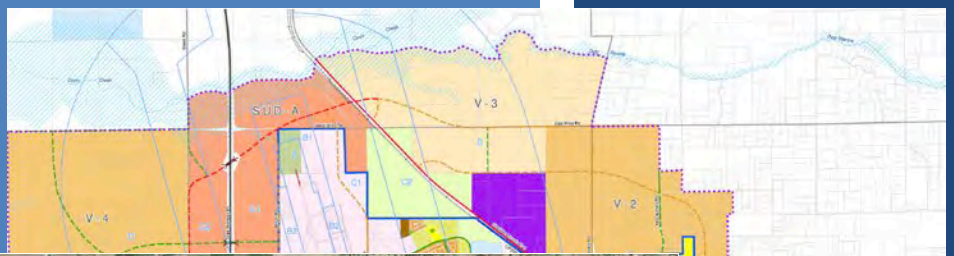
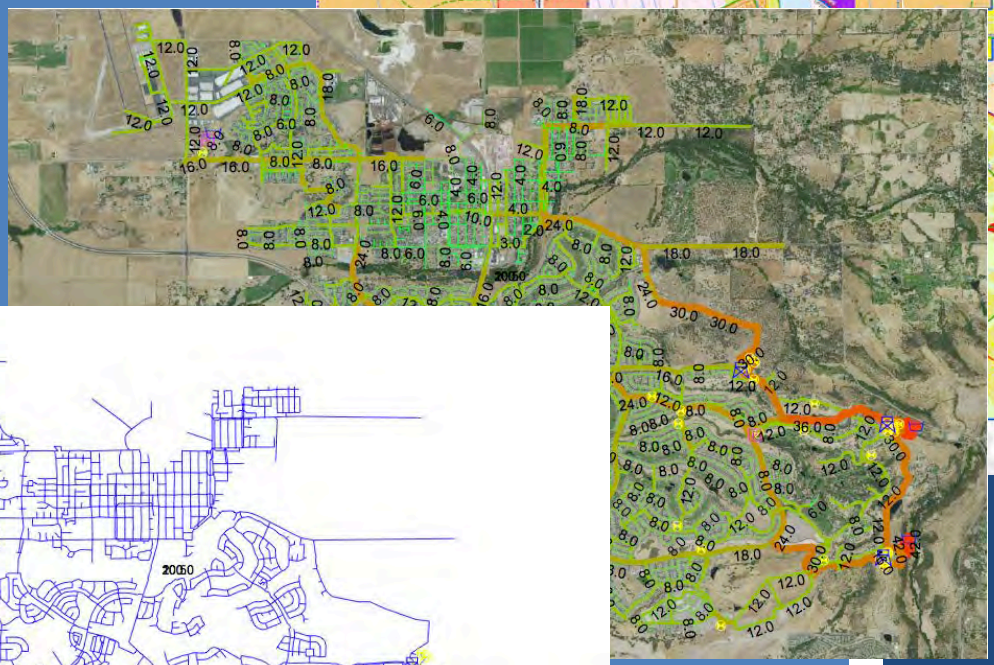
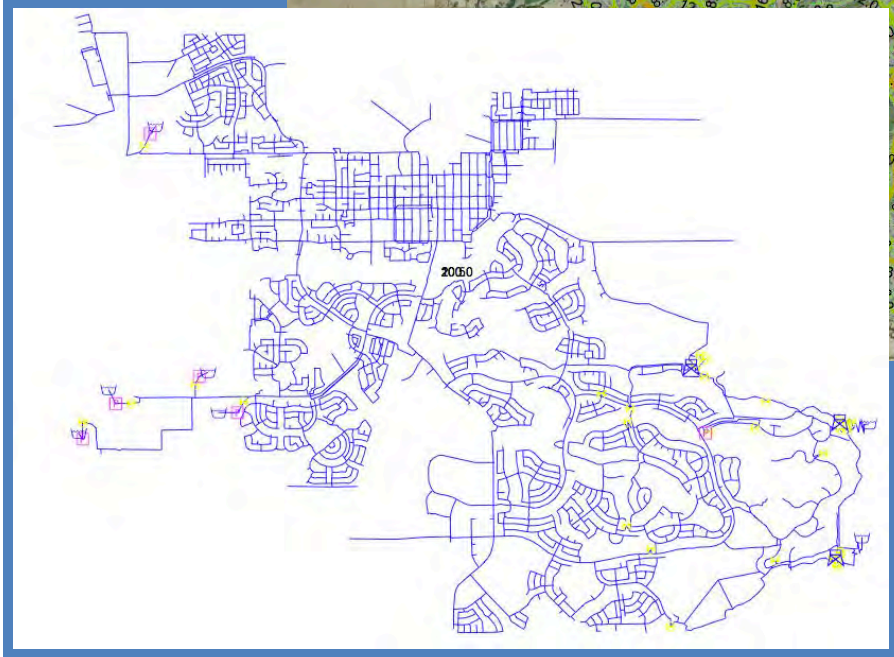
WATER MASTER PLAN 2017







Prepared for
City of Lincoln

Tully & Young
Comprehensive Water Planning

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This 2017 Water Master Plan has been prepared under the guidance

of a California Registered Civil Engineer

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Comprehensive Water Planning

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List of Acronyms

ACP	Asbestos Cement Pipe
ACWA	Association of California Water Agencies
ADD	Average Day Demand
adwd	Average dry weather demand
ADWF	Average Day Wastewater Flow
AWWA	American Water Works Association
BDCP	Bay Delta Conservation Plan
bgs	below ground surface
BMP	Best Management Practices
BO	Build out
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Project
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
CWP	California Water Plan
D.A.	Development Agreement
DAF	Dissolved air flotation
DBPR	Disinfection By-Product Rule
DDW	Division of Drinking Water
DFW	Department of Fish and Wildlife
DMM	Demand Management Measures
DOF	Department of Finance
DSC	Delta Stewardship Council
DU	Dwelling Units
DWR	California Department of Water Resources
EIR	Environmental Impact Report
Eto	Evapotranspiration
FERC	Federal Energy Regulatory Commission
FRP	Facility Replacement Plan
fsp	Feet per second
GET	Groundwater Extraction Treatment
GIS	Geographic Information System
GMP	Groundwater Management Plan

GPCD	Gallons Per Capita Per Day
gpm	gallons per minute
GSA	Groundwater Sustainability Act
GSP	Groundwater Sustainability Plan
GSWC	Golden State Water Company
HDR	High Density Residential
IP	Cast iron pipe
IRWMP	Integrated Regional Water Management Plan
JPA	Joint powers authority
LAFCO	Local Agency Formation Commissions
LAR	Lower American River
LDR	Low Density Residential
LMS	Lincoln Meter Station
LU	Land Use
MAF	Million Acre Feet
MCL	Maximum Contaminant Level
MDD	Maximum day demand
MDR	Medium Density Residential
MFP	Middle Fork Project
MG	Million gallons
mg/L	milligrams per liter
mgd	million gallons per day
MOU	Memorandum of Understanding
MWELO	Model Water Efficiency Landscape Ordinance
ND	non-detect
NDMA	N-Nitrosodimethylamine
NID	Nevada Irrigation District
NOP	Notice of Preparation
NPDES	National Pollution Discharge Elimination System
O&M	Operation and maintenance
OAL	Office of Administrative Law
PCWA	Placer County Water Agency
PFE	Public Facility Element
PG&E	Pacific Gas & Electric Company
PHD	Peak hour demand
PRSs	Pressure Reducing Stations
PRVs	Pressure Reducing Valves
PSA	Purveyor Specific Agreement
RWA	Regional Water Authority
RWQCB	Regional Water Quality Control Board
RWSP	Regional Water Supply Project
SACOG	Sacramento Area Council of Governments

SCADA	Supervisory Control and Data Acquisition
SCWA	Sacramento County Water Agency
SGA	Sacramento Groundwater Authority
SGMA	Sustainable Groundwater Management Act
SMUD	Sacramento Municipal Utility District
SOI	Sphere of Influence
SSWD	Sacramento Suburban Water District
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
UIFR	Unimpaired Inflow to Folsom Reservoir
USBR	United States Bureau of Reclamation
UV	Ultraviolet
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Plan Act
WFA	Water Forum Agreement
WMP	Water Master Plan
WPCGMP	Western Placer County Groundwater Management Plan
WQCP	Bay Delta Water Quality Control Plan
WSCP	Water Shortage Contingency Plan
WSE	Water Supply Evaluation
WTP	Water Treatment Plant
WWTRF	Wastewater Treatment and Reclamation Facility

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Acknowledgements

Tully and Young, Inc. would like acknowledge all of the people who worked diligently to complete the City's 2017 Water Master Plan.

City Council for the City of Lincoln

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EXECUTIVE SUMMARY

The City of Lincoln commissioned this Water Master Plan (WMP) in October of 2014 in order to analyze the City's water supply reliability and water management efforts. Accordingly, this WMP is a thorough assessment of the City's organizational structure, water demand, water supplies, water governance, and infrastructure. The WMP culminates in a set of recommended actions that advance the detailed analysis provided in the document. This Executive Summary captures the main themes from each WMP chapter and addresses central points that best explicate those themes.

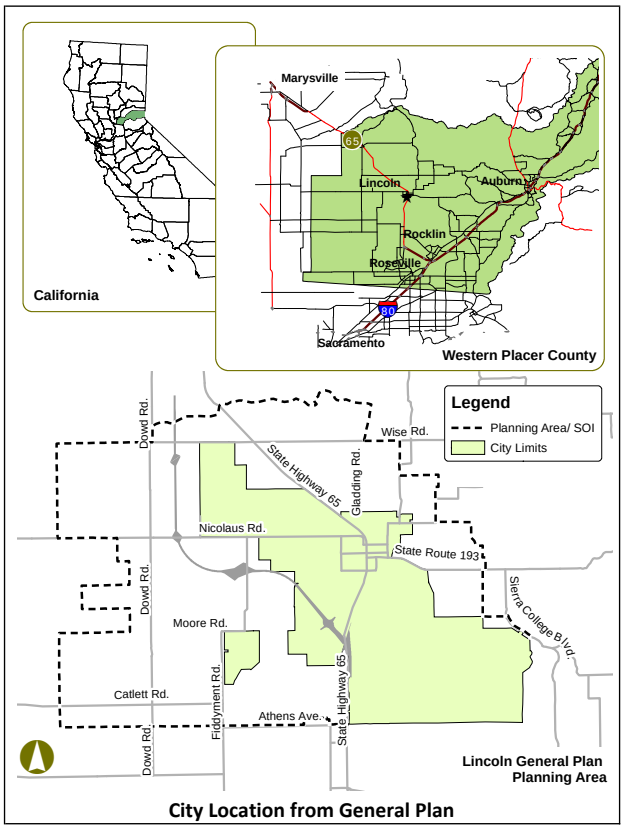
Chapter 1. Introduction and Historical Setting

Chapter 1 describes California's Water Framework and the City of Lincoln's historical setting. California's Water Framework is a broad overview of the major issues that affect water resources management that face all Californians. Specifically, large-scale issues like population growth, land conversion from agriculture to urban uses, climate change, and increased governance all affect water management at a macro-level. In other words, managing the City's water resources in the context these large-scale issues requires the City to track them and occasionally engage. For example, climate change impacts may alter water resource distribution throughout the State of California that could create significant water deficits in densely populated areas. Development of new water resources – like desalination – or reallocation of water resources from other existing users – through long-term conservation mandates in water surplus areas – may drive water policies over the course of the next millennium.

Continually monitoring California's Water Framework is of utmost importance to the City's long-term water management strategy. The following list summarizes the overarching issues that constitute California's Water Framework: population growth, agricultural to urban land conversion, trends in agricultural practices towards permanent crops, hydrologic variation, climate change, complicated water rights and entitlements, extensive water governance structures, expanding water competition, integrated land and water planning, mandated groundwater management, infrastructure investments, and copious planning documents. Within these categories, the City of Lincoln has local integration issues as well as regional, statewide, and even international issues that directly implicate its local water supply reliability.

The City's long history informs its growth patterns and water management. The City originated as a mining and agricultural town yet has transitioned into a suburban center. The conversion of agricultural lands to residential lands requires transitioning from

untreated sources of water to treated sources of water. This transition requires state-of-the-art infrastructure delivery systems to meet growing demands and comply with state and federal regulations. For instance, the City has transitioned its raw water canal deliveries and open-pond water treatment efforts into sophisticated treated water delivery systems that combine wholesale water purveyors' and the City's infrastructure systems. And although portions of the City's system still rely on 80-year old pipes, the ongoing water system conversion aligns with the City's 2008 General Plan objectives and continues a rigorous program of water system improvements. Maintaining these historical improvements, in light of California's Water Framework, requires continued diligence and strategic planning.

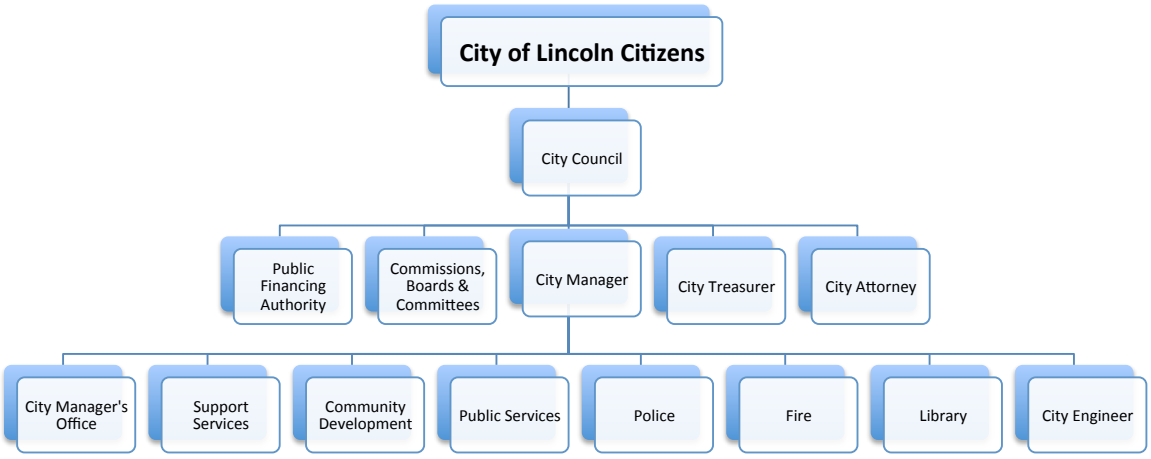


Chapter 2. City Planning and Policies

Chapter 2 describes the City's organizational structure, administrative responsibilities, and management practices as they relate to the City's potable water system. This chapter also examines the various planning documents that impact water supply planning and water management in the City of Lincoln. The City's governance combined with its planning documents constitute the organizational structure for the City's water supply reliability and water planning efforts.

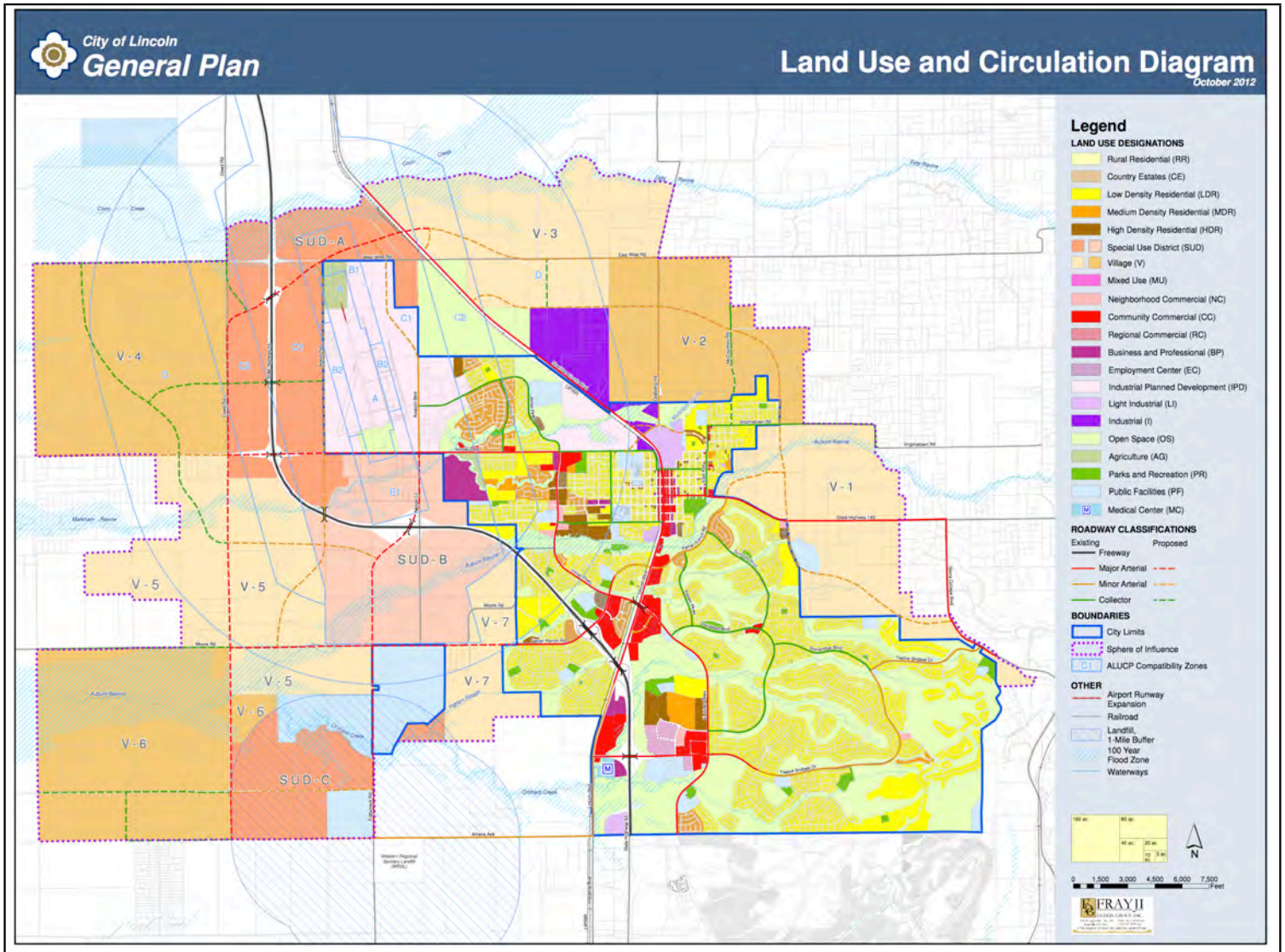
The City's organizational structure is derived from **Figure ES-1** shown below. Within this structure, all listed departments have some impact on the City's water planning and management with the exceptions of the Police and Library departments. The City Manager implements the City Council's water policies and provides guidance back to the City Council on potential policy actions that the Council should consider. The remaining departments implement the City Manager's directives as they are appropriately delegated.

Figure ES-1 – City of Lincoln Organizational Flow Chart



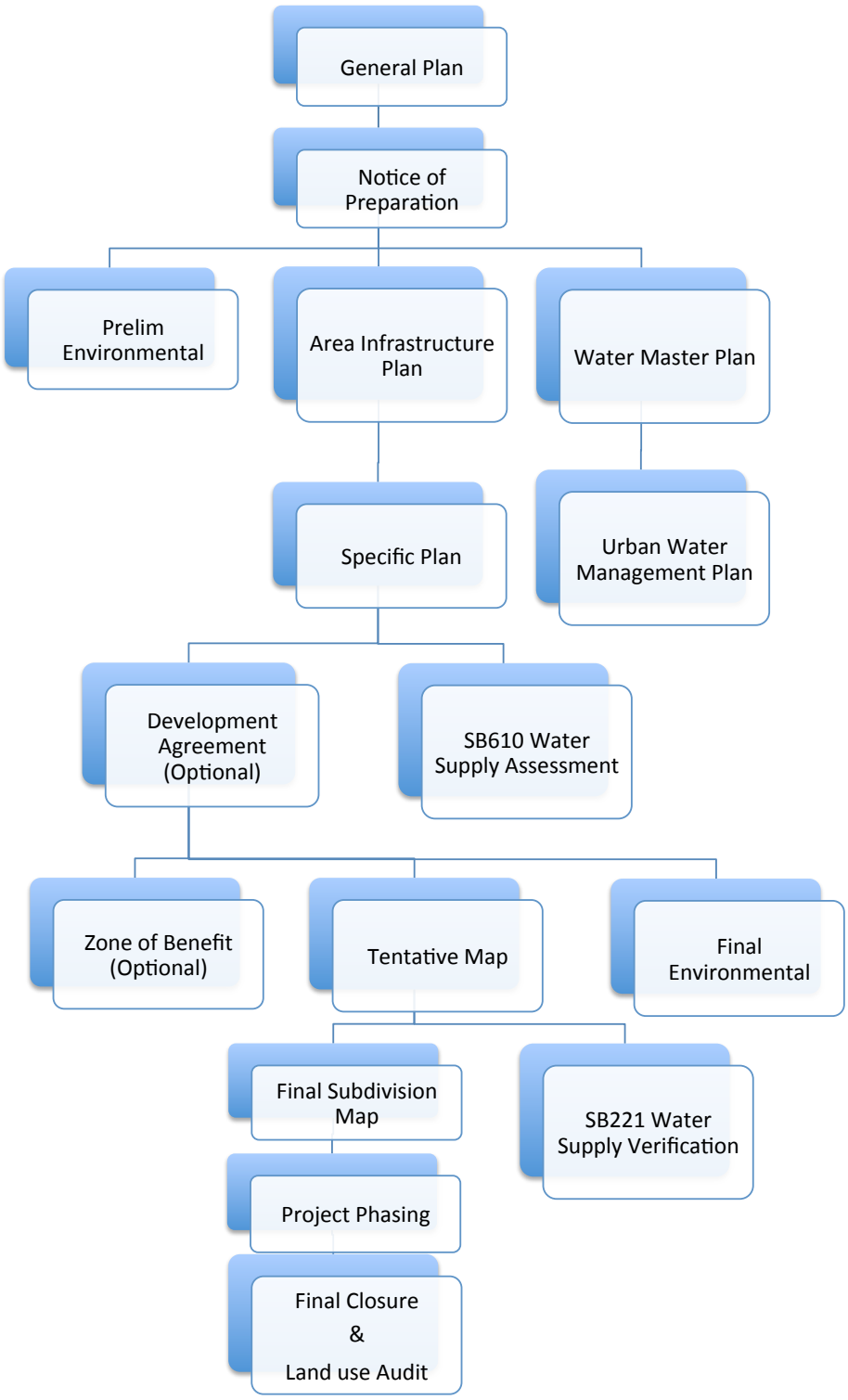
The majority of departments in the City of Lincoln have designated responsibilities that relate to water. In most cases, these responsibilities overlap with the responsibilities of other departments. For instance, the Support Services Department assesses end user water demands in order to derive customer billing for water usage. These end-user water demands are then aggregated and used by the Community Development Department in determining future demands associated with similar housing types planned for the new developments. The City Engineer also uses end-user demands to adequately size new infrastructure and repair existing infrastructure to meet customer needs. The Public Services Department uses end-user demands to ensure that water system is functioning properly to meet the daily needs of the City's customers. Last, the Support Services Department ensures that the funds are available to meet the future infrastructure needs derived from end-user demands and that revenues derived from customers as well as developers are adequate. Accordingly, the importance of continued integration and communication within the City's management structure on issues like assessing water demands has far reaching impacts to all aspects of the City's long-term water planning.

The land use and water supply planning documents required for successful long term planning are shown in **Figure ES-2** on page ES-5. Each of these documents has unique water planning requirements that are described in detail in **Chapter 2**.



2008 General Plan Land Use Map

Figure ES-2 – The City of Lincoln Water and Land Use Organization



The City's 2008 General Plan is the City's planning document that guides all other planning documents. The General Plan outlines the general growth policies and long-term land-use planning objectives of the City. As described in detail in **Chapter 2**, the General Plan elements – conservation, open space, public utilities, and water – as well as the Environmental Impact Report (EIR) required under the California Environmental Quality Act (CEQA) – developed the foundation for the City's water management objectives. As more information has become available through progressive City data collection, investigations, and planning, there have been more updates to the water management components in subsequent documents. For instance, the City's 2015 Urban Water Management Plan used two water meter studies that analyzed detailed meter data, to more accurately assess the City's current and future water demands. The information derived from these analyses is incorporated into the City's infrastructure planning through, among other things, this WMP, the SB 610 Water Supply Assessments, and Development Agreements. Thus, revising information originating from the 2008 General Plan as well as incorporating newly available information derived from the City's most recent analyses solidify the City's land-use and water planning objectives.

All of the planning documents shown in **Figure ES-2** require continuous synthesis in order to ensure that the planning assumptions and calculation methodologies remain congruent. And even where inconsistencies within the documents are identified, clear explanations that distinguish outdated findings with thoroughly reviewed new findings require a comprehensive understanding of the existing documentation. Importantly, precise analyses that integrate the numerous documents allow the large-scale infrastructure to be accurately determined and the financial water management components appropriately assessed.

Chapter 3. Water System Description

Chapter 3 provides a general overview of the wholesale agencies' water systems as well as the City of Lincoln's existing water system. In addition, this chapter provides a detailed assessment of specific attributes of the City's retail water system. Last, this chapter also serves as a reference guide for future water system engineers, staff, and managers, enabling those persons to identify and address planning and engineering issues in the City's water conveyance system. The size and complexity of the City's water system is described in relation to the City's Innovyze hydraulic water model that has been integrated with the City's Geographic Information System where applicable.

