input portion of the Plan update. Discussion was held on using the City's website and posting a questionnaire as well as locations and events that could distribute questionnaires and receive input. The questionnaire will need to be bi-lingual as it was before.

Plan Review results: The participants had not reviewed the Plan and will form a committee and review it for the future input and update.

Strategy for submitting review by noting pages that need updating and giving updates separate from the Plan CD.

Report on Mitigation Strategies completed or in process

- This data must be specific – each department agreed to go over the strategies for their department and make changes and report on completed projects. Penny Forbes said the information from the previous IT input was outdated and no longer appropriate. Jan asked her to document her information and submit any new strategies they may have.

Strategies:

A discussion was held on the need for back-up generators. The area they are to be used and the cost of the generators while estimated to be $350,000.00 each, needs to be discussed and developed further as a strategy.

Battery backup for traffic lights was identified as a need. 15 currently have the backup and 20 more need the back up.

Discussion was held on the warning and notification system and if it is robust enough with safeguards.

Discussion was held on measuring the interoperability with Glendale, Pasadena and San Gabriel and if further development is needed there.

Discussion was held on portable generators that are currently available in the community and the potential to have a written agreement to use those generators in a disaster.

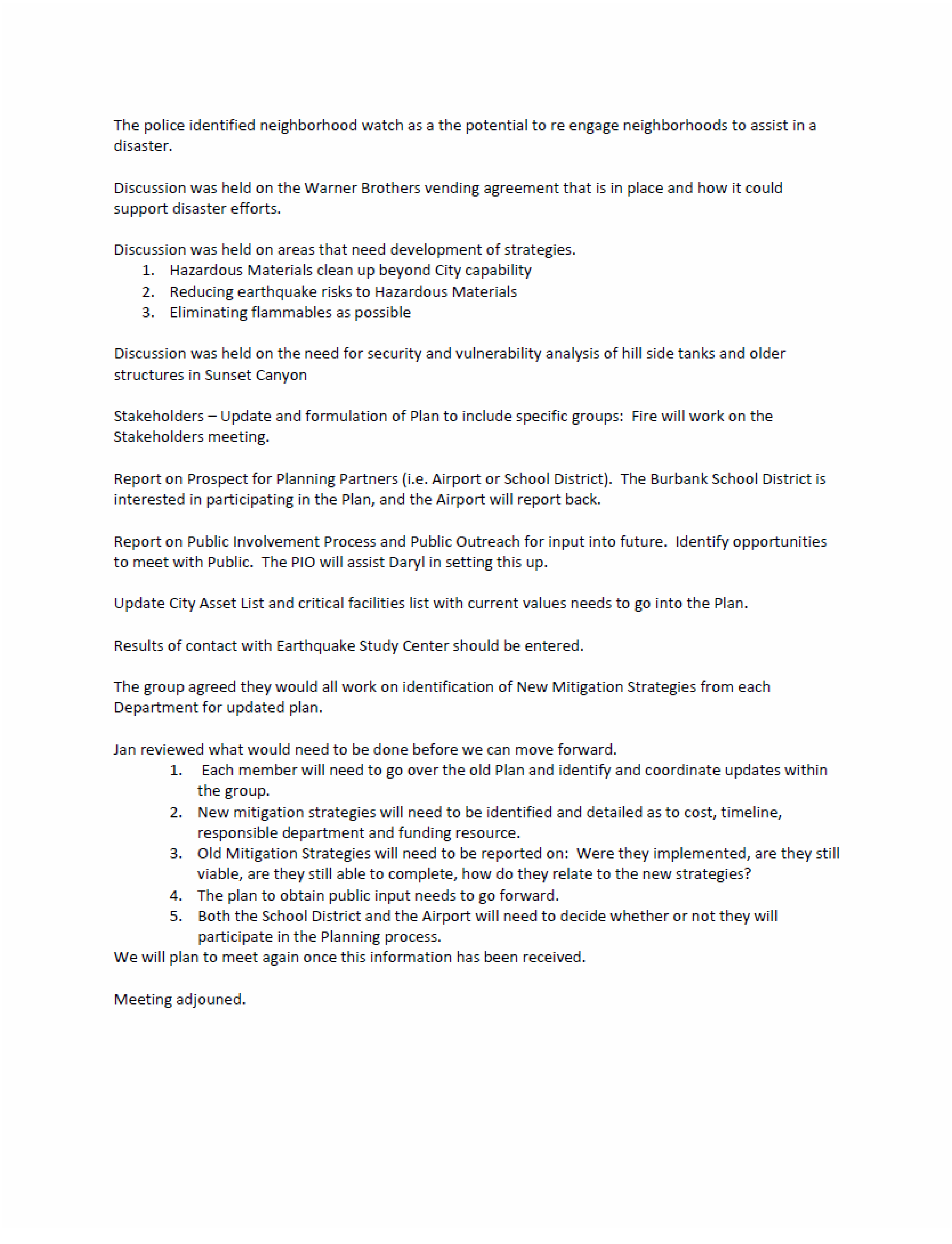
NBC has a 5 megawatt generator and Quest has a 2.5 megawatt.

The airport has some portable and backup generator capability. They have the capability to have a mobile hospital in their B-6 Parking Lot, and are served with fiber optics. They have offered to serve as a regional airport in the event of a regional disaster. They could become the entry point for resources for the County if LAX and other airport are damaged.

Discussion was held on developing a Faith-based Initiative.

1. It would need an organization to tie the churches together
2. Develop a method to coordinate resources and distribute resources
3. Identify the personnel available for a response and estimate additional personnel needed.
4. Identify community resources available.

There is a ministerial association that will work with the City Disaster Council.



The police identified neighborhood watch as a the potential to re engage neighborhoods to assist in a disaster.

Discussion was held on the Warner Brothers vending agreement that is in place and how it could support disaster efforts.

Discussion was held on areas that need development of strategies.

1. Hazardous Materials clean up beyond City capability
2. Reducing earthquake risks to Hazardous Materials
3. Eliminating flammables as possible

Discussion was held on the need for security and vulnerability analysis of hill side tanks and older structures in Sunset Canyon

Stakeholders – Update and formulation of Plan to include specific groups: Fire will work on the Stakeholders meeting.

Report on Prospect for Planning Partners (i.e. Airport or School District). The Burbank School District is interested in participating in the Plan, and the Airport will report back.

Report on Public Involvement Process and Public Outreach for input into future. Identify opportunities to meet with Public. The PIO will assist Daryl in setting this up.

Update City Asset List and critical facilities list with current values needs to go into the Plan.

Results of contact with Earthquake Study Center should be entered.

The group agreed they would all work on identification of New Mitigation Strategies from each Department for updated plan.

Jan reviewed what would need to be done before we can move forward.

1. Each member will need to go over the old Plan and identify and coordinate updates within the group.
2. New mitigation strategies will need to be identified and detailed as to cost, timeline, responsible department and funding resource.
3. Old Mitigation Strategies will need to be reported on: Were they implemented, are they still viable, are they still able to complete, how do they relate to the new strategies?
4. The plan to obtain public input needs to go forward.
5. Both the School District and the Airport will need to decide whether or not they will participate in the Planning process.

We will plan to meet again once this information has been received.

Meeting adjouned.

Burbank Hazard Mitigation Plan Update
Meeting
November 3, 2009

Present at the Meeting:

Daryl Isozaki	Fire	disozaki@ci.burbank.ca.us	818 968 2766
Stacey Holderbach	Public Works	sholderbach@ci.burbank.ca.us	818 238 3905
Michael Forbes	CDD/Planning	mforbes@ci.burbank.ca.us	818 238 5250
Jody Hidey	Library	Jhidey@ci.burbank.ca.us	818 238 5567
Gwen Indermill	PRCS	Gindermille@ci.burbank.ca.us	818 238 5334
Tom Lim	CDD/BLDG	Tlim@ci.burbank.ca.us	818 238 5239

The meeting was called to order at 0905 hrs, at Burbank Fire Department Headquarters, by Chairperson Daryl Isozaki

Discussion:

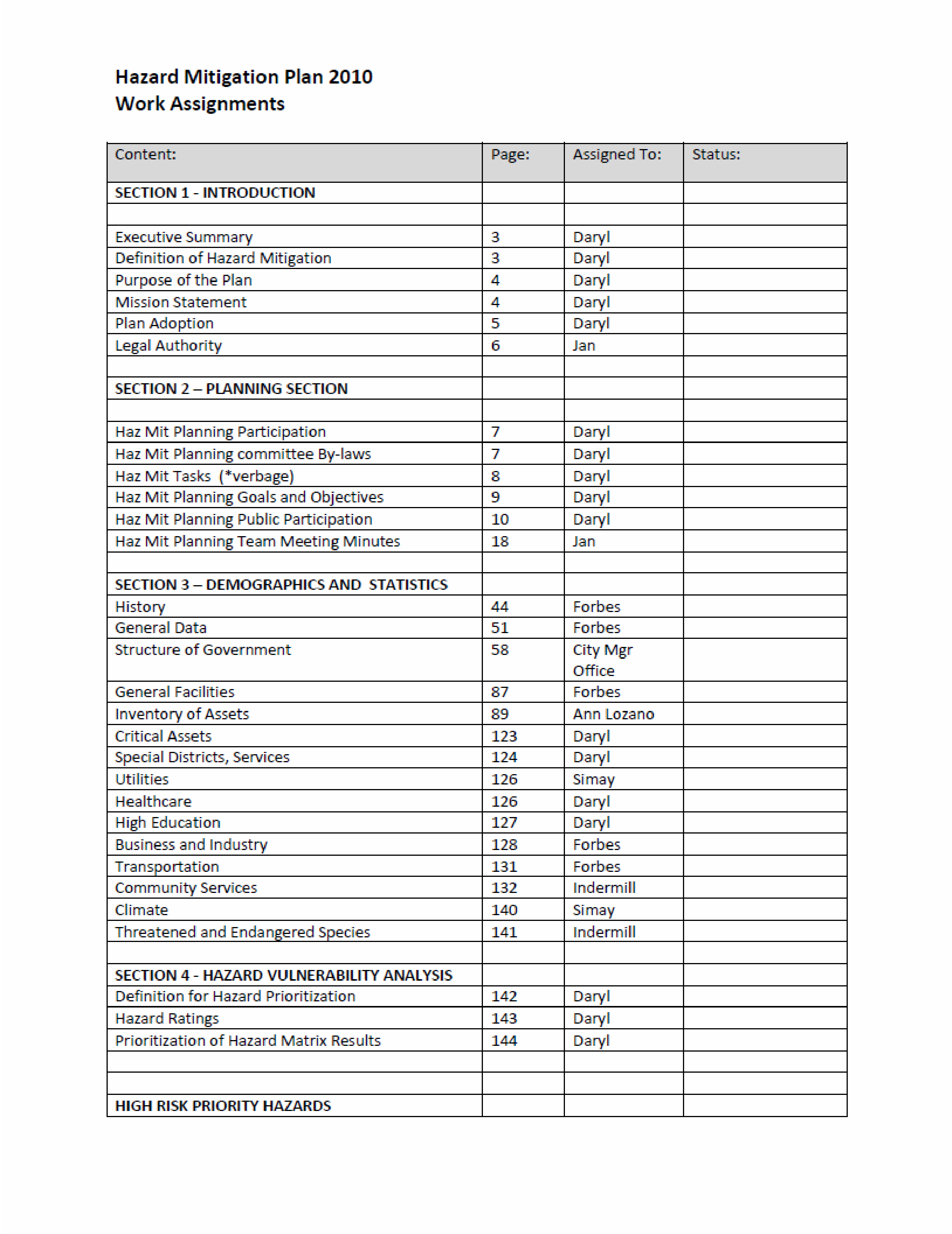
The purpose of this meeting was to assign sections in the Hazard Mitigation Plan to the steering committee member that was most versed with the subject matter. All assignments were made during this meeting to complete the work assignments matrix noted below.

