NORTH TORRANCE WELL FIELD PROJECT

WaterSMART: Drought Resiliency Project Grants for FY 2016

PREPARED FOR:

Bureau of Reclamation
Acquisition Operations Branch
Attn: Michael Dieterich
Mail Code: 84-27852
PO Box 25007
Denver, CO 80225
mdeiterich@usbr.gov
PH: (303) 445-2484

PREPARED BY:

City of Torrance
20500 Madrona Avenue
Torrance, CA 90503
JDettle@TorranceCA.gov
PH: (310) 618-3059
FAX: (310) 781-6902
John Dettle, Engineering Manager/Project Manager

April 11, 2016

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TECHNICAL PROPOSAL

Executive Summary

Date: APRIL 11, 2016
City: TORRANCE
County: LOS ANGELES
State: CALIFORNIA

Project Length of Time: 24 MONTHS
Estimated Completion Date: JULY 2018
Located on a Federal Facility: NO
Estimated New Water Supply: 3,849 AFY

The City of Torrance, California (population 148,495) requests $297,000 to offset costs associated with the $15 million North Torrance Well Field Project (NTWFP), which will provide 3,849 acre feet per year (AFY) of water for potable use. The NTWFP includes three wells: Well No. 9 is an existing well that will be modified, and Wells No. 10 and 11 will be constructed for a total sustainable yield of 9,000 gallons per minute, or 14,510 AFY. The wells will provide a ***local water source*** in a densely populated region that is almost completely reliant on federal imported water. The City will utilize 3,849 AFY of the new water source to first meet our adjudicated limit for groundwater, and the remaining supply will be used for potable water storage and the capacity for Conjunctive Use. The NTWFP will also include a water treatment facility on City property west of Yukon Elementary School; a new distribution water main; and a 3 million gallon storage tank.

For the purposes of this grant application, the City will discuss the entire project and its benefits throughout the text, ***but will request funds only to offset costs to drill Well No. 10***. **The project components for Well No. 10 have a total cost of $1,100,000, which, should the project be awarded, will be divided by Reclamation ($297,000 grant request) and the City ($803,000 local matching funds).** Thus, the Work Plan, Schedule, and Project Budget will only reflect those activities associated with Well No. 10. However, Reclamation funds will enable benefits associated with the entire project portfolio. The City has contributed over $5 million toward the project thus far. Currently, due to the prevalence of brine water in the City, we are only utilizing about a third of our groundwater rights, and we depend on imported water for over 65% of our supply. Our community remains in extreme drought, and continues to seek measures to reduce reliance on imported water sources that include the State Water Project – a water source that is severely impacted by the lack of snowpack in the Sierras and bone-dry lake beds throughout the state – and the Colorado Aqueduct. The complete project will allow the City to utilize its allocated groundwater production capacity of 5,640 AFY. It will provide the City with the pumping capacity to participate in groundwater storage or Conjunctive Use programs (ability to store and use groundwater during drought years), and advance the City's goal to move toward more water independence and less reliance on imported water sources. Most importantly, it is paramount that we utilize this rare opportunity to utilize local water sources to manage the impacts of prolonged, extreme drought.

Background Data

Figure 1. Project Location Map

The City of Torrance incorporates 20.48 square miles in the South Bay region of Los Angeles County in Southern California. In 2014, the population was estimated by the United States Census Bureau at 148,495. The City is served by the Torrance Municipal Water Department (TMWD) and is a member agency of Metropolitan Water District of Southern California (Metropolitan).

Problems with Water Supply

The City of Torrance suffers from two primary issues concerning water supply. First, the ongoing occurrence of extreme drought affects the City's allocations for imported water from Metropolitan and our few local wells. Second, the City's groundwater supplies have been

declining for several years due to overpumping and contamination that occurred decades ago. Most of the groundwater in Torrance is brine or has high concentrations of nitrates and unsuitable for pumping. Two of our groundwater wells were decommissioned due to high chloride levels from a saline plume from the Pacific Ocean, where seawater infiltrated local groundwater. **There is only one area in Torrance where water is of higher quality and suitable for local use**. The proposed project provides a significant opportunity to utilize high quality groundwater in the north portion of the City, which is uncommon in the region. We must continue to find alternative sources of water supply to offset imported water and realize the full allocation of our groundwater rights. The proposed project will do just that.

The North Torrance Well Field Project (NTWFP) will enable Torrance to modify an existing well (Well No. 9), drill two new wells, and tap into its best quality groundwater. Reclamation funds will allow the City to drill Well No. 10, and enable a $1,100,000 portion of the total $15 Million overall project. It is part of a long-range plan to increase local water sources and reduce dependence on imported water for our 26,000 residential, business and industrial customers.

Torrance Municipal Water Department (TMWD). The City of Torrance owns and operates TMWD, which is allowed to pump 5,649 acre feet of groundwater per year. TMWD serves residents and business customers covering 78% of the City. The Department is responsible for local water supply, the monitoring and maintenance of water quality, planning preventive and predicative maintenance, the operation and repair of the water system, distribution system, and interfacing with the State Health Department and other agencies regarding water quality matters. Please see *Appendix A* for *TMWD Service Area Map.*

The adjudicated limitations are designed to prevent over-drafting groundwater from the West Coast Basin which underlies the entire City of Torrance and 11 other cities. *TMWD is currently only utilizing about a third of its groundwater rights (pumping 1,800 AFY).* Likewise, groundwater provides only a small portion, (about 3.5 percent) of Torrance's water supply. **The proposed project will enable the City to realize its full allocation of 5,649 AFY – an increased, new water supply of 3,849 AFY - and increase our percentage of total supply from 3.5 percent to 23.8 percent groundwater.**

The TMWD staff and system:

- Deliver over 30,000 acre feet (9.8 billion gallons) of both potable (drinking water) and recycled water supplies to residential, business and industrial customers in the City;
- Maintain and repair 320 miles of distribution pipelines, 2,700 fire hydrants, 7,500 valves and 26,000 service connections;
- Provide responses to emergencies and water outages on a 7 day/24 hour basis; and
- Conduct approximately 2,200 water quality tests annually as part of a comprehensive water quality program.

Topographically, the service area consists of the El Segundo Sand Hills and the Torrance Plain. Along the southern edge of the service area are the Palos Verdes Hills, which rise about 445

feet at the southern border of Torrance. The service area overlies the West Coast Groundwater Basin, which consists of four main water bearing formations in the vicinity of Torrance, the Gage, Gardena, Lynwood, and Silverado aquifers. TMWD has five imported water connections with a total capacity of 33,666 gallons per minute to receive Metropolitan water. TMWD also has one active well, and one inactive, or standby well, to pump groundwater from the West Coast Basin.