The City's wholesale water providers – Placer County Water Agency (PCWA) and Nevada Irrigation District (NID) – deliver potable water supplies derived from their water rights and contracts through PCWA's water system. The water supplies originate in the

Yuba/Bear River watershed as well as the American River watershed and are delivered to PCWA's Foothill Water Treatment Plant for transformation into potable water assets. From the Foothill Water Treatment Plant, potable water is delivered to the Lincoln Metering Station on the City's outer perimeter. At this location, wholesale water delivery from the PCWA system ends and the City's retail water system begins. Also at this location, the delivered water is further split into the "unregulated" and "regulated" supply systems as noted in the City-PCWA water supply contract (analyzed in **Chapter 5**). The regulated water moves into the City's lower elevation regions while the unregulated water remains in the upper system to serve the high elevation lots generally in the Catta Verdera development.

The City's retail water system is derived from two water sources – wholesale water delivered through PCWA's water system and groundwater derived from the City's wells. The City's system is essentially split into two sub-systems corresponding to the unregulated and regulated systems described above. **Figure ES-3** below depicts the City's retail water system.

Figure ES-3 – Diagram of Main Water System

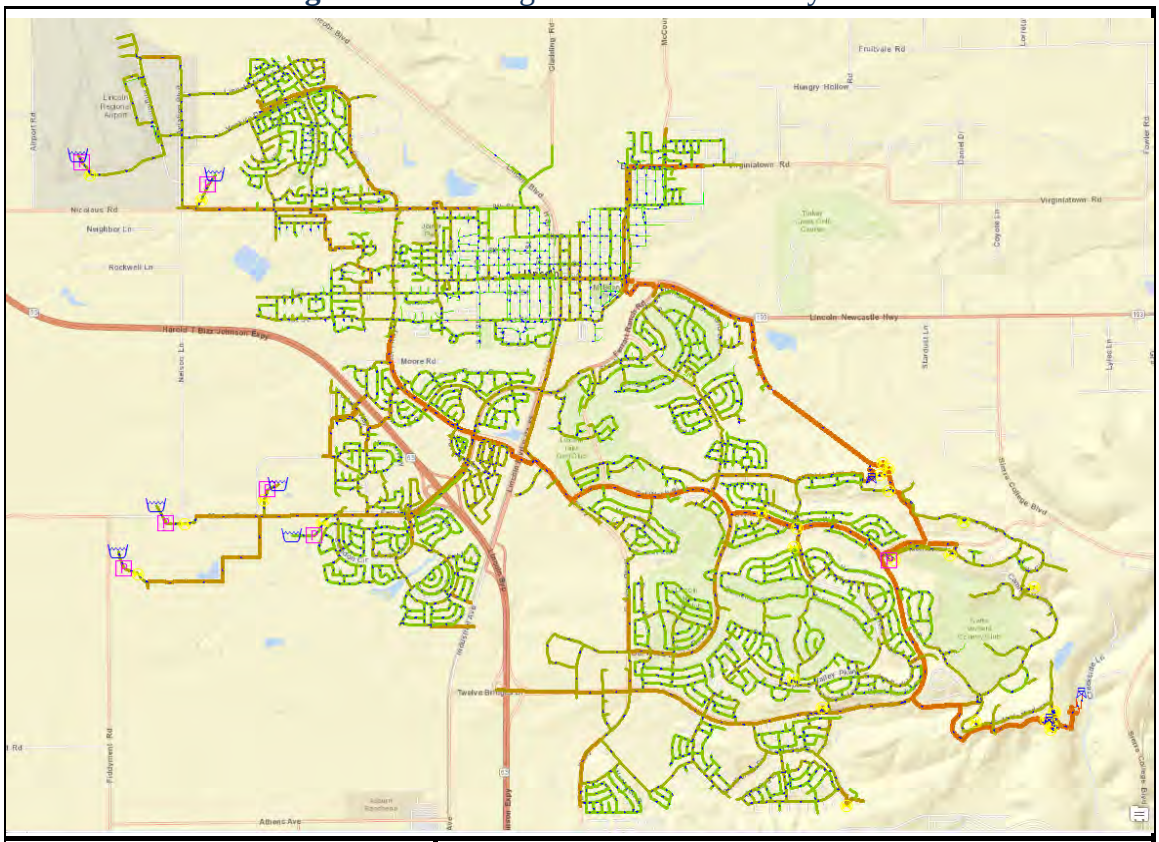


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Image Sources:
City Water System GIS, Licensed ESRI ArcGIS
City Water Model, Innovyze InfoWater

The main infrastructure features of the City's retail water system include the following items: the 5 million gallon tank at Catta Verdera South, the 3 million gallon tank at Reservoir 1, the Catta Verdera Temporary Booster Pump Station, and the City's 5 active wells (Nicolaus, Westwood, Moore, Fiddyment, and Nelson). All of these facilities are described in detail in **Chapter 3**.

Additional infrastructure components are incorporated into the City's retail water system. These less prominent components include: City Meter at the 5 MG Tank, Altitude Valve and City Meter at the 3 MG Tank, 5 MG Tank and 3 MG Tank bypasses, 9 pressure reducing stations located closer to the eastern areas in the City, 5 pipeline crossings under Hwy 65, three Auburn Ravine pipeline crossings, and 7 Railroad Track pipeline crossings. The City also has 5 major transmission mains – 30-inch at the 5 MG Tank, 18-inch at Twelve Bridges Drive South, 20-inch at the 3 MG Tank near Oaktree Lane, 24-inch Twelve Bridges pipeline, and the 24-inch Oak Tree Lane pipeline. In addition, the City has an emergency backup intertie with PCWA's system on its southern border, a Del Webb backup meter, the Nicolaus Road and Q Street Altitude Valves, and the abandoned 1.5 MG Tank at the 3 MG Tank location. The City also manages 1,998 fire hydrants. Taken together with the smaller infrastructure depicted in **Figure ES-3**, the City has a robust and complex retail water delivery system.

Chapter 4. Water Demand Characteristics

Chapter 4 describes all aspects of the City's water demand. Understanding water demand characteristics is essential to enable the City of Lincoln to reliably forecast future customer water demands and then plan for and secure reliable water supplies. Further, securing water supplies that are based on the demand calculations requires the City to plan and budget for the necessary improvements to the delivery system infrastructure. **Chapter 4** characterizes the City's forecast water demands to build-out[1] and discusses the translation of that annual demand forecast into values important for infrastructure planning.

The City's annual water demand from 2010 to 2015 is depicted in **Table ES-1** below. As shown in that table, the City's water demand was highest in 2013 – the first year of the State's ongoing drought. As demand reduction mandates were issued by the State Water Resources Control Board, the City's annual demand lessened, as expected, to a 2015 low of 7,628 acre-feet.

[1] This information is consistent with the City's recently adopted 2015 Urban Water Management Plan (UWMP), but extends the demand forecast beyond 2040 to build-out. The UWMP limited the demand forecast to 2040.

Table ES-1 – Recent City Population and Annual Water Demand

Year	Population	Gross Water Use (af/yr)
2010	42,819	9,203
2011	43,142	9,481
2012	43,915	10,091
2013	44,336	10,858
2014	45,259	8,948
2015	45,837	7,628

For purposes of water reliability assessments and infrastructure planning in this WMP, the project team needed to estimate a demand based upon normalized conditions. The team utilized the meter data from 2011 and 2013 and calculated a normalized demand for the City of Lincoln for 2015 at 10,174 acre-feet. This demand calculation is representative of a static point in time for water demands on the City's water system. It is evident that this demand will change over time with changed conditions and this assumption is factored into the overall water demand analysis. The predicted future build-out annual demand is approximately 36,000 acre-feet of water.

The demand chapter also forecasts the City's future water demands based upon a detailed assessment of anticipated growth, water demand factors derived from the 2011 and 2015 meter studies, and the resulting incremental growth expected in the City over the next 50 years. Specifically, the City used the 2008 General Plan and subsequently adopted Specific Plans as well as satellite imagery to determine the overall growth in the City and its Sphere of Influence (SOI). The water demand factors were derived from actual meter data taken from the City's existing customers and superimposed upon landscape features that comply with conservation-based land-use planning laws. Last, the demand chapter analyzed the predicted growth rate for the City based upon the City's past growth waves, the State's growth projections, and Placer County's growth projections. Recognizing that this rate may fluctuate over time, the City Council concluded that an estimated 3% annual growth rate was appropriate for City planning purposes.

The annual demand projections can be translated into maximum day (Max Day) and peak hour (PH) demand estimates that allow for infrastructure sizing and planning as well as managing the City's wholesale water supply contract with PCWA. The City's retail water system must meet the Max Day water demand, the PH water demand during that Max Day, as well as any fire flow conditions that may result from an emergency during the PH flow. Infrastructure planning requires not only the ability to deliver the water

supplies from the potential sources to meet these demands, but also to ensure the safety and longevity of the City's water system in executing these deliveries.

The City's predicted build-out Max Day demand is 67 million gallons – meaning this volume of water must be able to move through the City's system during the highest use day when the City reaches build-out conditions. The City has decided that it will plan for approximately 57 MG during Max Day for its potable water system and allow the additional 10 MG to be derived from its non-potable system. As such, the City's demand forecasts for Max Day are derived from a 57 MG Max Day potable delivery where total annual potable water demands would approximate 30,000 acre-feet.

Chapter 5. Surface Water Supplies

Chapter 5 describes the City of Lincoln's existing and planned surface water assets through build-out of the City's current land-use projects as depicted in the 2008 General Plan and subsequent planning documents. The surface water supplies that are used within the City and its SOI are derived from two contract entitlements – the PCWA-City of Lincoln Water Supply Contract and the NID-City of Lincoln Temporary Water Service Contract. All of the water derived from these contracts is delivered through PCWA's treatment and conveyance system.

In 2012, the City entered into an updated water supply contract with PCWA for delivery of treated surface water.[2] The PCWA Contract entitles the City to a Maximum Delivery Entitlement of 18,501,424.5 gallons (~ 18.5 million gallons) of treated water supply.[3] The contract distinguishes between regulated and unregulated deliveries as follows:

- Maximum day Regulated Deliveries of 17,774,452 gallons per day; and
- Maximum day Unregulated Deliveries of 726,972.5 gallons per day.

Regulated water deliveries are those deliveries where the City uses its system operations to deliver water on a demand pattern for certain uses within the City. Specifically, the City uses its facilities to regulate pressure and accommodate peak demands. Unregulated water deliveries are those water deliveries that are provided to the City where PCWA uses its system operations to manage the water deliveries. PCWA's unregulated deliveries currently serve the City's "high elevation lots" generally in the Catta Verdera

[2] The Contract is titled: "Contract between Placer County Water Agency and the City of Lincoln for a Treated Water Supply" dated November 13, 2012. (Hereafter, "PCWA Contract").
[3] Article 5(b) PCWA Contract.

area.[4] The PCWA Contract also contains opportunities for the City to purchase additional supplies beyond the Maximum Delivery Entitlement identified in the contract.

The City's potable surface water assets come from two sources: PCWA and NID. These sources rely upon underlying water rights and contracts to make water available for use in the City of Lincoln. Specifically, the City receives potable water from PCWA's American River post-1914 appropriative water rights permits as well as its contract entitlement with Pacific Gas & Electric Company (PG&E). PCWA's Central Valley Project (CVP) contract entitlement is not yet available for PCWA's diversion and use. The City receives NID water from NID's pre-1914 appropriative water rights, post-1914 appropriative water rights, and its contract entitlement with PG&E. All water supplies derived from these sources are collectively managed in the City's retail system so as to comply with applicable law and best meet the City's demands in different year types, reduce delivery costs, manage water quality issues, and handle drought and emergency situations. As such, water deliveries from each identified source may fluctuate in any given year because of management decisions, regulatory constraints, and hydrological conditions.

Table ES-2 depicts PCWA's water supplies that are available to meet all of PCWA's demands in the future, including those of the City of Lincoln through the PCWA Contract. PCWA's post-1914 appropriative water rights permits from the American River have a priority date of 1958 – junior in priority to the Federal Central Valley Project water rights that fill Folsom Reservoir. These water rights are directly diverted from PCWA's American River diversion facility as well as diverted to storage into PCWA's storage system for metered deliveries into PCWA's system throughout a water year. These water rights were curtailed in 2014 and 2015 when the state issued its curtailment orders for all post-1914 appropriative water rights. PCWA's system deliveries derived from these water rights, however, were not impacted as the SWRCB issued corresponding conservation mandates to end users in the Placer County area.

Table ES-2 – PCWA Available Surface Supplies

Supply	Average/ Normal	Single Dry Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
	af/yr	af/yr	af/yr	af/yr	af/yr
Pacific Gas & Electric	110,400	55,200	82,800	82,800	82,800
Middle Fork Project	120,000	80,400	120,000	120,000	120,000
Central Valley Project	32,000	16,000	24,000	24,000	24,000
Pre-1914	3,400	850	1,700	1,700	1,700
Total	265,800	152,450	228,500	228,500	228,500

[4] Article 5(c) PCWA Contract.

PCWA's two PG&E contract entitlements are derived from PG&E's water rights associated with the Drum-Spaulding project. Generally, these water rights have senior priorities and are based on pre-1914 appropriative water rights filings.[5] As shown in **Table ES-2**, PCWA anticipates a normal year PG&E contract entitlement supply availability of approximately 110,400 acre-feet.

The City and Nevada Irrigation District (NID) entered a temporary water supply contract for water deliveries to NID customers and developments that will be incorporated into the City's service area upon annexation. Through this agreement, NID provides additional surface water to the City for deliveries into the NID service area. The water contemplated in this agreement is provided by NID to PCWA for treatment and delivery to the City. Historically, NID has delivered through PCWA's system as much as 1,920 acre-feet of water to NID's service area within the City's boundaries. The actual amount of water that will be available to the City in the future, however, has not been finalized and the existing agreement has no clause expressly quantifying the available supply.

NID's water supplies consist of a variety of water rights and contracts that implicate the reliability of these supplies for current and future deliveries to the City. Specifically, NID has numerous pre-1914 appropriative water rights to waters in the Yuba River, Bear River and Deer Creek watersheds as well as post-1914 appropriative water rights to waters in the same watersheds. Collectively, these appropriative water rights allow for water diversions and collections to storage approximating 450,000 acre-feet of water each year. In addition to these rights, NID has a water supply contract with Pacific Gas & Electric Company for as much as 54,000 acre-feet of water in normal years. **Table ES-3** below depicts the collective water assets and storage rights of NID available for use in the entire NID service area.

Table ES-3 – NID Available Water Supplies

Supply	Average/ Normal	Single Dry	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
	af/yr	af/yr	af/yr	af/yr	af/yr
Watershed Runoff	221,500	221,500	221,500	221,500	221,500
Carryover Storage	201,985	129,400	129,400	129,400	129,400
PG&E Contract	54,361	8,000	8,000	8,000	8,000
Total	477,846	358,900	358,900	358,900	358,900

The water derived from these sources constitutes the City's surface water supply portfolio and are described in more detail in **Chapter 5**. Each asset is derived from specific water rights, contracts, and planning arrangements that are subject to specific regulatory rules and contractual constraints. Some water assets that enter the City and its SOI are not

[5] A full analysis of PG&E's water rights is beyond the scope of this CWMP.

controlled by the City yet may influence the City's water management activities among the water assets that the City does control. Nevertheless, the diversity of surface water assets available to the City in its water supply portfolio as well as the volumes of water controlled by its wholesale providers, make the City of Lincoln's surface water supplies, in combination with the City's groundwater supplies (discussed in **Chapter 6**), available to meet its demands in normal years, a single-dry year, and multiple-dry years.

Chapter 6. Groundwater Technical Assessment

Chapter 6 provides a thorough assessment of the City's groundwater. Specifically, the chapter defines the North American Groundwater Sub-basin and its current groundwater conditions; explains the City's existing well system and groundwater rights; describes the governance structure and existing plans as related to the groundwater system; and assesses future governance issues, groundwater banking and long-term strategy objectives. The interaction of all four of these issues drive the City's long-term groundwater supply reliability.

The North American Groundwater Sub-basin (Sub-basin) is one of 18 sub-basins of the 7,900 square-mile Sacramento Groundwater Basin. The approximate total storage of the Sub-basin is 4.9 million acre-feet – about 5 times larger than the total storage of Folsom Reservoir. **Figure ES-4** shows the geographic extent of the Sub-basin.

Figure ES-4 – North American Groundwater Sub-basin

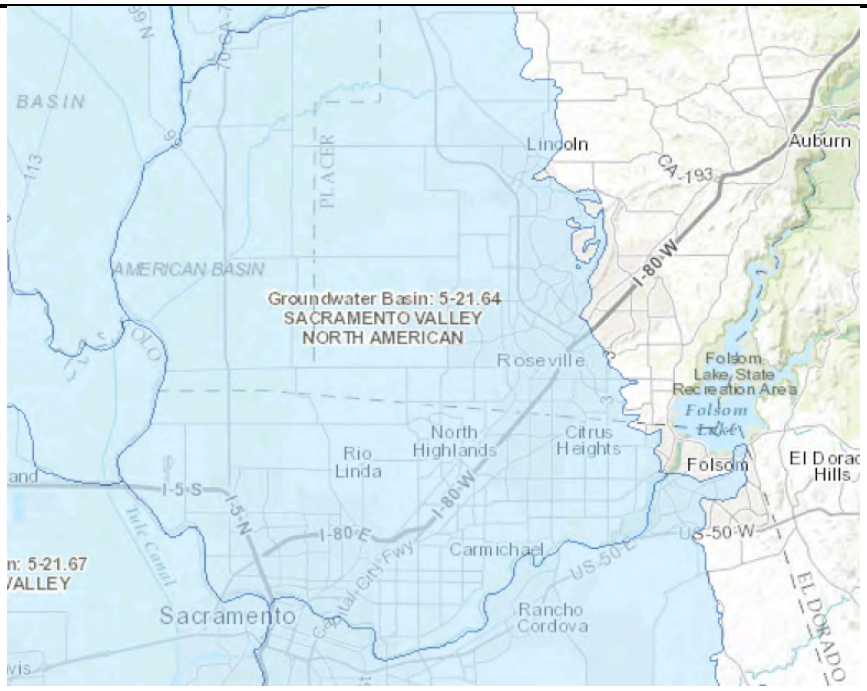

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Image Sources:
Sacramento Valley North American Basin
Bulletin 118, Basin 5-21.64

The Sub-basin's hydrogeological vertical profile includes geological deposits generally categorized in the following formations from oldest to youngest – Mehrten, Laguna, Turlock Lake (Riverbank), and Alluvial. The City generally utilizes groundwater derived from the Mehrten formation and pumps water from its 5 active wells located in and around the City limits. These wells include the Nicolaus, Westwood, Moore, Fiddyment, and Nelson wells. The locations of these wells are depicted in **Figure ES-5**.

Figure ES-5 – City of Lincoln Production Wells Map

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Image Sources:
Google Earth Pro

The City's historical groundwater pumping volumes since 2008 are depicted in **Table ES-4**. The City intends to utilize no more than 10 percent average annual groundwater in the future while maintaining the availability to utilize as much as 75 percent of its average day demand in case of an emergency. **Table ES-5** depicts the City's anticipated future groundwater pumping in 5-year increments.

Table ES-4 – Historical Groundwater Pumping

Acre Feet							
2008	2009	2010	2011	2012	2013	2014	2015
1,085	836	962	2,686	2,620	1,113	691	707

Table ES-5 – Future Groundwater Pumping

Acre-feet					
2020	2025	2030	2035	2040	BO
1,230	1,348	1,530	1,711	2,034	3,568

The City intends to use its groundwater supplies over a different pattern during the course of a year in order to manage peaking during the high water use months. Moreover, the City will use its overlying groundwater rights to potentially serve non-potable water

demands as well as its appropriative groundwater rights and stored groundwater supplies to meet its potable needs through its potable water distribution system.

Governance of the Sub-basin is subject to a number of existing governance agencies and private individuals as well as the newly forming authorities under the Sustainable Groundwater Management Act (SGMA). Currently, there are 5 groundwater management plans (GMP) that exist in the Sub-basin. They are: the Western Placer County GMP, South Sutter GMP, Sutter County GMP, Natomas Central Mutual Water Company GMP, and the Sacramento Groundwater Authority GMP. All of these GMP's have bearing on the overall management of the Sub-basin. The SGMA will require formal consultation among public and private groundwater interests in the Sub-basin in order to form one or more Groundwater Sustainability Agencies (GSA's) and Groundwater Sustainability Plans (GSP's). At this time, SGA has formed a GSA and is working to formulate its own GSP. Others, like the Western Placer County GMP group with the addition of Placer County, are looking to form a GSA before the July 2017 deadline.

Last the City's 2008 General Plan policies include the evaluation of groundwater recharge.[6] The City has been addressing its groundwater recharge efforts in the context of its increased usage of surface water resources and delivery of reclaimed water resources (in lieu of agricultural groundwater pumping). These efforts have resulted in groundwater elevation recovery in the City of Lincoln area whereas groundwater levels have dropped in areas closer to Sutter County with exacerbated groundwater use. As such, the City's groundwater management efforts require recognition and formalization – including potential development of groundwater banking protocols.

Chapter 7. Water Supply Reliability

Chapter 7 defines water supply reliability in the context of the City of Lincoln's water system and determines that the City's water supplies and delivery system are reliable. Water supply reliability is a synthesized assessment of water demand, water supply, and conveyance infrastructure. Isolating any of those components from the other components renders a water supply reliability assumption inadequate. As described in this chapter, the City's accurate demand calculations, integrated water supply system, and redundant delivery infrastructure combine to render a system with sufficient water supply volumes and conveyance capabilities to conclude that the City has reliable water supplies.

[6] 2008 General Plan Policy – PFS2.11 Groundwater Recharge.

City Well

The City has accurate water demand calculations. The Master Demand Spreadsheet Tool (MDST) synthesizes the City's current and future land use plans with state-of-the-art water demand accounting methodologies. Specifically, the MDST uses two recent meter studies (2011 and 2015) as well as thorough assessments of current and future regulatory schemes to assess the City's current demand and predict the City's future demands. These demands are analyzed to account for monthly City-wide demands as well as maximum day demands, peak hour demands, and fire flow demands that are critical for understanding the sizing of a water system. In short, the City's foundational demand calculations – as depicted in **Chapter 4** – are accurately represented and satisfy the first element of determining water supply reliability.

As described in **Chapter 5**, the City's numerous sources of water, including potable supplies from Placer County Water Agency, Nevada Irrigation District, and groundwater as well as its non-potable supplies from PCWA, NID, groundwater and reclaimed supplies, have numerous quantifiable benefits. In short, the City's multiple sources of supply reduce the risk that reliance on a single source of supply creates – that failure of that single source eviscerates supply reliability. Because of its diverse water supply portfolio as well as the volumes available in each component of the portfolio, the City is able to switch availability among all its water sources either to supplement potable supplies entering its water system or reduce demands so that available potable supplies may be used for essential purposes. In 2011, the City's major surface water supplies delivered through PCWA's system were vastly reduced due to a failure of the Bear River Canal. In this situation, the City was able to increase its groundwater delivered into its potable water system in order to offset the reduced volume of potable surface water available from PCWA. The ability to use alternative sources in a water supply portfolio based upon unpredictable conditions exemplifies water supply reliability.

Although the supply sources are reliable, the City's existing water supply portfolio requires additional steps with PCWA and NID in order to further secure potable surface water supply reliability in the future. These steps include improving contractual provisions with PCWA and NID as well as securing all water supply assets from the wholesalers to meet long-term development needs. The City must also aggressively engage with groundwater stakeholders in the SGMA processes in order to protect its long-term groundwater assets. Last, the City should further clarify its Master

Reclamation Permit and associated Waste Discharge Permit in order to ensure that current and future reclaimed water uses are preserved.

The third component in a water supply reliability assessment is infrastructure. The City's existing water system infrastructure meets the minimum thresholds for a reliability conclusion. Specifically, although the City has limited infrastructure redundancy in the event of an infrastructure problem, it does have contingency plans and emergency interties that allow it to handle infrastructure failures. As described in **Chapter 3**, the City uses water derived from the regulated flow ledger on the City-PCWA contract to pump water into portions of the Catta Verdera development. If the pump system failed, this portion of the Catta Verdera development would be without an adequate potable water delivery system. The City is taking actions to rectify this infrastructure limitation in order to mitigate this water supply reliability risk.

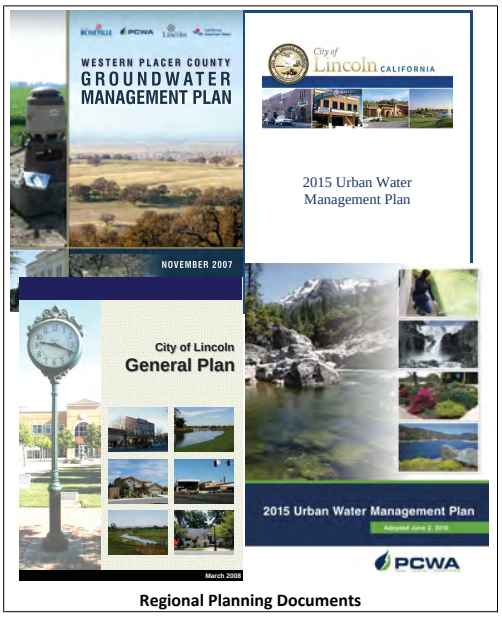
Similarly, the City receives its surface water supplies through a single source – Placer County Water Agency. The City is working with Nevada Irrigation District to develop a second potable water delivery system – the NID Regional Water Supply Project – that could delivery both NID water and PCWA water into the City's water system. Such redundancy in major system delivery systems will provide the City with adequate infrastructure redundancy as it approaches build-out conditions. In addition, augmenting groundwater pumping capacity – as is planned – in order to provide an additional infrastructure component in the case of catastrophic surface water outages is critical. All of these plans are moving forward as part of the City's long-term water supply reliability assessment.