With the assignments made, it was agreed that updates to the existing HMP plan would be made on a working draft. This working draft was to reside in the City network, drive "I," under HMP 2010. All corrections were tracked in order to maintain the information in the original document while tracking the changes and updates.

The working draft, once updated, would be sent to the contractor to compile and edit all new updates and corrections. A date to invite the contractor to review the draft plan with the Steering Committee would be made at a future date.

Meeting adjourned at 1100 hrs.

ATTACHMENT 1

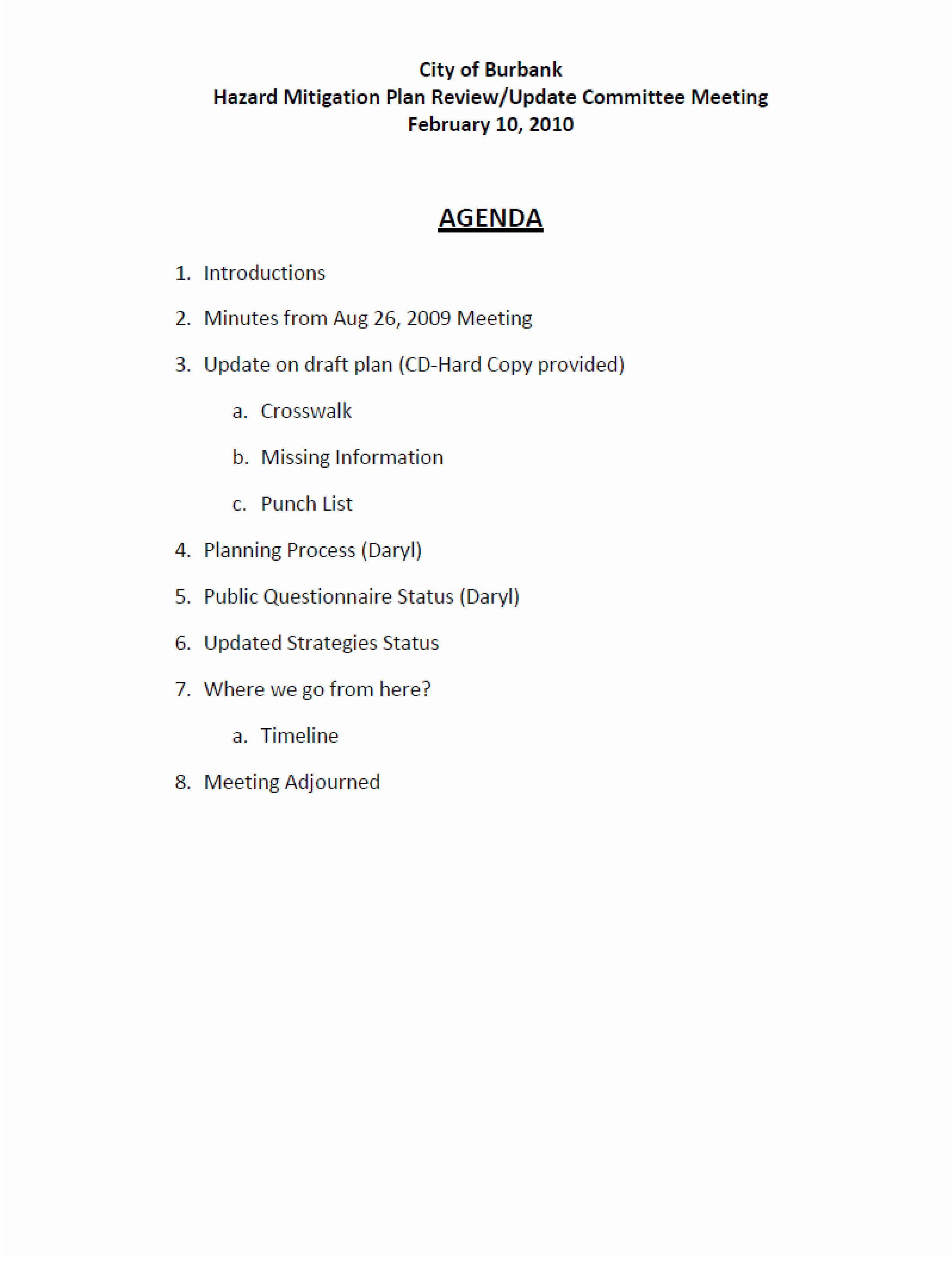


Hazard Mitigation Plan 2010
Work Assignments

Content:	Page:	Assigned To:	Status:
SECTION 1 - INTRODUCTION			
Executive Summary	3	Daryl	
Definition of Hazard Mitigation	3	Daryl	
Purpose of the Plan	4	Daryl	
Mission Statement	4	Daryl	
Plan Adoption	5	Daryl	
Legal Authority	6	Jan	
SECTION 2 – PLANNING SECTION			
Haz Mit Planning Participation	7	Daryl	
Haz Mit Planning committee By-laws	7	Daryl	
Haz Mit Tasks (*verbage)	8	Daryl	
Haz Mit Planning Goals and Objectives	9	Daryl	
Haz Mit Planning Public Participation	10	Daryl	
Haz Mit Planning Team Meeting Minutes	18	Jan	
SECTION 3 – DEMOGRAPHICS AND STATISTICS			
History	44	Forbes	
General Data	51	Forbes	
Structure of Government	58	City Mgr Office	
General Facilities	87	Forbes	
Inventory of Assets	89	Ann Lozano	
Critical Assets	123	Daryl	
Special Districts, Services	124	Daryl	
Utilities	126	Simay	
Healthcare	126	Daryl	
High Education	127	Daryl	
Business and Industry	128	Forbes	
Transportation	131	Forbes	
Community Services	132	Indermill	
Climate	140	Simay	
Threatened and Endangered Species	141	Indermill	
SECTION 4 - HAZARD VULNERABILITY ANALYSIS			
Definition for Hazard Prioritization	142	Daryl	
Hazard Ratings	143	Daryl	
Prioritization of Hazard Matrix Results	144	Daryl	
HIGH RISK PRIORITY HAZARDS			

Earthquake	145	Daryl	
Transportation Accidents	204	Daryl	
Transportation Loss	210	Daryl	
Wildland/Urban Interface Fires	216	Daryl	
Terrorism & Weapons of Mass Destruction	235	Daryl	
Utility Loss/Disruption/Substation	243	Simay	
Water/Waste Water Disruption	247	BWP	
Hazardous Materials Incidents	269	Daryl	
Information Disruption / Losses	New	Penny F. / IT	
Aviation Disasters	276	Forbes	
MODERATE RISK PRIORITY HAZARDS			
Severe Weather/Destructive Winds	283	Simay	
Explosions	294	Sean Kelley	
Economic Disruption	297	Forbes	
Floods	301	Public Works	
Civil Unrest	303	Sean Kelley	
LOW RISK PRIORITY HAZARDS			
Dam Failure	313	Stacey Holderbach	
Special Events	314	Daryl	
Sinkholes	315	Simay	
Volcanic Activity	316	Daryl	
Drought	317	Daryl	
Estimated Losses (Hazus Study)	318	Jan	
SECTION 5 – HAZARD MITIGATION STRATEGIES			
Mitigation Goals and Objectives	321	Daryl	
Identification and Prioritization of Mitigation Actions	321	Daryl	
Strategy Synopsis Matrix	322	Jan	
Strategies	324	All	
SECTION 6 – FUTURE ACTIONS AND GOALS			
Long-term Goals, Objectives, and Actions	364	Daryl	
Capabilities Assessment	370	Forbes	
SECTION 7 – PLAN MAINTENANCE			
Monitoring, Evaluating, & Updating	373	HMP Committee	
Continued Public Involvement	373	Emerg. Mgt / PIO	
Glossary of Acronyms	375	Daryl	
Appendix 1 BUSD		Cynthia Gonzales (BUSD)	

ATTACHMENT 1



City of Burbank
Hazard Mitigation Plan Review/Update Committee Meeting
February 10, 2010

AGENDA

1. Introductions
2. Minutes from Aug 26, 2009 Meeting
3. Update on draft plan (CD-Hard Copy provided)
    a. Crosswalk
    b. Missing Information
    c. Punch List
4. Planning Process (Daryl)
5. Public Questionnaire Status (Daryl)
6. Updated Strategies Status
7. Where we go from here?
    a. Timeline
8. Meeting Adjourned

City of Burbank Hazard Mitigation Planning Committee Meeting

February 10, 2010

In attendance:

NAME	TITLE	PHONE	E-MAIL
Penny Forbes	IT Sr Analyst	x-5087	pforbes@ci.burbank.ca.us
Edward Skvarna	BH Airport Police Chief	818 402 4798	eskvarna@bur.org
Stacey Holdenbach	Pub Works Adm Analyst	x3905	sholderbach@ci.burbank.ca.us
Michael Forbes	Dep City Planner	x5250	mforbes@ci.burbank.ca.us
Sean Corrigan	City Engineer	x3804	scorrigan@ci.burbank.ca.us
Sean Kelley	Burbank PD Support Svcs	x3391	skelley@ci.burbank.ca.us
Tom Lim	Bldg Dept Plan Check Eng	x5239	tlim@ci.burbank.ca.us
Cynthia Gonzales	BUSD Emerg Coord	818 729 4584	cynthai.gonzales@burbankusd.org
Joanne Koch	Asst Mgmt Svcs Dir	x5010	jkoch@ci.burbank.ca.us
Gwen Indermitt	Rec Svcs Mgr	x5353	gindermitt@ci.burbank.ca.us
Rich Rogala	Consultant	707 374 6529	rich@dimensionsui.com

The meeting was called to order at 0905.

INTRODUCTIONS

The minutes from the August 26, 2009 meeting were read and approved with the following corrections:

1. E-mail address for Marlene Burton should read "Mburton@burbankusd.org"
2. First line under "Discussion" should read Michael Forbes vice Penny Forbes

Daryl informed the committee that the goal of this meeting is to review the work accomplished on the Plan Update to this point and to identify what needs to be done to finish it.

Chief Skvarna recommended that as a mitigation effort, resources from studios and the airport should be identified available for response and prevention.

Rich Rogala introduced the latest draft version of the plan. Some formatting was changed to meet the new compliance requirements. All information provided to him has been entered in this edition, Daryl said that he will make a pdf of the word document and put it on the "I" drive for everyone to review. Changes should be made via separate document and placed in the individual's personal folder on the "I" drive whereupon they will be forwarded to Rich for formatting and entry into the plan.