Water sources currently available to TMWD consist of imported water purchased from Metropolitan, groundwater including desalinated water purchased from the Water Replenishment District of Southern California (WRD), and recycled water purchased from the West Basin Municipal Water District (WBMWD). Imported water supplies are delivered to TMWD by Metropolitan which diverts water from the Colorado Aqueduct, and from the State Water Project (SWP), via the California Aqueduct. ***Both the Colorado Aqueduct and the Cal Fed Bay Delta Program (aka State Water project) are Bureau of Reclamation facilities.***

Figure 2
City of Torrance
Current Water Consumption

Water Supply Sources	% of Average Annual Supply	Annual Consumption (AFY) 2014 - 2015
Imported Water	68.5	**16,205**
Local Supply (Groundwater)	3.5	**829**
Local Supply (Desalter)	5.8	**1,366**
Recycled Water	22.2	**5,270**
Totals	100	**23,670**
Note: Water consumption during this period was reduced compared to typical consumption due to partial shutdown of the Exxon Mobile refinery which uses recycled water and also due to drought-related conservation mandates.		

On January 17, 2014, California Governor Jerry Brown declared a State of Emergency for California in the face of record dryness, triggering a variety of water conservation measures and a request for California residents to voluntarily cut back on water use.[1] In 2015, facing continuing extreme drought, Governor Brown declared another State of Emergency, and announced California's first call for statewide mandatory water restrictions. According to the California Department of Water Resources, snowpack in the Sierras, which supplies much of the State Water Project, is still far from enough to signal a potential end to California's continuing drought.[2] Even more telling is an article from the *Huffington Post*, 12/29/14, "2014 in Review: Reflecting on California's Drought, Disappearing Water Sources:"

[1] *Orange County Register*, 1/18/14
[2] *Los Angeles Times*, 12/31/14

"Even with late-December storms that were the strongest in five years, 2014 was one of the driest years on record for California, with one study suggesting it's the worst in 1,200 years. To make matters worse, new analysis from satellite data suggests the Golden State needs another 11 trillion gallons of water (or one and a half times the capacity of a full Lake Meade) to recover from this three-year drought. According to the University of Nebraska Drought Monitor, most of California -- with the exception of the far northwest and southeastern corners -- is still in the red, or 'extreme' or 'exceptional drought.'"

Fig. 3. *A Bay Area reservoir (feeds into SWP) is completely dry in April 2015.*

Not only is the City's imported water supply affected by these conditions, but so are local groundwater supplies, which are greatly reduced as a result of recent drought conditions. These factors have forced Metropolitan to tap into reserves in order to maintain deliveries to Torrance and the rest of the 26-member agencies. The City is now under more pressure than ever to implement alternative water conservation and management processes.

The project will enable the City to increase its well water use dramatically, up to its adjudicated limit of more than 5,000 AFY. This will reduce the City of Torrance's continued dependence on imported water which currently provides over 65% of the City's water. Less dependence means that the City can utilize this local well water from the proposed project during dry years and cut back on imported allocations. In wet years, the City can 'bank' a portion of the groundwater for conjunctive use during the next drought.

Technical Project Description

As indicated in the Executive Summary, the full portfolio of the larger NTWFP consists of far more than the activities for Well No. 10. However, for the ease of reporting and fiscal efficiency, we will describe a high-level overview of the full project here, but the *Estimated Project Schedule* in the Project Implementation section will reflect Well No. 10 activities only, which represents the scope of work for which BOR funding is requested.

NTWFP Project Overview

The City of Torrance is implementing the NTWFP to expand its pumping and treatment capacity to obtain the City's full groundwater allotment and provide sufficient reserve capacity to participate in conjunctive use and enable additional groundwater extractions during a drought or emergency.

The NTWFP will utilize the design-build methodology for design and construction of the following components:

- ✓ Modify Well No. 9. This includes removal of a 1 million gallon tank, booster station, and treatment system from McMaster Park increasing public open space;
- ✓ Drill two additional wells (No. 10 and No. 11):
    - o Well No. 10. The pilot hole for proposed Well No. 10 was drilled at the project site in June 2009 to determine water quality parameters and develop the design for the well. Geoscience observed the construction of the pilot hole and prepared a report recommending the well design. The well was drilled to a depth of 904 feet below ground surface and backfilled to a depth of 46 feet below ground surface. The conductor casing was installed and grouted in place. The well will be completed as part of this project at this location;
    - o Well No. 11. Well No. 11 is proposed to be constructed just west of Yukon Avenue, north of the I-405 Freeway within the expanded school parking lot. Construction of this well is deferred until a later date;
- ✓ Construct a water treatment facility on City-owned property west of Yukon Elementary. Treatment facilities and Well Nos. 10 and 11 will be designed to allow for automatic operation with remote monitoring and supervision. The water treatment system will be designed for a maximum flow of 9,000 gallons per minute and provide treatment for the bacteriological and virus disinfection;
- ✓ Modify the Yukon Elementary parking lot to allow for large vehicle access to the project site;
- ✓ Install a booster pump station to discharge the treated water to the City's distribution system;
- ✓ Install a new distribution water main; and
- ✓ Construct a 3 million gallon storage tank for emergency storage. The site will allow a tank with a maximum diameter of approximately 115 feet.

The construction of two additional groundwater wells, storage tank and water treatment facility will bring the City's groundwater production capacity to 5,640 AFY, its adjudicated limit. The NTWFP will also include treatment for iron and manganese with space available for fluoridation and future treatment for possible disinfection by products and total dissolved solids.

The NTWFP is shovel-ready. It will be completed within two years of funding using a design-build approach. All preliminary work has been completed. These tasks include:

1. Acquisition of a 2-acre property (west of Yukon Elementary);
2. Acquisition of a 25-foot easement from the Torrance Unified School District to access the property, installation of raw water line, electric, phone, sewer, stormdrain pipes, and access road;
3. Feasibility Study and preliminary Design;
4. CEQA - A Mitigated Negative Declaration was procured in April of 2016.

Please see the proposed detailed *Estimated Project Schedule* under ***Evaluation Criterion D: PROJECT IMPLEMENTATION*** for activities specific to construction of Well No. 10. Please also see *Appendices B – E* for *Project Map, Well Drawings, Site and Grading Plan*, and *Well No. 10 Floor Plan*.

Evaluation Criteria

Evaluation Criterion A—Project Benefits

Please describe how the proposed project will improve drought resiliency, including: Will the project make additional water supplies available?

Yes. The proposed project will make 3,849 AFY of water available for potable uses.

If so, what is the estimated quantity of additional supply the project will provide and how was this estimate calculated?

The estimated quantity of 3,849 AFY of additional supply was calculated using potential draws from Well No.'s 9, 10, and 11 using the "forward simulation" methodology, which includes developing a ground water model (i.e., drilling a test hole) and calibrating the model until observed data (i.e., pumping test data) match estimated specific capacity within an acceptable accuracy. For purposes of analysis of the proposed new wells, the City used forward simulation at a site-specific pilot hole (Well No. 10 site) to estimate potential yields. Geoscience observed the construction of a pilot hole, drilled to a depth of 904 feet below ground surface, and backfilled to a depth of 46 feet below ground surface. Conductor casing was installed and grouted into place. After the simulation was complete, Well No. 10 was estimated to yield 3,000 gallons per minute (4,842 AFY). The entire NTWFP is estimated to produce 3,000 gallons per minute/per well, or 9,000 gallons per minute total (14,510 AFY). The project will not include the total amount of supply as a projected source of new water, as only the adjudicated limit per year – a total of 5,649 AF – is sustainable. The total of new water supply available was taken from the total adjudicated limit less the current groundwater supply (5,649 AFY – 1,800 AFY = 3,849 AFY). While the project will produce more than that number for storage and possible conjunctive use, it will not draw more than the adjudicated limit.