Chapter 8. Strategic Water Issues

Chapter 8 of the Comprehensive Water Master Plan addresses the strategic water management issues facing the City of Lincoln in the context of the State's Water Framework as well as regional management issues. As described in this chapter, the issues facing the City vary in their complexity and geographic scope. In some cases, issues are entirely local and involve specific identifiable actions that are easily discerned. But in other instances, issues are complex with statewide and even global significance that require management actions aimed at mitigating the local risk.[7]

[7] Risk management as applied to water supply reliability was discussed in more detail in **Chapter 7**.

It is clear that the management of the City's water assets has become exponentially more complicated since the adoption of the 2008 General Plan. Indeed, the worsening four-year drought crisis has illuminated the lack of statewide water planning, highlighted the growing insurgency of federal and state regulatory agencies into local and regional issues, and underscored the City's water asset and water conveyance vulnerabilities.



Regional Planning Documents

A number of water management challenges are facing the City – both internally and externally. Critical to the management of the City's water assets is the continued diligence in perfecting the City groundwater rights, recycled water rights and surface water entitlements, as well as protecting the City's ability to provide a balanced water supply during wet and dry years to meet customer demands. In addition, the City must be prepared to control a dynamic assortment of issues that continue to evolve in light of the State's limited water resources. This control begins by forming an adaptive issue management structure that enables swift issue identification, clear issue prioritization, and effective issue engagement strategies.

As described in detail in **Chapter 8**, the City's regional and statewide issue tracking requires engagement in numerous water-related forums. Moreover, the City's issue tracking requires synthesis with the City's long-term water planning efforts in order to assure the appropriate issues are recognized and prioritized appropriately relative to preserving the City's water supply reliability.

The priority issues include leading the regional Sustainable Groundwater Management Act groundwater administration efforts in the North American Groundwater Sub-basin. This issue requires not only continually monitoring the Regional Water Authority (RWA), Sacramento Groundwater Authority (SGA), and Western Placer County GMP group's efforts, but also actively engaging in those forums to preserve the City's interests. Coalescing groundwater planning efforts among public and private interests across the entire North American Groundwater Sub-basin will require significant input of time and effort. Avoiding basin-wide adjudication should remain a high priority.

Other significant issues including the Bay-Delta Water Quality Control Plan Update and the California WaterFix continue to impact the City's surface water assets, and

potentially the City's reclaimed water assets. The City must continue to engage regional stakeholders and forums – including litigation forums – in order to preserve the surface water supplies in the region. For instance, in October of 2016, regional stakeholders covering the entire Sacramento Valley (including numerous stakeholders from the American River watershed) testified at the State Water Resources Control Board (SWRCB) hearings on the California WaterFix. Significant amounts of written and oral testimony were presented by regional stakeholders about the implications of the California WaterFix on surface water supplies. The City should monitor these actions closely as the outcome of this hearing will impact the surface water assets available to the City. In short, this example of an issue with statewide significance will impact the City's long-term water supply reliability. Simply relying upon external sources to inform the City of the issue's progress and resolution is insufficient to adequately integrate the WaterFix into the City's own supply reliability assessments.

Chapter 9. Water Model Presentation and Assumptions

The City of Lincoln has a long history of providing water to its residents – likely dating back before its incorporation in 1890. In providing water, the City became responsible for the development and upkeep of a water conveyance system. The City still manages and operates a potable water system with pieces of infrastructure that date back to at least 1929.[8] The existing water system contains pipes from every construction era since the City's formation all coalesced into a single conveyance arrangement. The pipe materials include: concrete, iron, steel, and PVC with the oldest redwood pipes having been fully removed. The City has continued to grow, expanding from a small town, to a City with over 45,000 residents. The miles of pipe, number of valves, pressure settings, and infrastructure locations all require maps, spreadsheets, and databases to monitor and service. Furthermore, the additions to the system must be carefully engineered to comply with the newest fire flow and design standards as well as tested and verified to keep the existing City water system in compliance with applicable law and regulations.

Since the 1970's, universities and private companies have been writing computer software to process engineering complexities in urban water systems. Computers are now capable enough to store all of a City's water system details and display the impacts of system changes in advance of problems arising. In the early 2000's, the City of Lincoln was tracking water system expansions and maintenance projects in a Geographic Information System (GIS) format and had developed a water system model. With the housing crisis of the late 2000's, the City's urban growth substantially slowed and the

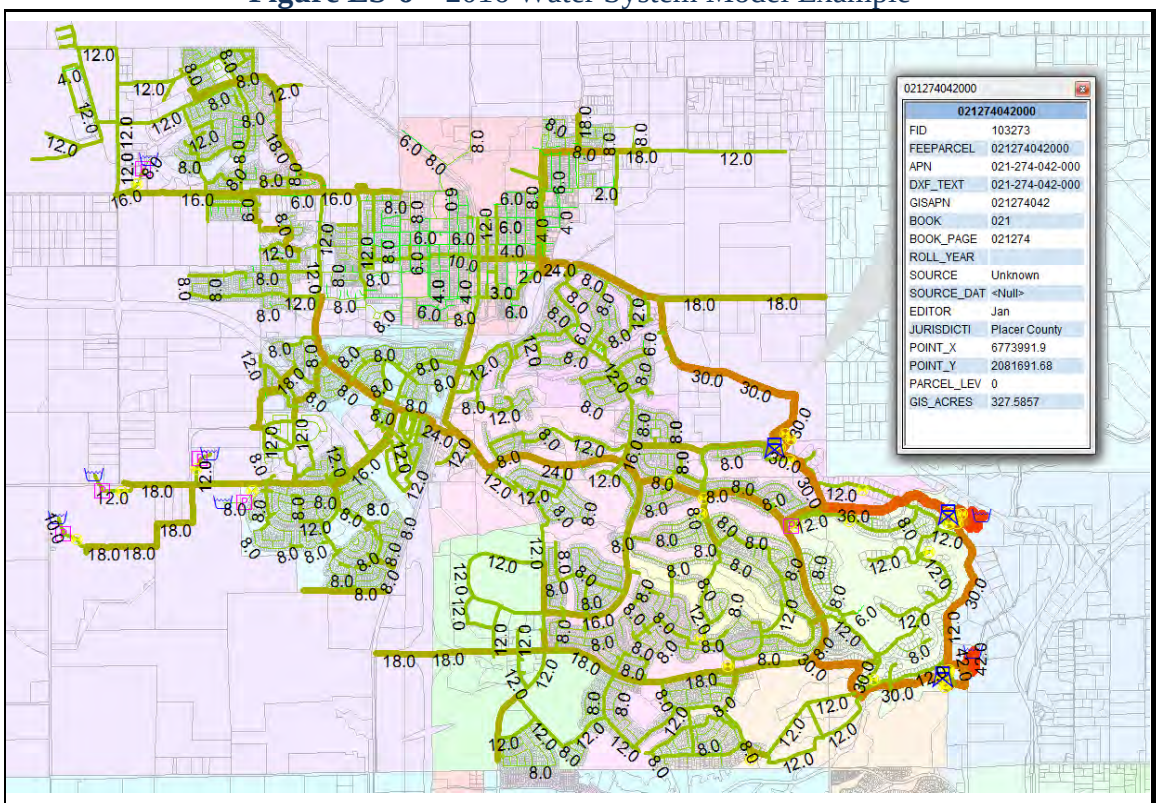
[8] 1929 is the oldest category of infrastructure cataloged in the City GIS system in 2009 by Ecologic. Much of the raw water systems controlled by the PCWA and NID date back to the gold rush days. As described in **Chapter 1**, these systems provided water to the City in its earliest years.

need for modeling additions to the water system stopped. Coupling the downturn with a lack of funding, the GIS database was mothballed. Fast-forward to the mid 2010's, and development has returned to the City as well as the need for an accurate, scalable, and robust water system model coupled with a comprehensive GIS database. The primary purpose of **Chapter 9** is to provide an overview of the City's updated model and explain its functional utility.

The City's previous water model was last updated in 2011 to derive some early infrastructure sizing and the connection estimates for the proposed Village 1 development. The current model displays pipe lengths, pipe materials, flow rates, GIS-related information, and system tracking into a single platform. With over 200 miles of pipe and nearly 3,000 pipe sections, there was a significant amount of work involved with updating the model representation of the City's constructed infrastructure and cross-checking infrastructure assumptions against the field maps to execute necessary corrections.

Figure ES-6 presents an example of the 2016 Water System Model. It is important to note that the model scaled in this example is depicts the larger infrastructure components throughout the City. The model has much more specific data – down to the street level – that is available for modeling assessment. For instance, exact pipe lengths, installation dates, and building materials can be entered into the modeling system. Minor corrections to the new model will be ongoing in the future as updated drawings are reviewed and analyzed. These corrections will have negligible impact on the overall results of the model and will not change the validity of the results drawn from the model.

Figure ES-6 – 2016 Water System Model Example



Tully & Young
Comprehensive Water Planning

Image Sources:
City Water System GIS, Licensed ESRI ArcGIS
City Water Model, Innovyze InfoWater

The City's water model incorporates all levels of detail related to the City's water system including: fire hydrants, pumps, tanks, pressure reducing valves (PRVs), wells, and other key infrastructure. The model also allows the City to assess flow rates, pressures, and other issues that may create infrastructure problems in the system. The model not only handles existing conditions but also allows the City to assess future major infrastructure projects that may also improve City water supply reliability. Accordingly, the City's water model is an important tool in analyzing the City of Lincoln's water supply reliability and water management system.

Chapter 10. Facility Replacement Program

Chapter 10 addresses the City of Lincoln's potable water supply projects identified as part of the Facility Replacement Program (FRP) based on water system infrastructure ages, materials, known conditions, and modeling results. The recommended FRP projects will assist the City in meeting build-out demand as well as current fire flow conditions. This chapter was developed in consultation with City Staff. Ongoing

projects and recommended projects are based upon conditions known as of August 2016. **Table ES-6** lists the City's FRP projects.

Table ES-6 – Facilities Replacement Program Projects

Project	Status	Timeframe
Larger 4" CIP Replacement	Underway	Completion within 5 years
C-Street Replacement	Underway	Completion within the year
East 9th Street	Near-term	Spring of 2017
East 5th Street	Near-term	Summer of 2017
LDS	Near-term	Completion in 2017
Summerplace	Near-term	Completion in 2017
Summerset - F Street	Near-term	Completion in 2017
Design Life Pipe Replacement	Long-term	15+ years
ACP Replacement	Long-term	15+ years
Older Rail Undercrossings	Long-term	15+ years
Fireflow Supply Issues	Underway	Ongoing

Chapter 11. Capital Improvement Program

Chapter 11 describes the potable water supply projects identified for Capitol Improvement Program (CIP) for the City of Lincoln based upon the City's build-out demand water modeling results, water supply portfolio, and water shortage planning. As the City of Lincoln's potable water system expands to meet additional needs, major infrastructure systems and pipelines will be constructed by affected developers in order for those developments to meet each development's fundamental project needs.

The City's existing infrastructure policies enable the City to pay for upsizing and expansion costs beyond those needed for an identified development. All developments contribute money to the City for the costs (as defined in the City's Impact Fees in the Master Fee Schedule) of the upsizing and expansion. If upsizing and expansion goes beyond the needs of an identified development (e.g. is slated to satisfy a City need), then the City would pay for the incremental component on its own. The projects listed in **Table ES-7** cover the CIP efforts that will be required for each major stage of City development within the City. **Table ES-8** identifies projects outside the City that the City will likely financially support. Many of these CIPs are categorized by an identified "Village" – the terminology associated with individual developments listed in the City's 2008 General Plan – in order to simplify the analysis and cost allocations.

Table ES-7 – Capital Improvement Program Projects Within City

Project	Status	Timeframe
Phase III Pipeline Connection and Metering Station	Underway	Completion by 2018
10 MG Tank and Pipeline at CV North	Underway	Completion within 5 years
Oak Tree Lane Replacement and Realignment	Near-term	Completion within 5 years
Village 1 Backbone Infrastructure	Near-term	Completion within 5 years
Village 5/SUD B Backbone Infrastructure	Near-term	Completion within 5 years
Village 7 Backbone Infrastructure	Near-term	Completion within 5 years
Airport Storage and Pump Station	Long-term	Completion as needed (10+ years)
Reservoir 1 Expansion	Long-term	Completion as needed (10+ years)
Village 2 Backbone Infrastructure	Long-term	15+ years
Village 3 Backbone Infrastructure	Long-term	15+ years
Village 4/SUD A Backbone Infrastructure	Long-term	15+ years
Village 6 Backbone Infrastructure	Long-term	15+ years
SUD C Backbone Infrastructure	Long-term	15+ years

Table ES-8 – Capital Improvement Program Projects Outside City

Project	Status	Timeframe
Phase III Pipeline	Underway	Completion by 2018
Bickford Pipeline	Underway	To be Completed as Necessary to Maintain Service
Ophir Water Treatment Plant	Underway	To be Completed as Necessary to Maintain Service
Sacramento River Diversion Project	Long-term	15+ years
NID Water Supply Project	Underway	To be Completed as Necessary to Maintain Service

Chapter 12. Water Management Recommendations

Chapter 12 summarizes the water management recommendations derived from the previous eleven chapters of the Comprehensive Water Master Plan that meet the City's long-term water management objectives. These fundamental objectives include protecting the City's water supply reliability, improving water planning and management, and constructing the necessary infrastructure to meet current and future demands. As described in **Chapter 1**, the ever-changing California Water Framework coupled with the City's rapid expansion necessitate continued diligence on water management issues in order to protect the City's water interests. Maintaining reliable long-term water supplies requires persistent efforts to stabilize the water asset acquisition, finance and build key infrastructure, create system flexibility to adapt to changed conditions, and stabilize internal water management efforts. Although the entire list of recommendations should be reviewed in that chapter, the priority recommendations are noted below:

- Monitor trends in integrated land and water planning, including new laws and regulations that further intertwine the two specialty fields.

- Create a specific land and water planning procedure that is applicable to all large and small development projects within the City. Cross-reference planning documents in the context of this planning procedure (e.g. assure consistency among documents).

- Regularly update the **Master Demand Spreadsheet Tool** in order to keep real-time demands and future demand predictions updated for project development and implementation.

- Investigate potential water use policies that can help manage peak hour and Max Day demands in a manner that can decrease pipeline sizing and other infrastructure expansion.

- Understand PCWA's long-term demand for its water assets throughout PCWA's service area. Assess growth rates and patterns to understand whether growth in PCWA's service area may impact the reliability of PCWA supplies delivered to the City.

- Support PCWA's decision to design and construct the Ophir Water Treatment Plant.

- Support NID's desire to design and construct the Regional Water Treatment Plant in order to create surface water supply reliability within the City of Lincoln as well as create redundant infrastructure systems capable of supporting the City in emergency outage conditions.

- Continue to develop and enhance the City's non-potable water supplies and develop associated uses for those supplies that relieve tension on the City's potable water system.

- Develop emergency groundwater management protocols and backup electrical and treatment systems to handle water supplies in case of a large-scale surface supply outage. Emergency protocols should include identification and installation of backup generators, automated water quality testing, and redundant system management.

- Preserve decision-making authority for the City on any governing body formed out of SGMA. The City's groundwater rights must be preserved through active City governance in a GSA.

- At a minimum, continue to actively engage in GSA formation and provide staff support to execute tasks and achieve governance outcomes – but consider leading efforts to ensure local control of important groundwater assets. Developing a political plan to work with regional entities to ensure local control of groundwater resources is paramount.

- Support PCWA in all aspects of its permit renewals on water right permits 18356 and 18358 so as to preserve the supplies available under those rights for uses in the City of Lincoln and its SOI as well as other areas in PCWA's service area.

- Develop and refine the City's conjunctive use efforts.

- Continue Facilities Replacement Program efforts with priority projects.

- Continue engagement in all regional water entities including RWA and WPCGMP group.

- Conduct normal year max day fire flow tests and re-calibrate the model to within 10% of the test calibration in the next normal water use year.

- Require developers through newly adopted policies to perform and submit development specific water modeling with defining parameters and product expectations.

- Undertake rigorous cost assessment of major potable water infrastructure projects – specifically, NID's Regional Water Supply Project and its associated infrastructure as well as PCWA's Ophir Water Treatment Plant project and its associated infrastructure.

- Develop a strategic assessment team that will organize CIP potable water projects and create processes to determine each project's utility. Utilize strategic assessment team to allocate costs for projects in coordination with City finance team.

CHAPTER 1. INTRODUCTION AND HISTORICAL SETTING

1.1 Purpose

Since October 2014, the City of Lincoln has been investigating its water assets, analyzing its technical and infrastructure needs, and preparing a synthesized water management plan. The purposes of this Water Master Plan (WMP) are to memorialize the findings associated with the City's efforts and outline a long-term plan that addresses the City's central water-related policies, strategic facility and infrastructure investments, and regional land and water expansion opportunities. The WMP captures relevant portions of these themes in each chapter while thoughtfully separating the priority actions from the secondary and tertiary ones. This WMP is designed to be a living document – a document that should be updated, at a minimum, every five years as conditions change in order to best serve the City's long-term development needs. The WMP organizes the City's strategic management planning and has practical application to the City's facilities replacement plans and land-based developmental needs. As such, the WMP provides a thorough platform to substantiate the City's water-related decision-making efforts while documenting their foundational underpinnings.

1.2 Document Organization

The Water Master Plan is organized into the following chapters to focus important topics and provide easy reference to relevant substantive materials:

Chapter 1 provides a framework of the water issues in the State of California as well as a history of the City and its water supply and infrastructure.

Chapter 2 describes the City of Lincoln's land and water planning organizational structure as well as the relevant documents that inform the City's water management.

Chapter 3 provides a full description of the City's existing water system as well as the planned future water system.

Chapter 4 details existing water demand characteristics and forecasts future water demand to meet the land-uses envisioned by the City's 2008 General Plan. It also establishes the necessary data for infrastructure sizing and placement.

Chapter 5 analyzes the City's water assets, including assets owned and controlled by the City's primary wholesale water purveyors – Placer County Water Agency and Nevada Irrigation District.

Chapter 6 assesses the City's groundwater assets and the regional issues associated with groundwater management.

Chapter 7 synthesizes the water supply and demands by demonstrating the reliability of water supplies through the City's build-out time horizon.

Chapter 8 presents the strategic water issues that impact the City's water assets and potential long-term water supply reliability, identifying the key political and regulatory forums that may require additional City engagement.

Chapter 9 details an overall assessment of the City's updated water infrastructure model, the key assumptions incorporated into the model, and important findings associated with the analysis of specific infrastructure representations.

Chapter 10 outlines the City's Facilities Replacement Plan that will inform the City's priorities for potable water infrastructure maintenance and replacement efforts.

Chapter 11 outlines the City's Capitol Improvement Plan that identifies the critical infrastructure needs to meet the City's long-term growth objectives envisioned by the 2008 General Plan

Chapter 12 provides the long-term water management plan and recommendations derived from the proceeding eleven chapters in order to organize the City's water management objectives.

1.3 California's Water Framework

As described in the eight water workshops presented to the City Council,[1] California's Water Framework (Framework) is a combination of variable hydrology, competition for limited water resources, as well as complex laws, policies and regulations. The Framework creates an evolving water system that lacks planning security – meaning that the City cannot rely on the existing Framework in order to protect its long-term interests. The Framework may change dramatically – and as seen in 2014 with the State's legislative incursion into local groundwater management. Accordingly, the City's long-term water plan must account for potential significant change.

California's Water Framework has numerous ongoing water issues. The bulleted list below outlines the primary issues confronting the City:

[1] Eight City Council workshops were held between October 2014 and December 2015.

- *California's Population*: The population in California is approaching 39 million and is projected to exceed 50 million by 2050. Water supplies will be needed to meet the needs of the state's growing population.

- *California Agriculture*: Farming and ranching occurs throughout 43 million acres of land in California. Irrigated agriculture is shifting from annual crops to permanent crops, requiring greater water supply certainty and reliability to maintain financial viability.

- *California's Hydrology*: Average annual runoff totals about 71 million acre-feet per year (MAF) with 56 MAF occurring north of Sacramento and 15 MAF occurring south of Sacramento. Nearly 30 MAF of the water from this runoff is consumed south of Sacramento, 15 MAF is used north of Sacramento and the remainder is dedicated to the environment, goes unused, or is lost.

- *Climate Change*: Measured changes in the form of precipitation (more rain and less snow), affecting the timing of runoff, indicate that the State's hydrological systems are changing. Changing hydrological systems will require modified storage and conveyance systems to meet expanding needs.

- *Water Rights and Entitlements*: California has numerous forms of water rights and entitlements that are unclear and often in conflict. The lack of clarity as related to the nuances and exceptions in the water allocation system adds uncertainty to the reliability of water supplies.

- *California's Water Governance*: Numerous state and federal agencies all regulate water or regulate issues that affect water assets. Moreover, thousands of special districts, joint powers authorities, and private companies regulate and affect water supplies. Often the objectives of these entities are misaligned.

- *Water Competition*: Water assets must be spread among many users, intensifying competition for water supplies. Endangered and threatened species, Delta water quality, municipal and industrial uses, agricultural uses, energy production, and habitat restoration all vie for same water resources.

- *Integrated Land and Water Planning*: Water is dictating modern land planning. Historically, land plans were approved and water supplies were delivered. Today, water supplies must be proven before land plans can be ratified.

- *Groundwater Management*: Groundwater management of California's 515 groundwater basins is now at the forefront of government attention and regulation. Long-term reductions in groundwater pumping are inevitable in areas of the state with chronically overdrafted groundwater basins. Stable basins may be more closely regulated to assure overdraft does not begin.

- *Infrastructure Investments*: Major infrastructure investments, like expanded treatment facilities or improved conveyance facilities, are complicated and require

large financial investments. These investments are often made when the return on those investments are derived over longer periods of time and tied to uncertain land-use and population expectations.

- *Planning Documents*: The sheer number of legally required land and water planning documents and the organization of those documents is often complicated, leading to opportunities for inconsistent data or policy representations. Each land or water planning document has legal significance, highlighting the critical need to draft documents that are internally and externally consistent, or that contain explanatory text to assure success in long-term project development and decision-making.

1.4 City of Lincoln's Historical Setting

5th Street Burge Hotel and IOOF Building 1905
Photo Curtousy Lincoln Native Sons

The City of Lincoln's current water supply reliability and water-related infrastructure is derived from its storied history. This section is dedicated to explaining a portion of that history as relevant to the overall Water Master Plan effort.

The City of Lincoln was established during a time of great change in the United States. California's Gold Rush had ended and the recalcitrant gold miners were establishing new settlements throughout the state while the fragile Union was on the brink of the Civil War. Although California was on the edge of the great confrontation, it held the keys to the natural resources wealth of the west. The area encompassing the current City of Lincoln contained mining and agricultural resources that were of great interest to the emerging society.

The original Lincoln town site was surveyed and recorded by Theodore Judah in the late 1850's in conjunction with the routing of the California Central Railroad through the area. The City is named from the second owner of the town site – Charles Lincoln Wilson, who sold the first town lots in 1859. In 1863, copper in mineable quantities was discovered creating a brief second mining boom in the area. The fledgling town relied on several sources of water in the area to meet the mining, agricultural and residential needs. Specifically, water was derived from natural watercourses, man-made ditches connecting the Sierra's to the foothills, shallow hand dug wells, and cisterns filled with precipitation from rooftops. After the Civil War, Lincoln became a hub for the burgeoning cattle and fruit production in the area. Cattle ranching in and around the City grew at an incredible pace and pasture land for grazing livestock greatly expanded.

Openland Grazing

In the 1870's, industrial opportunity came to the town in the form of the discovered coal and clay deposits around and underneath the town site, including areas under the current City Hall. These mined coal deposits were quickly exhausted as additional mining opportunities and industry arose. Gladding-McBean & Co. mined the clay resources from the ancient Ione Formation that emerged from the land surface on the edge of town. Since its inception in the 1870's, Gladding-McBean & Co. provided clay and terra cotta pipes for water and wastewater systems in the City.

The City of Lincoln incorporated in 1890 as a California General City. Additional mining opportunities arose as granite quarry operations were underway east of the City, similar to those in the Loomis Basin. The mining, industry, farming, and ranching caused the City's population to more than double from about 1,000 persons in the 1890's to about 2,400 people in 1950. The town's human and industrial growth required reliable water supplies.

In 1895, the City issued its first water bond. The South Yuba Ditch Company constructed an 11-inch riveted iron pipeline from the Caperton Canal to the unlined City Pond just downhill from the canal. The water supply then flowed by gravity to the City primarily to sell water for fire protection from hydrants served by a small network of iron pipes beneath City streets predominantly east of the railroad.

Pipes at Glagging McBean

Photo Courtesy lifeinlincoln.wordpress.com

The Caperton Canal was an uncovered man-made ditch running from the Sierras to the southeast through the heart of Placer County to meet the mining, urban and agricultural needs in the region. In 1924 a 14-inch pipeline of cast iron and riveted steel replaced the 11-inch line that connected the City to the Caperton Canal. The City also acquired a 5-acre site downhill of the Caperton Canal, later named "City Pond," and constructed the unlined impoundment. In the early 1950's, the 14-inch pipeline from the Caperton Canal was replaced with a 20-inch asbestos-cement transmission pipeline. Remnants of the 20-inch pipeline are still in service today. The open ditches and open ponds that were the sources of the City's potable water system soon gave way to enclosed pipes, better treatment systems, and confined storage as the City developed its relationship with regional wholesale water providers.