DISCUSSION

Rich discussed the following after reviewing this version of the plan using the new FEMA Crosswalk:

1. Clarify Public Involvement
    a. Discussion: Daryl said that the new questionnaire will be completed and put up on the website as well as made available by hard copy at public buildings
    b. Two public meetings are scheduled on Feb 15 and 18 to be held from 6-7 PM in the Burbank Fire Training Building. Daryl has prepared a PowerPoint slide

presentation to show the goals of the LHMP, There will be question and answer sessions after each presentation.
    c. Announcements for the meetings will be sent in Utility bills to 40,000+ residents
    d. Government Access Cable Channel 6 will also be used to announce the meetings and the availability of questionnaires
    e. Daryl will provide results of meetings and surveys by 2/28 to be entered in the plan by Rich

2. Opportunities for neighboring communities, agencies, businesses, academia, nonprofits and other interested parties
    a. The following have been and plan to be included in seeking input for this edition of the plan
        i. Bob Hope Airport
        ii. Burbank Unified School District
        iii. Saint Joseph Hospital
        iv. Burbank Ministry Group
        v. City of Glendale
        vi. City of North Hollywood
        vii. Metro
        viii. CALTRANS
    b. Daryl will provide documentation to be entered into the plan by Rich
3. Review and incorporate information from other plans, studies, reports, technical data.
    a. Daryl assigned each department the responsibility to provide information contained in these documents that would be pertinent to the LHMP.
    b. The information will be forwarded to Rich to be added to the appropriate sections of the plan
    c. The committee identified the following:
        i. HAZUS for Great California Shakeout drill conducted in 2009
        ii. Landslide and liquefaction map updates
        iii. Reference to the Multi-hazard Functional Plan
        iv. Updated fire maps
        v. Information from the City General Plan (Safety and Land Use Elements). {Rich will research this and add the information pertinent to the LHMP}
        vi. Studies on redevelopment
4. Repetitive Loss Properties
    a. Rich said that the crosswalk requires the plan to address repetitive loss properties for all the High and Moderate Risk natural hazards identified by the committee. This needs to be addressed in two categories… potential for repetitive loss for each natural hazard and historical repetitive loss for each natural hazard.
    b. Daryl assigned the responsibility to identify these properties to each of the persons on the committee who had responsibility for updating the risk the first go-round.
    c. The information will be passed to Rich for inclusion into the LHMP
5. Rich said that the crosswalk also requires that the jurisdiction look at specific types and numbers of existing and future buildings regarding risk vulnerability. This goes for not only flood damage, but damage from all other natural hazards identified as high risk and moderate risk priorities.
6. Land use and development trends with regard to risk and vulnerability

   a. The City Planner said that since Burbank is ‘built out’ there would be little input for development, however there are regulations (pertaining to obtaining permits) for building along the hillsides and in areas where fire hazards are high.
   b. Information regarding land use and development with regard to the LHMP will be sent to Rich to be incorporated
7. Other planning mechanisms available for incorporation of mitigation requirements. Identifying the process for incorporation and how they are incorporated.
   a. Rich explained that we need to show how other plans (e.g. General Plan, etc) benefit from the information contained in the LHMP. Example: Does the Land Use and Development Element of the General Plan make reference to the LHMP in determining what restrictions to place in areas defined as high and moderate risk?
   b. This information will be passed on to Rich for incorporation

Public Works said that there are substantial grants pending the update of the plan. This generated a discussion on time line for getting the plan completed and into the system for the approval process, It was decided that committee members having changes, additions to the newest draft of the plan get the information to Daryl by 2/24. Daryl will forward the information to Rich in a bundle whereupon Rich will begin entering. Rich will get the completed document to Daryl prior to 3/9 when it will be distributed to the City Council members for study and then consideration for adoption at the 3/16 council meeting.

The committee decided to add Pandemic as a risk in the LHMP. Daryl will write up the analysis and forward it to Rich for inclusion as well as identify what priority it will fall under.

Meeting adjourned at 1050.

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
September 23, 2010

AGENDA

1. Introductions
2. Review crosswalk comments
3. New Consultant - Ken Goettel
4. Timeline
    a. Revision Period
    b. Submission
5. Next meeting?
6. Meeting Adjourned

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
September 23, 2010

Meeting Notes

This committee meeting was the first meeting after receipt of detailed review comments from FEMA on the March 10, 2010 draft plan and also the first meeting with Kenneth Goettel, a consultant under contract to help the city finish the mitigation plan.

Goettel presented a detailed review of the 2005 Mitigation Plan and the March 2010 draft of the updated plan and noted the following significant deficiencies in both plans:

- Much of the hazard, vulnerability and risk data are outdated and/or incomplete. Much of the data are generic to Southern California and not Burbank-specific.
- The plan is massive and contains much material which is only marginally useful or extraneous for a mitigation plan. The size and organization of the plan make it difficult to access important information, for both technical and non-technical readers.
- The mitigation action items mostly focus on emergency planning and response activities, with few items that address specific mitigation measures for identified high risk situations for critical or important buildings or infrastructure in Burbank.
- The plan includes many human-caused hazards for which there are few, if any feasible mitigation measures. Dealing with human-caused hazards is predominantly in the bailiwick of emergency planning, rather than mitigation planning.

After extensive discussion, the consensus decision of the Mitigation Planning Committee was to refocus the 2011 Burbank Hazard Mitigation Plan on natural hazards only with the following major revisions/enhancements to the March 2010 draft:

- Update the hazard information for each of the major natural hazards,
- Refine the vulnerability and risk assessments for each of the major natural hazards,
- Redefine critical facilities with more specificity,
- Refocus and reprioritize hazard mitigation goals, objectives, and action items to emphasize pragmatic, implementable measures that address the highest risk situations in Burbank and that will significantly reduce risk.

- Identify specific mitigation projects with the best likelihood of garnering FEMA mitigation project grants for implementation, and
- Improve the usability and accessibility of the Burbank Hazard Mitigation Plan by re-organizing the plan and removing materials not essential for mitigation planning.

The primary objectives for this substantial revision of the draft plan were:

- Meet FEMA's planning requirements, including FEMA's required and recommended revisions submitted in the Crosswalk Review of the March 2010 draft, and

Make the 2011 Burbank Hazard Mitigation Plan as pragmatic, useful and accessible to both technical and non-technical readers

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: September 23, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	**Participant**	**Present**
Fire	Ray Krakowski	X
Fire	Daryl Isozaki	X
Fire	Sana Arakelian	X
Police	Armen Dermenjian	X
Police	Carlos Gomez	
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	
Water & Power	Bill Mace	
Water & Power	Albert Lopez	
Water & Power	Devin Burns	
Management Services	Allan Amico	X
Information Technology	Penny Forbes	
Parks, Recreation & Community Services	Gwen Indermill	X
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	X
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	X

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
October 5, 2010

AGENDA

1. Introductions
2. Revision Plan - Ken Goettel
    a. Layout
    b. Priority Items
    c. Plan progress
3. Cross referencing “Crosswalk” with revision plan for comments
4. Channeling update information to consultant
    d. Stacey Holderbach – Primary
    e. Sean Corrigan & Daryl Isozaki - CC
5. Timeline
6. Next meeting?
7. Meeting Adjourned

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
October 5, 2010

Meeting Notes

This meeting focused on review of the plan revisions to be made, including the layout, prioritizing hazards, and updating progress of action items.

Committee also updated the revised “punchlist” along with the “crosswalk” with items accomplished and those yet to be achieved.

Committee assigned the lead “point of contact” person to be Stacey Holderbach and indicated Sean Corrigan and Daryl Isozaki to be copied on all submissions.

A timeline for completion of the revision was established, along with the next meeting date of 10/26/10.

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: October 5, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	X
Fire	Daryl Isozaki	X
Fire	Sana Arakelian	X
Police	Armen Dermenjian	X
Police	Carlos Gomez	
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	
Water & Power	Bill Mace	
Water & Power	Albert Lopez	
Water & Power	Devin Burns	
Management Services	Allan Amico	X
Information Technology	Penny Forbes	X
Parks, Recreation & Community Services	Gwen Indermill	X
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	X
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Jennifer Kaplan	X
Burbank Unified School District	Chuck Colgan	
Goettel & Associates Inc.	Kenneth Goettel	

City of Burbank
Hazard Mitigation Plan Committee Meeting
October 26, 2010

AGENDA

1. Introductions
2. Progress Report
3. Needed Information – Rundown from Ken Goettel
4. #38 – Implementation of 2005 Action Items - All
5. GIS Mapping
6. Channeling update information to consultant
    f. Stacey Holderbach
7. Timeline -
8. Next meeting?
9. Meeting Adjourned

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
October 26, 2010

Meeting Notes

Daryl Isozaki provided the committee with a progress report on the revisions made so far and noted items still outstanding.

The committee discussed the need for GIS mapping services to be provided by IT for the various maps to be added/updated for the revised HMP.

A reminder to funnel all information through Stacey Holderbach was given and the timeline was reviewed and adjusted to allow for the larger than expected amount of info-gathering that needed to be done.

The next meeting was established for 11/16/10.

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: October 26, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	
Fire	Daryl Isozaki	X
Fire	Sana Arakelian	
Police	Armen Dermenjian	X
Police	Carlos Gomez	
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	
Water & Power	Matt Elsner	X
Water & Power	Albert Lopez	
Water & Power	Devin Burns	X
Management Services	Allan Amico	X
Information Technology	Penny Forbes	X
Parks, Recreation & Community Services	Gwen Indermill	X
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
November 16, 2010

AGENDA

1. Introductions
2. Progress Report
3. Needed Information – Rundown from Ken Goettel
4. Review 2005 action items – What have we pursued?
5. 2005 Strategy review – What should we keep?
6. Public participation – Direct and indirect participation
7. Next meeting?
8. Meeting Adjourned

City of Burbank
Hazard Mitigation Plan Committee Meeting
November 16, 2010

Meeting Notes

Daryl Isozaki provided the committee with a progress report on the revisions made so far and outstanding items still needed.

A comprehensive review of the 2005 action items was performed, indicating which had been completed, which were still in progress and which were no longer necessary.

Committee discussed public participation (surveys, public notices, council items) on the action items.

Committee discussed whether or not to include properties outside Burbank in the HMP and chose not to do so.

The next meeting was established for 12/2/10.

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: November 16, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	
Fire	Daryl Isozaki	X
Fire	Sana Arakelian	
Police	Armen Dermenjian	
Police	Carlos Gomez	X
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	X
Water & Power	Bill Mace	
Water & Power	Albert Lopez	X
Water & Power	Devin Burns	X
Management Services	Allan Amico	X
Information Technology	Penny Forbes	X
Parks, Recreation & Community Services	Gwen Indermill	X
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
December 2, 2010

AGENDA

1. Introductions
2. Progress Report
3. Review Chapters 7, 8, & 9
4. Action Items
5. Public participation – Direct and indirect participation
6. Meeting with Ken Goettel – Dec. 21 or 22???
7. Meeting Adjourned

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: December 2, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	
Fire	Daryl Isozaki	X
Fire	Sana Arakelian	
Police	Armen Dermenjian	
Police	Carlos Gomez	
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	
Water & Power	Bill Mace	
Water & Power	Albert Lopez	X
Water & Power	Devin Burns	X
Management Services	Allan Amico	X
Information Technology	Penny Forbes	X
Parks, Recreation & Community Services	Gwen Indermill	
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	

City of Burbank
Hazard Mitigation Plan Committee Meeting
December 2, 2010

Meeting Notes

Daryl Isozaki started off with committee member introductions and introduced his successor, Jeff Howe.

Daryl provided a progress report for the committee on the revisions made so far and outstanding items still needed.

The committee reviewed chapters 7, 8, & 9 of the revised HMP and assigned tasks to various committee members for review and info-gathering.

The committee discussed updating the action items to reflect only mitigation efforts for natural hazards and provided updates for 2005 action items.

Public participation efforts were discussed in relation to completion of the action items.

The next meeting to be held with the presence of the consultant was set for 12/21/10. The next meeting for the committee was planned for 12/14/10.