What percentage of the total water supply does the additional water supply represent? How was this estimate calculated?

TMWD delivers roughly 23,670 AFY of water to approximately 26,000 residents and businesses, representing about 78% of the City of Torrance.[3] TMWD purchases the majority of its supply (approximately 65%) from Metropolitan. The imported water supplies are sourced from the Colorado Aqueduct and the SWP. The City relies so heavily on imported water because we can

[3] Torrance.gov

only pump 1,800 AFY from our existing groundwater wells. The 1,800 AFY represents only 31% of Torrance's adjudicated right to pump up to 5,640 AFY from the West Coast Groundwater Basin, a limitation resulting from water quality issues (brine caused by seawater intrusion and high concentration of nitrates). If TMWD uses local groundwater wells to source 5,640 AFY of its 23,670 AFY total, the additional water supply represents up to 23.8% of the City's total water supply. Implementation of Well No. 10 will allow Torrance to realize 100% of its adjudicated pumping rights, **while reducing the City's reliance on imported water from 68.5% to less than half of our total water supply.**

Figure 4
City of Torrance
Percentage of Water Supply Comparison

Water Supply Sources	% of Average Annual Supply	% of Average Annual Supply Post-Project
Imported Water	68.5	**49**
Local Supply (Groundwater)	3.5	**23.8**
Local Supply (Desalter)	5.8	**5.8**
Recycled Water	22.2	**22.2**
Totals	100	100

Provide a brief qualitative description of the degree/significance of the benefits associated with the additional water supplies.

Torrance residents will benefit from a local, high-quality water source that is cost-efficient. Much of the groundwater in Torrance is not suitable for local use. Regulatory entities measure and monitor Total Dissolved Solids (TDS) in water to calculate the total mineralization of water. Coastal Torrance has been significantly affected by the salinization of the Silverado Aquifer – data from West Coast Basin wells indicate that while most drinking water wells in production had TDS concentrations within the Maximum Contaminant Levels, production wells located close to the coast in Torrance had TDS concentrations above recommended levels. The water at the proposed Well No. 10 site is in North Torrance, the only area in the City with higher quality water suitable for local use. The significance of this is extremely important to note as we move toward our goal of less dependence on imported water. The volatility of our imported water supply (and that of all Southern California) is at an all-time high, and the need for local, high-quality water for potable use is paramount. This project will produce potable, high-quality water that is currently not available to our residents. The locally sourced water will provide a less costly source than that of our imported, desalter, or recycled water, drawing the overall cost of our water supply down, which translates to more sustainable water rates for customers.

How will the project build long-term resilience to drought? How many years will the project continue to provide benefits?

The project will decrease the City's dependence on drought-stricken imported water supplies, and move closer to local supply sustainability. The project will continue to provide benefits for at least 20 years, and we expect that the well will provide benefits for upwards of 35 years or more. A significant threat to Torrance's drought resilience is its dependency on imported water. The State Department of Water Resources (DWR) has not granted any of its contractors their entire request for water for the last 10 years. California's conservation plans for the SWP are predicated on the assumption that individual regions become more self-sufficient by investing heavily in water conservation, water-use efficiency, water recycling, and use of a region's surface or underground storage waters. The City of Torrance is working diligently to increase self-sufficiency in water supply, and has met the Governor's mandate to reduce potable water use by 20%. By increasing our groundwater supply portfolio from 3.5 to 23.8%, the City will reduce the need to purchase imported water and help preserve CRA and SWP supplies.

How will the project improve the management of water supplies? For example, will the project increase efficiency or increase operational flexibility (e.g., improve the ability to deliver water during drought or access other sources of supply)? If so, how will the project increase efficiency or operational flexibility?

The proposed project will increase water management efficiency by allowing the City to gain more control of its water sources. As mentioned above, supply shortages have forced SWP to make steep cuts to regional water supplies for the last decade. The proposed project will allow Torrance to cut back on imported water and use this new, local water during drought years, and 'bank' reserve groundwater from this source during wet years, when the imported water supply is consistent.

Will the project make new information available to water managers? If so, what is that information and how will it improve water management?

Torrance is committed to researching and collecting information about the groundwater it will collect from the proposed site, in partnership with the Water Replenishment District of Southern California (WRD), mentioned in more detail further in the application. The water supply quality and quantity data the City will collect will include, but not be limited to: groundwater elevation data; groundwater extraction data; surface water supply; total water use; change in groundwater storage; and sustainable yield.

Will the project have benefits to fish, wildlife, or the environment? If so, please describe those benefits.

Yes. Several benefits to the Madrona Marsh are listed further in the *Evaluation Criterion C—Severity of Actual or Potential Drought Impacts to be Addressed by the Project* section. Here, we will address the benefits to the California Bay Delta. In 2008, the Fish and Wildlife Service issued a biological opinion which determined that the continued operation of the Central Valley Project (CVP) and State Water Project (a Reclamation facility) was likely to jeopardize the

continued existence of the Delta Smelt, a small fish that lives in the Bay Delta (source of SWP water) and adversely modify its critical habitat.[4] Delta Smelt, among other endangered species, are adversely affected by federal and state exportation of fresh water from the Delta (CVP/SWP). Delta water salinity levels continue to increase, without sufficient fresh water replenishment, thus recent population samples, in an area which typically yielded 50 to 100 smelt fish, now present only six fish, with increased water salinity cited as a major contributing factor. Reduced reliance on imported water from the SWP will contribute to preserving the Delta Smelt habitat, and help protect other species.

What is the estimated quantity of water that will be better managed as a result of this project? How was this estimate calculated? What percentage of the total water supply does the water better managed represent? How was this estimate calculated?

The proposed water will better manage 23,670 AFY. The estimate was calculated by adding our imported water supply and local water supply (including groundwater, desalter, and recycled water) for a total water supply number. The project will better manage 100% of our total water supply. The NTWFP will decrease our dependence on imported water from 68% to 49%, increasing our local water supply portfolio to more than half of our total supply. This means that we can offer more competitive pricing structures even as our population grows, and control over half of our water supply, which has historically never happened for our City. With local control we can utilize or bank local supply depending on prevailing drought conditions, and increase our drought resiliency by growing our reserves of non-imported water supply. By requesting less future allocations from Metropolitan, we are better managing our water supply during dry and drought conditions, thus managing our entire portfolio of water supply sustainably.

Provide a brief qualitative description of the degree/significance of anticipated water management benefits.