Since the creation of the Placer County Water Agency (PCWA) in the 1950's, Lincoln has received deliveries of both PCWA raw and treated surface water to meet City demands as well as raw and treated water derived from Nevada Irrigation District (NID) assets. Areas involved in agriculture in Placer County around the City limits have also been supplied raw surface water from PCWA and NID canal systems. As the City has expanded its boundaries and the corresponding need for treated water, the raw water deliveries to the previously agricultural areas have typically decreased.

In the 1970's two new 1.5 million gallon steel storage tanks replaced the City's open impoundment (City pond) off of the Caperton Canal, which had served the City since the turn of the 19th century. One tank was installed on the Reservoir 1 site. The second tank was located west of the Auburn Ravine at Highway 193 as a safety precaution against failure of the 20-inch transmission pipeline connecting the two tanks. Associated with these improvements was the construction of a 14-inch treated water pipeline by PCWA from PCWA's Sunset Water Treatment Plant at the end of the Caperton Canal at the Lincoln-Rocklin border to the City pond site. This new treated water line allowed the City to shut down, and later abandon, its chlorination facilities at the Reservoir 1 site.

In the 1980's, groundwater was introduced into the City's treated water system with the upgrading of a City-owned agricultural well into a municipal water supply (City Well No.2) just east of the airport. A second City production well (Well No. 4) was completed west of the airport in 1990. Water quality from both wells met the state's water quality standards and was commingled into the City's water system that derived surface supplies from PCWA.

The late 1990's saw an unprecedented boom in the City's population, increasing from about 7,500 to about 40,000 in less than 10 years. The City's infrastructure was expanded ahead of the growth to accommodate increases in water demand but still relied on remnants of an old system. In fact, the current historical assessment of the City's existing infrastructure that is incorporated into this CWMP has identified numerous pipes dating back to the 1920's. Nevertheless, the City completed significant surface water infrastructure systems and drilled additional wells to meet City demands.

Lincoln's current population of 45,800 is forecast to grow to 80,000 over the next few decades and expand beyond 130,000 at City build-out. The City's 2008 General Plan defines the City land use with a Sphere of Influence that provides growth limits based on land use densities and the anticipated infrastructure needed to serve the projected buildout population. From 1998 to 2008, the City water system was rapidly expanded to meet the new demands. Below is a listing of the more significant items that have been developed to accommodate the City's growth. All of these items are discussed in greater detail in other Chapters of this Water Master Plan.

- *PCWA Water Supply Agreement*. Renegotiating the City's Water Supply Agreement with PCWA for increased surface water deliveries and allow the expanding City limits to define the PCWA service area.

- *NID Water Supply Agreement*. Signing an MOU with NID and PCWA to allow NID water to be served in the NID service area within the City limits.

- *City Groundwater Analyses*. Completing the groundwater investigations into the volume and location of groundwater underlying the City, and the City's first groundwater management plan and identifying the groundwater underlying the City as a high quality, stabilized and valuable potable water supply.

- *Western Placer Groundwater Management Plan*. Signing an MOU with PCWA, City of Roseville and Cal-American Water Company forming the Western Placer County Groundwater Management Partnership (WPCGMP) for establishment of a regional groundwater management planning entity.

- *NID Regional Water Supply Project*. Signing agreements with NID to pursue the feasibility and construction of a Regional Water Supply Project to provide NID treated water directly to NID lands with the City.

- *Construction of Groundwater Wells*. Development of groundwater supplies within the City that meet State requirements for quality, with only disinfection, required for emergency and peak demand management purposes.

- *Completion of the Regional Wastewater Treatment and Reclamation Facility*. The WWTRF provides a tertiary treated recycled water product via ultra-violet radiation that was State-approved as the first recycled water permitted for direct application to fodder and rice crops. This permit and subsequent water rights expansion allows for recycled uses within the City.

- *PCWA Emergency Intertie*. Emergency intertie between the treated water systems of the City and PCWA-Rocklin.

- *PCWA Conveyance Facilities*. Signing agreements with PCWA for the City participation in the funding and construction of new PCWA transmission pipelines and new metering facilities to increase deliveries to the growing City and replace the undersized pipeline and metering station of the 1970's at the Reservoir 1 site.

- *Various Developer Agreements*. Signing of agreements with individual developers that (1) allowed combined funding of large one-time pipeline projects and (2) ceded the underlying groundwater supplies below the developments to the City.

Since 2008, the growth rate in the City has fallen back to fewer than 500 connections per year. This slower rate has been accommodated in the new water-related infrastructure, including use of treated surface water, disinfected groundwater, and raw surface water.

This infrastructure has been master-planned, built and effectively managed by the City for the influx population of over 30,000 people in a ten-year span.

CHAPTER 2. CITY PLANNING AND POLICIES

2.1 Introduction

This chapter of the Lincoln Water Master Plan (WMP) focuses on the City's organization, the paramount water planning aspects of the City's land use planning program, and the integration of City management with the water planning efforts. Accordingly, this section has the following format: 1) the organization, administration and management of the City as it pertains to Lincoln's water system; 2) the policies and planning documents guiding the City's understanding and implementation of water use and planning; and 3) the practical application of integrating the City organization with the development of planning documents and policies.

2.2 Water System Organization, Administration and Management

This section discusses the City's organization, administrative responsibilities, and management practices as they relate to the City's potable water system. The general assessment provided in this section is subject to refinement by City Staff in the context of changing management activities within the City. Accordingly, this section is organized as follows: City Council, City Management, and Specific Public Services.

2.2.1 Lincoln City Council

The City is a general law city with an elected five member City Council. The Lincoln City Council is elected based on an at-large, non-divisional approach to citizen representation. Council members are elected to four-year terms to oversee the City operations and to guide the future development of the City. Council-member terms are staggered so that a measure of continuity is maintained in the transition from one Council to the next. Election for three of the Council seats occurred in 2016, with the two remaining seats up for election two years later in 2018. This election is repeated similarly every two years. The City Council utilizes a mayoral rotation system to determine which Council members shall be chosen to serve as Mayor and Mayor Pro Tem. The City Council also serves as the Board of Directors for the City's Successor Agency to the Former Redevelopment Agency and the Lincoln Public Financing Authority.

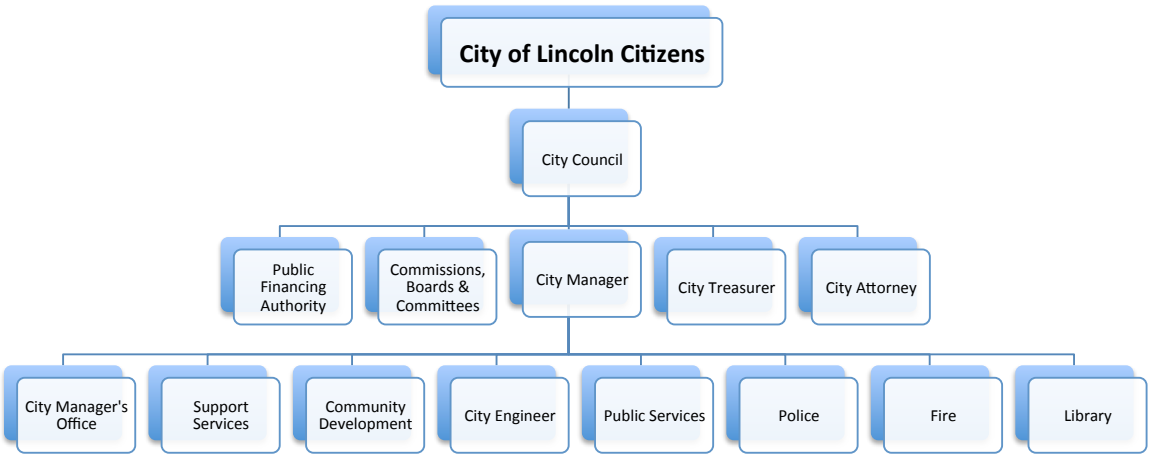
The City Council, with staff support, periodically reviews and prioritizes City activities and develops annual representation assignments including primary and alternate representatives and participants in various external forums. Relative to the City's potable water system these activities include, but are not limited to, representation with the Sacramento Regional Water Authority, Western Placer County Groundwater

Management Partnership, California League of Cities, as well as participation in regular meetings and special activities relating to regional water resources planning and policy issues.

2.2.2 City Management

The City staff is organized into seven (7) major departments reflecting the "full-service" activities of the City – all of which report directly to the City Manager. The departments include: City Manager's Office, Community Development, City Engineer, Public Services, Fire, Police, Lincoln Public Library, and Support Services. **Figure 2-1** diagrams the City's management structure. Departments primarily related to the City's water system include: City Manager's Office, Community Development, City Engineer, Public Services, Fire, and Support Services.

Figure 2-1 – City of Lincoln Organizational Flow Chart



The major responsibilities for the City's water system reside with the City Manager and his staff. Specifically, all City services are under the direction of the City Manager – including all aspects of water and wastewater. As the chief executive for the City, the City Manager balances the desired level of municipal services set by City Council policies and the available revenue to provide those services. Moreover, the City Manager is the key liaison between the City Council and the public. The City Manager is also responsible for representing the City in local, regional, and statewide venues for water resources planning that impact and influence City policy. The City Manager delegates these responsibilities to specific departments at his discretion.

2.2.2.1 City Manager's Office

With respect to City water system management, there are four distinct water systems serving the City. These systems are as follows: potable water, wastewater, recycled water and raw water. All four systems include pipe, ditch and storage systems that are impacted by other public agencies. For instance, as described in greater detail in **Chapter 5**, the City's potable water system is subject to the water management activities of its main surface water suppliers – Placer County Water Agency and Nevada Irrigation District. Although the discussion in this section focuses on the potable water system, the other three water management areas follow a similar regulatory path and require the City Manager's and his staff's regular attention.

The City Manager's Office provides leadership, general administrative direction, and policy implementation on behalf of the City's potable water issues. This department's staff, including the, City Clerk and Public Information Officer, work across all departments and disciplines within the City, providing consultation, direction and support. The City Clerk provides administrative services to all departments in the City. The Public Information Officer is charged with acquiring and distributing public information materials relevant to the City's function. All of these staff members are intimately involved in the City's potable water management efforts.

2.2.2.2 City Engineer

The City Engineer is charged with coordinating and synthesizing the City's infrastructure projects, including all projects related to the potable water system. This effort requires continued consultation with all other City Departments under the City Manager's supervision. The City Engineer's Department is responsible for the inspection and installation of water infrastructure systems. These efforts are harmonized with the Community Development Department in order to ensure the City's building efforts conform to State law, City Ordinances, and City Policies as well as the latest engineering standards. The City Engineer is also responsible for enforcing the City's standards and specifications for all construction and maintenance projects within the City through plan check and review as well as on-site inspections. The City Engineer's Department must also respond to fire flow and facility location requests, maintain City's base map, GPS and GIS database, determine cost estimates for developer generated fees, and update the City's construction standards and specifications on a regular basis.

2.2.2.3 Support Services

Support Services maintains the financial documentation for the City. Support Services organizes the Utility Billing for the City including: accounts receivable, accounts payable, and customer service. Support Services also oversees the City's general finance including: audit compliance, general ledger management, fixed assets management, financial reporting, and property inventory. Last, Support Services manages the City's

Information Technology efforts. In essence, Support Services provides key internal services to all departments, employees, and external customers. Related to water, Support Services is the vital unit charged with gathering meter data that informs the City's demand calculations as well as managing information technology relevant to water planning. These delegated administrative functions are designed to reduce overhead costs, increase efficiency, and provide effective customer service. The major responsibility areas in Support Services related to water are described below.

Accounting and Inventory

Accounting handles all aspects of the monthly, quarterly, and annual financial activity for the City, including water contracts and audit compliance. Inventory is responsible for monitoring, assessing and ordering of inventory, inventory paperwork, surplus materials and equipment, as well as audit and financial reporting compliance.

Billing and Collections

This aspect of Support Services produces and collects water bills for about 17,700 single-family residential connections, over 1,000 multi-family residential connections, and nearly 400 non-residential parcels. Support Services also produces and collects past due notices, 48-hour notices and shut off notices on a monthly basis. Staff also handles all liens, adjustments to accounts, customer service and Accounts Receivable audit compliance.

Customer Service

Customer Services annually receives requests for information (telephone and walk in) and dispatches over 4,000 service calls related to water and other issues. Staff also handles about 70,000 payments per year and customer correspondence.

Information Technology

Information Technology staff develops all information and communications technology requirements for the City. Staff maintains the City's computer network to include: hardware (servers, workstations, laptops), software, printers, telecommunications, monitoring and risk assessment, licensing, and maintenance for all City staff involved with the City's water system. Again, related to water system management, Support Services also has responsibility and authority for the Supervisory Control and Data Acquisition (SCADA) system and Geographic Information System (GIS) system (when activated). The City also anticipates that the Water Master Plan modeling efforts will be coordinated through this department.

2.2.2.4 Community Development

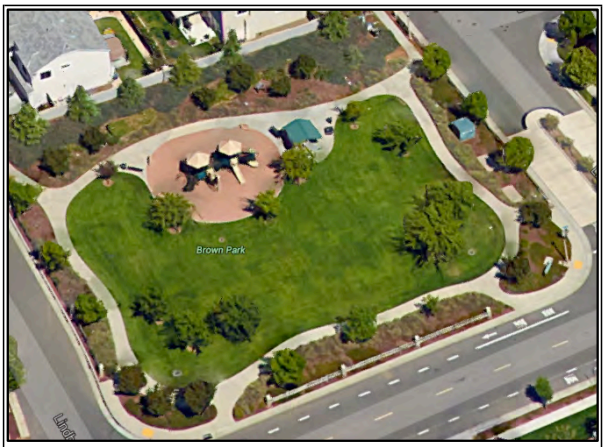
The Community Development Department, which houses the Planning and Building Divisions, Development Engineering, as well as Code Enforcement, is the key

department delegated leadership authority for development projects located in the City of Lincoln and its Sphere of Influence. The Department provides a broad array of community services to Lincoln residents and businesses. While all City departments are involved in at least some aspects of development, the Community Development Department receives and processes the actual development applications, which include Conditional Use Permits, Subdivision Mapping, Design Review, and Building Permits. Any development within the City of Lincoln must comply with the Lincoln General Plan and the Municipal Code, as well as state and federal law and regulations, described in more detail in **Section 2.3**.

The Community Development Department's Engineering Division is focused on project and program support of activities that are primarily in the public right-of-way and land use plan engineering. Such activities usually deal with public infrastructure such as roads, streets, bridges, and utilities and waterways. The Engineering staff review and approve all new residential development improvements for conformance to the City of Lincoln Improvement Standards and Design Criteria. Staff also review and impose "conditions of approval" for all new private development projects related to improvements within the public right-of-way. The Community Development Department directly coordinates efforts with the City Engineer and other departments.

2.2.2.5 Public Services

The Public Services Department provides and maintains public services for the City of Lincoln that improve the quality of life and ensure the health and safety of its residents. In the area of water, the Public Services Department is responsible for: potable water quality and delivery, wastewater and recycled water, and storm water, irrigation and maintenance of City parks, open space and landscape medians. The Public Services Department is subdivided into Environmental Utilities – that is responsible for potable water system operation and maintenance, and meter reading – as well as the Maintenance and Operations division.



Typical Neighborhood Park

Environmental Utilities

Environmental Utilities is responsible for sufficiently supplying instantaneous treated water demands to all services and maintain sufficient pressure for domestic and fire protection use. Public Services also provides continuous quality assurance and quality control of City potable water production activities and compliance

with Drinking Water Quality standards, regulatory reporting requirements, and maintaining a minimum system pressure.

Environmental Utilities, in 2013-the last year without drought considerations, provided approximately 9,700 acre-feet of treated water from PCWA and NID sources, and about 1,100 acre-feet of groundwater from City wells.[1] Environmental Utilities functions include preventive and corrective maintenance for all mechanical, electrical, chemical feed, and SCADA systems related to the water system.[2] The department responds to water quality issues and maintains water quality through distribution system-flushing and the City's Backflow Prevention program.

City Well

Environmental Utilities is responsible for compliance with federal and state water quality operations standards, including SWRCB-DDW and the EPA water quality testing programs such as: Total Coliform Rule, Title 22, Lead and Copper, Groundwater Rule, and the Disinfection By-Product Rule (DBPR). Water quality activities include:

- Bacteriological Testing: Bacteriological testing involves citywide sampling of the distribution system weekly.
- SWRCB-DDW/EPA Testing (Surface water and Groundwater): SWRCB-DDW/EPA requirements consist of surface water and groundwater testing for inorganic, secondary standards, general mineral, VOC, SOC, gross alpha, nitrate, nitrite, NDMA, and perchlorate in accordance with Title 22 of the California Code of Regulations. Distribution system testing under the Stage 2 DBPR is completed quarterly.
- Unregulated Contaminant Monitoring Rule UCMR-3: The EPA requires that all public water systems conduct assessment monitoring of unregulated contaminants every 5 years. The list of contaminants is provided by the EPA.
- National Pollution Discharge Elimination System (NPDES) Sampling: The City is required to maintain a Low Threat NPDES permit for all flushing and well pump to waste discharges to surface drainages within the City boundaries. Sampling is required once per quarter in order to maintain this permit.

[1] These numbers are rounded for explanatory purposes. **Chapter 4** details water usage in the City of Lincoln in 2013.
[2] Environmental Utilities must coordinate these efforts with the Information Technology component in the City Manager's Office.

- Flushing Program: In the City, there are many dead end mains that require periodic, high velocity flushing to reduce sedimentation and taste and odor complaints.

Environmental Utilities is also responsible for City well site maintenance and storage tank maintenance. The well maintenance for Well 2, Westwood, Moore Road, Fiddyment and Nelson is divided into the following categories: controls, chemical feed, and site maintenance. The storage tanks – Catta Verdera South (5 MG tank) and Reservoir 1 (3 MG tank) – maintenance is divided into the following categories: controls, site maintenance, inspection, and cleaning. Environmental Utilities is also responsible for the associated water sample stations, monitoring well maintenance, and pressure regulating station maintenance that includes maintaining controls, site maintenance, and inspection.

Last, Environmental Utilities provides the transmission and distribution functions that deliver adequate amounts of water for domestic and fire protection use to the City's customers. Operation and maintenance (O&M) functions include: service line repair, water main repair, valve repair, fire hydrant repair, meter repair, replacement and maintenance activities. Department-panned system maintenance functions include: meter installation, service line replacement, minimal water main replacement, mainline valve replacement, fire hydrant replacement and all labor and benefit cost associated with these functions. Environmental Utilities is responsible for providing 24-hour emergency service for replacements and repairs of water mains, fire hydrants, water services and valves. The Department is required to respond to Underground Service Alerts (dig requests) within the City boundary. Environmental Utilities annually tracks the work covering approximately 230 miles of active water main, 20,000 water meters, and 2,000 fire hydrants.

Environmental Utilities, in coordination with Information Technology, also leads the City's data management efforts for the potable water system. The data management functions occur using the automated Supervisory Control and Data Acquisition (SCADA) program that allows for unmanned operation of the water facilities and continuous monitoring and reporting of water production, system pressure, equipment operation times and many other performance parameters. The ongoing nature of data management systems requires continuous planning, rotation and upgrade of hardware and software as well as training for City personnel using the various programs necessary to operate the City's water system. There are well-established monitoring practices for tracking critical performance and scheduled replacement of key production and maintenance equipment. The City tracks performance and replacement schedules using spreadsheets.

Maintenance & Operations

The Maintenance & Operations Division is responsible for equipment owned and operated by City staff. This includes the service vehicles and most of the specialty equipment operated by the Environmental Utilities personnel on the City water system.

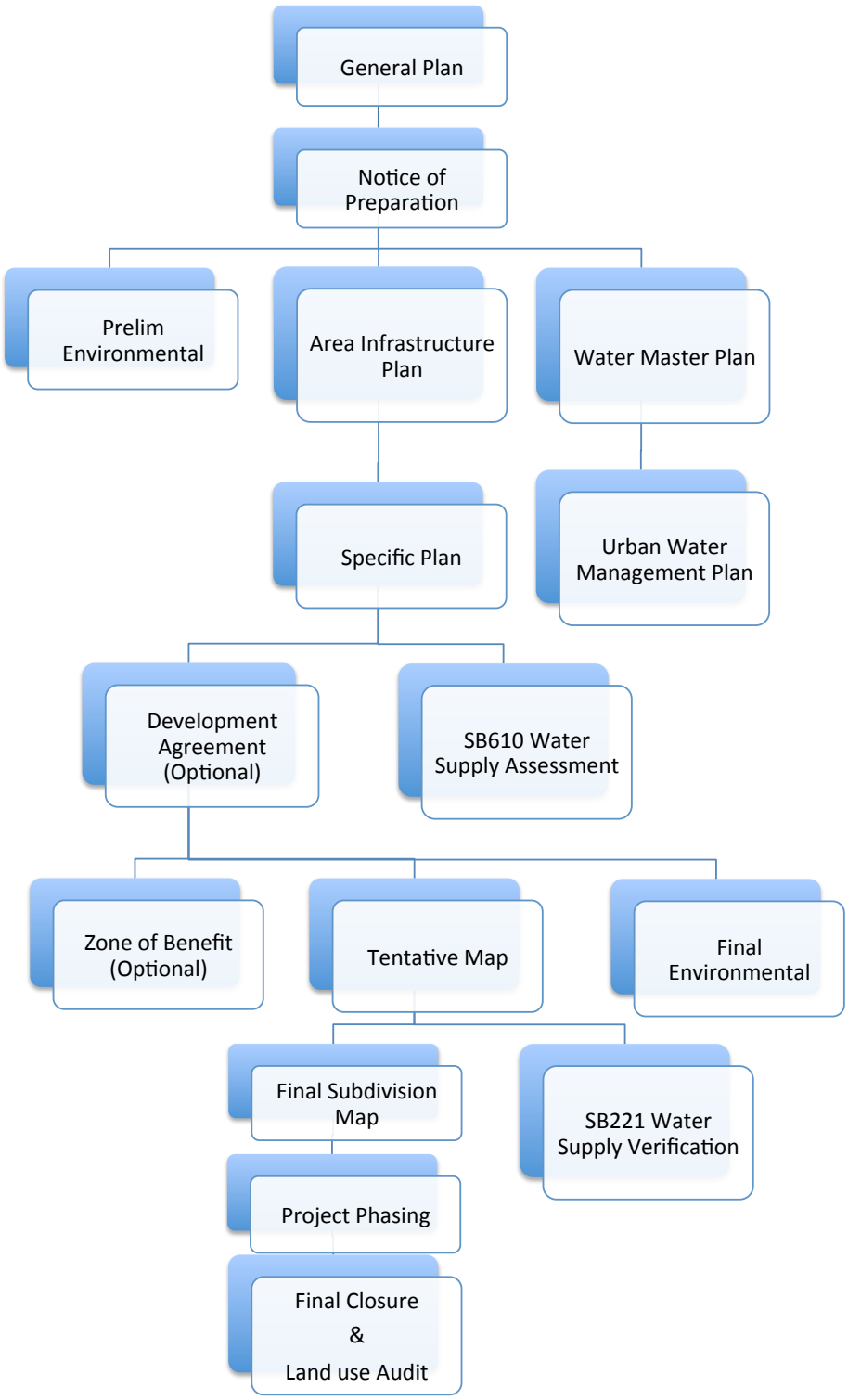
2.3 Planning and Policies

This section describes the various planning documents that impact water supply planning and water management in the City of Lincoln. The documents described in this section include: General Plan, Specific Plans, Water Master Plan, Urban Water Management Plan, SB 610 Water Supply Assessments, Developer Agreements, SB 221 Water Supply Verification, Low Threshold Project water analysis, Water Reclamation Plan, and California Environmental Quality Act (CEQA) analyses. All of these documents have some bearing on the land use and water planning in the City of Lincoln.

Figure 2-2 below shows the general relationship between the land use plans and water supply management plans in the City of Lincoln. Note the chart does not show a Reclamation Plan or a Low Threshold Project water analysis as those two water-planning documents supplement the land use and water planning flow chart depicted. Nevertheless, both of those planning tools are described in this document.

This section provides the City with (1) practical information about the relevant planning documents needed to inform the review and preparation of water reliability analyses as part of local planning processes (also see **Chapter 7**); and (2) a broad overview linking the City's organizational structure with the planning document requirements. The City will use this section to thoroughly integrate its water resources management issues with its land use planning processes. Last, the section identifies the assumptions that are used in the planning documents to develop the data and conclusions as well as an assessment of the typical scope and depth of the required elements.

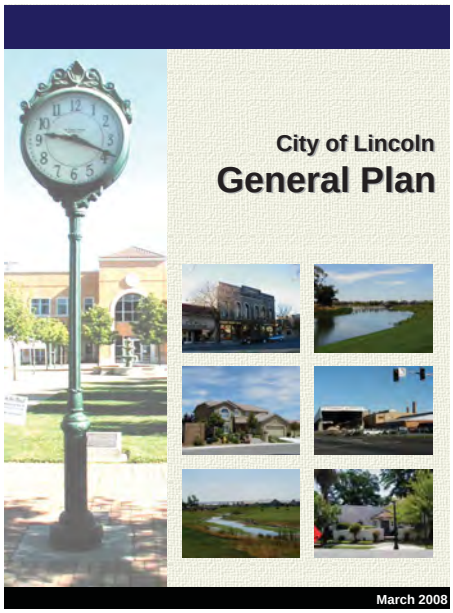
Figure 2-2 – Water and Land Use Organization within the City of Lincoln



2.4 General Plan

A General Plan is the blueprint for land use planning at the local government level. A General Plan is based on the regulatory requirements set forth in Government Codes sections 65300 et seq. A General Plan is a "project" and, as such, is subject to the requirements of the California Environmental Quality Act (CEQA) – a state law that requires assessment of hydrologic and water quality impacts in evaluating "a project." CEQA requirements are described throughout the body of this section.