City of Burbank
Hazard Mitigation Plan Committee Meeting
December 14, 2010

AGENDA

1. Introductions
2. Progress Report
3. Review Chapters 6 (Earthquakes)
4. Action Items
5. Public participation – Direct and indirect participation
6. Meeting with Ken Goettel – Dec. 21 @ 9 a.m., Executive Conference Room
7. Meeting Adjourned

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
December 14, 2010

Meeting Notes

Daryl Isozaki provided a progress report for the committee on the revisions made so far and outstanding items still needed.

The committee reviewed the earthquake chapter and assigned tasks for info-gathering and review.

2005 and 2010 Action Items were discussed and tasks were assigned to various members to determine the progress of 2005 items and to review/refine 2010 items.

Committee discussed efforts to include the public involvement in the HMP and the various Action items.

The committee was reminded of the next meeting for 12/21/10 with the consultant.

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: December 14, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	
Fire	Daryl Isozaki	
Fire	Sana Arakelian	
Police	Armen Dermenjian	
Police	Carlos Gomez	X
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	
Water & Power	Bill Mace	
Water & Power	Albert Lopez	X
Water & Power	Devin Burns	
Management Services	Allan Amico	
Information Technology	Penny Forbes	
Parks, Recreation & Community Services	Gwen Indermill	
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
December 21, 2010

AGENDA

1. Introductions
2. Ken Goettel – Plan Status
3. Assign Punchlist items
4. Review Chapters
5. Action Items - Discussion
6. Meeting Adjourned

ATTACHMENT 1

City of Burbank
Hazard Mitigation Plan Committee Meeting
December 21, 2011

Meeting Notes

This meeting focused on discussions of draft materials submitted by the consultant to the committee, including draft chapters for each hazard, lists of critical facilities, status-update for the action items in the 2005 mitigation plan and others.

The meeting also included a review of the consultant's "punchlist" of data items needed from the committee, including assignment of each item to a committee member with subject matter expertise.

> A partial draft of updated action items was also discussed, with additions and corrections made by committee members.

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: December 21, 2010

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	
Fire	Daryl Isozaki	
Fire	Sana Arakelian	
Police	Armen Dermenjian	
Police	Carlos Gomez	X
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	X
Water & Power	Bill Mace	
Water & Power	Albert Lopez	X
Water & Power	Devin Burns	
Management Services	Allan Amico	X
Information Technology	Penny Forbes	
Parks, Recreation & Community Services	Gwen Indermill	
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	X

City of Burbank
Hazard Mitigation Plan Committee Meeting
February 1, 2011

AGENDA

1. Introductions
2. Ken Goettel (Consultant) – Plan Status
3. Outstanding Punchlist items
4. Action Items - Inputs
5. Timeline
    a. Public Meeting
    b. Plan Review Inputs
6. Public Meeting Powerpoint
7. Submission to Cal-EMA - FEMA
8. Adjournment

City of Burbank
Hazard Mitigation Plan Committee Meeting
February 1, 2011

Meeting Notes

This meeting included four main items:

1) The consultant presented a brief status summary of the various parts of the draft mitigation plan.

2) The consultant reviewed and updated the “punchlist” of data items, with remaining tasks assigned to specific committee members.

3) The committee reviewed, discussed and refined the draft list of action items.

4) The Next Steps in the mitigation planning process were discussed, including:

    a. Public outreach approaches, including posting the plan on the City’s website and e-mail notices to stakeholders.

    b. Possible dates for the next public meeting were discussed, and

    c. The consultant reviewed the steps in submitting the draft final plan to Cal-EMA and FEMA for re-review.

ATTACHMENT 1

CITY OF BURBANK
Office of Emergency Services

Date: February 1, 2011

Subject: Hazard Mitigation Plan 2011 Update - Committee Meeting

Department	Participant	Present
Fire	Ray Krakowski	X
Fire	Daryl Isozaki	X
Fire	Sana Arakelian	
Fire	Jeff Howe	X
Police	Armen Dermenjian	
Police	Carlos Gomez	X
Community Development	Tom Sloan	
Community Development	Tom Lim	X
Community Development	Michael Forbes	X
Public Works	Sean Corrigan	X
Public Works	Stacey Holderbach	X
Water & Power	Jorge Somoano	X
Water & Power	Bill Mace	
Water & Power	Albert Lopez	X
Water & Power	Devin Burns	
Management Services	Allan Amico	X
Information Technology	Penny Forbes	
Parks, Recreation & Community Services	Gwen Indermill	X
City Manager's Office	Krista Dietrich	
Public Information Office	Cinda Cates	
Public Information Office	Keith Sterling	
City Attorney's Office	Carolyn Barnes	
Library Services	Jody Hidey	
Financial Services Department	Patrick Flynn	
Burbank Unified School District	Chuck Colgan	X
Goettel & Associates Inc.	Kenneth Goettel	X

STAKEHOLDER INTERVIEWS

Burbank Unified School District – Cynthia Gonzalez / Chuck Colgin

The Burbank Unified School District (BUSD) has been involved in the planning process since the update commenced in June 2009. Representation from the BUSD have provided input during the updating of the 2005 plan by reviewing plan sections, providing inputs on action items and participating in HMP Steering Committee meetings for the 2011 plan. The BUSD is currently in the process of updating their HMP with Goettel & Associates Inc., the contractor hired by the City of Burbank. Updated hazard information from the City's mitigation plan is being included in the BUSD Hazard Mitigation Plan.

Bob Hope Airport – John Scanlon

The Bob Hope Airport is in the process of updating their Airport Emergency Plan (AEP). Although the AEP is essentially an emergency response plan, the hazard information will be updated and fortified using the Burbank Hazard Mitigation Plan information. The City of Burbank and the Airport continue to strengthen relations in the areas of fire prevention, emergency response, disaster preparedness, with limited emphasis on mitigation.

Burbank Ministerial Association (BMA) – Paul Clairville

Paul Clairville was very clear about the BMA's positive relationship with the Fire Department. Through the years, contact between the Fire Department and the faith based community has been very limited with the exception of emergency medical service responses and occasional public relations education.

It was outwardly stated that the faith-based community is in need of guidance in the area of disaster preparedness, in both planning and training. Basic emergency planning varies based on the church site, but in general, church facilities that have school programs, congregations, and special events have a very limited scope in their capabilities to address disasters and emergencies. With limited staff time, emergency planning experience and funding for disaster preparedness, it is very difficult for faith-based groups to develop emergency plans, implement their plans, and provide for plan maintenance.

The Office of Emergency Management has initiated discussions with the Burbank Ministerial Association regarding the development of basic emergency plans and disaster preparedness for the faith-based community. A basic emergency plan template has been provided to the BMA to provide guidance to participating churches that do not know where to start in the development of a basic preparedness and emergency plan. It was further discussed that the establishment of a structured organization of participating churches is essential to coordinate the development of community-wide disaster plans, training/education, and the procurement of equipment/supplies.

Burbank Fire Corps Volunteer Program – Eric Baumgardner

The Burbank Fire Corps Program, otherwise known as BFCP, was established by the Burbank Fire Department with three main objectives. The first and foremost objective is to educate and train the community in basic emergency and disaster preparedness. Second is to have a core group of credentialed volunteers willing and dedicated to providing service to the Burbank Fire Department and the community which it serves. Third is to provide educated and competent volunteers to augment the city's emergency resources during a significant disaster when city resources are overwhelmed.

The primary daily operational mission of BFCP is to educate and serve the community. Through this primary daily operational mission, the BFCP provides public education to the public regarding emergency and disaster preparedness as well as train and educate the public on how to take care of themselves, their family and their community following a significant event as well as provides various emergency service-related community service.

The program focuses on providing public education in structured classroom environments as well as providing informational speaking engagements at public and private venues including public education at public gatherings and other special events. The program also provides a structured training program to give volunteers the knowledge and training to provide basic response such as disaster medical and triage, basic fire suppression (with extinguishers or small diameter hand lines with a water supply other than a fire engine), basic light search and rescue as well as basic and advanced radio communications skills utilizing both commercial and amateur radio equipment.

Through its public outreach/education, the BFCP is a valuable asset to aid in educating the public in both preparedness and mitigation.

Burbank Temporary Aid – Barbara Howell

Burbank Temporary Aid (BTAC) is a community based non-profit organization that continues to strive to help create a community where the poor, working poor, and homeless are able to access the resources and services they need to move from poverty to self-sufficiency. The facility that it resides in is a relatively new remodeled facility that provides food distribution, hygienic care, and other ancillary services which include: utility bill assistance, transportation assistance, ID/license replacement program, limited medical assistance, limited emergency shelter via a voucher program with cooperating businesses in the area, shower and laundry facilities for the homeless and the holiday “Santa’s Room” gift program for needy children.

The Center is aware that their normal clientele and others in need will converge on the Center for assistance in the event of a major emergency. In an effort to maintain their ability to serve the community, the Center has considered the purchase of a portable generator for their refrigeration units for perishable goods. They have already instituted mitigation measures to their warehouse facility by anchoring shelving units throughout. Decisions to mitigate and prepare for disasters are directly related to their financial challenges in obtaining funding to operate the Center. This continues to be a daunting issue, due to the escalating number of clients without the corresponding rise in funding/donations.

Providence Saint Joseph Medical Center – Connie Lackey

The only hospital facility in the City of Burbank is Providence Saint Joseph Medical Center (PSJMC). Providence Saint Joseph Medical Center is an acute care hospital licensed for about 450 beds. The hospital facility consists of several multi-storied buildings with construction dates ranging from 1947 to 2007. The North Tower and newly completed Northeast Tower meet the most critical construction standards for seismic safety, but the older portions of the facility do not. Financial constraints have precluded the establishment of a seismic retrofit program for the facility; however a nonstructural damage mitigation program is in its infancy.

As a result of the 1971 San Fernando Earthquake, the State of California passed the 1972 Hospital Act. This act preempts the primary responsibility for hospitals from local control, and charges the state with regulatory review responsibility. Although the legislation conveys the importance of keeping a hospital facility functioning after a major earthquake, the Act does not require that a hospital remain undamaged. The design and construction standards implemented as a result of the 1972 Act are considerably more rigorous than those employed in the construction of older, pre-1972 hospitals. State law requires that general acute care hospitals be upgraded to current earthquake design standards if undergoing voluntary rehabilitation.

Hospital facilities have detailed disaster plans which deal with seismic hazards, as well as other disasters and emergencies occurring at the hospital or to which the hospital must respond. The hospital provided information re: seismic performance of their buildings which was incorporated into the 2011 update of the Burbank Hazard Mitigation Plan.

Warner Bros Studios – Jeanette Johnson

Warner Bros Studies elected not to participate in the 2011 update of the Burbank Hazard Mitigation Plan.

Burbank Older Adult Group Focus Group (includes: Senior Board, Advisory Council on Disabilities, House Committee, and senior PRCS Social Services Division staff.

The "Older Adult" population is lagging behind in the use of computer technology. It was stated that computer access is not readily available, and in many cases "Older Adults" have not embraced the advances in technology, acquired the training, or do not have the financial means to participate and therefore are less informed about various programs and information that the City releases. Traditional methods (mail, flyers, radio, television) of disseminating information are still preferred by a majority of older adults. Along the same lines, it was also suggested to consider the type of media used to disseminate the information and the languages that would best reach out to the various ethnic and "Older Adult" groups. The Joslyn Senior Center has made strides to promote computer education through the development of a computer lab which is scheduled to be completed in 2010. Access to computers will be a major benefit for Joslyn Senior Center visitors, but serving the home bound population will remain a challenge.