Conjunctive Use – The City of Torrance is allowed to bank, or reserve, 1,000 to 2,000 AFY of unused groundwater rights. During years when imported supply is not constricted, the City can bank 1,000 to 2,000 AFY of groundwater from Well No.'s 9, 10, and 11 for future 'conjunctive' use, bolstering our resilience to ongoing drought or the next drought cycle. This back-up supply will help save imported water during dry years, alleviating the stress on state water supplies deeply affected by drought conditions.

Good groundwater management will provide a buffer against drought and climate change, and contribute to reliable water supplies regardless of weather patterns. The significance of reliable water supplies that buffer our community against drought are numerous. To name a few, the benefits include increased groundwater storage, increased groundwater quality for

[4] "Envisioning a Healthy and Sustainable Bay-Delta Ecosystem," US Fish and Wildlife Service. <http://fws.gov/sfbaydelta>, accessed on April 3, 2016.

Torrance residents, conjunctive use opportunities, and less dependence on imported water supplies.

Wells

The three wells in the NTWFP area include Well No. 10 (new); Well No. 11 (new); and Well No. 9 (modified existing well). Each of the three wells are expected to produce a capacity of 3,000 gallons per minute (4,842 AFY), a total of 9,000 gallons per minute for the well field, or 14,510 AFY. The City plans to utilize the groundwater as a supplemental supply. The estimate was calculated using the "forward simulation" methodology as described in detail earlier in the application. The City plans to utilize the new wells to realize our full allocation of groundwater, which is 5,649 AF of groundwater per year.

Physical Description of Wells

- ✓ Well No. 9. Depth: 594 feet below ground surface; Diameter: 18-inch casing; Sustainable Well Yield: 3,000 gallons per minute (4,840 AFY); Specific Capacity: 39 gallons per minute per foot.
- ✓ Well No. 10. Depth: 904 feet below ground surface; Diameter: 18-inch casing; Sustainable Well Yield: 3,000 gallons per minute (4,840 AFY).
- ✓ Well No. 11. Well No. 11 is expected to be similar to existing Well No. 9. The expected well yield is 3,000 gallons per minute. Casing diameter is expected to be 18 inches.

West Coast Basin

The adjudicated limitations are designed to prevent over-drafting groundwater from the West Coast Basin (Basin). In 1961, the Basin was adjudicated. The adjudication limits the allowable annual extraction of groundwater per water rights holder within West Basin in order to prevent seawater intrusion and an unhealthy groundwater level. As part of the adjudication, the Court appointed the California Department of Water Resources (DWR) to serve as Watermaster to account for all water rights and groundwater extraction amounts per year. Since the adjudicated groundwater production is substantially higher than the natural recharge of the Basin, the California State Legislature in 1959 created the Water Replenishment District of Southern California (WRD) to manage, regulate and replenish the Basin. Each year WRD determines the amount of supplemental recharge that is needed for the Basin based upon annual groundwater extractions and groundwater levels. As part of the recharge and protective duties, WRD procures imported water and recycled water for the West Coast Basin Barrier Project and Dominguez Gap Barrier Project to prevent seawater intrusion. The Basin is not experiencing overdraft or land subsidence. Please see *Appendix F West Coast Basin Map* for physical locations of the West Coast Basin Barrier Project and Dominguez Gap Barrier Project – the additional water supplies for this Basin.

Groundwater Monitoring Plan

As mentioned above, the WRD is the groundwater management agency responsible for managing, regulating, and replenishing the Basin, and is the official Groundwater Level Monitoring Entity for the Basin. WRD is in support of the proposed project to enhance local sustainability. WRD has been monitoring the Central Basin and West Coast Basin for over 50 years, and produces the Regional Groundwater Monitoring Report annually with comprehensive information from WRD's growing network of aquifer-specific monitoring wells and in-depth water quality analysis. The Regional Groundwater Monitoring Report presents information on groundwater levels and groundwater quality for the previous water year which runs from October 1 through September 30 of each year.

WRD will continue to update and augment its RGWMP to best serve the needs of the District, the pumpers, and the public. Some of the possible mitigation activities planned, or which utilize data generated from this program for the current year 2015-16, are listed below.

- ✓ Continue to maximize recycled water use without exceeding regulatory limits;
- ✓ WRD will continue to maximize recycled water use at the West Coast Basin Seawater Intrusion Barrier and will promote maximum permitted recycled water injection at the Dominguez Gap and Alamitos Gap Seawater Intrusion Barriers;
- ✓ WRD will continue efforts under its Groundwater Contamination Prevention Program in order to minimize or eliminate threats to groundwater supplies. The Groundwater Contamination Prevention Program includes several ongoing efforts, including the CBWCB Groundwater Contamination Forum with key stakeholders that meet regularly and share data on contaminated groundwater sites within the District.

Describe how the mitigation actions will respond to or help avoid any significant adverse impacts to third parties that occur due to groundwater pumping.

The proposed project received a CEQA Mitigated Negative Declaration. The City performed an inundation study on the 3 million gallon tank. The results suggested that mitigation was necessary to prevent flooding at the project site. To mitigate this possible impact, design was altered to allow for the tank to be partially lowered 23 feet below ground, and lowered the entire project site by one foot. Finally, the design includes the installation of 3-foot floodgates, which will control water flow before draining through the stormdrain.

Evaluation Criterion B—Drought Planning and Preparedness

Please see *Appendix H DROUGHT PLAN - Section 2 (Water Supply); Section 7 (Contingency Plan)*; and *Appendix 1 (Other Supply Reliability Risks)* of the *Torrance Urban Water Management Plan*.

Explain how the applicable plan addresses drought. The City of Torrance has a long history of preparing for and addressing drought and its consequences. The City's efforts include the development of the comprehensive Urban Water Management Plan (UWMP, 2010). Prior to the UWMP, the City worked with Metropolitan and other relevant entities and agencies to

develop the 1996 and subsequent 2004 Integrated Resource Plans (IRP) that have made investments in conservation and supply augmentation as a part of its long-term water management strategy, and provided a large portion of information for the UWMP. We refer to the UWMP as the drought contingency plan of reference for this application.

The UWMP includes a Contingency Response Plan that implements initiatives to optimize water supply during water shortages or drought conditions. In the event of a water shortage, City Council implements the appropriate water conservation stage by resolution. The objectives of the UWMP Response Plan are to: a) prioritize essential uses of available water; b) avoid irretrievable loss of natural resources; c) manage current water supplies to meet ongoing and future needs; d) maximize local municipal water supplies; e) eliminate water waste city-wide; f) create equitable demand reduction targets; and g) minimize adverse financial effects.

Explain whether the drought plan was developed with input from multiple stakeholders. Was the drought plan developed through a collaborative process? As part of the UWMP, the initial resource strategies included a multi-level collaborative process that involved Metropolitan member agencies, retail water agencies, other water and wastewater managers, environmental, business, and community interests. In the fall of 2008, Metropolitan's senior management, Board of Directors, member agency managers, elected officials, and community groups collectively met and discussed strategic direction and regional water solutions at a series of four stakeholder forums; nearly 600 stakeholders participated in the forums. Stakeholder data was directly utilized in the UWMP.