The City of Lincoln is required to prepare a General Plan to ensure rational and orderly land use planning consistent with a community vision. A General Plan must contain a Land Use Element, which typically identifies the broad land use classifications and zoning designations on a land use map. Water resources management approaches are presented as sets of goals, policies and implementation strategies focusing primarily on conservation and preservation of the resource. Water resources are typically discussed in the context of the Conservation Element or Open Space Element, both of which are required. Some General Plans contain a standalone element on public utilities or water resources. The scope of the water resources discussion in the General Plan is driven by the principle of "Internal Consistency," meaning that the text and data must be consistent among all of the General Plan elements.



While water resources are often discussed within the General Plan elements themselves, the water supply and demand analysis is typically reserved for the assessment of hydrologic and water quality impacts under the California Environmental Quality Act (CEQA). The assessment of impacts under CEQA may be aided by an understanding of supplies and demands as presented in an Urban Water Management Plan (UWMP) or similar other supply and demand assessment that allows the entity preparing the Environmental Impact Report (EIR) to assess impacts to groundwater and surface water supplies, as well as impacts to drainage and water quality.

In simplified terms, the translation of the General Plan as a "project" into the Project Description for the environmental assessment serves as the basis for an analysis of the direct and reasonably foreseeable indirect environmental impacts of the General Plan. The CEQA Guidelines identify hydrologic and water quality factors to consider in determining whether a project might have a "substantial" impact upon hydrologic

resources, including groundwater aquifer depletion, supply expansion, supply sufficiency, and alteration in drainage or water quality. A General Plan should consider development of a Water Supply Evaluation in order to ensure that the most recent water information is included in the overall planning scheme. The City of Lincoln prepared a Water Constraints Analysis as part of its 2008 General Plan which has been the starting point for subsequent water analyses performed for the City.

A General Plan is the broadest land use planning document that a local government develops, and the environmental assessment that is developed for the General Plan may be utilized for a subsequent project to assess impacts. Development of comprehensive demand projections and supply conditions at this phase of planning can benefit subsequent phases of planning. In contrast, incomplete or incorrect analysis can cause problems for future supply and demand analyses contained in other planning documents. For instance, overestimating demands may lead to unnecessary expense in developing water sources or conveyance systems to customers. Moreover, often forgotten players in the land use and water supply planning framework are the Local Agency Formation Commissions (LAFCOs), which are tasked with considering water service efficiency when evaluating public services as part of annexation and Sphere of Influence (SOI) modification proceedings. This is important at the General Plan stage because General Plan updates often serve as the platforms for SOI expansion and service area annexations.

It is also important to recognize the intersecting areas of expertise contained in the General Plan and subsequent documents. For a General Plan to successfully convey a broad blueprint regarding the future of the City, it must successfully incorporate all possible factors and expertise into its planning. For example, to successfully include meaningful CEQA mitigations recommendations the City needs input from scientists to determine what the environmental impacts of a project may be; a financial analysis to incorporate cost considerations and prohibitions; and legal consultation verifying the legal requirements have been met. Synthesizing these elements is critical for successful plan completion.

General Plans should be updated every five years to reflect changed conditions within the City. Oftentimes, projected growth rates, projected growth patterns, and strategic infrastructure plans require revision as the pace of General Plan implementation changes. The City should consider updating its 2008 General Plan to reflect relevant changed conditions in the City.

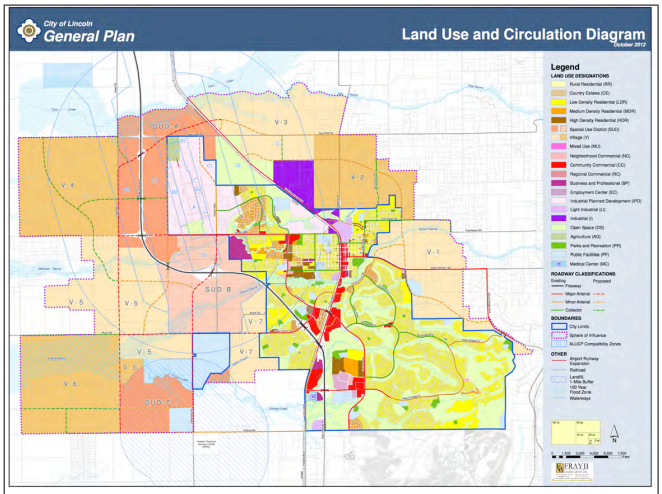
2.4.1 Conservation, Open Space, Public Utilities and Water Elements

General Plans are organized by elements, and must contain a specific section with policies regarding natural resources conservation and open space, and also should contain

policies regarding water resources. The Conservation Element should contain policies regarding the conservation, utilization and development of natural resources. The Conservation Element should also provide a venue for community members to develop land use policies to reconcile conflicting demands for scarce resources, through coordination with local water purveyors and evaluation of water supply and demand information. The Conservation Element is critical for developing the General Plan.

The Open Space Element is defined as "any parcel or area of land or water that is essentially unimproved and devoted to an open-space." The Open-Space Element seeks to preserve water resources important for habitat, agricultural purposes, and groundwater recharge purposes. The Open Space Element is often overlooked in assessing water assets and demands in General Plan water evaluations.

The Public Utilities and Water Element is not a specific requirement of a General Plan but is often developed as part of the General Plan. Surprisingly, there are no specific requirements regarding the contents or manner in which a General Plan should consider water resources. But the overriding principle of "internal consistency" (between and among the elements) guides the scope and depth of information that should be provided. Thus, handling impact of various required elements necessitates assessment of public utilities and water. For purposes of the water analysis, consistency with the land use element in the General Plan is critical. General Plans contain a Land Use Element that designates the proposed general distribution, general location, and extent of the uses of the land for all public and private classifications. The Land Use Element should also contain standards of population density and building intensity for the land use classifications. As mentioned above, the City of Lincoln prepared a Water Constraints Analysis as an appendix to its General Plan in 2008.



2008 General Plan Land Use Map

2.4.2 General Plan Timing

State law requires a City to prepare a General Plan upon incorporation and update the General Plan Housing Element at least every eight (8) years. General Plans require CEQA review and the CEQA process generally runs concurrently with the development of a General Plan. A Notice of Preparation (NOP) must be circulated for 30 days describing the draft General Plan. A draft Environmental Impact Report (EIR) must be circulated for a 30-60 day comment period before adoption. The lead agency must issue responses to written comments on

the draft EIR to the commenting party at least 10 days prior to certification of the EIR. Before adoption of the final EIR, the local jurisdiction must certify the EIR and make findings as to how significant environmental effects have been mitigated. Certification must take place within one year after deeming the initial project application complete.

2.4.3 General Plan Specific Provisions

The discussion of water resources in the Conservation Element, the Open Space Element, or a unique Water Resources or Public Utilities Element, incorporates a set of goals, policies, and implementation strategies. These goals, policies and strategies are typically conservation and preservation oriented, and based upon a broad understanding of a jurisdiction's current and future water resources issues. Examples of such goals, policies and strategies include:

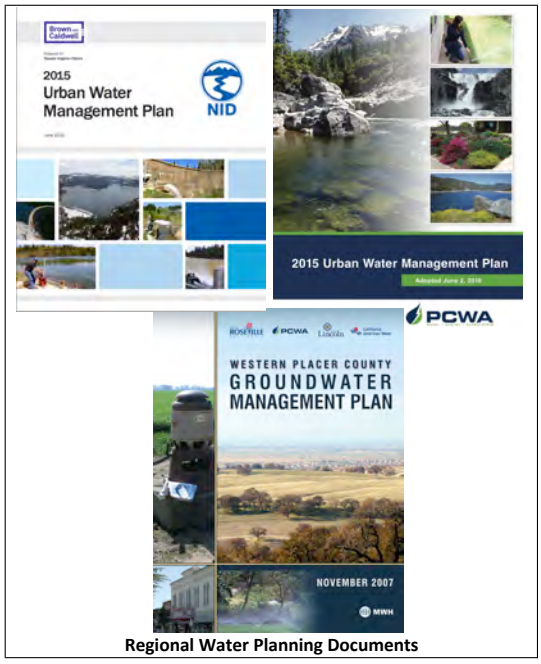
- Goal: To ensure that water supplies of sufficient quality and quantity will be available to serve the community needs, now and into the future.
- Policy: Protection of water resources and supply systems through sound system management.
- Implementation Measure: Maintenance of local water ordinances to protect the integrity of water supplies.
- Policy: The agency shall work to ensure continued reasonable alternate water supplies.
- Implementation Measure: The agency shall encourage water supply districts and companies in the county to identify and develop water supply sources, other than groundwater, where feasible.

A land use entity, prior to adoption of or a substantial amendment to a General Plan, is required to distribute the General Plan to "public water systems", serving 3,000 or more connections, for a 45-day review and comment period. This provision requires the public water system to provide the land use entity with the following information: (1) the most current UWMP; (2) a description of its water supply sources in wet, normal and dry years; (3) a description of the demands from all sources in the previous five years; (4) any proposed additional supplies; (5) a description of total current customers by category; (6) quantification of demand reduction associated with water use reduction measures in a water supplier's urban water management plan; and (7) any additional information that would allow for a determination of adequacy of existing and future supplies for the existing and projected demands.

Under the General Plan, the requirement that a public water system with more than 3,000 connections submit this information parallels the requirements contained in an UWMP. As such, this information should be readily available, unless the public water system just

reached the connection threshold or needs to update UWMP figures. While a discussion of water resources is valuable for various land use decisions that have an impact on watershed management and water quality, the primary purpose of this information is to consider whether demands are consistent with supplies and to address the potential water resource needs of a given jurisdiction.

While the coordination requirements of the General Plan process apply to the City and its relationships with PCWA and NID, the requirements to prepare a Conservation Element and an Open Space Element still remains with the City alone. Moreover, regardless of the number of connections that the City has, the requirement of internal consistency compels the City to consider water-planning elements. Specifically, under a General Plan adoption or General Plan amendment, land uses are certain to change and any discussion of water resources needs to accurately reflect the anticipated land use plans in a given jurisdiction. The City must account for water for human consumption through pipes or other constructed conveyances, including collection, treatment, storage, and distribution facilities, either under or not under the control of the operator of the system, which are used primarily in connection with the system. Thus, the City should not only be coordinating its General Plan with the regional UWMPs, but also making sure the General Plan aligns with its relevant Water Master Plan – the plan described below that generally assesses water infrastructure related issues. All of these items are critical considerations in the General Plan process.



Regional Water Planning Documents

2.4.4 Level of Specificity

The General Plan provides the broadest view of land use planning and water supply planning of all the documents discussed in this section. As shown, the General Plan elements qualitatively address water resources but the development of these qualitative principles requires substantive underlying analysis. Accordingly, the goals, policies and implementation strategies regarding water resources should be analyzed for internal consistency with the Land Use Element, including both qualitative and quantitative provisions. Because adoption of a substantial amendment to a General Plan requires an environmental assessment pursuant to CEQA, water resources are typically addressed in greater detail in an EIR and tier from relevant planning documents from regional purveyors (as available).

2.4.5 Relevance of LAFCO on General Plan Water Supply Planning

General Plan updates are often tied to the adoption or modification of a Sphere of Influence (SOI). An SOI represents the probable physical boundary and service area of a local agency or municipality as approved by the LAFCO. Within each county, LAFCO is responsible for approving SOI adoptions and modifications for each City and special district. LAFCOs consider amendments based upon the principles of logical and orderly development and coordination of local governmental services.

Among other elements, a LAFCO evaluates water service when considering whether an efficient SOI modification is possible. LAFCOs consider SOI boundaries based upon four factors: (1) present and planned land use; (2) present and probable need for public facilities; (3) present capacity and adequacy of public services (including water); and (4) social or economic communities of interest. In contemplation of an SOI modification, a LAFCO first considers a local entity's five, ten, and twenty-year growth projections and the associated land use changes. There should be a description of the present and probable need for public services concurrent with projected land uses. If the LAFCO processes alter land uses, then the water supply evaluation may need revision to maintain consistency. Generally, the water planning analyses contained in General Plans, General Plan EIRs, UWMPs or SB 610 WSAs will be satisfactory for LAFCO approvals.

For the City of Lincoln, multiple LAFCO issues are in play. Not only is the City's Sphere of Influence for its land use designations a LAFCO concern, but also the water supplies emanating from its wholesale water providers – Placer County Water Agency and Nevada Irrigation District. The wholesale entities' service areas are both within the City's existing boundaries and SOI. As such, coordinating the best mechanisms for water supply delivery from these entities is essential to satisfying not only the requirements of the General Plan, but also the LAFCO service boundary determinations for water supply availability. Furthermore, the City's water reclamation projects, raw water deliveries, private surface water rights in the City's SOI, and groundwater conditions should also be considered in the General Plan process. At this time, there are no considerations of changing the service area boundaries for PCWA and NID.

2.4.6 General Plan Summary

The General Plan presents a unique opportunity for the City, the public, and wholesale water agencies to mutually engage in the land and water planning process. The broad approach used in a General Plan typically allows for identification of policies regarding resource uses and impacts, as well as delineation of various responsibilities for meeting planning objectives. From a water planning perspective, a General Plan plays a significant role because it: (1) serves as an opportunity for public review of the hydrology

and water quality impacts associated with City growth; (2) may set the foundation for subsequent project-specific reviews that may attempt to utilize the General Plan and its supporting documents as the basis for subsequent decisions; (3) provides an opportunity for responsible agencies to participate in the planning process through providing detailed water information and reviewing the planning documents, including mitigation measures potentially adopted in an EIR.

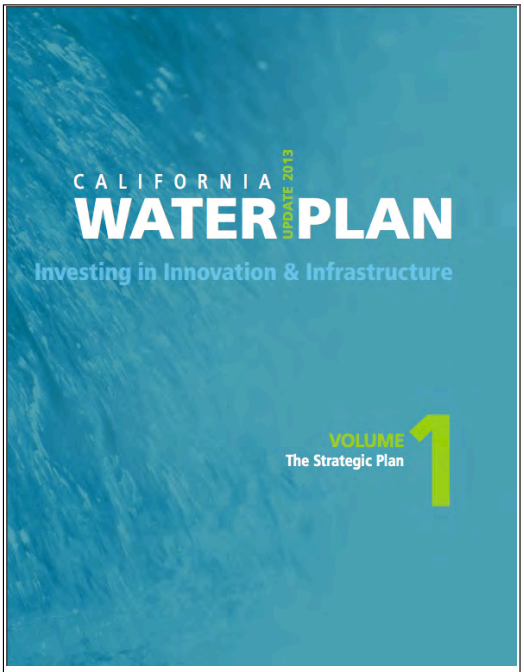
While a General Plan is a critical land use and water resource planning document, it is important to keep its limitations in mind, notably that it is infrequently updated because of the considerable staff time and financial resources involved in such an effort. This has the potential to lead to other problems related to water supply planning. Often, a developer will drive the project planning process and may hire a consultant to prepare an environmental assessment or SB 610 Water Supply Assessment for a project (discussed below). If the local jurisdiction does not institute quality control of the developer documents, consistency problems among project specific planning documents may emerge. Thus, the General Plan serves as the foundation for consistency determinations in the project specific documents, and it needs to remain relevant to local jurisdictional staff and decision makers.

2.5 Water Master Plan

Water Master Plans (WMP) are generated by water purveyors in California typically to (1) identify the water supply and water infrastructure assets available to their existing customers, (2) define the additional assets to meet current demands and future growth needs of existing and new customers, and (3) determine the assets that need to be upgraded or replaced over selected periods of time. In some cases, the WMP also presents the financial resources, funding sources and long-term investments necessary to continue efficient operations of the purveyor's water facilities. The WMP is a comprehensive document providing an overview and analysis of water supply, infrastructure, future supply and demand projections, and strategies for maintaining and expanding the purveyor's existing supplies and facilities.

2.5.1 California Water Plan

The California Water Plan (CWP) or Bulletin No. 3, State Water Resources Board, is defined by California Water Code Section 10004 to 10013 and summarized below. The CWP is updated every five years. The State of California (State) has a primary interest in the orderly and coordinated control, protection, conservation, development, and utilization of the water resources of the State by all individuals and entities. It is the policy of the State that the CWP is accepted as the master plan that guides the orderly and coordinated control, protection, conservation, development, management and efficient utilization of



California Water Plan

the water resources of the state. The California Water Plan utilizes information gleaned from individual purveyor Water Master Plans as well as Urban Water Management Plans in drawing its conclusions. Relevant portions of the California Water Plan include the assessment of groundwater resources and groundwater aquifer systems that are tied to Department of Water Resources Bulletin 118. Moreover, statistical assessments of drought frequency, climate change, and population growth are all components of the California Water Plan that can have direct bearing on the City's water planning efforts. The California Water Plan is used as a foundational document in assessing the California Water Framework (**Chapter 1**) and other statistical data used in this CWMP.

2.5.2 Purveyor Water Master Plans

Water Master Plans are the primary technical and engineering document that a water purveyor uses in developing, modifying, funding and operating their water systems. These documents generally provide information regarding the overall engineering structure of a water system as well as the delivery capabilities, ages of equipment and conveyance mechanisms, as well as proposed system improvements.

Complex water models provide the most useful modern tool in assessing water systems and addressing various safety and flow concerns. These modeling systems include mechanisms to delineate pipe diameters throughout the system, flow rates, capacity constraints, storage needs, and system deficits in water pressure and flow rate. Although the modeling systems are merely tools to address the system function and operations, the models are useful to allow quick assessment of problematic areas in the context of other available information.

The primary goal of a typical WMP is to first evaluate the existing system for water assets available, system age, system performance, regulatory compliance, and system expandability. Tools used to accomplish this include: purveyor records for operation, maintenance and revenue, field tests and computer modeling of the water infrastructure, regulatory or contractual requirements, and other available information provided by the water purveyor. Water asset review would include water rights, water permits, water supply contracts, groundwater development potential, recycled water use potential, demand reductions due to conservation efforts, and demand reductions related to building

code changes. This asset review is often deemphasized or overlooked completely in the WMP process resulting in very poor infrastructure recommendations and even building infrastructure that has little or no utility. For instance, depicting a groundwater supply as the well capacity, as is often done in a WMP, ignores the important nuances associated with the regulatory structure and hydrogeology of an groundwater basin that limit supply availability.

Review of water infrastructure includes: water production or delivery capacities, treatment facilities, storage facilities, flow and pressure regulating facilities, pumping facilities, pipelines and interconnections. Review of operations includes pressure zone needs, fire flow capacities, leakage and repair records, daily and hourly demand patterns for identifying factors, and infrastructure capacities and limitations in the modeling efforts for the existing system. Together these pieces help derive the total functionality of a water purveyors system with particular emphasis on the engineering components of the projects.

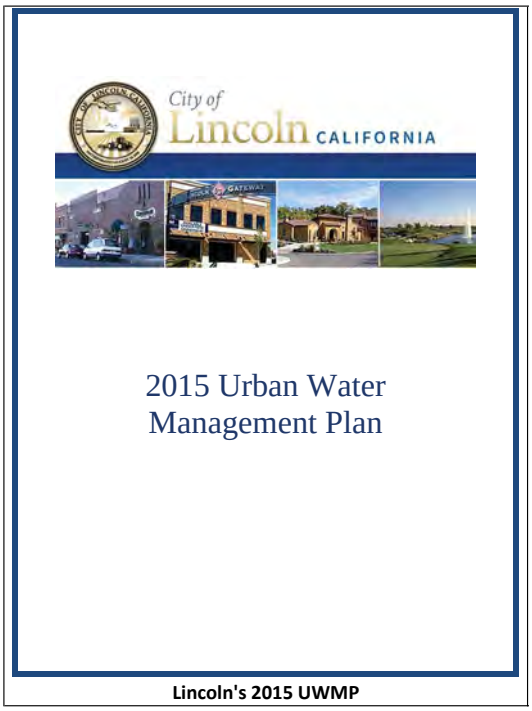
The WMP next identifies the potential growth based on General Plan population projections over a planning period (or updated projections), and recognized short-term and long-term development projects inserted into a planning horizon that can vary between 10 to 100 years. With the existing water infrastructure and water assets identified, the approved land uses with the purveyors service area determine the aggregate water demand and proposed infrastructure to serve the future development as well as continue to serve existing commitments. Variability in the future tends to produce multiple scenarios to evaluate impacts on the projected infrastructure and strain on the financing model. The water purveyor's Urban Water Management Plan should contain significant population and demand data needed for the future projections. The recommended infrastructure improvements are usually prioritized based on a combination of existing and pending service commitments. The resulting capital improvements program lists prioritized projects to be needed to meet current and future demands and identifies the capital funding annually required to provide those improvements. A financial plan and corresponding rate study would provide the funding requirements for the water system expansion.

Over the last decade, climate change impact analysis has entered into the environmental analysis of water-related projects in the State. This development has prompted water purveyors to identify not just their potable water sources, but also the non-potable water uses that can supplant potable water uses. The recent drought in California has made the public acutely aware of the need for water conservation and amenable to retrofitting water fixtures with those more water efficient.

The City has maintained a Water Master Plan providing a comprehensive plan and overview of all the elements impacting the City's current and future water needs and infrastructure. As shown in **Chapters 4** through **11**, this 2017 Water Master Plan, serves to update the City's previous stand alone water master plan, expands and synthesizes new information, and reflects changes that have occurred within the City and the SOI. The WMP assesses available water resources, additional or revised water-related projects and infrastructure, and changes within the regulatory and legal structures that impact water service to the City.

2.6 Urban Water Management Plan

The Urban Water Management Plan (UWMP) is the foundational water supply document for the City of Lincoln. While some water suppliers have historically viewed the UWMP as a "check-the-box" exercise, the quality of analytical detail is becoming more important as water supplies become scarcer and broader analyses are required to understand and disclose the reliability and sufficiency of the water supply. Though there is greater need for scrutiny and analysis, the Urban Water Management Planning Act (Act) recognizes the challenges associated with gathering data and recommends developing conclusions based upon information that is "reasonably available."



Lincoln's 2015 UWMP

The Act is intended to promote efficient use of urban water supplies, ensure water supply reliability in various hydrologic conditions, and provide a mechanism for long-term resource planning through the preparation of a UWMP. The Act is applicable to a publicly or privately owned water supplier serving water to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually.

Following approval of the UWMP by the public water supplier, the supplier must submit an UWMP to the California Department of Water Resources (DWR) every five years. The UWMP is the broadest, most comprehensive water supply and demand document that a public agency prepares. A well-prepared UWMP can be used as the basis for other analyses, including a supply and demand analysis within a General Plan, for a Senate Bill 610 Water Supply Assessment (SB 610 WSA), for a SB 221 Water Supply Verifications (SB 221 Verification), a water supply and demand analysis for a low-threshold project, or

as the technical basis for an environmental analysis required under the California Environmental Quality Act (CEQA). Thus, accurately preparing an UWMP and ensuring synthesis with previous water planning analyses can greatly reduce expenditures related to long-term water resources management and planning.

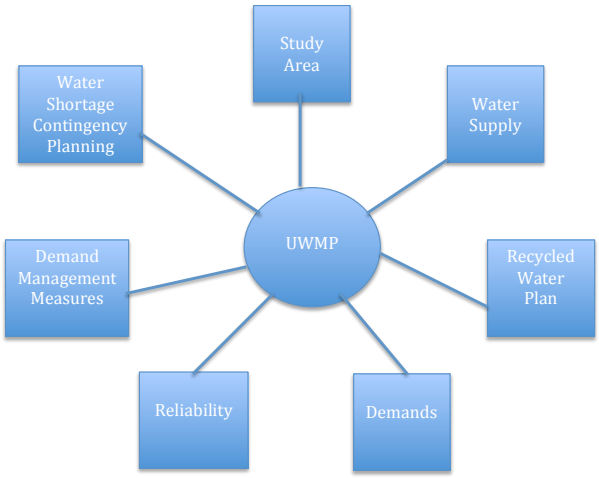
While DWR reviews the UWMP for consistency with the statutory requirements, it does not "reject" an UWMP filed by an urban water supplier. If a plan includes all of the required information, it is "complete." If a plan is not complete, DWR will request that the supplier improve its plan by addressing the provisions identified as "Not Addressed." The contents and analysis in a UWMP are tested when the UWMP is used as a reference in the preparation of an SB 610 WSA or SB 221 Verification because, at that point, projects become most publicly visible and the assumptions used within the UWMP may be tested. Moreover, those assumptions may again be challenged in the context of CEQA or other publicly available project assessment as those documents have legal significance.

Preparation of a UWMP requires a coordinated effort with other water purveyors in the region that may be affected by the planning efforts of the preparing entity. Thus, the preparing entity must notify such entities, make a draft copy of the UWMP available, and request comments regarding the content and recommendations prior to its formal adoption after a public hearing.