Social Services Division, Connect with Your Community, PIO, and Fire Department should work collaboratively to address community education issues that focus on groups that are underserved and at-risk as it relates to disaster, safety, and fire-related information. Special attention must be given to target "Older Adult" groups that have limited access to new technologies.

Communication technology barriers are a major obstacle for educating the older adult population in the City of Burbank particularly in the areas of disaster preparedness, mitigation, planning, and response. Annual presentations are well received by older adults who can attend, but that is just a small percentage of the audience that is targeted to receive needed information.

OTHER STAKEHOLDERS – DISTRIBUTION LISTS AND NOTICES

BURBANK DISASTER COUNCIL CONTACT LIST:

Name	Agency or Organization
Baumgardner, Eric	L.A. City Emergency Management
Brandel, Dusty	Board of Realtors
Bradley, Gerald	Burbank Army National Guard
Cates, Cinda	City of Burbank
Cavaglieri, Bob	NBC Universal
Chitwood, Rony Pannell	Disney
Clairville, Paul	Burbank Ministerial Association
Colgan, Chuck	Burbank Unified School District
Diaz, Mauro	Woodbury University
Dilibert, John	Burbank Police
Domingo, Marcus	Bob Hope Airport Fire
Driotez, Greg	Bob Hope Airport Fire
Dunn, Joe	Burbank Fire Corps Volunteer
Edwards, Michael	American Red Cross
Gabriel, Ed	Disney
Gallagher, Richard	Warner Bros.
Gonzales, Cynthia	Burbank Unified School District
Guzman, Ed	Charter Communications
Howe, Jeff	City of Burbank
Howell, Barbara	Burbank Temporary Aid Center
Huddleston, Jim	Charter Communications
Indermill, Gwen	City of Burbank
Isozaki, Daryl	City of Burbank
Johnson, Jack	The Gas Company
Lackey, Connie	Providence Saint Joseph Medical Center
Little, Eric	Burbank National Guard Armory
Lohne, Ingrid	Contract Svcs Administrative Trust Fund
Martinez, Henry	Charter Communication
Olson, Gary	Burbank Chamber of Commerce
Pantaleo, Gary	The Gas Company
Pearson, Judy	Aramark
Ripley, Mike	NBC Universal
Rogers, Mike	L.A. County Public Health
Ross, Francesca	Warner Bros. Records
Ruiz, Norma	Warner Bros.
Sales, Rafael	Charter Communication
Scanlon, John	Bob Hope Airport Fire
Skvarna, Edward	Bob Hope Airport Police
Shamburg, Jerry	Disney Global Crisis Management
Stapleton, Edward	Burbank Temporary Aid Center
Storbakken, Steve	Providence Saint Joseph Medical Center
Valadez, Pablo	L.A. County Fire Homeland Security
Weston, JJ	Burbank Transportation Management Org.

ATTACHMENT 1

LOCAL MITIGATION PLAN REVIEW CROSSWALK

INSTRUCTIONS FOR USING THE PLAN REVIEW CROSSWALK FOR REVIEW OF LOCAL MITIGATION PLANS

Attached is a Plan Review Crosswalk based on the ***Local Multi-Hazard Mitigation Planning Guidance***, published by FEMA in July, 2008. This Plan Review Crosswalk is consistent with the *Robert T. Stafford Disaster Relief and Emergency Assistance Act* (Stafford Act), as amended by Section 322 of the *Disaster Mitigation Act of 2000* (P.L. 106-390), the *National Flood Insurance Act of 1968,* as amended by the *National Flood Insurance Reform Act of 2004* (P.L. 108-264) and *44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning,* inclusive of all amendments through October 31, 2007.

SCORING SYSTEM
N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.
S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

When reviewing single jurisdiction plans, reviewers may want to put an N/A in the boxes for multi-jurisdictional plan requirements. When reviewing multi-jurisdictional plans, however, all elements apply. States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements. Optional matrices for assisting in the review of sections on profiling hazards, assessing vulnerability, and identifying and analyzing mitigation actions are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.:

Example

Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the **new or updated** plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?		**NOTE: Burbank's comments and documentation on changes to meet FEMA's July 28, 2010 review requirements are in GREEN.** **After careful consideration of the FEMA comments and re-review of the March 2010 draft, Burbank decided that the previous draft needed a comprehensive overhaul and reorganization to make the plan more usable for both technical and non-technical readers. This version is a complete re-write and re-organization of the previous draft. See attached cover letter for an overview of the reasons for this substantial re-write and the major enhancements included in this much improved version of Burbank's plan.**		
B. Does the **new or updated** plan address the **impact** of each hazard on the jurisdiction?				
		SUMMARY SCORE		

LOCAL MITIGATION PLAN REVIEW SUMMARY

The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

Prerequisite(s) (Check Applicable Box)	**NOT MET**	**MET**
1. Adoption by the Local Governing Body: §201.6(c)(5) OR		
2. Multi-Jurisdictional Plan Adoption: §201.6(c)(5) **AND**		
3. Multi-Jurisdictional Planning Participation: §201.6(a)(3)		

Planning Process	**N**	**S**
4. Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)		

Risk Assessment	**N**	**S**
5. Identifying Hazards: §201.6(c)(2)(i)		
6. Profiling Hazards: §201.6(c)(2)(i)		
7. Assessing Vulnerability: Overview: §201.6(c)(2)(ii)		
8. Assessing Vulnerability: Addressing Repetitive Loss Properties. §201.6(c)(2)(ii)		
9. Assessing Vulnerability: Identifying Structures, Infrastructure, and Critical Facilities: §201.6(c)(2)(ii)(B)	▨	▨
10. Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)	▨	▨
11. Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)	▨	▨
12. Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii)		

*States that have additional requirements can add them in the appropriate sections of the *Local Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Mitigation Strategy	**N**	**S**
13. Local Hazard Mitigation Goals: §201.6(c)(3)(i)		
14. Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)		
15. Identification and Analysis of Mitigation Actions: NFIP Compliance. §201.6(c)(3)(ii)		
16. Implementation of Mitigation Actions: §201.6(c)(3)(iii)		
17. Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)		

Plan Maintenance Process	**N**	**S**
18. Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(ii)		
19. Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)		
20. Continued Public Involvement: §201.6(c)(4)(iii)		

State		
Multi-jurisdictional: Letter of Commitment for each jurisdiction		
Summary of mitigation projects		
Summary of hazards		

LOCAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED ☐

See Reviewer's Comments

PLAN APPROVED ☐

ATTACHMENT 1

LOCAL MITIGATION PLAN REVIEW CROSSWALK

Local Mitigation Plan Review and Approval Status

Jurisdiction: City of Burbank	**Title of Plan: Burbank Hazard Mitigation Plan**	**Date of Plan: March 10, 2011**

Local Point of Contact: Jeff Howe	**Address:** **Burbank Fire Department** **311 East Orange Grove Ave.** **Burbank, CA 91502**
Title: Emergency Services Coordinator	
Agency: Burbank Fire Department	
Phone Number: (818) 238-3350	**E-Mail: JHowe@ci.burbank.ca.us**

State Reviewer:	**Title:**	**Date:**

FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region [Insert #]	**NOTE: Burbank's comments and documentation of the changes made to meet FEMA's review requirements and recommendations are in GREEN**	
Plan Not Approved		
Plan Approved		
Date Approved		

Jurisdiction:	**dFIRM in plan?**	**Adopted**	**Participating**	**Risk Assessment**	**Mitigation Action**	**NFIP Status**		
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**N/A**	**CRS Review Y/N**	**CRS Class**
1. City of Burbank	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**N**	**N/A**
2.									

*** Notes: Y = Participating N = Not Participating N/A = Not Mapped**

LOCAL MITIGATION PLAN REVIEW CROSSWALK

PREREQUISITE(S)

1. Adoption by the Local Governing Body

***Requirement §201.6(c)(5)**: [The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the local governing body adopted **new or updated** plan?		**Burbank's City Council adopted the draft plan on March 30, 2010. However, because the current plan is a substantial re-write of the previous draft, the final plan will be resubmitted to City Council for adoption, after FEMA review and approval.**		
B. Is supporting documentation, such as a resolution, included?				
		SUMMARY SCORE		

2. Multi-Jurisdictional Plan Adoption

***Requirement §201.6(c)(5)**: For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **new or updated** plan indicate the specific jurisdictions represented in the plan?	**N/A**			
B. For each jurisdiction, has the local governing body adopted the **new or updated** plan?	**N/A**			
C. Is supporting documentation, such as a resolution, included for each participating jurisdiction?	**N/A**			
		SUMMARY SCORE		

3. Multi-Jurisdictional Planning Participation

***Requirement §201.6(a)(3)**: Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multi-jurisdictional plans.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**N/A**			

B. Does the **new or updated** plan describe **how** each jurisdiction participated in the plan's development?	N/A			
C. Does the updated plan identify all participating jurisdictions, including new, continuing, and the jurisdictions that no longer participate in the plan?	N/A			
		SUMMARY SCORE		

PLANNING PROCESS: *§201.6(b): An open public involvement process is essential to the development of an effective plan.*

4. Documentation of the Planning Process

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process* ***shall*** *include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan* ***shall*** *document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

			SCORE	
Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**N**	**S**
A. Does the plan provide a narrative description of the process followed to prepare the **new or updated** plan?	**Chapter 3, Section 3.3, pp. 3-2 to 3-10**	**Chapter 3 has a detailed narrative description of the update process. Appendix 3 contains over 50 pages of supplemental documentation of the update process.**		
B. Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?	**Chapter 3, Section 3.3, pp. 3-2 to 3-10**	**Upon receipt of FEMA's July 2010 review comments and a "from scratch" review of the entire draft mitigation plan, the planning committee realized that the March 2010 update of the 2005 plan was still outdated and needed a comprehensive overhaul and reorganization. In September 2010, Burbank contracted with a new consultant and began a broad update and improvement of the previous draft. The March 2011 draft is nearly a complete re-write, with updated hazard, vulnerability and risk assessments for each hazard, along with updated mitigation goals, objectives and action items. This new update incorporates all of FEMA's required revisions and nearly all of FEMA's recommended revisions.**		
C. Does the **new or updated** plan indicate who was involved in the **current** planning process? (For example, who led the development at the staff level and	**Chapter 3, Section 3.3, pp. 3-2 to 3-5**	**The comprehensive update process is documented in Chapter 3 and Appendix 3. The basis for forming the Hazard Mitigation Planning Team (HMPT), the members of**		

4. Documentation of the Planning Process

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process* ***shall*** *include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan* ***shall*** *document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

	Location in the		**SCORE**	
were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, *etc.*?)		**the HMPT, and their roles and responsibilities are described in pp. 3-2 to 3.5.**		
D. Does the **new or updated** plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)	**Chapter 3 and Appendix 3**	**Need response to FEMA's required revisions:** **A paragraph noting the public participation in the two public workshops and their major concerns has been added on page 3-8.** **A Spanish questionnaire was used in the 2010-2011 update and a copy is provided in Appendix 3 (p. A3-3)**		
E. **Does the new or updated plan discuss the** opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?	**Chapter 3 and Appendix 3**	**Stakeholders interviewed are listed in Section 3.4.4 (Page 3-10, with summary notes included in Appendix 3. Outreach efforts for other stakeholders are described in Section 3.4.5 (Page 3-10), with distribution lists and notices included in Appendix 3.**		
F. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?	**Chapter 5, Section 5.3.2 (pp. 5-2 – 5-3)**	**Knowledge transfer works in two directions: 1) the updated hazard and vulnerability information in the 2011 update of Burbank's Mitigation Plan will be incorporated into the other plans listed in the section and 2) Information in existing plans, studies, reports and technical information was incorporated into the mitigation plan as described in Section 5.3.2.**		
		SUMMARY SCORE		