Does the drought plan include consideration of climate change impacts to water resources or drought? Yes. In Appendix 1, Section 2, the UWMP discusses climate change and Metropolitan's focus as an active and founding member of the Water Utility Climate Alliance (WUCA). "As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change."[5] Overall, Metropolitan's planning activities listed in the UWMP strive to support adopted policy principles on climate change by: supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply; supporting flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts; and evaluating staff recommendations regarding climate change and water resources against the California Environmental Quality Act (CEQA) to avoid adverse effects on the environment.

Describe how your proposed drought resiliency project is supported by and existing drought plan. Does the drought plan identify the proposed project as a potential mitigation or response action? Does the proposed project implement a goal or need identified in the drought plan? The proposed drought resiliency project to drill two new wells that penetrate existing aquifers in North Torrance to capture clean potable water for city residents and

[5] UWMP 2010, Appendix 1, p. 2-25.

businesses is supported by the UWMP. As stated in Section 2.4 of the UWMP "Projected Supply Outlook," the Plan directly identifies the North Torrance Well Field Project as part of its mitigation and response strategy, "Torrance Municipal Water District (TMWD) understands the need to discover and support local water supply projects in an effort to decrease dependence on imported supplies. As part of this process, TMWD is in the process of upgrading its groundwater supply facilities to include the addition of at least two new wells in the North Torrance Well Field in the northern part of the City. These wells will help TMWD to extract their adjudicated pumping right of 5,640 AFY." The project helps implement the City's goal to reduce their dependence on imported water.[6]

Describe how the proposed project is prioritized in the referenced drought plan. One of the primary objectives of the UWMP is to "maximize local municipal water supplies."[7] The NTWFP will meet this objective by extracting clean potable water from currently high-quality local aquifers in the area. The proposed construction of two additional groundwater wells, storage tank, and water treatment facility will bring the City's groundwater production capacity to 5,640 AFY, its adjudicated limit. Moreover, the project will provide the City with the pumping capacity to participate in groundwater storage or Conjunctive Use programs and will advance the City's goal to move toward more water independence and less reliance in imported water sources.

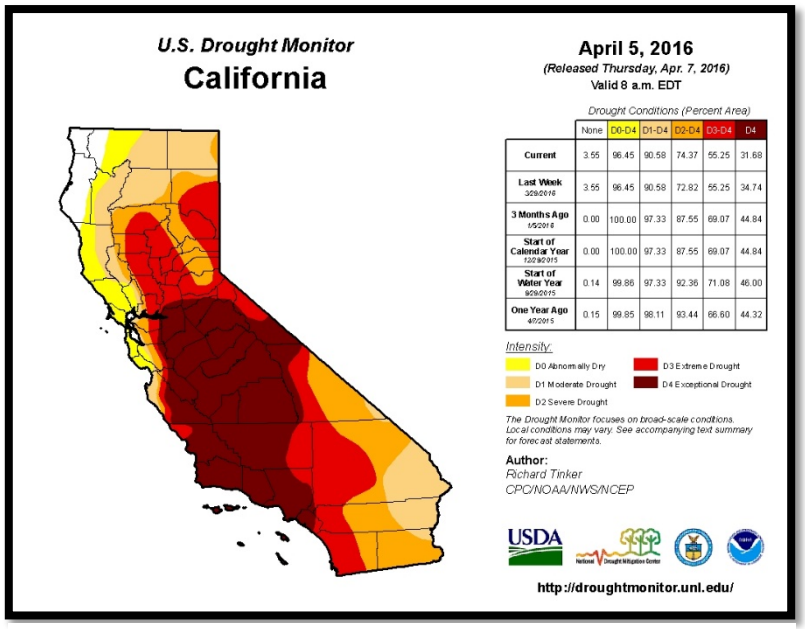

Fig. 5. *Torrance is located within the area of Extreme Drought in Los Angeles County, shown above in maroon.*

Evaluation Criterion C—Severity of Actual or Potential Drought Impacts to be Addressed by the Project

What are the ongoing or potential drought impacts to specific sectors in the project area if no action is taken, and how severe are those impacts? 2014 was one of the driest years in California's recorded history, and, faced with record drought conditions in 2015, California Governor Jerry Brown declared a State of Emergency, and announced California's first set of *statewide* mandatory water restrictions. In the face of a major ongoing drought, Torrance is experiencing a variety of drought impacts, such as potential shortages of drinking water

[6] UWMP 2010, p. 2-10
[7] UWMP 2010, p. 7-1

supplies, increased risk of wildfires, and environmental concerns. Impacts include the following:

Water Supply Shortage. Sixty-eight percent of Torrance's potable water is imported from Metropolitan, which draws water from the State Water Project (SWP), as mentioned throughout this application. The SWP is an enormous water conveyance system, supplying water to contractors throughout California. The water supply available to the SWP is derived directly from the Sierra Nevada snowpack. By the end of 2015, the Sierra Nevada Snowpack held only *8%* of its historical average. March 2016 brought storms which increased the snowpack levels, however, the improvement in snowpack levels has not been evenly distributed, and Torrance remains in "Exceptional Drought" conditions, the highest level of intensity.[8] Southern California is expected to experience an increase in regional demands in the years 2015 through 2035 as a result of population growth. Increased population necessitates increases in water supply demand.

Increased Risk of Wildfires. Southern California has seen at least one massive wildfire each decade since the mid-20th century, and the record-setting drought conditions have dried out much of the terrain in all of Los Angeles County, including Torrance.[9] In extended drought conditions fire behavior can become more extreme, because trees and plants that have been dried out due to drought burn more quickly. Wildfires also pose economic threats to urban residents, like those in Torrance. An average 500 homes are destroyed throughout the state each year, with Los Angeles County homes posing the highest risk of being destroyed in a wildfire than any other county in the state. A disastrous consequence of water scarcity is the reduced ability to contain and suppress fires, which could intensify the already-extreme fire risk.

Fig. 6. *An egret in Madrona Marsh, Torrance, CA.*

Environmental Impacts.

Coastal areas like Torrance's Madrona Marsh are of particular concern because of grave ecosystem threats.[10] Torrance is home to the Madrona Marsh Wildlife and Preserve Center, the largest coastal prairie in California, and the last vernal marsh habitat within the region. It is designated as a "Significant Ecological Area" by Los Angeles County, due to its irreplaceable resources.[11] The marsh is home to over 100 species that are listed as endangered, threatened, or concerned.[12] Scientists warn of coastal flooding and mass fish and water-bird extinctions.