The UWMP requires completion of several elements intended to capture the balance between projected supplies and demands, and also to present both short-term and long-term demand management strategies, and alternative source development methods (including recycled water). While one of the primary objectives of a UWMP is assessment and disclosure of the supply and demand balance of a jurisdiction over a 20-year time horizon, a UWMP does not need to contain conclusions regarding the sufficiency of the water supply relative to projected demands. Nevertheless, the substantive elements of a UWMP do include data beyond that which is required in SB 610 WSAs and SB 221 Verifications, and even though a conclusion regarding sufficiency is not required, the elements of a UWMP should be carefully prepared with the understanding that the data will likely be used for sufficiency analyses at a later date.

The general elements included in the UWMP are illustrated in **Figure 2-3** and are discussed below.

Figure 2-3 – Components of UWMP



2.6.1 Study Area

The California Water Code requires preparation of a UWMP based upon the service area of the urban water purveyor. In some cases, the service area may overlap with the political boundary of a local government because the local government is the purveyor. There may be other cases in which the local government does not serve water to all areas within its jurisdiction, in which case it would not be required to include a discussion of the areas served by other water purveyors. On the other hand, a local jurisdiction may have an obligation, for health and safety purposes, to ensure availability of adequate supplies for those areas served by other purveyors in the case of a supply shortage or catastrophe and, therefore, may consider incorporating those obligations into its UWMP analysis.

The definition of the geographic Study Area is critical for analytical purposes because the land use based demand projections necessitate use of consistent total acreage figures. Subdivision of the Study Area into smaller segments may be appropriate for several reasons, including: (1) unique supply and demand considerations, such as provision of water to one area of the larger political jurisdiction by another water purveyor; (2) wholesale arrangements for certain portions of a jurisdiction that should be considered separately because the unique supply characteristics of the water purveyor may impact supply reliability; and (3) water right limitations associated with particular sources and uses of the purveyor's available water supplies.

To gain a broader understanding of future demand trends and provide justification for the unit demands developed as part of a UWMP, the UWMP must include a discussion of the

population projections for the study area. Population projections also assist in the evaluation of the potential savings that may be realized from implementation of the Demand Management Measures that are also required to be assessed in the UWMP. Thus, the juxtaposition of a land-use based demand assessment and a population-based demand assessment provides additional analytical rigor for these calculations.

2.6.2 Water Supplies

A UWMP requires a description of the supplies available to the urban water supplier over a 20-year planning horizon. The UWMP should describe the legal nature of each water supply, though it is not a requirement to include documentation supporting the supply in the UWMP itself.

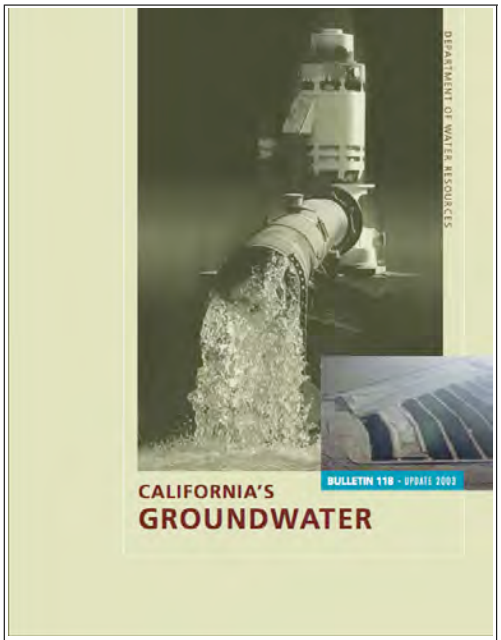
Surface Water: Based upon the Study Area delineations, surface water resources should be described consistent with water rights and contract entitlements, including the supply volume, point(s) of delivery and area served. The California Supreme Court's decision in the *Vineyard*[3] case highlights the importance of a "reasoned analysis of the circumstances affecting the likelihood of the water's availability." Thus, any documents that may be incorporated into an environmental analysis associated with CEQA, must address the key findings of this California Supreme Court decision. Speculative water supplies may be insufficient for purposes of meeting the *Vineyard* criteria. In the UWMP, the likelihood of a supply materializing does not have an impact on the conclusions in the document, but if these same supplies are going to be cited as potential sources in subsequent planning documents the disclosure of uncertainties becomes increasingly critical. This should probably compel a "reasoned analysis" in the UWMP because of its foundational nature.

Groundwater: Two of the primary issues related to a discussion of groundwater supplies are: (1) whether there is a reasonable and accurate description of the basin; and (2) whether the requirement to indicate whether the basin is in overdraft impacts future "sufficiency" determinations in subsequent water supply analyses. Generally, a UWMP requires a description of the groundwater basin consistent with the California Department of Water Resources Bulletin 118 summary. Whether the description of the basin is reasonable is in large part an intuitive hydrogeologic consideration. The goal to provide information regarding the basin from the urban water supplier pumps to serve demands in the Study Area. Clearly, this analysis can become quite complicated because the aquifer from which the urban water supplier pumps is not uniform across its range, contains cones of depression and hydrophobic lenses. Therefore, some uncertainty will almost always be present regarding the "basin" from which the urban water supplier pumps

[3] *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal. 4th 412.

unless detailed studies of the basin have been conducted – and even if those analyses are complete some level of uncertainty will still exist.

An urban water supplier must determine whether DWR has projected the basin is or will become overdrafted if present management conditions continue, in the most current official departmental bulletin (i.e., Bulletin 118) that characterizes the condition of the groundwater basin . . . ." Bulletin 118-03 indicates that the Legislature did not provide direction or funding to undertake an overdraft analysis of the State's groundwater basins. Therefore, except for the 11 basins that Bulletin 118-03 recognizes as being in "critical overdraft," the scope of the analysis required under the statute is unclear. Nevertheless, this omission probably does not relieve the City from identifying overdraft conditions based on other available information. To help in this effort, Bulletin 118-03 does provide working definitions of "historical" and "projected" overdraft from which a good faith analysis of overdraft should be considered.



Bulletin 118

DWR Bulletin 118 defines "overdraft" as "the condition of a groundwater basin or subbasin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions." DWR also defines "projected overdraft" as "an estimate of future water shortages based on an assumed management program within the basin, including projected supply and projected demand."

In 1978, DWR was directed by the legislature to develop a definition of "critical overdraft." As a result of public workshops and input from water managers, DWR developed a definition of critical overdraft that was utilized in DWR's Bulletin 118-80 as follows: "A basin is subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." Ultimately, DWR utilized this definition to identify 11 basins in "critical overdraft," and Bulletin 118-03 has retained this list.

The description of the basin, including "overdraft" considerations, is directly related to the methodology that an urban water supplier employs in an SB 610 WSA (described in **Section 2.10**) to determine whether there are "sufficient" groundwater supplies available because sufficiency is directly related to the available supplies and all other demands

relying upon the same supply source. Ultimately, the requirements for determining sufficiency of groundwater supplies may be the product of case law resulting from challenges to SB 610 WSAs. While this standard is relevant to SB 610 WSAs, the connection between a Water Supply Assessment and an UWMP may ultimately drive public water systems to prepare the UWMP consistent with this requirement.

2.6.3 Reliability

The Act requires a 20-year projection of water supply availability, as well as the availability of these supplies in normal, single-dry and multiple-dry years. The reliability analysis should be distinguished from the analysis of the nature of the water supplies themselves. Reliability analyses should be performed on those supplies that have been identified as available to serve demands. The interaction of hydrology and the identified water rights and entitlements is critical to assessing the reliability of supplies in different hydrologic year types. A few examples of reliability analyses include:

- *Historic Hydrologic Data*: Reliability is often assessed by analysis of historic supply conditions, with specific emphasis on the driest single and multiple dry-year periods. To perform this analysis, historic hydrologic data needs to be available over a sufficient time period to be able to select representative periods of time. Commonly, a multiple dry-year analysis entails consideration of supply conditions in three successively dry years. Based upon water supply conditions in the representative year(s), the City can estimate the quantity of water that might be available in these worst-case scenarios based upon the City's existing water rights.
- *Negotiated Agreements*: Reliability may also be assessed according to the details of a negotiated agreement that drive reductions in dry years based upon a unique formula such as reservoir inflow. For instance, specific provisions associated with drought conditions are described in the City's water agreement with PCWA. These conditions may drive reliability and should be reflected in the UWMP.
- *Groundwater*: Groundwater reliability presents a complicated issue because of the limited information available regarding groundwater supplies. Further detail regarding "sufficiency" of supplies is discussed in the evaluation of the SB 610 WSA in **Section 2.10**.

2.6.4 Demands

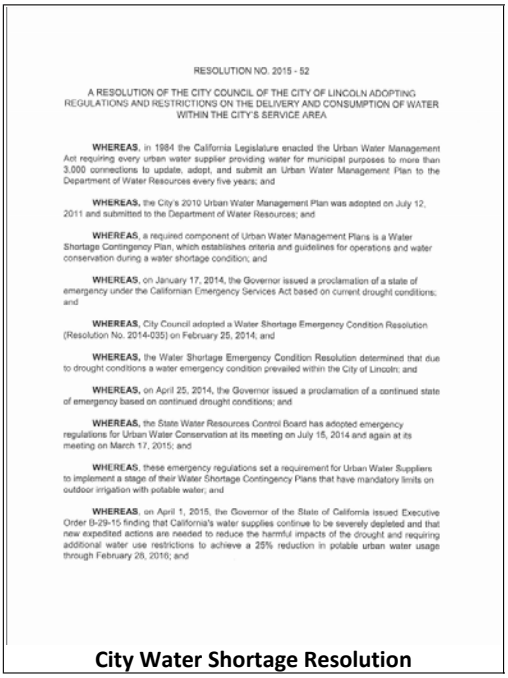
The Act also requires preparation of the past, current and projected demands by sector. Historic and current demands may be reported based upon available data, including water treatment plant production and end user meter data. A UWMP should also provide a detailed description of projected demands in five-year increments for a twenty-year period. The methodologies for developing these demand projections are described in detail in **Chapter 4** of this document.

As discussed previously, the importance of the demand assessment in light of future use for subsequent SB 610 WSAs and General Plans should be strongly considered to help avoid inconsistencies that could become problematic for subsequent land use planning decision documents.

2.6.5 Demand Management Measures

The Act requires that the urban water supplier describe long-term Demand Management Measures (DMMs). One of the primary objectives of this requirement is to ensure that urban water purveyors make a good-faith effort to use water efficiently prior to initiating water supply projects that may not be as cost-effective per unit of water. While reporting DMMs is a requirement for preparation of a UWMP, there are also incentives for maintaining a robust DMM program through membership in the California Urban Water Conservation Council (CUWCC). Preparation of, and reporting on, DMMs is critical to land use planning efforts because the DMMs are intended to make water "go further" per unit of land or for a population within a given jurisdiction. A detailed listing of required DMMs is available through the California Department of Water Resources.

2.6.6 Water Shortage Contingency Plan



RESOLUTION NO. 2015 - 52

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LINCOLN ADOPTING REGULATIONS AND RESTRICTIONS ON THE DELIVERY AND CONSUMPTION OF WATER WITHIN THE CITY'S SERVICE AREA

WHEREAS, in 1984 the California Legislature enacted the Urban Water Management Act requiring every urban water supplier providing water for municipal purposes to more than 3,000 connections to update, adopt, and submit an Urban Water Management Plan to the Department of Water Resources every five years; and

WHEREAS, the City's 2010 Urban Water Management Plan was adopted on July 12, 2011 and submitted to the Department of Water Resources; and

WHEREAS, a required component of Urban Water Management Plans is a Water Shortage Contingency Plan, which establishes criteria and guidelines for operations and water conservation during a water shortage condition; and

WHEREAS, on January 17, 2014, the Governor issued a proclamation of a state of emergency under the Californian Emergency Services Act based on current drought conditions; and

WHEREAS, City Council adopted a Water Shortage Emergency Condition Resolution (Resolution No. 2014-035) on February 25, 2014; and

WHEREAS, the Water Shortage Emergency Condition Resolution determined that due to drought conditions a water emergency condition prevailed within the City of Lincoln; and

WHEREAS, on April 25, 2014, the Governor issued a proclamation of a continued state of emergency based on continued drought conditions; and

WHEREAS, the State Water Resources Control Board has adopted emergency regulations for Urban Water Conservation at its meeting on July 15, 2014 and again at its meeting on March 17, 2015; and

WHEREAS, these emergency regulations set a requirement for Urban Water Suppliers to implement a stage of their Water Shortage Contingency Plans that have mandatory limits on outdoor irrigation with potable water; and

WHEREAS, on April 1, 2015, the Governor of the State of California issued Executive Order B-29-15 finding that California's water supplies continue to be severely depleted and that new expedited actions are needed to reduce the harmful impacts of the drought and requiring additional water use restrictions to achieve a 25% reduction in potable urban water usage through February 28, 2016; and

City Water Shortage Resolution

The Act requires an analysis water shortage contingency planning in conjunction with the UWMP. The Act also requires an urban water supplier to identify actions and plans for implementation of measures according to the plan in the case of water shortage. The water shortage contingency plan (WSCP) must consider stages of action up to a 50 percent reduction in supplies. Also, the urban water supplier must estimate available supplies, assuming a three-year dry period, consistent with the driest three-year period on record. The purveyor must consider mandatory prohibitions, penalties, methods for implementation (including resolutions or ordinances), and measurement approaches for determining whether conservation targets are being achieved. Also, the UWMP should contain an analysis of the costs to the agency resulting from shortages.

From the perspective of an UWMP, the biggest issue related to the applicability of a water shortage contingency plan is quantifying the water savings achieved from

temporary conservation actions. Because the goal is to achieve water savings sufficient to align demands with supplies, measurement becomes critical. By evaluating demands on an indoor/outdoor basis, it is possible to contemplate potential savings from various rationing activities designed to curtail outdoor uses, which are typically considered "discretionary."

The City of Lincoln has established a water shortage contingency plan as part of its 2015 UWMP which can be enacted under Municipal Code Section 13.04.600, which states "the city manager is authorized to enact, impose, implement, and modify water conservation restrictions in order to meet the state or local water conservation standards, and to declare the appropriate water conservation stage as provided in the City's water shortage contingency plan." This plan has been developed by the City in compliance with the State's requirements for water shortage contingency planning under the UWMP. The City's WSCP consists of four Stages of Action to address potential water supply reductions of up to 50 percent. Upon the declaration of a water shortage by the City Council, the appropriate stage can be implemented. The stages include voluntary and mandatory water demand management measures that may be implemented as appropriate to address the severity and anticipated duration of the water supply shortage. Stages of Action may be triggered by 1) current supply conditions, 2) future supply conditions, 3) regulatory actions, or a 4) loss of supply due to natural or human induced disasters.

In conjunction with the voluntary and mandatory conservation measures enacted through the stages of action, the City also maintains prohibitions on water waste. City of Lincoln Municipal Code Sections 13.04.400-13.04.440 outline specific water practices that are prohibited at all times within the City. However with the recent issuance of EO B-37-16, the City's water waste ordinance is no longer in compliance with State law. The EO outlines five specific activities that are now mandated as water use prohibitions. They are:

- Hosing off sidewalks, driveways and other hardscapes;
- Washing automobiles with hoses not equipped with a shut-off nozzle;
- Using non-recirculated water in a fountain or other decorative water feature;
- Watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation; and
- Irrigating ornamental turf on public street medians.

Lincoln's Municipal code Currently incorporates prohibitions against open hoses without a shut off nozzle. And although the rest of the new mandated prohibitions are addressed as demand reduction measures within the Water Shortage Contingency Plan, they are not contained within the Municipal Code as prohibitions. Therefore, the City should update Section 13.04.400 to incorporate these new prohibitions, as well as reassess the existing

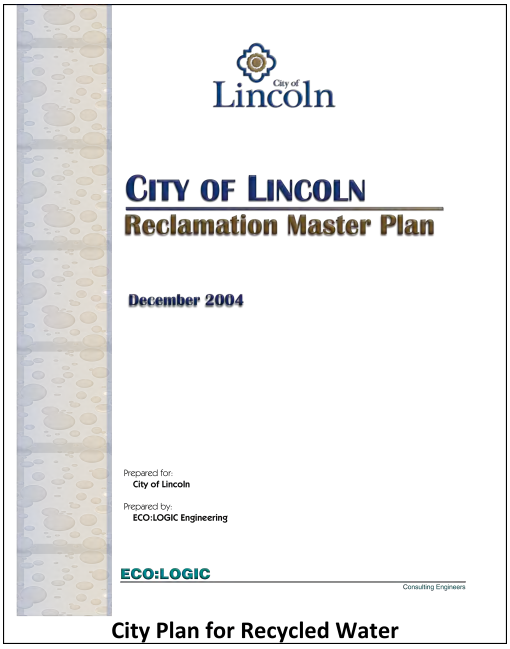
WSCP now that several demand management measures are permanent prohibitions to determine if additional actions or revisions to the plan should be made. While reviewing the WSCP, the City should also develop a more robust set of triggering events to identify when a shortage in water supply is occurring. This will help ensure that the WSCP is consistently applied and enable the City to monitor its potential for supply shortfalls closer.

Adequate Water Supply is required to be demonstrated by new developments before approval from the City is granted. This policy is in line with the State goals towards long term water planning and management.

It is important to note that in addition to the policies discussed in this Section, the City is also impacted by regional organizations and State plans which are discussed later in this document. These include RWA, IWGMP, and the future impacts of SGMA as it is implemented.

2.6.7 Recycled Water Plan

The UWMP Act requires consideration of recycled water opportunities, including capacity of wastewater collection systems, water quality of the wastewater and its suitability for various applications, and the potential demand within the urban water purveyor's jurisdiction for recycled water. There are a number of issues that emerge as part of this planning exercise, including: (1) the manner in which recycled water is classified in the supply and demand analyses; (2) the costs and benefits of developing recycled water infrastructure; and (3) the ability to ensure that the recycled water meets water quality discharge standards promulgated by the Regional Water Quality Control Board for various suburban and agricultural irrigation applications.



City Plan for Recycled Water

Many water supply and demand analyses classify recycled water as a source of supply, when recycled water opportunities may be better classified as demand reduction opportunities. Recycled water is originally part of an urban water purveyor's supplies, so it is not a new supply, but rather a way of reusing the original supply such that total demands may be reduced. Also, a water supply and demand analysis that projects recycled water will be a source of supply may be oversimplifying a highly complicated

process that requires acquisition of a water discharge permit from the Regional Water Quality Control Board, as well as potential agreements to distribute water to willing users.

Recycled water presents unique demand reduction opportunities that can be realized through application of such water for irrigation purposes. To realize these benefits, an urban water purveyor may have to make significant infrastructure investments. Even in California's Central Valley, where water resources are at a premium, retrofitting an existing water system to serve recycled water requires a significant economy of scale before such a venture may be beneficial. New developments present the most promising opportunity to install infrastructure for delivery of recycled water because the pipe can be installed underground alongside other utility infrastructure. In both cases, the economics of utilizing recycled resources for demand reduction is heavily dependent upon the scarcity of water and the cost of infrastructure.

The regulatory challenges associated with securing a permit to apply recycled water in public and semi-public landscaping and for crop irrigation should not be underestimated. The primary concern in the permits is protection of groundwater resources from degradation in water quality resulting from percolation of the applied recycled water. The Central Valley Regional Water Quality Control Board typically requires tertiary treatment of water prior to reuse of such water in landscaping and irrigation applications and the City of Lincoln meets those requirements. There may also be background and ongoing monitoring requirements to characterize the potential impacts that the recycled water operation is having on the groundwater.

2.6.8 UWMP Summary

UWMPs, though completed every five years, offer an essential opportunity for a water purveyor to provide consistent and comprehensive analysis of water supply and demand conditions that can be used for subsequent land use planning efforts. As a document required by the State, the UWMP must fit within the required parameters, but even with those parameters it provides the City with an opportunity to develop a robust planning and forecasting document examining current and future impacts on water supply and demand. This effort facilitates long-term water management planning to assist the City in determining if additional water supplies may be needed or if specific water supply infrastructure projects may be prudent for the City. Failure to pay attention to the reliance on UWMPs may create constraints for other planning efforts or require additional analysis and documentation to align and explain variances.

2.7 Specific Plan

A Specific Plan is a land-planning instrument that is used for the systematic implementation of the City's General Plan. Provisions within each Specific Plan require that it be consistent with the City's General Plan. Moreover, the Specific Plan enables City management and staff to synchronize land-planning analyses with water planning criteria in order to produce a thoroughly vetted planning document.

A Specific Plan may be as generic as setting forth broad policy concepts, or as detailed as providing direction to every facet of development. A Specific Plan may assess the type, location, and intensity of land uses as well as the design and capacity of infrastructure needed to serve those uses. It may also be the keystone document in understanding the financial components for assessing, designing, and building numerous public improvements – including water supply infrastructure. The Specific Plan must unify the General Plan with the other land planning and water planning documents in order to present a cohesive approach to a development project.

California Government Code Sections 65450 et seq. governs the particular details for development of Specific Plans. These sections define the context of a Specific Plan, describe the minimum content that must be contained in a Specific Plan, provide statutory support and mechanisms for the collection of fees, address additional environmental review procedures, and outline the protocols for adoption and implementation of Specific Plans. California law mandates that a Specific Plan shall include a text and diagrams that specify all of the following in detail:

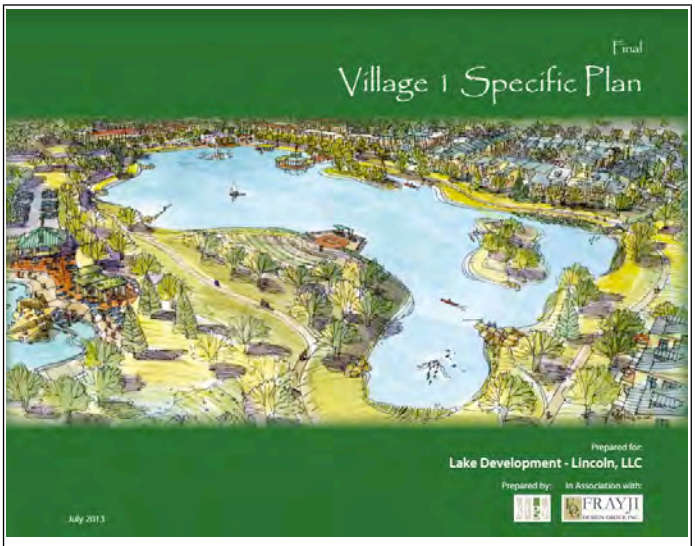
- The distribution, location and extent of the uses of land including open space, within the area covered by the plan.
- The proposed distribution, location and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy and other essential facilities proposed to be located within the area covered by the plan.
- Standards and criteria by which development will proceed, and standards for the conservation and utilization of natural resources, where applicable.
- A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out paragraph (1), (2), and (3).

The Specific Plan must also include a statement of relationship of the Specific Plan with the General Plan. This nexus between planning documents is the key component of land planning laws. In addition to the required items, a Specific Plan may include optional contents to "address any other subjects which in the judgment of the planning agency are

necessary or desirable for the implementation of the General Plan." These discretionary items are the key aspects of the City's long-term planning efforts.

The governing statutes provide flexibility with regard to preparing additional components of a Specific Plan. This flexibility allows public agencies to generate standards for the creation of a wide range of projects or solutions to any type of land use issues. The City has incorporated the Code requirements into its guidelines and requirements for its Specific Plans as well as adopted additional local criteria.

A Village Specific Plan, as detailed in City Goal Land Use (LU) 15.1, or a Special Use District Specific Plan as detailed in City Goal LU-16, is required to be submitted to City Staff and approved by the City Council. The purpose of a Village Specific Plan is to ensure a mixed-use concept as envisioned in the General Plan. A mixed-use concept is a diverse mixture of residential and non-residential land uses. An approved Specific Plan and a General Plan Amendment is required prior to development of land within an area designated as a Village. A City-approved Village Specific Plan is also required before a Development Agreement (described in **Section 2.8**) with the City can be completed as described below. As part of a Village Specific Plan, a land use diagram is prepared that delineates the land uses and facilities to be developed within the Village. No remnant or unplanned areas will be created as final village boundaries may be modified. The City's objective in these criteria is to have whole, fully integrated land use plans that are compatible with the General Plan and the General Plan's supporting environmental compliance documents.



Example Specific Plan

A Specific Plan requires environmental review under the California Environmental Quality Act (CEQA) because it is a "project" as defined under applicable law. The environmental review, as detailed in later sections of this chapter, requires an Initial Study to determine preliminary environmental issues and an Environmental Impact Report (EIR) to detail environmental impacts of the project and mitigation measures associated with the project.

A Village Specific Plan must adhere to the water planning concepts defined in the General Plan and other planning documents. For instance, a General Plan may have

technical components related to water supply and water infrastructure, encompassing legal, financial, engineering, structural and political elements. Moreover, the City may have a Water Master Plan and an Urban Water Management Plan that may prescribe certain water management efforts needed in a Specific Plan. As an example, a Village Specific Plan may need to incorporate oversized water mains in its planning documents so that other subdivisions envisioned in the General Plan, that lie beyond the Specific Plan that is the subject of the identified Village, can receive municipal water service at a future time. This thorough integration of documents requires analysis and synthesis of each planning document that impacts the City's water management future. Failure to synthesize these items can create unnecessary expenses or infrastructure duplication that results in inefficiencies and monetary waste.

All Specific Plans prepared for a village-designated area must meet the State law requirements as outlined in the Government Code as well as the specific City of Lincoln policy provisions. The City of Lincoln has developed a four part specific plan implementation framework: Land Use Framework, Design Framework, Circulation Framework and the Infrastructure / Public Facilities Framework. Within each framework, the Specific Plan will provide the goals and policies that will guide future decisions on projects within the Specific Plan area. The frameworks will also include a detailed implementation plan that will identify responsibilities, financing requirements, as well as project phasing and timing.