RISK ASSESSMENT: *§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

5. Identifying Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the updated plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?	**Chapter 1, Section 1.3, pp. 1-2 and 1-3**	**As noted earlier and in the cover letter which accompanies this annotated Crosswalk, Burbank has completely revised the mitigation plan to focus on the natural hazards which pose the greatest risk to Burbank: Earthquakes, Wildland/Urban Interface Fires, Landslides/Mudslides, Floods, Windstorms and Drought. Other natural hazards which pose minimal or nil risk are briefly addressed in Chapter 12, along with human-caused hazards.** **The relative prioritization of hazards (Table 1.3, page 1-11) is based on a technical evaluation of hazards: the frequency and consequences of events for each hazard which were combined semi-quantitatively. The rankings of relative risk reflect approximate rankings of expected annual damages for the full range of events for each hazard. Clearly, earthquakes and fires pose the greatest risk to Burbank. The other four natural hazards pose substantially less risk because the effects are localized (landslides and floods) or the effects are generally minor (windstorms) or manageable by conservation measures (drought).** **The 2005 plan and the March 2010 update draft included numerous human-caused hazards. However, upon re-consideration, the planning team decided to focus the 2011 update on the major natural hazards. The human-caused hazards are dealt with in Burbank's emergency planning and emergency response planning more logically and more effectively than in the mitigation plan. Furthermore, inclusion of human-caused hazards is not required per FEMA's mitigation planning guidance.**		

B. Does the **new or updated** plan include **a description** of the types of **all natural hazards** that affect the jurisdiction?		**Burbank is confident that the relative prioritization of hazards as discussed above accurately reflects the relative risk to Burbank posed by each of the natural hazards. We did not use a "point system" based on categories of historical occurrences, ranges of frequencies of occurrence, percent of population affected and other sometimes used categories because such parameters tend to overweight hazards which occur frequency (but with minor damages) or hazards which affect the entire city (but with minor damages) and underweight hazards such as earthquakes and wildland/urban interface fires which may have devastating consequences, even if the frequency is low.**		
		SUMMARY SCORE		

6. Profiling Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment* ***shall*** *include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan* ***shall*** *include information on previous occurrences of hazard events and on the probability of future hazard events.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** **N**	 **S**
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Chapter 1, Section 1.3, pp. 1-2 and 1-3**	**The FEMA reviewer's comments that the hazard data and maps were outdated in the March 2010 draft are completely true. As described in Chapter 1, we have completely updated the hazard information for each of the major natural hazards included in the 2011 draft. See Chapters 6 to 12 for detailed information on each hazard. Each of the major hazards is now in a separate chapter which includes the hazard, vulnerability and risk evaluations because we believe this makes the information more accessible to the reader.** **NOTE: the CGS SHZM map for Burbank is shown in Chapter 6 (p. 6-12). However, this map is from 1999 and does not include the latest ground water data which substantially affect the liquefaction potential. As discussed on page 6-13, the areas within Burbank with high liquefaction potential are likely much smaller than suggested by the 1999 map.**		
B. Does the risk assessment identify the **location** (*i.e.*, geographic area affected) of each natural hazard addressed in the **new or updated** plan?	**Chapters 6 to 11.**	**The updated maps are all in color to make them much easier to read and most of the maps include streets which make it apparent which parts of Burbank are subject to the**		

		various hazards. **Earthquakes, windstorms and drought are recognized as hazards which may affect the entire city, while floods, fires and landslides are recognized as hazards which affect only portions of the city.**		
C. Does the risk assessment identify the **extent** (*i.e.*, magnitude or severity) of each hazard addressed in the **new or updated** plan?	**Yes in above chapters.**	**Quantitative hazard data are included for all of the natural hazards, to the extent data are available, including windstorms and drought. See Chapters 6 to 11.**		
D. Does the plan provide information on **previous occurrences** of each hazard addressed in the **new or updated** plan?	**Chapters 6 to 11 to the extent historical events are documented**	**Previous occurrences of disaster events are included for each hazard.** **Previous flood events in Burbank are discussed in Section 9.2, pp. 9-1 and 9-2. There have been no major floods since the LA County flood control infrastructure was built and upgraded. Minor stormwater drainage flooding is discussed in Section 9.3 – p. 9-9**		
E. Does the plan include the **probability of future events** (*i.e.*, chance of occurrence) for each hazard addressed in the **new or updated** plan?	**Chapters 6 to11 to the extent that sufficient hazard data exist**	**The probability of future droughts is discussed in Sections 11.2 Variability and Long Term Changes in Water Supply and 11.4 Probability of Future Droughts.** **Volcanic hazards are minimal for Burbank, limited to a small possibility of ash falls, and are briefly addressed in Chapter 12 Other Hazards.**		
		SUMMARY SCORE		

7. Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Chapters 2, 4 and 6 to 11.**	**The hazard, vulnerability and risk assessments have been completely updated for each of the major hazards, including the latest hazard maps/data and new HAZUS runs for earthquakes – Chapters 6 to 11.** **Recent and future development in Burbank is discussed in Chapter 2, Section 2.9 – because Burbank is virtually built out, future development is largely limited to redevelopment of already developed parcels. No new development housing vulnerable populations have been completed.** **A synopsis of mitigation action items completed since the 2005 mitigation plan is provided in Section 4.5.** **Estimated potential dollar loss estimates have been updated or added for each major hazard. Earthquake loss estimates are based on new HAZUS runs: Section 6.5. Fire and landslide loss estimates are based on the range of possible affected structures for a range of severity of disaster events (Sections 7.5 and 8.4). Flood loss estimates are given in Section 9.8. Windstorm loss estimates are given in Section 10.7.**		
B. Does the **new or updated** plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	**Chapters 6 to 11.**	**Vulnerability summaries are provided for each of the natural hazards in Chapters 6 to 11. The vulnerability to drought is in Section 11.5.**		
C. Does the **new or updated** plan address the **impact** of each hazard on the jurisdiction?	**Chapters 6 to 11**	**The impacts of each hazard are provided in Chapters 6 to 11.**		
		SUMMARY SCORE		

8. Assessing Vulnerability: Addressing Repetitive Loss Properties

Requirement §201.6(c)(2)(ii): *[The risk assessment]* ***must*** *also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Not applicable**	**This FEMA requirement was added to the planning requirements in 2008.**		
B. Does the new or updated plan describe vulnerability in terms of the types and numbers of *repetitive loss properties* located in the identified hazard areas?	**Chapter 9, p. 9-12**	**Burbank has no properties on FEMA's repetitive loss lists. See Section 9.7.1, 7th bullet which notes this fact.**		
		SUMMARY SCORE		

9. Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): *The plan* ***should*** *describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area … .* ***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **updated** plan document describe how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Chapters 6 to 11**	**For earthquakes, the entire city is at risk; HAZUS runs are used to document the expected numbers of vulnerable/damaged structures. For fires, landslides/ mudslides and floods, the numbers/types of structures in the high hazard areas are identified: Fires – Page 7-9, Landslides/Mudslides – Page 8-9 and Floods – Page 9-12.**		
B. Does the **new or updated** plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	**Chapters 6 to 11**	**SEE comments under "A"**		
C. Does the **new or updated** plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	**Chapter 2, Section 2.9**	**Burbank is virtually 100% built out, so future development will be almost entirely limited to gradual redevelopment of parcels that are already developed. Burbank's adoption of seismic building code provisions, special provisions in the high fire hazard area and enforcement of NFIP regulations ensures that future development will be built safely.**		
		SUMMARY SCORE		

10. Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate … . **Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Chapters 6 to 11**	**The potential loss estimates in the 2005 Mitigation Plan were completely updated for the 2011 Mitigation plan.**		
B. Does the **new or updated** plan estimate **potential dollar losses** to vulnerable structures?	**Chapters 6 to 11**	**There are quantitative estimates of potential losses for earthquakes, fires, landslides, and floods. For wind damage, there are rough estimates only. For drought, the impacts are described qualitatively.**		
C. Does the **new or updated** plan describe the **methodology** used to prepare the estimate?	**Chapters 6 to 11**	**Yes. For earthquakes: HAZUS. For other hazards, the methodology is described in narratives accompanying the dollar estimates of potential losses.**		
		SUMMARY SCORE		

11. Assessing Vulnerability: Analyzing Development Trends

Requirement §201.6(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions. **Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Chapter 2, Section 2.9**	**An updated narrative re: development is included in this section.**		
B. Does the **new or updated** plan describe land uses and development trends?	**Chapter 2 Section 2.9**	**Recent and future development in Burbank is discussed in Chapter 2, Section 2.9 – because Burbank is virtually built out, future development is largely limited to redevelopment of already developed parcels. No new development housing vulnerable populations have been completed.**		
		SUMMARY SCORE		

12. Multi-Jurisdictional Risk Assessment

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment* ***must*** *assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Not applicable**			
B. Does the **new or updated** plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	**Not Applicable**			
		SUMMARY SCORE		

MITIGATION STRATEGY: *§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

13. Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy* ***shall*** *include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	**Chapter 4**	**The goals in the 2005 plan, Section 6 – Future Actions and Plans, included both "long-term" and "future" goals (with duplication) as well as 16 objectives which partially duplicated the goals. The 2005 plan also had 39 "actions" and 5 "action items" separate from the 46 "mitigation strategies" outlined in Section 5 – Hazard Mitigation Strategies. The 2011 Mitigation Planning team deemed this plethora of overlapping duplicative material to be confusing and redundant. Thus, the 2011 draft is a complete almost from scratch update, which differs substantially in content and organization compared to the 2010 draft, which was little changed from 2005 The goals etc. in the 2005 plan were almost completely replaced by new goals etc. in the 2011 draft** **Progress from 2005 to 2011 vis-à-vis the above 2005 goals,**		

		objectives and action items is documented in the 2011 update in Sections 4.5.1 and 4.5.2. These sections addressed the more concrete "action items" listed in Section 5 of the 2005 plan, which contribute to achieve the goals and objectives noted above. The goals and objectives in the 2005 mitigation plan were carefully re-evaluated and completely updated by the Hazard Mitigation Planning Team for the reasons stated at the bottom of page 4-11. The 2011 Mission Statement, Goals and Objectives are on pages 4-1 to 4-4. These items accurately reflect the City of Burbank's 2011 priorities. The refocused goals and objectives emphasize mitigation measures to reduce threats to people and the built environment, as well as enhancing emergency response, increasing public awareness, incorporating mitigation planning into other types of related planning, and vigorously seeking funding sources for mitigation actions.		
B. Does the **new or updated** plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?		The 2011 Mission Statement, Goals and Objectives are on pages 4-1 to 4-4.		
		SUMMARY SCORE		

14. Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): *[The mitigation strategy* ***shall*** *include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	Chapter 4, Section 4.5.2	The 46 "mitigation strategies" are more concrete measures of the types usually designated as "action items." The progress in achieving these items is discussed in Section 4.5.2, and tabulated in Table 4.2 As discussed in the cover letter and above, the 2011 update is almost a complete re-do of the mitigation plan. In effect, the action items in the 2005 plan and the very similar action items in the March 2010 draft were almost <u>completely replaced by new action items</u>. This "wholesale" replacement was done because many, indeed most, of the previous action items were		

		really emergency planning measures, with few mitigation measures to directly reduce risks. Furthermore, the new action items better address the identified high risk situations/locations for the various natural hazards.		
B. Does the **new or updated** plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	**Chapter 4, Chapters 6 to 11.**	**Chapter 4 has tables with the 2011 multi-hazard and hazard-specific action items. Chapters 6 to 11 have the hazard specific action items for the hazard addressed in each chapter.** **The planning committee concurred with the FEMA's reviewer's require revision to remove the many "non-mitigation" items from the "strategies"(that is, the action items in the March 2010 draft). We've also added specific mitigation measures for wildland/urban interface fires and landslides/mudslides and the other natural hazards.**		
C. Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	**Application of building and zoning codes in Chapter 5, page 5-2**	**Burbank is confident that our continuing enforcement of building codes, especially for seismic and fire, and the NFIP requirements, along with Burbank's enhanced requirements such as the provisions for Fire Severity Hazard Zone and Burbank's seismic and flood ordinances ensure that the effects of hazards are new buildings are minimized to the maximum extent practical.**		
D. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	**Chapter 4, Chapters 6 to 11.**	**Chapter 4 has tables with the 2011 multi-hazard and hazard-specific action items. Chapters 6 to 11 have the hazard specific action items for the hazard addressed in each chapter. These apply to existing buildings and infrastructure.**		
		SUMMARY SCORE		

15. Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Requirement: §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

			SCORE	
Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**N**	**S**
A. Does the updated plan document how the planning team reviewed and analyzed this section of the plan	**N/A**	**These NFIP requirements were not included in the 2005 plan because FEMA added these in 2008.**		

and whether this section was revised as part of the update process?				
B. Does the new or updated plan describe the jurisdiction (s) participation in the NFIP?	**Chapter 9, Section 9.7 – pp. 9-12 to 9-15**	**This section includes all of the NFIP-related information, per FEMA's updated requirements for mitigation plans.**		
C. Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?		**Burbank is, and always has been, in full compliance with NFIP's requirements. There are no further actions, other than continuing current practices, to ensure future compliance with NFIP. A mitigation action item to continue to ensure full compliance with all NFIP requirements as been added to the mitigation action items.**		
		SUMMARY SCORE		

16. Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element of this section of the plan and whether this section was revised as part of the update process?	**Chapter 5, Section 5.3**	**The implementation sections of the 2005 plan and the nearly identical sections of the March 2010 draft were reviewed by the mitigation committee and found to be simply inadequate. Thus, these sections were completely re-written for the 2011 plan.**		
B. Does the **new or updated** mitigation strategy include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	**Chapter 5, Section 5.4**	**Burbank's multi-faceted method for evaluating and prioritizing the new 2011 mitigation actions is summarized in Section 5.4, page 5-6.**		
C. Does the **new or updated** mitigation strategy address how the actions will be implemented and administered, including the responsible department, existing and potential resources and the timeframe to complete each action?	**Chapter 4, Action Item tables for each hazard**	**The action item tables include a statement of each action item, the responsible department(s), the target timelines (contingent upon resource availability), and the mitigation goals addressed.** **The potential resources for all of these action items include internal (City of Burbank) staff and financial resources and external sources such as FEMA and other grants. The primary constraint for all of these action items is simply the availability of resources.**		
D. Does the **new or updated** prioritization process include an emphasis on the use of a **cost-benefit review** to	**Chapter 1, Chapter 5, and**	**Burbank recognizes the importance of BCA as included in the plan in several places , including:**		

maximize benefits?	**Appendix 2.**	○ **Chapter 1, Section 1.7 – The Role of Benefit-Cost Analysis in Mitigation Planning,** ○ **Chapter 5, Section 5.3.3 – Cost Effectiveness of Mitigation Projects,** ○ **Chapter 5, Section 5.4 – Prioritization of Mitigation Actions and** ○ **Appendix 2 – Principles of Benefit-Cost Analysis** **Benefit-cost considerations in the mitigation plan were qualitative judgments made by the consultant, Kenneth Goettel who has 20 years of experience with benefit-cost analysis and has completed benefit-cost analyses many hundreds of mitigation projects. Formal BCAs were not completed as part of the mitigation plan because the mitigation actions are conceptual at this point in time: cost estimates and engineering details necessary to quantify the effectiveness of the measures are not yet available.**		
E. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?		**A progress report on the action items in Burbank's 2005 Mitigation Plan is provided in Section 4.5.** **The action items in the 2005 plan and the very similar action items in March 2010 draft were reviewed by the mitigation committee and found to be simply inadequate. As correctly noted by the FEMA reviewer, many of these "action items" were not really mitigation measures. Thus, the committee basically started over and generated new action items which address the highest risk hazards and meet Burbank's 2011 goals, objectives and priorities.**		
		SUMMARY SCORE		

17. Multi-Jurisdictional Mitigation Actions

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there* ***must*** *be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the **updated** plan document how the planning team reviewed and analyzed each element in this section of the plan and whether they were revised as part of the update process?	N/A			
B. Does the **new or updated** plan include identifiable **action items** for each jurisdiction requesting FEMA approval of the plan?	N/A			
C. Does the **updated** plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (*i.e.*, deferred), does the updated plan describe why no changes occurred?	N/A			
		SUMMARY SCORE		

PLAN MAINTENANCE PROCESS

18. Monitoring, Evaluating, and Updating the Plan

Requirement §201.6(c)(4)(i): *[The plan maintenance process* ***shall*** *include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			N	S
A. Does the updated plan document how the planning team reviewed and analyzed each element of this section of the plan and whether this section was revised as part of the update process?	Chapter 1, Section 1.3	Section 1.3 provides a "gentle" discussion of the reasons why Burbank undertook a complete revision of the 2005 mitigation plan (and the nearly identical March 2010) draft. To be blunt, for purposes of this review, the Hazard Mitigation Planning Team simply reached a consensus that the 2005 plan was not useful and had been used very little, if at all, since adoption. This was the motivation for the complete rewrite.		
B. Does the **new or updated** plan describe the method and schedule for **monitoring** the plan, including the responsible	Chapter 5, Section 5.5	The method and schedule for monitoring and evaluating the 2011 plan is provided in Section		

department?		5.5.1.		
C. Does the **new or updated** plan describe the method and schedule for **evaluating** the plan, including how, when and by whom (*i.e.* the responsible department)?	Chapter 5 Section 5.5	The method and schedule for monitoring and evaluating the 2011 plan is provided in Section 5.5.1.		
D. Does the **new or updated** plan describe the method and schedule for **updating** the plan within the five-year cycle?		The method and schedule for updating the plan by 2016 is provided in Section 5.5.1		
		SUMMARY SCORE		

19. Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): *[The plan* ***shall*** *include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the **updated** plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?	Chapter 5, Section 5.3.2, pp. 5-2 – 5-3	As with the other plan sections, the 2011 plan is a complete re-write. The 2005 mitigation plan was minimally, if at all, incorporated into other City of Burbank planning mechanisms. The committee consensus is that minimal knowledge transfer occurred because the 2005 plan was so massive and poorly organized that it was used only minimally. A key objective of the 2011 rewrite is to make the plan more accessible and usable for a wide range of both technical and non-technical users.		
B. Does the **new or updated** plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?	Chapter 5, Section 5.3.2, pp. 5-2 – 5-3	Knowledge transfer will work in both directions: continued incorporation of information in related plans into the mitigation plan and "export" of information such as updated hazard data and maps into other planning efforts.		
C. Does the **new or updated** plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	Chapter 5, Section 5.3.2, pp. 5-2 – 5-3	Knowledge transfer will work in both directions: continued incorporation of information in related plans into the mitigation plan and "export" of information such as updated hazard data and maps into other planning efforts.		
D. Does the **updated** plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (*e.g.*, risk assessment) into other planning mechanisms, when appropriate?	Chapter 5, Section 5.3.2, pp. 5-2 – 5-3	As noted under Part A comments above, the 2005 plan was barely used. The barriers to success in this area were the massive size (400+ pages) and poor organization of the 2005 plan. The committee is confident that the 2011 update removes these		

		barriers by making the material much more accessible. For example, in the 2011 plan, the hazard, vulnerability, risk assessment and mitigation action items for each hazard are in separate chapters. So, for example, if seismic issues arise in another planning effort, the updated more comprehensive seismic information in the 2011 mitigation plan is immediately available in one chapter instead of being scattered through a 400+ page document.		
		SUMMARY SCORE		

20. Continued Public Involvement

Requirement §201.6(c)(4)(iii): *[The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the **updated** plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?	**Chapter 5, Section 5.5.2**	**As with all other plan sections, this section was completely redone for the 2011 update.** **Burbank recognizing that we did a poor job of maintaining the 2005 mitigation plan. However, Burbank is committed to a much more robust maintenance program and schedule for the 2011 mitigation plan**		
B. Does the **new or updated** plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	**Chapter 5, Section 5.5.2**	**This section outlines Burbank's approach to continued public participation during the 5 year cycle of the 2011 plan, leading to the 2016 update.**		
		SUMMARY SCORE		

LOCAL MITIGATION PLAN REVIEW CROSSWALK

MATRIX A: PROFILING HAZARDS

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the jurisdiction. **Completing the matrix is not required**.

Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each *applicable* ***hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.***

To check boxes, double click on the box and change the default value to "checked."

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Location		B. Extent		C. Previous Occurrences		D. Probability of Future Events	
	Yes	N	S	N	S	N	S	N	S
Avalanche	☐	☐	☐	☐	☐	☐	☐	☐	☐
Coastal Erosion	☐	☐	☐	☐	☐	☐	☐	☐	☐
Coastal Storm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dam Failure	☒	☐	☒	☐	☒	☐	☒	☐	☒
Drought	☒	☐	☒	☐	☒	☐	☒	☐	☒
Earthquake	☒	☐	☒	☐	☒	☐	☒	☐	☒
Expansive Soils	☒	☐	☒	☐	☒	☐	☒	☐	☒
Levee Failure	☒	☐	☒	☐	☒	☐	☒	☐	☒
Flood	☒	☐	☒	☐	☒	☐	☒	☐	☒
Hailstorm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hurricane	☐	☐	☐	☐	☐	☐	☐	☐	☐
Land Subsidence	☒	☐	☒	☐	☒	☐	☒	☐	☒
Landslide	☒	☐	☒	☐	☒	☐	☒	☐	☒
Severe Winter Storm	☒	☐	☒	☐	☒	☐	☒	☐	☒
Tornado	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐	☐	☐	☐	☐
Volcano	☒	☐	☒	☐	☒	☐	☒	☐	☒
Wildfire	☒	☐	☒	☐	☒	☐	☒	☐	☒
Windstorm	☒	☐	☒	☐	☒	☐	☒	☐	☒
Other ________________	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other ________________	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other ________________	☐	☐	☐	☐	☐	☐	☐	☐	☐

Legend:

§201.6(c)(2)(i) Profiling Hazards
A. Does the risk assessment identify the location (*i.e.*, geographic area affected) of each hazard addressed in the **new or updated** plan?
B. Does the risk assessment identify the extent (*i.e.*, magnitude or severity) of each hazard addressed in the **new or updated** plan?
C. Does the plan provide information on previous occurrences of each natural hazard addressed in the **new or updated** plan?
D. Does the plan include the probability of future events (*i.e.*, chance of occurrence) for each hazard addressed in the plan?

MATRIX B: ASSESSING VULNERABILITY

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that the new or updated plan addresses each requirement. **Completing the matrix is not required**.

Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each ***applicable*** *hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk. Note: Receiving an N in the shaded columns will not preclude the plan from passing.*

To check boxes, double click on the box and change the default value to "checked."

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	§201.6(c)(2)(ii) Assessing Vulnerability: Overview	A. Overall Summary Description of Vulnerability		B. Hazard Impact		§201.6(c)(2)(ii) Assessing Vulnerability: Identifying Structures	A. Types and Number of Existing Structures in Hazard Area (Estimate)		B. Types and Number of Future Structures in Hazard Area (Estimate)		§201.6(c)(2)(ii) Assessing Vulnerability: Estimating Potential Losses	A. Loss Estimate		B. Methodology	
	Yes		N	S	N	S		N	S	N	S		N	S	N	S
Avalanche	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Coastal Erosion	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Coastal Storm	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Dam Failure	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Drought	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Earthquake	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Expansive Soils	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Levee Failure	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Flood	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Hailstorm	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Hurricane	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Land Subsidence	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Landslide	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Severe Winter Storm	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Tornado	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Tsunami	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Volcano	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Wildfire	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Windstorm	☒		☐	☒	☐	☒		☐	☐	☐	☐		☐	☐	☐	☐
Other ________	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Other ________	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐
Other ________	☐		☐	☐	☐	☐		☐	☐	☐	☐		☐	☐	☐	☐

Legend:

§201.6(c)(2)(ii) Assessing Vulnerability: Overview

A. Does the **new or updated** plan include an overall summary description of the jurisdiction's vulnerability to each hazard?

B. Does the **new or updated** plan address the impact of each hazard on the jurisdiction?

§201.6(c)(2)(ii)(A) Assessing Vulnerability: Identifying Structures

A. Does the **new or updated** plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?

B. Does the **new or updated** plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

§201.6(c)(2)(ii)(B) Assessing Vulnerability: Estimating Potential Losses

A. Does the **new or updated** plan estimate potential dollar losses to vulnerable structures?

B. Does the **new or updated** plan describe the methodology used to prepare the estimate?

LOCAL MITIGATION PLAN REVIEW CROSSWALK

MATRIX C: IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure consideration of a range of actions for each hazard. **Completing the matrix is not required.**

Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each ***applicable*** *hazard. An "N" for any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Comprehensive Range of Actions and Projects	
	Yes	N	S
Avalanche	☐	☐	☐
Coastal Erosion	☐	☐	☐
Coastal Storm	☐	☐	☐
Dam Failure	☒	☐	☒
Drought	☒	☐	☒
Earthquake	☒	☐	☐
Expansive Soils	☒	☐	☐
Levee Failure	☒	☐	☒
Flood	☒	☐	☒
Hailstorm	☐	☐	☐
Hurricane	☐	☐	☐
Land Subsidence	☒	☐	☐
Landslide	☒	☐	☐
Severe Winter Storm	☒	☐	☒
Tornado	☐	☐	☐
Tsunami	☐	☐	☐
Volcano	☒	☐	☐
Wildfire	☒	☐	☐
Windstorm	☒	☐	☒
Other ______________	☐	☐	☐
Other ______________	☐	☐	☐
Other ______________	☐	☐	☐

To check boxes, double click on the box and change the default value to "checked."

Legend:
§201.6(c)(3)(ii) Identification and Analysis of Mitigation Actions
A. Does the **new or updated** plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?

NOTE: based on the hazard, vulnerability and risk assessments, the hazards identified in Chapter 10 do not require any mitigation actions because the risks are negligible or nil.

APPENDIX G: AWWA WATER AUDIT FORM

ATTACHMENT 1

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Burbank/Burbank Water and Power (1910179)
Reporting Year: 2015 1/2015 - 12/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

				Pcnt:		Value:	
Volume from own sources:	7	10,276.000	acre-ft/yr		● ○		acre-ft/yr
Water imported:	7	4,766.000	acre-ft/yr		● ○		acre-ft/yr
Water exported:		0.000	acre-ft/yr		● ○		acre-ft/yr

WATER SUPPLIED: 15,042.000 acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

Billed metered:	7	14,507.000	acre-ft/yr				
Billed unmetered:			acre-ft/yr				
Unbilled metered:			acre-ft/yr	Pcnt:		Value:	
Unbilled unmetered:		188.025	acre-ft/yr	1.25%	● ○		acre-ft/yr

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

AUTHORIZED CONSUMPTION: 14,695.025 acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

WATER LOSSES (Water Supplied - Authorized Consumption)

346.975 acre-ft/yr

Apparent Losses

				Pcnt:		Value:	
Unauthorized consumption:		37.605	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	8	70.480	acre-ft/yr		○ ●	70.480	acre-ft/yr
Systematic data handling errors:	8	37.605	acre-ft/yr	0.25%	○ ●	37.605	acre-ft/yr

Apparent Losses: 145.690 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 201.285 acre-ft/yr

WATER LOSSES: 346.975 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 535.000 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	279.0	miles
Number of active AND inactive service connections:	8	26,661	
Service connection density:		96	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 8 80.0 psi

COST DATA

Total annual cost of operating water system:	10	$16,443,000	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$3.09	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	9		$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 77 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Water imported

ATTACHMENT 1

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: City of Burbank (1910179)
Reporting Year: 2016 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<----------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:		Value:	
Volume from own sources:	+ ?	7	9,612.000	acre-ft/yr	+ ?	● ○		acre-ft/yr
Water imported:	+ ?	7	5,005.000	acre-ft/yr	+ ?	● ○		acre-ft/yr
Water exported:	+ ?	7	22.700	acre-ft/yr	+ ?	● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **14,594.300** acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:		Value:	
Billed metered:	+ ?	7	14,068.000	acre-ft/yr				
Billed unmetered:	+ ?	n/a		acre-ft/yr				
Unbilled metered:	+ ?	n/a		acre-ft/yr				
Unbilled unmetered:	+ ?	5	36.400	acre-ft/yr		○ ●	36.400	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: ? **14,104.400** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) **489.900** acre-ft/yr

Apparent Losses

					Pcnt:		Value:	
Unauthorized consumption:	+ ?		36.486	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	8	67.400	acre-ft/yr		○ ●	67.400	acre-ft/yr
Systematic data handling errors:	+ ?		35.170	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? **139.056** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **350.844** acre-ft/yr

WATER LOSSES: **489.900** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? **526.300** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	8	286.0	miles
Number of active AND inactive service connections:	+ ?	8	26,661	
Service connection density:	?		93	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ?

(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 8 115.0 psi

COST DATA

Total annual cost of operating water system:	+ ?	8	$22,329,288	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	10	$3.61	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	8	$729.94	$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 73 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Water imported
3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: City of Burbank (1910179)
Reporting Year: 2017 | 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<-------------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

						Pcnt:		Value:	
Volume from own sources:	+ ?	7	9,520.800	acre-ft/yr	+ ?		● ○		acre-ft/yr
Water imported:	+ ?	7	6,113.800	acre-ft/yr	+ ?		● ○		acre-ft/yr
Water exported:	+ ?	7	14.900	acre-ft/yr	+ ?		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 15,619.700 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:		Value:	
Billed metered:	+ ?	7	14,943.200	acre-ft/yr				
Billed unmetered:	+ ?	n/a		acre-ft/yr				
Unbilled metered:	+ ?	n/a		acre-ft/yr				
Unbilled unmetered:	+ ?	5	39.000	acre-ft/yr		○ ●	39.000	acre-ft/yr

AUTHORIZED CONSUMPTION: ? 14,982.200 acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

WATER LOSSES (Water Supplied - Authorized Consumption) 637.500 acre-ft/yr

Apparent Losses

					Pcnt:		Value:	
Unauthorized consumption:	+ ?		39.049	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	8	125.900	acre-ft/yr		○ ●	125.900	acre-ft/yr
Systematic data handling errors:	+ ?		37.358	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 202.307 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 435.193 acre-ft/yr

WATER LOSSES: 637.500 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 676.500 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	8	286.0	miles
Number of active AND inactive service connections:	+ ?	8	26,661	
Service connection density:	?		93	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 8 115.0 psi

COST DATA

Total annual cost of operating water system:	+ ?	8	$22,329,288	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	10	$3.71	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	8	$729.94	$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 73 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Water imported
3: Billed metered

ATTACHMENT 1

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: City of Burbank (1910179)
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

						Pcnt:		Value:	
Volume from own sources:	+ ?	7	10,147.000	acre-ft/yr	+ ?		● ○		acre-ft/yr
Water imported:	+ ?	7	6,139.000	acre-ft/yr	+ ?		● ○		acre-ft/yr
Water exported:	+ ?	7	135.000	acre-ft/yr	+ ?		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED:		**16,151.000**	acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

					Pcnt:		Value:	
Billed metered:	+ ?	7	15,548.000	acre-ft/yr				
Billed unmetered:	+ ?			acre-ft/yr				
Unbilled metered:	+ ?			acre-ft/yr				
Unbilled unmetered:	+ ?	5	39.000	acre-ft/yr		○ ●	39.000	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION:	?	**15,587.000**	acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

564.000 acre-ft/yr

Apparent Losses

					Pcnt:		Value:	
Unauthorized consumption:	+ ?		40.378	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	8	67.100	acre-ft/yr		○ ●	67.100	acre-ft/yr
Systematic data handling errors:	+ ?		38.870	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses:	?	**146.348**	acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	?	**417.653**	acre-ft/yr
WATER LOSSES:		**564.000**	acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:	?	**603.000**	acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	8	286.0	miles
Number of active AND inactive service connections:	+ ?	8	26,661	
Service connection density:	?		93	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	+ ?	8	115.0	psi

COST DATA

Total annual cost of operating water system:	+ ?	8	$25,774,725	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	10	$3.71	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	8	$755.48	$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 73 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Water imported

3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: City of Burbank (1910179)
Reporting Year: 2019 1/2019 - 12/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

	Grading	Value	Unit	Pcnt:		Value:	Unit
Volume from own sources:	7	10,145.000	acre-ft/yr		● ○		acre-ft/yr
Water imported:	7	5,550.300	acre-ft/yr		● ○		acre-ft/yr
Water exported:	7	104.020	acre-ft/yr		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 15,591.280 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ?
for help using option buttons below

	Grading	Value	Unit	Pcnt:		Value:	Unit
Billed metered:	7	14,726.700	acre-ft/yr				
Billed unmetered:			acre-ft/yr				
Unbilled metered:			acre-ft/yr				
Unbilled unmetered:	5	39.000	acre-ft/yr		○ ●	39.000	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: 14,765.700 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 825.580 acre-ft/yr

Apparent Losses

	Grading	Value	Unit	Pcnt:		Value:	Unit
Unauthorized consumption:		38.978	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

	Grading	Value	Unit	Pcnt:		Value:	Unit
Customer metering inaccuracies:	8	94.950	acre-ft/yr		○ ●	94.950	acre-ft/yr
Systematic data handling errors:		36.817	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 170.745 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)
Real Losses = Water Losses - Apparent Losses: 654.835 acre-ft/yr

WATER LOSSES: 825.580 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 864.580 acre-ft/yr
= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

	Grading	Value	Unit
Length of mains:	8	286.0	miles
Number of active AND inactive service connections:	8	27,646	
Service connection density:		97	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes
Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 9 115.0 psi

COST DATA

	Grading	Value	Unit
Total annual cost of operating water system:	8	$26,969,789	$/Year
Customer retail unit cost (applied to Apparent Losses):	10	$4.00	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	8	$869.60	$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 74 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Water imported
3: Billed metered

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