[8] US Drought Monitor, NOAA, USDA as of March 24, 2016
[9] USGS.gov
[10] EPA.gov
[11] planning.la.gov
[12] torranceca.gov/MadronaMarsh

Reduced breeding success has been documented for the Willow Flycatcher, Red-tailed Hawk, and waterfowl – evidence that the drought is having a substantial effect on local birds.[13]

Describe any projected increases to the severity or duration of drought in the project area resulting from climate change. A 2015 study which analyzed multiple levels of atmospheric pressure concluded that climate change worsened California's dry season by up to 20%.[14] President Obama recently issued a Memorandum and Action Plan to communicate impacts of drought. The national Memorandum specifically names California water basins suffering from, or at-risk for drought. Experts predict climate change is expected to increase the frequency, intensity, and duration of droughts.[15] Scientists are comparing Southern California's current drought conditions to similar mega-droughts in the region that occurred 1,000 years ago. Severe water shortages caused major societal disturbances, including human mortality. They warn that drought conditions will be as or more severe than the mega-droughts of the past, and cannot be ignored.[16]

Evaluation Criterion D—Project Implementation

The proposed project is capable of proceeding into a financial assistance agreement with the Bureau of Reclamation. The proposed $797,000 match is immediately available and will be sourced from the City's *Water Enterprise Fund*.

The City of Torrance Public Works Department will manage the project, and has a proven capacity to manage large-scale, grant-funded projects. The Public Works Department has over 200 employees to support operating activities and construction projects and has an annual operating budget slightly over $11.5 million. Over the past five years, the City has received over $14 million in federal and state grant funding to implement complex projects ranging from a water desalination plant expansion ($3 million Proposition 50 grant) to storm water basin enhancements ($3.3 million State Water Resource Board and $300,000 Bureau of Reclamation grant).

We employ a standard grant management process that includes developing tracking tables at the onset of a new grant award and reviewing all grant contract requirements. Project Manager, John Dettle, PE, and the Torrance Public Works Staff will be responsible for overseeing this particular project's grant reporting, reimbursement requests, overseeing the design contracting and process, and the public/education outreach. Mr. Dettle has 25 years of project management experience, including administration of the following large-scale construction projects: 1) Machado Lake Trash TMDL Project (Prop. 84, $1.75 million grant); 2) Stormwater Basin Enhancement Project (Prop. 84, $3.3 million and BOR, $300,000); 3) Southern

[13] Southern California Audubon Society, ca.audubon.org
[14] Geophysical Research Letters August 2015
[15] (Building National Capabilities for Long-Term Drought Resilience" issued 3/21/16
[16] Climate Institute, Volume 27, No. 2

California Water Replenishment District Desalter Expansion Project (Prop. 84 IRWM, $3 million, Prop. 50, $4 million); and 4) North Torrance Well Field Project (Prop. 84, IRWM, $3 million).

We have a proven track record of successfully managing grant-funded projects and will bring the same level or project management experience to this final design and specifications project.

The RFP will be provided to the short-listed firms prequalified during the RFQ phase, and these firms will be invited to submit technical and price proposals in response to the City's subsequent RFP. The RFP is associated with the overall project, and not just activities for Well No. 10, thus not included in the Project Schedule, below.

Figure 7. Estimated Project Schedule

No.	High Level Activities/Milestones	Lead	Deliverable	Start/ End Dates
	Task #1: Grant Management			
1.1	Grant Award and Fully Executed Grant Agreement.	BOR/City	Grant award executed.	06-2016/ 07-2016
1.2	Grant Administration (expected to commence July 1, 2016, with project closeout July 1, 2018 (24 months)	City	Successful audit.	07-2016/ 07-2018
1.3	Submit quarterly program performance reports.	City	Quarterly reports submitted by City.	07-2016/ 07-2018
1.4	Submit requests for reimbursement.	City	Requests for reimbursement submitted by City.	07-2016/ 07-2018
1.5	Submit financial reports including required Federal forms.	City	Financial reports submitted by City.	07-2016/ 07-2018
1.6	Complete final report including project evaluation and final payment request.	BOR/City	Final report submitted by City.	07-2018
1.7	Project Close-out/Final Payment anticipated from BOR (24 months from date Grant Agreement executed).	City	Final payment from BOR.	07-2018
	Task #2: Design and Permitting			
2.1	Design work and construction documents are complete.	City	Design plans on file.	01-2016
2.2	A mitigated negative declaration has been approved and procured.	City	Copy of mitigated negative declaration	04-2016
2.3	Obtain construction permits.	City	Copies of all construction permits	08-2016
	Task #3: Construction			
3.1	Complete well construction including: installation of grouted conductor casing; drill pilot hole; obtain water samples for zone testing and test for water quality; install filter pack; develop well by airlifting and swabbing; obtain further water samples and test for constituents requested by the California Code of Regulations; disinfect well; prepare and submit the well completion report to the California Department of Water Resources.	Contractor	Invoices for construction.	10-2016 / 04-2018

No.	High Level Activities/Milestones	Lead	Deliverable	Start/ End Dates
3.2	Install/construct well building (cinder block wall and tile roof).	Contractor	Invoices for building.	10-2016 / 04-2018
3.3	Install pumps and motors. Install test pump for final development by pumping and surging; measure flow rate and groundwater level; conduct step drawdown and constant rates pumping tests.	Contractor	Invoices for pumps and motors.	10-2016 / 04-2018
3.4	Install piping, including: install Type 316 stainless steel casing, one 2-inch stainless steel sounding tube, and two 3-inch gravel feed tubes (mild steel).	Contractor	Invoices for piping.	10-2016 / 04-2018
3.5	Complete electrical work and instrumentation. The electrical work will include a new electrical transformer. The utility requirements will be per Southern California Edison standards. Take geophysical logs, run caliper, gyroscopic, and video surveys; provide downhole color video of well casing and screen.	Contractor	Invoices for electrical work and instrumentation.	10-2016 / 04-2018
	Task #4: Monitor Water Usage			
4.1	Develop monthly tracking reports (using Well No. 10 meter data) for water supply.	City	Well No. 10 water meter data/tracking reports.	04-2018/ ongoing

Permits. All work is to be in accordance with the City of Torrance, California Department of Water Resources and California Department of Public Health (CDPH). Standard permits required for the NTWFP include the following:

- ✓ Caltrans. Coordination and permitting will be required from Caltrans for routing of pipelines under the I-405 Freeway.
- ✓ Torrance Unified School District. Coordination will be conducted with the TUSD to discuss and mitigate impacts to the Yukon Elementary School property both during construction and from operation and maintenance activities.
- ✓ Southern California Edison. The site will require new 480-volt 3-phase electric service to operate electric motors for the well pumps for Well Nos. 10 and 11 in addition to operation of the BPS.
- ✓ State Water Resources Control Board (SWRCB). A general permit to discharge storm water associated with construction activity including clearing, grading, and excavation activities that disturb greater than 1 acre of total land area is required.
- ✓ City Plan Checking and Permit Process. When completed, the plans need to be submitted by the selected design-build contractor to the City of Torrance for plan-check approval.
- ✓ Los Angeles County Flood Control District (LACFD). A permit from the LACFD will be required for tie-in to the storm drain system for the drain line which may contain water from the reservoir overflow and drain and future flush flow from any of the wells.
- ✓ Los Angeles County Sanitation District (LACSD). A permit from the LACSD will be required for the sewer from the utility building.