2.7.1 Land Use Framework

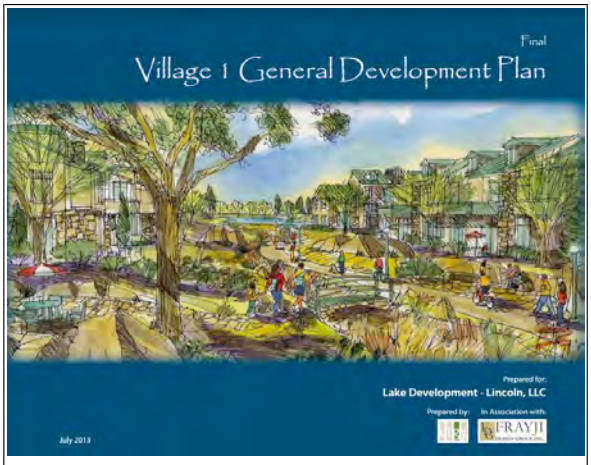
The Land Use Framework will include the proposed land use pattern, actual development densities in each neighborhood, and development phasing. The framework will also include specifics on development standards. The Specific Plan prepared will provide complete guidance on the land use provisions that will guide future development within the Planning Area. At a minimum, these provisions will address the following topics:

- **Land Use Classification.** A land use classification system that clearly identifies the uses that may be allowed in each area neighborhood. The Specific Plan will provide further details on development standards for each neighborhood. This classification system would use clear terminology to define and further describe allowable uses.
- **General Site Planning and Development Standards.** These standards will specify the requirements that would be applied to all development and land uses regardless of the applicable land use designation. These would address, as appropriate, site access requirements and entry statements; energy efficiency; fences, walls, soundwalls, hedges, buffers, and other screening; noise regulations; outdoor lighting standards; performance standards (e.g., air quality, glare, vibration, etc.), undergrounding of utilities; and other similar topics.

- **Development Standards.** Development standards for each land use designation (e.g., building forms, design objectives, land use objectives, height limitations, setback requirements, site coverage requirements, etc.) will be organized in tables and graphically illustrated wherever possible.
- **Housing Mix.** The Specific Plan will discuss the proposed mix of housing types within the village. A key to the housing component will be to incorporate a mix of housing types (as specified elsewhere in this section), and to provide phasing mechanisms that ensure the development of this housing mix in each phase of the project. For example, it may be undesirable to develop a village that leaves the majority of high-density development (VHDR designations) to the final phases in the plan.

2.7.2 Design Framework

The Design Framework provides detailed design guidelines that will be used as the Specific Plan is implemented / developed. The purpose of these guidelines will be to establish the expected level of design within the village while still maintaining project flexibility and innovation. The objective of this framework is not to dictate a specific design, but to establish design expectations.



Example Additional Development Planning

The design guidelines provided will be illustrated to help explain the intent and expectations. This part of the Specific Plan will also incorporate detailed landscaping standards, including specific requirements for preliminary and final landscape plan submittal and review.

The Design Framework will also provide guidance on the integration of the streetscape into the overall project design. The framework will define building type requirements of each neighborhood and define how buildings address the street and interact with public improvements and the public rights-of-way to define the overall character of the streetscape (e.g., new urbanism principles and smart growth concepts).

2.7.3 Circulation Framework

The Circulation Framework will include the proposed circulation network, system elements, design standards, and system phasing. This framework will address all components of the circulation system, including vehicular traffic, bicycles, pedestrian

movement, NEV's, and transit. This component will also address parking and loading standards if different from the standard City requirements.

2.7.4 The Infrastructure / Public Facilities Framework

The Infrastructure / Public Facilities Framework will cover infrastructure requirements (water, sewer, storm drainage, electricity, natural gas, and communications) as well as parkland, schools, and other public facilities. For infrastructure, the framework will address the proposed trunk infrastructure system improvements and system phasing necessary to support implementation of the land use plan.

Overall, the City ensures each village contains a mix of land use types. The four village components, Village Center, Village Center Neighborhood, Outer Village Neighborhoods and Transitional Neighborhoods, each include at least three different types of land use based on seven basic types of land use identified. The City requires the completion and approval of a Specific Plan for the entire Village Planning Area.

Prior to the approval of any Village Specific Plan, a Village Infrastructure Master Plan will be required that details the on-site infrastructure components necessary to serve the project. For water, this includes diagrams of all necessary infrastructure to serve both potable and non-potable water sources in the Village as well as necessary pipe alignments and sizes that may be needed to meet future development. These Village Infrastructure Master Plans display detailed design information within the village for infrastructure improvements, phasing, and financing. Initial environmental review by the City identifies information and technical studies required by CEQA and additional information as needed during the review process by the City. Community outreach program is provided describing how the community is informed about the project and how their concerns will be addressed. Formal public review and comment is solicited after the publication of the CEQA environmental document and the Specific Plan.

The Specific Plan is the first detailed step in implementing the policies and vision outlined in a General Plan. The City's Specific Plan guidelines require synthesizing the General Plan vision but also those policies adopted as part of the water management planning process – including a Water Master Plan, Urban Water Management Plan, and Reclamation Plan. The seamless synthesis of all of these documents allows for flawless environmental review analysis as well as significant streamlining of the land use planning processes.

2.8 Development Agreement

A Development Agreement (D.A.) is a voluntary contract between the City and a property owner, usually a Specific Plan project developer. The D.A. sets the standards

and conditions that govern the development of the property, such as project phasing related to dwellings and infrastructure, finance of infrastructure, development fees, and the term of the D.A.

The City of Lincoln Ordinances provide a framework for the City Council to enter into a D.A. Ordinance 18.84.070, titled “Findings required for council approval” states:

The council shall not approve the development agreement unless it finds that the agreement:

(1) Is consistent with the objectives, policies, general land uses and programs specified in the general plan and any applicable specific plan;

(2) Is compatible with the uses authorized in and the regulations prescribed for the land use zone(s) in which the real property is located;

(3) Is in conformity with public convenience, general welfare and good land use practices;

(4) Will not be detrimental to the health, safety and general welfare of persons residing in the immediate area nor be detrimental or injurious to property or persons in the general neighborhood or to the general welfare of the residents of the City as a whole;

(5) Will not adversely affect the orderly development of property or the preservation of property values;

(6) Is consistent with the provisions of Government Code sections 65864 through 65869.5.

The D.A. provides certainty to the developer that its project will be isolated from changes in the City’s zoning laws over the course of development. But the D.A. also contracts the developer to provide specifically outlined remunerations to the City. These remunerations may include infrastructure improvements, public open space designations, or monetary payments into various funding accounts, such as "in lieu" development fees, in exchange for contractual certainty.

Through the negotiation of a D.A. for a Village, the City and the developer will contractually agree to the specifics of a Village Specific Plan infrastructure design, construction phasing and funding. The D.A. will identify necessary project background and approval components, including: a City Council certified final Environmental Impact Report for the Village Specific Plan; project benefits and approved land use

entitlements; and City Council approval of Village consistency with the General Plan. A City D.A. generally contains the following article sections:

Article 1- General Provisions – term definitions and agreement details, notices.

Article 2 – Development of the Property – land uses, entitlements, PFE program, timing.

Article 3 – Developer Obligations – infrastructure improvements, financing.

Article 4 – City Obligations – PFE commitments, reimbursements, permits.

Article 5 – Annual Review – terms of D.A. and compliance.

Article 6 – Default, Termination and Enforcement and legal action related to each.

Article 7 – Defense and Indemnity/Hold Harmless.

Article 8 – Cooperation in the Event of Legal Challenge.

Article 9 – Miscellaneous Provisions – Agreement options, Attorney's fees, Obligation of Owners.

Article 10 – Provisions related to Lenders – obligations and rights.

Article 11 – Entire Agreement and Exhibits – Listing of pages and exhibits for D.A. [4]

New development is required to comply with the City's adopted Village Infrastructure Master Plan as well as other relevant planning documents adopted and followed by the City. Exhibits that are generally included in a D.A. may identify the Village boundaries, infrastructure improvements proposed both within and outside of the Village boundaries, as well as other components analyzed as part of the Specific Plan process. The new development will provide contributions towards existing and future improvements necessary to serve the development inside and outside of the Village boundaries. All of these components can be negotiated with City Management so long as they meet the general conditions provided in City Ordinances and State law.

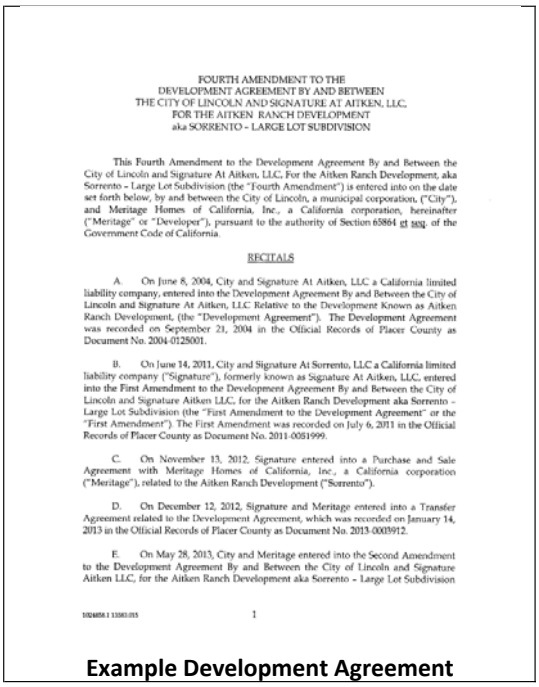
Included in the details of the Village D.A. will be the developer's recognition of the City's policy regarding foregoing or assigning of any and all water rights (i.e. - surface, groundwater, storage) within the proposed annexed areas of the development. The City's intent is to collect differing and diverse water rights available to the City from land

[4] The information here is based on the 2012 Lincoln 270 Amended D.A. and 2013 Village 7 D.A.

owned by the developer for any type of water supplies inherently delivered or granted to the land. These City-acquired water assets from the developer may be considered in offsetting purchased raw and potable water supplied to the City by PCWA and NID.

The Village D.A. shall also include the developer's recognition of the City's policy regarding the formula for determining the developer's obligation to fund infrastructure beyond the project's in-tract needs, including but not limited to off-site piping, storage and well requirements. As larger projects are needed to meet the City's expanding population, these provisions have become paramount.

The D.A. is to be processed, considered and executed in accordance with State law and City codes. The City holds a public hearing to deliberate on the merits of the proposed project and D.A. Finally, after assessing public comment and making the findings associated with Ordinance 18.84.070 described above, the City Council may approve or disapprove of a developer agreement as necessary. Even after approval, the D.A. can be amended through City Council action at its discretion.



FOURTH AMENDMENT TO THE
DEVELOPMENT AGREEMENT BY AND BETWEEN
THE CITY OF LINCOLN AND SIGNATURE AT AITKEN, LLC,
FOR THE AITKEN RANCH DEVELOPMENT
aka SORRENTO - LARGE LOT SUBDIVISION

This Fourth Amendment to the Development Agreement By and Between the City of Lincoln and Signature At Aitken, LLC, For the Aitken Ranch Development, aka Sorrento - Large Lot Subdivision (the "Fourth Amendment") is entered into on the date set forth below, by and between the City of Lincoln, a municipal corporation, ("City"), and Meritage Homes of California, Inc., a California corporation, hereinafter ("Meritage" or "Developer"), pursuant to the authority of Section 65864 et seq. of the Government Code of California.

RECITALS

A. On June 8, 2004, City and Signature At Aitken, LLC a California limited liability company, entered into the Development Agreement By and Between the City of Lincoln and Signature At Aitken, LLC Relative to the Development Known as Aitken Ranch Development, (the "Development Agreement"). The Development Agreement was recorded on September 21, 2004 in the Official Records of Placer County as Document No. 2004-0125001.

B. On June 14, 2011, City and Signature At Sorrento, LLC a California limited liability company ("Signature"), formerly known as Signature At Aitken, LLC, entered into the First Amendment to the Development Agreement By and Between the City of Lincoln and Signature Aitken LLC, for the Aitken Ranch Development aka Sorrento - Large Lot Subdivision (the "First Amendment to the Development Agreement" or the "First Amendment"). The First Amendment was recorded on July 6, 2011 in the Official Records of Placer County as Document No. 2011-0051999.

C. On November 13, 2012, Signature entered into a Purchase and Sale Agreement with Meritage Homes of California, Inc., a California corporation ("Meritage"), related to the Aitken Ranch Development ("Sorrento").

D. On December 12, 2012, Signature and Meritage entered into a Transfer Agreement related to the Development Agreement, which was recorded on January 14, 2013 in the Official Records of Placer County as Document No. 2013-0003912.

E. On May 28, 2013, City and Meritage entered into the Second Amendment to the Development Agreement By and Between the City of Lincoln and Signature Aitken LLC, for the Aitken Ranch Development aka Sorrento - Large Lot Subdivision

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Example Development Agreement

The planning commission, not less than once every 12 months from the effective date of the development agreement, reviews the D.A. between the City and an identified developer for compliance with its terms and conditions. The planning commission conducts a public hearing, at which time the party or parties to the D.A., other than the City, must demonstrate good-faith compliance with the terms of the D.A. If the Planning Commission determines that there has not been compliance in good faith with the terms and conditions of the agreement, the commission may include in its report a recommendation for the modification or termination of the D.A.

After approval of the D.A., the City and the developer have two additional documents to finalize to clarify their cooperative efforts for the development-related infrastructure improvements: Conditions of Approval and Memoranda of Understanding. The Conditions of Approval is one of the last City-generated documents for a developer's project before the permitting for construction is issued. The Conditions of Approval for developments with a signed D.A. rely on the D.A. for infrastructure-related requirements. This process is designed to avoid redundancy and potential conflicts with the D.A. If the

developer's project does not require a D.A., then the Conditions of Approval will contain specific items related to infrastructure requirements both internal and external to the proposed development.

A Memorandum of Understanding (MOU) between the City and a developer can be approved prior to the construction of Public Facility Element (PFE) related infrastructure that benefits the City but not necessarily the developer or his development. The developer would already be committed through a D.A. to construct the required infrastructure (water, sewer, drainage, streets and underground utilities) for a specific project. The City would indicate it has PFE-related projects not required to serve the developer's project but are required to be integrated into the developer's infrastructure design. The developer would agree to assist the City with the design and construction management of the PFE facilities. The developer would be funding the design and construction of the PFE projects to a specific agreed-upon amount. The City would be responsible for all costs exceeding the developers funding amount.

Taken in sequence, the General Plan, Specific Plan and the Developer Agreement make up the key aspects of the land use component of the planning process. The important aspect of these documents is that they must consider and actively address water-related planning and management issues that face the City. Such issues may include simply accessing additional water supply sources through purchases of water molecules to addressing infrastructure related issues by constructing oversized pipes, gather funds for large infrastructure improvements, or identifying future easements or transmissions that would benefit the City's potable and non-potable systems. Consideration of the political, legal, financial and structural implications of the D.A. are critical to ensure that the project will be successful. Furthermore, synthesis of planning documents is crucial for effective long-term planning.

2.9 California Environmental Quality Act (CEQA)

Large-scale land use planning efforts generally require CEQA compliance. As described in **Section 2.4**, General Plan adoptions and updates are considered "projects" under CEQA, and thus require, at a minimum, an Initial Study of environmental impacts. If the Initial Study indicates that there are "significant" impacts, then the local entity needs to prepare an Environmental Impact Report (EIR). An EIR requires distribution of a Notice of Preparation to responsible agencies, which have 30 days to comment regarding the scope of the potential impacts. Upon receipt of all comments, the lead agency must complete a draft EIR. Generally, the assessment of hydrology and water quality is part of the Initial Study, and if there are direct, or reasonably foreseeable indirect impacts that are significant, the draft EIR.

Other water and land planning documents have a different nexus with CEQA. For instance, an SB 610 WSA – described in **Section 2.10** – is the primary water supply document that is used in determining environmental impacts associated with water in an EIR. In other projects, like low threshold projects, an EIR may be the only environmental analysis that considers water issues for an identified project. Accordingly, CEQA is an integral part of land use and water supply planning.

2.9.1 Initial Study and EIR Contents

The Project Description drives the scope of the water supply analysis and the associated environmental analysis that need to be considered in an Initial Study and draft EIR. A Project Description should include: (a) the precise location and boundaries of the proposed project, including its location from a regional perspective; (b) a purpose statement and clear set of objectives to help the lead agency develop a reasonable range of alternatives and a statement of overriding considerations; and (c) a general description of the project's technical, economic, and environmental characteristics. The intended uses of the EIR should also be included. The Project Description should detail the changed conditions that account for the potential environmental impacts associated with the direct physical and "reasonably foreseeable" indirect physical changes in the environment.

Example Environmental Impact Report

The California Supreme Court, in the *Vineyard* decision, emphasized the importance of the principle of "reasonable foreseeability" when considering the potential environmental impacts of obtaining a water supply for a project, and encourages presentation of the broadest extent of information possible to allow decision makers to understand the environmental benefits, impacts and costs of supplying water to a project. Consistent with the principle of "reasonable foreseeability," the *Vineyard* court further recommended that there not be any "ignoring or assuming" a solution of supplying water to a proposed development will manifest itself at a later stage in the development review process. The implication is that "reasonably foreseeable" physical changes may be less certain at the General Plan stage than at the Community or Specific Plan stage and therefore, the hydrologic analysis of the physical changes in the environment may be more general. Nevertheless, the analysis of reasonably foreseeable physical changes should be commensurate with the specificity of the activities presented in the land-use planning document. Thus, to the extent a land use activity is reasonably certain, and its

impacts can be contemplated, those impacts need to be evaluated at the earliest applicable stage in the land use planning process.

2.9.2 Hydrology Section

The Initial Study and draft EIR are intended to disclose the potential impacts of physical changes in the environment caused by a project. More specifically, the draft EIR provides further detail regarding those impacts deemed significant, and also includes mitigation measures and policy rationale for accepting certain environmental impacts. The CEQA Guidelines provide a list of relevant hydrologic and water quality factors to consider when preparing an Initial Study and draft EIR for a General Plan or other project subject to CEQA. The Guidelines include the following factors:

- *Groundwater*: Will there be a substantial depletion of groundwater supplies or interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
- *Supply Expansion*: Will the project result in the need for new systems or a substantial expansion or alteration to the local or regional water supplies that would result in a physical impact to the environment?
- *Insufficient Supplies*: Will the project result in insufficient water supplies available to serve the project from existing entitlements and resources?
- *Drainage*: Will the project result in a substantial alteration of the existing drainage pattern of the site or area, including alteration of the course of a stream or river?
- *Water Quality*: Will there be a substantial alteration in surface or groundwater quality as a result of an alteration in drainage patterns?

These factors are broad, and leave room for a good faith reasoned analysis of the potential environmental impacts associated with utilizing or acquiring supplies and development of water demands. For example, when considering whether acquisition of sufficient water resources will cause a "substantial depletion" such that there would be a "lowering of the groundwater table level," the guidelines indicate that some lowering of the table might not be a significant impact over a certain period of time but would be considered a substantial impact if it persists over some longer average period of time. These impacts on the basin should be explained and to the extent they are significant, mitigation measures should be identified that would reduce the impact to "less than significant." Such a measure might include participation in the implementation of a regional groundwater management plan. Also, determination of whether a "substantial expansion of the local or regional supplies" may be considered a significant impact provides little indication of the "trigger" for such an impact. Most likely, any supply

expansion involving infrastructure development will ultimately trigger an environmental assessment, and the question of whether to prepare the assessment will depend whether the direct or reasonably foreseeable indirect impacts of an infrastructure project are certain. Additionally, analysis of whether a land use plan will result in "insufficient water supplies" presents issues similar to those that must be addressed in Senate Bill 610 Water Supply

Based upon the analysis of impacts, the lead agency must explain how significant environmental effects identified in the EIR will be mitigated or why mitigation measures are not feasible. The lead agency must certify that there will be no significant effects, or that the effects will be minimized and there is a compelling rationale as to why remaining affects are acceptable.

2.9.3 Water Supply Evaluation

One method for developing the information necessary to include in a Conservation, Open Space, Public Utilities, Water Resources Element or an environmental assessment of hydrology and water quality impacts is to prepare a Water Supply Evaluation (WSE). A WSE is most applicable to a jurisdiction that is newly incorporated or that has not reached the connection threshold for development of an UWMP. A WSE is not a statutory requirement, and, as such, there are no substantive requirements for a WSE. Nevertheless, given the previous discussion in this document regarding internal consistency, the need to assess whether water resource management measures will have a significant environmental impact, and the implications of EIR tiering, there may be value in developing a formal water supply and demand evaluation. In addition, a WSE can become a platform from which to prepare future SB 610 WSA compliant assessments or future UWMP updates. The potential components of a WSE are outlined below.

2.9.4 Contents

To effectively complete the environmental investigation so that it meets the objectives of the accompanying planning document, a WSE should contain the following elements:

- *Study Area*: The Study Area is the geographic boundary of the political jurisdiction preparing the WSE. Accurately defining the geographic study area is critical for analytical purposes because the land use based demand projections necessitate use of consistent total acreage figures.
- *Land Use Data*: The Study Area sets the boundaries for preparation of the land use data, including the land use classifications and relevant densities for all land area. A description of land use information should consider the development planning horizon of a Land Use Plan and any specifically referenced development proposals contained in a General Plan. While there may be value in considering a 20-year

demand projection consistent with requirements of a SB 610 WSA, consistency with the Land Use Element in a General Plan should be maintained.

- *Water Demands*: Based upon the land use data, unit water demand factors should be assigned to all land areas based upon the land use classifications. The unit water demands should be presented at the level of detail applicable to the General Plan and should incorporate any ordinances or policies contemplated in the General Plan that may affect unit water demand (i.e. conservation or landscape ordinances). If it is not possible to incorporate actual unit demands for indoor and outdoor uses based upon the nature of the land use at the early stages of the planning process, demands should be presented in aggregate per-acre of land area.
- *Water Supplies*: A WSE should include a description of a jurisdiction's current and future surface water supplies, including source and reliability. If applicable, a WSE should provide: (1) a description of the relevant groundwater subbasin based upon the current DWR Bulletin 118 description; (2) well hydrographs from available wells in an area that greatly exceeds the Study Area boundary; (3) groundwater contours and elevation trends for the same broader geographic area; and (4) supplier historic use, conveyance capacity, and projected use.
- *Dry-Year Supply Reliability*: If dry-year supply reliability projections have not been made in an applicable UWMP, development of reliability projections for a General Plan update are probably not necessary unless there are highly certain development proposals being contemplated, and there is a desire to prepare such analyses in a timely fashion.
- *Integration of Supplies and Demands*: A discussion of the relationship between supplies and demands will provide a basis for assessment of potential environmental impacts that might materialize with the expansion of existing supply infrastructure or acquisition of new supplies.
- *Conclusions*: With mitigation and overriding policy considerations in mind, develop conclusions related to integration results that will be useful in the contemplation of alternative scenarios under the General Plan.

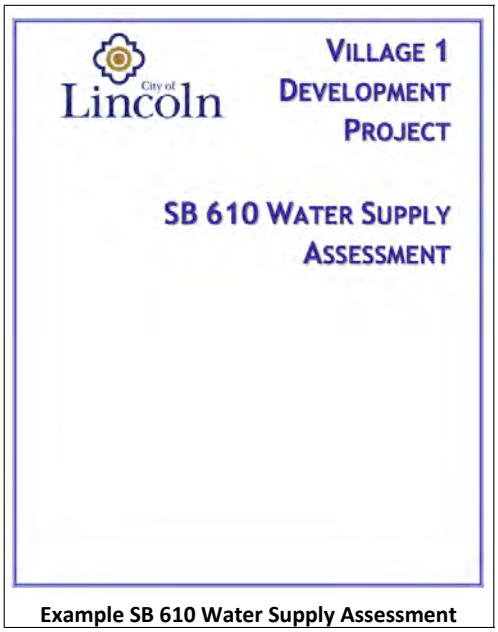
2.9.5 Project Alternatives

CEQA Guidelines § 15126.6 outlines the requirements for evaluating the environmental impacts of project alternatives, including the no-project alternative. A WSE is unique because there is more flexibility in the consideration of project alternatives under CEQA when there is not an overriding statutory requirement to generate specific information (such as the case with the SB 610 WSA). These scenarios might include land use designation changes in the existing jurisdictional boundaries, a proposal for various changes within a SOI, and even consideration of future land use modifications within a proposed SOI. Each of these footprints has an existing water demand and a potential future water demand consistent with the jurisdiction's proposed land use plans. To consider the environmental impacts of the "project," it is necessary to evaluate the

existing and future water demands and the associated hydrology and water quality impacts. Such an approach provides the lead agency with the information necessary to consider the environmental impacts of its immediate decision to approve land use changes under the proposed General Plan.

2.10 SB610 Water Supply Assessment

Enacted in 2001 (effective January 1, 2002), Senate Bill 610 Water Supply Assessment (SB 610 WSA) added section 21151.9 to the Public Resources Code requiring that any proposed "project," as defined in Water Code Section 10912, comply with Water Code section 10910, et seq. Commonly referred to as a "SB 610 Water Supply Assessment," Water Code section 10910 et seq. outlines the necessary information and analysis that must be included in an environmental impact report (EIR) to ensure that a proposed land development has a sufficient water supply to meet existing and planned water demands over a 20-year projection.