Engineering and Design Work Complete. The North Torrance Well Field Project is shovel-ready. It will be completed within two years of funding using a design-build approach. All preliminary work has been completed. These and other tasks include:

- ✓ Acquisition of a 2-acre property (west of Yukon Elementary);
- ✓ Acquisition of a 25-foot easement from the Torrance Unified School District to access the property;
- ✓ Feasibility Study and preliminary Design; and
- ✓ CEQA - A Mitigated Negative Declaration has been procured.

Describe any new policies or administrative actions required to implement the project.

No new policies or administrative actions are required to implement the project.

Evaluation Criterion E—Nexus to Reclamation

How is the proposed project connected to a Reclamation project or activity? Torrance receives approximately 69% of its water from the Metropolitan Water District of Southern California, which is the designated contractor for the Colorado River Project and the Cal Fed Bay Delta Project (State Water Project). The City's goal is to continue to reduce its dependence on these sources with successful water conservation methods.

Does the applicant receive Reclamation project water? Yes. The City receives its water from Metropolitan, which is supplied from the original water sources of the Colorado River Aqueduct and the State Water Project (SWP).

Is the project on Reclamation project lands or involving Reclamation facilities? The project is not on Reclamation lands but will directly benefit Reclamation project facilities and environmental impacts due to a long-term, decreased dependence on Reclamation water.

Is the project in the same basin as a Reclamation project or activity? No.

Will the proposed work contribute water to a basin where a Reclamation project is located? Yes. The proposed project will decrease dependence on both the State Water Project and the Colorado Aqueduct projects, which means that less water will be pulled from these projects' source basins.

Will the project help Reclamation meet trust responsibilities to any tribe(s)? The proposed project will not meet trust responsibilities to tribes directly. However, freeing up water from the SWP and Colorado Aqueduct by utilizing local supplies in untapped aquifers through the two new wells in North Torrance will indirectly allow Reclamation facilities to better meet their responsibilities to tribes.

Performance Measures

Facilities and wells will be designed to allow for automatic operation with remote monitoring and supervision. Each well will be tied together with the SCADA workstations via a fiber-optic network.

Performance Measure for Quantifying Benefits

The City of Torrance proposed to use two performance measures to quantify the proposed project's benefits: 1) Total Groundwater Produced; and 2) Total Groundwater Served to Customers.

The City will use 2015 data as the baseline, which includes only groundwater from non-project wells in the amount of 1,800 AFY. During project construction, the City will gather baseline data and develop a report template to submit with quarterly Program Performance Reports. The first report will include methodology for collecting data and a project status. Upon the first quarter of well production, the Program Performance Reports will commence with data to show both **Total Groundwater Produced** from all Torrance groundwater wells, and **Total Groundwater Served to Customers**. We aim to show an incremental increase in total groundwater produced and served to customers with this project.

1) **Total Groundwater Produced:** We know that our average annual supply of groundwater is 1,800 AFY. We estimate that the new wells included in the NTWFP will produce enough potable water to fulfill our adjudicated limit of groundwater (5,640 AFY), and additional water for storage and possible Conjunctive Use. For the sake of this project application, we will measure the total amount of groundwater produced by all Torrance wells both before and after project construction is complete and the wells are in use. We will continue to gather incremental data each quarter during the reporting period to be published in our quarterly Program Performance Reports to the BOR.

2) **Total Groundwater Served to Customers:** We will utilize baseline data from 2015 to measure total amount of groundwater served to customers before project implementation, and measure the total amount of groundwater served post-construction during each quarter of the grant performance period. We will include this data with our quarterly Program Performance Reports to the BOR. Our research shows that we can increase our groundwater supply to customers to represent 23.8% of our portfolio versus 3.5%, which is its current rate.

Reporting will continue via the WRD and its annual Regional Groundwater Management Report, thus information regarding the viability of the project will be continually documented throughout its useful life.

Environmental and Cultural Resources Compliance

All applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. If any question is not applicable to the project, please explain why.

The project has been evaluated for both CEQA and NEPA compliance and it has been determined that the project is a Mitigated Negative Declaration for CEQA. A Negative Declaration is a document that states upon completion of an initial study, that there is no substantial evidence that the project may have a significant effect on the environment. For CEQA we refer to Article 6. Negative Declaration Process of Sections 15070 to 15075 (Title 14. California Code of Regulations Chapter 3. Guidelines for Implementation of the California Environmental Quality Act):

"A public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when: (a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or; (b) The initial study identifies potentially significant effects, but: (1) Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and; (2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment."

The City received a Mitigated Negative Declaration after adding the following elements to the design of the 300,000 gallon tank construction and installation: The City performed an inundation study on the 3 million gallon tank. The results suggested that mitigation was necessary to prevent flooding at the project site. To mitigate this possible impact, design was altered to allow for the tank to be partially lowered 23 feet below ground, and lowered the entire project site by one foot. Finally, the design includes the installation of 3-foot floodgates, which will control water flow before draining through the stormdrain.

Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The project is not expected to impact the surrounding environment other than dust during construction.

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

There are no known species listed as a Federal threatened or endangered species in the project area.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.

There are no wetlands or other surface waters inside the project boundaries.

When was the water delivery system constructed?

The water delivery system that will be the focus of the proposed project was constructed in the 1950's.

Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

The proposed project will not result in any modification of individual features of an irrigation system such as headgates, canals, or flumes.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

There are no buildings, structures, or features in the proposed project area that are listed or eligible for listing on the National Register of Historic Places.

Are there any known archeological sites in the proposed project area?

There are no known archeological sites in the proposed project area.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

No. In fact, the proposed project will have a highly positive effect on all residents of the City of Torrance and its surrounding areas including low income and minority populations. The project will produce a new source of safe drinking w=ater locally, decrease dependence on water imported from the State Water Project (SWP) and Colorado Aqueduct, and replace lost groundwater production.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

No, the project will not have any impacts on sacred sites or tribal lands.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

PERMITS

Permits. All work is to be in accordance with the City of Torrance, California Department of Water Resources and California Department of Public Health (CDPH). Standard permits required for the NTWFP include the following:

- ✓ Caltrans. Coordination and permitting will be required from Caltrans for routing of pipelines under the I-405 Freeway.
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- ✓ City Plan Checking and Permit Process. When completed, the plans need to be submitted by the selected design-build contractor to the City of Torrance for plan-check approval.
- ✓ Los Angeles County Flood Control District (LACFD). A permit from the LACFD will be required for tie-in to the storm drain system for the drain line which may contain water from the reservoir overflow and drain and future flush flow from any of the wells.
- ✓ Los Angeles County Sanitation District (LACSD). A permit from the LACSD will be required for the sewer from the utility building.

MAXINE WATERS
MEMBER OF CONGRESS
43RD DISTRICT, CALIFORNIA

COMMITTEE:
FINANCIAL SERVICES
RANKING MEMBER

Congress of the United States
House of Representatives
Washington, DC 20515-0535

PLEASE REPLY TO:
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FAX: (202) 225-7854

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LOS ANGELES OFFICE
10124 SOUTH BROADWAY
SUITE 1
LOS ANGELES, CA 90003
PHONE: (323) 757-8900
FAX: (323) 757-9506

April 8, 2016

Secretary Sally Jewell
U.S. Department of the Interior
1849 C Street, N.W.
Washington, DC 20240

RE: BOR Drought Resiliency Project Grant – North Torrance Well Field Project

Dear Secretary Jewell:

I am writing to express my support for the City of Torrance's efforts to reduce its dependence on imported water through the North Torrance Well Field Project. This request for grant funding to the Bureau of Reclamation is to drill a new well as a part of a larger, comprehensive project that will increase the City's groundwater production capacity to 5,640 AFY, which is its adjudicated limit.