Example SB 610 Water Supply Assessment

The SB 610 WSA is the first of two development-specific water supply planning documents intended to closely link the demands of a set of proposed land uses contained in a proposed project with the water supplies available for that development. The standard for the certainty and reliability of water supplies sufficient to meet the demands of the proposed development is more exacting then that required for the Urban Water Management Plan (UWMP). Ultimately, because the SB 610 WSA is a source document for an EIR prepared for a proposed project pursuant to California Environmental Quality Act (CEQA), described earlier in this chapter, it must provide substantial evidence showing that sufficient water will be available to meet water demands for the water purveyor's existing and planned land uses over a 20-year planning horizon.

The relationship between CEQA and the SB 610 WSA drives the timing associated with preparation of an SB 610 WSA. The SB 610 WSA should be prepared concurrent with the EIR, such that the SB 610 WSA is utilized and referenced in the draft EIR. The SB 610 WSA should then be appended to the EIR that is certified by the local government agency approving the land use project. Thus, the SB 610 WSA is subject to the CEQA deadlines associated with issuance of a Notice of Preparation (NOP), a draft EIR and certification of a final EIR. The elements of a Water Supply Assessment are as follows:

- Initial considerations,
- Quantification of the proposed project's water demands,
- Description and documentation of water supplies,
- Sufficiency analysis.

2.10.1 Initial Considerations

The initial considerations require thorough vetting. First and foremost is to define the project and understand whether it is a project requiring an SB 610 WSA. Next, there should be a systematic assessment of any existing documentation related to the water supplies that will be utilized for the project. Both of these issues are described below.

2.10.1.1 Defining the Project

The initial question in conducting an SB 610 WSA is whether there is a "project" that is subject to the SB 610 WSA process. A "project" for SB 610 WSA compliance is different than the definition of a "project" subject to CEQA compliance as described elsewhere in this chapter. According to the SB 610 WSA requirements, a "project" is defined as any of the following:

- Residential development of more than 500 dwelling units;
- Shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- Commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- Hotel or motel, or both, having more than 500 rooms;
- Industrial, manufacturing, or processing plan, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
- Mixed-use project that includes one or more of the projects specified above;
- Project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

Defining the project has important implications to the scope of the WSA analysis as well. For example, if the project will have a non-potable water component – i.e. "purple pipe"

– and the source of the non-potable supply from the public water system is a contaminated groundwater basin, then a full analysis of the groundwater basin will be required in the sufficiency analysis. If however, the project identifies a potable supply for the "potential" non-potable uses, then the sufficiency analysis may be more confined. Accordingly, the definition of the project not only triggers the Water Supply Assessment analysis but it also shapes the scope of the water supply analysis that will be required.

2.10.1.2 Existing Documentation

The SB 610 WSA may be most efficiently completed in cases where an UWMP has been prepared that incorporates the defined project into its analysis. This incorporation means that the level of detail of the demands and the documentation of supplies have been sufficiently detailed in accordance with the requirements of the SB 610 WSA.

In cases where all of the information required for the SB 610 WSA is not contained in the UWMP, then the SB 610 WSA may still reference the UWMP and then develop the necessary level of detail to satisfy the legal requirements. And, even if the UWMP exists and contains very little if any information relevant to the SB 610 WSA analysis, it should still be referenced in the report.

The more critical issue arises where the UWMP exists but the information contained in that document is outdated or contrary to the findings in the SB 610 WSA. In this instance, it is important that the SB 610 WSA explain any discrepancies in the information between the two documents. And, where the UWMP pre-existed the SB 610 WSA, the SB 610 WSA should explain the changed conditions or changes in calculation methodologies that lead to the discrepancies. If a discrepancy is so large as to effectively eviscerate the UWMP, then it may be worthwhile for the water supply provider that developed the UWMP to revise some findings through an amendment process.

Lastly, other water planning documents should be examined as well for consistency. An older SB 610 WSA or a Water Master Plan that has conflicting information than that provided in the more recent SB 610 WSA can create issues that may jeopardize the project's success. Specifically, where items such as demand factors (described briefly below and further detailed in **Chapter 4**) or supply reliability issues (described briefly below and further detailed in **Chapter 5**) are different in earlier water-related analyses than in the applicable SB 610 WSA, discrepancies must be explained.

2.10.2 Quantification of the Proposed Project's Demands

Water Code section 10910 requires that an SB 610 WSA quantify water demands associated with the proposed project. Water demand methodologies include both the land use and population- based methods coupled with verification actions. The nature of land

uses within the project should be well defined. Such characteristics as the actual number of each type of residential dwelling unit, acreages and square feet of commercial and office land uses, acreages of parks and acreages of roads should be known. Water demand projections for each land use type need to be made over a 20-year period in 5-year increments.

Although not specifically required in Section 10910, water demands associated with the proposed project should be estimated for normal, dry and multiple dry-year hydrologic years. Accounting for variations in water demands during dry periods is also a critically important component of the analysis as demands changed based upon changed climatic conditions. As described earlier, water demands generally increase in dry periods as outdoor irrigation may start earlier in the year or require more water.

2.10.3 Description and Documentation of Water Supplies

There are numerous forms of water supplies that may be applicable to a proposed project. Generally, the supplies are derived from surface water resources or groundwater resources. In other instances, the source water may be further defined in potable and non-potable water quality categories. The basics of the surface water and groundwater supplies for purposes of SB610 WSA compliance are described below.

2.10.3.1 Surface Water Supplies

The surface water analytical requirements for the SB 610 WSA are similar to those for the UWMP, which requires a description of quantities received in prior years, and an analysis of supplies under normal, dry, and multiple-dry year projections. In contrast to an UWMP, the SB 610 WSA also requires inclusion of documentation to establish and support "rights" associated with the stated water supplies. This may include copies of contracts, water right permits, licenses or other recordings that establish proof that the right exists as represented in the sufficiency analysis. Generally, an SB 610 WSA will require the following elements: (1) proof of "right" to a supply; (2) quantification of historic use of the identified supplies over the past five years; and (3) proof or intent to obtain supplies to meet the expected future demand.

PG&E Drum-Spaulding Project

Image Couteasy 2014 FERC EIS

2.10.3.2 Groundwater Supplies

Similar to the requirements of a UWMP, a SB 610 WSA must include, among other things, the following information if groundwater will be a source of supply for a proposed project:

- A description of any groundwater basin or basins from which the proposed basin will be supplied;
- Whether the groundwater basin or basins have been subject to any adjudication proceeding;
- Whether California Department of Water Resources (DWR) has identified the basin or basins as overdrafted in the most current bulletin; and
- Efforts being undertaken to eliminate the long-term overdraft condition.

If groundwater is a source of supply for the proposed project, the analysis must also include "[a]n analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project."

City Well

Two important issues have arisen regarding the question of groundwater sufficiency: (1) whether an SB 610 WSA must analyze existing and planned water use of all users overlying the relevant basin or basins; and (2) Whether there can be a finding of sufficient groundwater when the groundwater basin has been identified as overdrafted. Examining all demands within a basin for purposes of determining whether overdraft exists may be one way of satisfying the Water Code requirement to evaluate "sufficiency" in light of basin conditions. Alternatively, a finding of "sufficiency" may not require a quantification of recharge and pumping throughout the entire basin, but rather analysis of historic hydrograph records to determine how the aquifer has behaved over a series of years under various demand scenarios. Again, the SB 610 WSA requirements use "sufficiency" intentionally, because it is a broad term that provides discretion for groundwater pumpers in a region to exercise the basin within an acceptable range, understanding that in some years recharge will exceed pumping and in others pumping will exceed recharge.

One of the toughest challenges for those public water systems preparing SB 610 WSAs is going to be finding the point at which adequate information has been gathered and analyzed for purposes of making a reasoned conclusion regarding groundwater supply "sufficiency." Because the notion of "sufficiency" as applied to groundwater supplies is

relatively untested, and there is probably room for reasoned arguments regarding the scope and depth of information necessary to make a "sufficiency" determination, this element of SB 610 WSAs is likely to be contested. Whether broadly developed pumping data for those using groundwater throughout a basin is necessary to determine whether a basin is in overdraft may be in open question in some circumstances. In many arenas, given the nature of groundwater rights, which are generally highly unregulated, sufficiency may be achieved through analysis of historic groundwater levels and development of basin-wide management measures that reflect the nature of the nature of long-term hydrologic cycles and the opportunities for conjunctive use.

2.10.4 Sufficiency Analysis

The "sufficiency" determination is really the heart of the SB 610 WSA. Sufficiency is evaluated differently based upon whether the water source is groundwater or surface water. Because surface water supplies are generally more easily measured than groundwater, the potential issues associated with a determination of "insufficiency" related to these supplies are likely to be political or legal, though there may well be occasions in which it is technically infeasible to deliver adequate surface water to a proposed project. On the other hand, groundwater sufficiency determinations are more likely to consider primarily technical issues related to availability of water in the aquifer and the ability to measure the reliability of the water source.

An SB 610 WSA is required to determine whether the water supplier's total projected water supplies will be available during normal, dry and multiple dry water years over a 20-year period to meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses. This analysis is relatively straightforward as long as the water supplier's determination that sufficient water will be available is supported by substantial evidence. Once the water supplier determines whether sufficient water will be available, Water Code section 10911(c) requires that the land use jurisdiction ultimately responsible for the proposed project's approval make an independent determination as to whether sufficient water will still be available to meet demands for the proposed project in addition to demands of existing and planned land uses.

The California Water Code, however, does not define "sufficiency" for purposes of preparing a WSA. Therefore, it is left to the local jurisdiction to develop or ensure that the water purveyor develops substantial evidence such that a conclusion regarding sufficiency can be reasonably drawn. Intuitively, the determination of sufficiency is akin to an accounting process in which supplies are "insufficient" if projections anticipate that there will not be enough supply (down to the acre-foot) to satisfy demands in any of the normal, single-dry or multiple-dry year scenarios.

While Water Code § 10911 implies that projected supplies instantly become insufficient at some point along the spectrum of balancing supplies and demands, there is probably not a bright line for determining "sufficiency" such that a local jurisdiction can point to it and conclude that because supplies are projected to exceed demands by just a few acre feet that supplies are definitely sufficient to meet demands. Given the inherent uncertainty in the projection process, the smaller the projected margin between supplies and exceed demands, the more evidence a local jurisdiction needs to provide that it is capable of developing alternative supplies, including demand management measures, to offset the risk of insufficient supplies.

2.10.5 Finding of Insufficiency

The WSA contemplates that sufficient water supplies may not be developed at the time the WSA is prepared. In this case, the water supplier must include its "plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies." The plans for developing water supplies should include information identifying:

- Costs and financing methods associated with developing the water supplies;
- Required permits, approvals and entitlements; and
- Estimated timeframes for developing the water supplies.

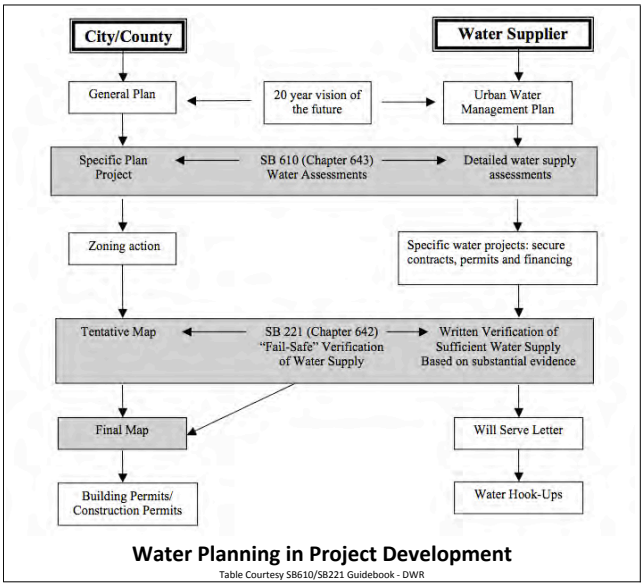
Although not expressly stated, the Water Code implies that plans for developing additional water supplies need to be narrowed to a few alternatives if not one identified source. A couple of issues emerge by requiring this approach, notably whether a jurisdiction may essentially accept the conclusion that there will be insufficient supplies for a "project" and yet approve the "project" if the water purveyor is able to develop adequate information regarding the acquisition of additional supplies. This issue highlights the relationship between the SB 610 WSA and the environmental assessment to which the SB 610 WSA is appended.

The California Supreme Court's *Vineyard* decision touches on some important themes that could drive the nature and scope of the relationship between the two documents. Specifically, *Vineyard* held that within an EIR, when evaluating the environmental impacts of supplying water to a project there must be certainty that the supplies evaluated will materialize, and are not speculative. Also, to the extent there is some uncertainty, *Vineyard* counsels that there should be discussion of alternatives and the environmental consequences of those alternatives. While *Vineyard* concerned the adequacy of an EIR (as opposed to an SB 610 WSA), these two holdings could have an impact on the scope of information that a land use agency seeks in an SB 610 WSA because of the need to evaluate the impacts of the water resources findings in the SB 610 WSA. Notably, at the

SB 610 WSA stage, a public water supplier should be focusing on a few highly likely sources. It is likely that the public water system will find additional pressure to specifically discuss the certainty associated with the "development of water supplies" consistent with the three bullet points above. The public water system will perhaps need to consider alternatives more carefully because of the requirement that the land use agency evaluate the environmental consequences of any identified alternative supplies.

2.10.6 Relationship to CEQA

Section 10911(b) of the California Water Code provides that the SB 610 WSA "shall" be included in the CEQA document. It is important to note that the requirements set forth for water supply and demand analyses in a SB 610 WSA cover a set of key elements that inform the broader CEQA analysis which should include consideration of hydrologic, water quality and any other impacts associated with the provision of supplying water to the proposed project. The same factors as those described in other sections of this subchapter may be utilized in this consideration of impacts including: (1) Substantial depletion of groundwater supplies; (2) Substantial expansion or alteration to the local or regional water supplies that would result in a physical impact to the environment; (3) Insufficient water supplies available to serve the project; (4) Substantial alteration of the existing drainage pattern; and (5) Substantial alteration in surface or groundwater quality as a result of an alteration in drainage patterns.



Water Planning in Project Development
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2.11 SB 221 Water Supply Verification

The purpose of the Senate Bill 221 Water Supply Verification (SB 221 Verification) is to "include as a condition in any tentative map that includes a subdivision a requirement that a sufficient water supply shall be available" to serve it. The requirement to prepare an SB 221 Water Supply Verification is triggered upon a local agency receiving a tentative map application for a proposed subdivision. A subdivision is defined as an addition of 500 or more dwelling units, or, if fewer than 5,000 connections exist, upon an increase of 10% or greater in the number of service connections. Upon receipt of a tentative map application, a local agency must send a copy of the application to any public water system that may provide water service to the identified lands. Upon receipt of the request

for verification, the public water system must provide the written verification of sufficient water supply to the local agency within 90 days. Also, the requirement that a tentative map comply with the California Environmental Quality Act (CEQA) is likely to be met by reference to earlier environmental analyses prepared as part of an area, specific, or community plan. If a tentative map application is submitted for a development project that does not meet the definition of "subdivision" as contained in Government Code 66455.3 then no SB 221 Verification is necessary.

Similar to a Senate Bill 610 Water Supply Assessment (SB 610 WSA), the heart of an SB221 Verification is the "sufficiency analysis" by the public water system. The SB 221 Verification defines "sufficient water supply" as the total water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection that will meet the projected demand associated with the proposed subdivision, in addition to planned future uses, including, but not limited to, agricultural and industrial uses. To this end, a public water system is required to consider the following factors when determining whether a "sufficient water supply" exists: (1) the availability of water over a historical record of 20 years; (2) applicability of water shortage contingency plan; (3) sector reductions in water use pursuant to resolution or ordinance; (4) amount supplier could reasonably receive from another source. If supplies are not currently available, a "sufficiency" determination may rely upon: (a) written contracts; (b) capital outlay projects; (c) construction permits; (d) regulatory approvals.

The information required in the SB 221 Verification may be gained from the SB 610 WSA or other water supply planning documents. Reliance on these documents for the SB 221 Verification, however, requires that these alternative documents meet the verification criteria or a finding that conditions have not changed since the other documents were adopted. Accordingly, preparing documents that are consistent in analyses of water supply and demand conditions may prove helpful in completing the necessary SB 221 Verification analysis.

The written verification of sufficient water supply has some unique requirements beyond those required in an SB 610 WSA. These requirements are:

- The verification shall consider the reasonably foreseeable impacts of the proposed subdivision on the availability of water resources for agricultural and industrial users within the service area of the public water system; and
- If a subdivision will use groundwater, substantial evidence shall be presented regarding the landowner rights to groundwater for the subdivision.
- If the written verification indicates that water supplies will be insufficient, the local agency may make a finding that additional supplies "are, or will be made available prior to completion of the subdivision" that will satisfy the verification requirements.

2.11.1 Sufficiency Analysis

The SB 221 Verification requires a highly refined "sufficiency" analysis. At the tentative map stage, the land use planning entity will be expected to provide specific, parcel by parcel, land use information for a specific development, thus allowing a water analysis of indoor and outdoor uses for land use classifications and corresponding acreages.

If supplies are not currently available for the subdivision, along with agricultural and industrial demands, proof of permitted and/or licensed water rights; proof of contracts for water; as well as any other capital outlay proposals, permits and or regulatory approvals may be used as proof of future supply availability. In the case of a project that is planning to receive surface water supplies through a new diversion, permits and regulatory approvals associated with a project should be highlighted in the supply verification. In addition to a discussion of specific water supply availability and the status of the procedures necessary to secure additional supplies, the SB 221 Verification, as part of the "sufficiency analysis" must also include an evaluation of the following four elements:

- *Availability of water over a historical record of 20 years*: this requirement is intended to prove that recent demands for water have been met on a consistent basis. Though it will not prove that supplies will be available to meet future demands, it does provide evidence of the District's ability to meet historical demand on its system.
- *Applicability of water shortage contingency plan*: As required by Water Code 10632 (for an UWMP), the agency needs to develop a plan that helps achieve a reduction in demands assuming up to a 50% reduction in supplies. This requirement, as it applies to an SB 221 Verification, seeks assurances that the water shortage contingency plan is applicable to the subdivision contained in the tentative map as well as the other water uses throughout the land use jurisdiction's service area. Because a water shortage contingency plan entails specific voluntary and mandatory actions to be undertaken by specific sectors, including residential and commercial, there needs to be a direct connection between the actions, the sectors, and the ability to measure demand reductions.
- *Sector reductions in water use pursuant to resolution or ordinance*: Commonly, a water shortage contingency plan will establish water service sector priorities to evaluate the impacts of supply shortages and reductions in service to the respective uses within each sector. For example, many jurisdictions will develop a variation on the following three sectors:

    1. *Health and Safety*: All residential indoor and all non-residential sanitary uses, including the wastewater treatment plant.

2. *Business*: All usage related to commercial activity, which may include businesses with major outdoor usage, such as golf courses and agriculture.

3. *Outdoor Irrigation*: All residential outdoor uses, and various large landscape customers.

- *Other Sources*: Government Code § 66473.7(a)(2)(D) requires an estimate of the amount of water a supplier could *reasonably receive* from other sources, including recycling, conservation and transfers. In most cases, the recycling and conservation data will have been evaluated in either the Urban Water Management Plan or a SB 610 WSA, but to the extent this information needs to be updated, an estimate should be provided.

2.11.2 Agricultural and Industrial Users

The definition of "sufficient water supply" in Government Code § 66473.7(a)(2) provides that supply needs to be available for the subdivision, "… in addition to existing and planned future uses, including, but not limited to, agricultural and industrial uses." Furthermore, 66473.7(g) provides that the SB 221 Verification shall include reasonably foreseeable impacts of the proposed subdivision on the availability of water resources for agricultural and industrial users within the public water system's service area, and currently utilizing the same sources but not receiving water from the city/county. This requirement may be met if the impacts have been previously analyzed as part of an Environmental Impact Report (e.g., as part of a SB 610 WSA).

2.11.3 Proof of Rights to Groundwater

If a subdivision will use groundwater, substantial evidence shall be presented regarding landowner rights to groundwater for the subdivision. The analysis that may be required to demonstrate "rights" to groundwater is far from clear. Groundwater rights are generally categorized as either overlying or appropriative. Generally, water purveyors that provide water to developments hold appropriative rights to groundwater. Appropriative rights to groundwater exist only in the event that there is surplus water in the groundwater basin. Accordingly, a finding of surplus may be required before a water provider can make water available for the development. While this is a starting point for a domestic water purveyor to prove rights to groundwater, an affirmative finding of a right to groundwater based upon surplus groundwater conditions may be extremely difficult to make in light of the complicated nature of underground water systems and the difficulty in assessing availability of supplies. In this light, proving a right to groundwater as opposed to merely

the availability of groundwater, is a nuance that has yet to be fully developed as part of a SB 221 Verification efforts to date.

2.11.4 Future Water Supplies

Government Code 66473.7(b)(3) provides that even in the case the SB 221 Verification indicates that there is an insufficient supply**,** the local agency may make a finding on the record, that additional supplies will materialize that will satisfy requirements. This provision raises an interesting evidentiary issue outside of the SB 221 Verification because the tentative map condition of verifying sufficient water supply need not be based entirely upon the conclusions in the Water Supply SB 221 Verification. In other words, this action may require a water purveyor to commit to a future act or promise a future condition without essentially having the water supply available. Accordingly, if the "finding" of the water purveyor is incorrect and the water supplies cannot be secured, an SB 221 Verification may be made that may not have a verifiable water supply for the development with it.

Example Future Water Supply

2.12 Low Threshold of Projects

The requirements of the Senate Bill 610 Water Supply Assessment (SB 610 WSA) and the Senate Bill Water Supply Verification (SB 221 Verification) are intended to ensure that development proposals meeting specific criteria are fully analyzed from a water supply and demand perspective so that a land use entity may make an informed decision regarding the environmental impacts of a project based upon substantial evidence. Assuming a project does not meet the thresholds to trigger an SB 610 WSA or SB 221 Verification, it is nearly certain that a land use entity will need to prepare an environmental assessment and ultimately an Environmental Impact Report (EIR). A "low threshold" project would be one that is not 500 units or greater and does not increase the number of connections of a jurisdiction with fewer than 5,000 connections by 10% or more.

In a "low threshold" project, the water supply analysis will almost exclusively be contained in the environmental assessment required pursuant to California Environmental Quality Act (CEQA). The CEQA discussion later in this chapter outlines the requirements for utilizing CEQA in the water planning process. The CEQA EIR analysis

should be more detailed at successive planning stages. The EIR should contain more detailed analyses of water supplies and the associated uncertainties of the supplies materializing, as well as a detailed analysis of alternatives and their associated environmental impacts.

Also, important to the analysis of "low threshold" projects in a draft EIR are the following four factors: (1) whether known direct impacts to water resources are addressed and whether the conclusions are supported by substantial evidence presented in the draft EIR itself; (2) whether the draft EIR analyzes a range of reasonably foreseeable indirect physical changes that could have an impact on water resources; (3) if applicable, whether the draft EIR appropriately relies upon tiering from previously completed environmental documents; and (4) whether the range of alternative supplies seems reasonable, and depending upon the planning stage, whether a refined subset of highly likely supplies are rigorously analyzed for their impacts on hydrology and water quality resources.

In summary, even though a land use proposal does not trigger the requirement to prepare an SB 610 WSA or SB 221 Verification, the project still must satisfy the CEQA requirements to assess hydrology and water quality impacts.

2.13 Reclamation Plan

The City of Lincoln has constructed a state-of-the-art regional wastewater treatment and reclamation facility (WWTRF) for the purposes of treating and disposing of wastewater generated within the City's General Plan area and collected from Placer County areas to the east towards the City of Auburn (WWTRF is described in detail in **Chapter 5**). , effluent from the Lincoln WWTRF is of sufficient quality to allow unrestricted reuse, including the farming of salinity sensitive crops, i.e. - rice for human consumption. The State Water Resources Control Board (SWRCB), which is empowered to permit and regulate wastewater treatment and disposal facilities, has an established policy encouraging the recycling of effluent to the extent possible rather than discharging effluent to surface waters or disposing of effluent on land. This policy is set forth in the Sacramento River and San Joaquin River Basin Plan, 1998, adopted by the Central Valley Regional Water Quality Control Board (RWQCB).

In order to implement this policy locally, the City of Lincoln completed a 2003 study of the potential for reuse of effluent from its WWTRF. Agricultural properties located in the vicinity of the WWTRF that are suitable for irrigation with the reclaimed water have been identified in the report titled "City of Lincoln - Facilities Plan and Water Recycling Study", May 2003. The 2004 Reclamation Master Plan of December, 2004 is an update to the 2003 Facilities Plan, and identifies additional users within the City and in the

proximity of the WWTRF that express interest in the reclaimed water since the Facilities Plan was completed.

The 2004 Reclamation Master Plan has not been formally updated. However, the reclaimed water has since shifted from identifying disposal sites, four City-owned sites and a City-leased site, to negotiating reclaimed water delivery contracts. The eight categories of potential recycled (hereinafter referred to as reclaimed) water with the City's SOI is still valid. They are as follows:

- City-controlled agriculture;
- private agriculture;
- golf courses;
- Western Placer Waste Management Authority,
- industrial users;
- City parks and recreational areas;
- street landscaping; and
- highway landscaping.

California Water Code section 13550 states that "the use of potable domestic water for nonpotable uses…is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available…." In the context of the City's long-term water planning, this law may have more implications to proposed land use plans than any other. The City's control over the WWTRF and the potential to deliver recycled water to non-potable uses may mean that sufficient infrastructure and delivery systems must be installed to address this mandate. As such, in addressing water supplies for all future land use planning issues, the City's Reclamation Plan should be consulted and integrated. The City's recycled water supplies are more fully described in **Chapter 5**.