I represent the 43rd Congressional District of California, which includes the City of Torrance. I am a strong advocate for innovative methods to address the environmental issues affecting our district. This includes water conservation measures that effectively address California's severe drought.

In order for us to mitigate the affects of climate change, California must examine conservation methods to efficiently manage our water supplies. I will continue to ardently support all efforts that encourage water conservation methods that help in providing clean, healthy water to our residents.

I appreciate your consideration of the City of Torrance's proposed project to dramatically increase its well water use and reduce its dependence on imported water. This project will help to preserve our water resources by diversifying water supply components serving the City of Torrance. If you have any questions, feel free to contact me or Ms. Kathleen Sengstock, my Senior Legislative Assistant, at (202) 225-2201.

Sincerely,

Maxine Waters

Maxine Waters
Member of Congress

TED W. LIEU
33RD DISTRICT, CALIFORNIA

COMMITTEE ON THE BUDGET

COMMITTEE ON OVERSIGHT
AND GOVERNMENT REFORM

Congress of the United States
House of Representatives
Washington, DC 20515–0533

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(202) 225-3976

5055 WILSHIRE BOULEVARD, SUITE 310
LOS ANGELES, CA 90036
(310) 652-3095

1600 ROSECRANS AVENUE, 4TH FLOOR
MANHATTAN BEACH, CA 90266
(310) 321-7664

April 6, 2016

Secretary Sally Jewell
U. S. Department of the Interior
1849 C Street, N. W.
Washington, DC 20240

Re: Bureau of Reclamation Drought Resiliency Project Grant

Dear Secretary Jewell:

I am pleased to offer my recommendation for the City of Torrance's North Torrance Well Field Project to drill a new groundwater well and increase the City's groundwater production capacity. The proposed project will enable to City to increase its well water use resulting in less dependence on imported water, which currently comprises approximately 95% of the City's water supply.

As a member of Congress, I represent the 33rd Congressional District of California including the City of Torrance. Throughout my Congressional service, I have been an outspoken proponent for tackling climate change and water issues. After coming to Congress, the first bill I introduced was the Climate Solutions Act, which aims to make California's groundbreaking renewable energy goals and climate emissions reduction targets a national model. The management and conservation of our water supply is a key component of addressing climate change at the local level, and is a first step to ensuring the success of our future environmental goals.

I fully support projects that address California's water imbalance. By increasing use of local water supplies, the City of Torrance is taking appropriate measures to expand water conservation methods. I will continue to ardently support all efforts that promote innovative uses of recycled water. I believe conservation efforts are paramount to protect our most precious and threatened resource – clean, healthy water.

I urge you to support the City's North Torrance Well Field Project that aims to provide a new source of potable water. Should you have any questions, please do not hesitate to contact Melissa Ramoso at (323) 651-1040.

Sincerely,

Ted W. Lieu

Ted Lieu
Member of Congress, 33rd District

BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES
822 KENNETH HAHN HALL OF ADMINISTRATION / LOS ANGELES, CALIFORNIA 90012
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April 1, 2016

Secretary Sally Jewell
U.S. Department of the Interior
1849 C Street, North West
Washington, DC 20240

Bureau of Reclamation Drought Resiliency Project Grant - City of Torrance

Dear Secretary Jewell:

I am thrilled to support the City of Torrance's application to the BOR Drought Resiliency Program for their North Torrance Well Field project. This project will significantly advance the City's efforts to be less dependent on imported water, thereby helping to preserve our water resources. Currently, the City uses a small percentage of their groundwater and obtains 95 percent of its water from imported water sources.

The proposed project will increase the City's groundwater capacity and add to its growing collection of alternative water supply projects. The City's project is shovel-ready with all preliminary work completed that includes:

- Acquisition of a 2-acre property;
- Acquisition of a 25-foot easement from the Torrance Unified School District to access the property; and
- Feasibility Study and preliminary design.

Grant funding is critical in the implementation of this important project. For this reason, I hope your agency will provide favorable consideration for the North Torrance Well Field Project.

Sincerely,

DON KNABE
Supervisor, Fourth District
County of Los Angeles

DK:ha

April 1, 2016

Secretary Sally Jewell
U. S. Department of the Interior
1849 C Street, N. W.
Washington, DC 20240

Subject: ***Bureau of Reclamation Drought Resiliency Project Grant***

Dear Secretary Jewell:

I, as the Torrance Director on the Board of the Metropolitan Water District of Southern California (MWD), am pleased to support the City of Torrance's application to the Bureau of Reclamation for funding under the WaterSMART Drought Resiliency Project Program. The City plans to complete a vital portion of the North Torrance Well Field Project, which will drill new groundwater wells in the north portion of the City, allowing for a new, sustainable potable water source for residents. The project is part of a long-range plan to increase local water sources and reduce dependence on imported water.

As a member of MWD, Southern California's wholesale water supplier, Torrance receives the majority of their potable water supply from our agency. MWD imports water from Northern California via the State Water Project (SWP) and from the Colorado River via the Colorado River Aqueduct (CRA). A number of reasons including extreme drought and deterioration of the Sacramento-San Joaquin Delta's delicate ecosystem have led to historic restrictions in water supply deliveries. The result is a pressing need to improve California's water reliability by enhancing local resources.

The City of Torrance's project will do just that. The City of Torrance owns and operates Torrance Municipal Water (TMW), which is allowed to pump 5,649 acre feet of groundwater per year. TMW is currently only utilizing about a third of its groundwater rights (pumping 1,800 AFY), but this project will allow the City to utilize far more groundwater and come closer to meeting their allocated level. Torrance continues to add important projects including desalination, recycled water infrastructure, and groundwater wells to their water portfolio, demonstrating their dedication to develop a locally-sustainable water supply and decrease dependence on imported water.

I strongly support this valuable project, and urge you to provide the City's application your utmost consideration.

Sincerely,

Russell Lefevre
Member, Board of Directors

RESOLUTION

The City of Torrance has scheduled the following draft Resolution for approval on April 19, 2016. The City will submit the required, adopted Resolution on April 20, 2016 to the Bureau of Reclamation.

RESOLUTION NO. 2016 - __

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TORRANCE APPROVING THE APPLICATION FOR GRANT FUNDS FROM THE BUREAU OF RECLAMATION WATERSMART: DROUGHT RESILIENCY PROJECT GRANT PROGRAM FOR FISCAL YEAR 2016

WHEREAS, the United States Department of the Interior has provided funds for the WaterSMART: Drought Resiliency Project Grant Program; and

WHEREAS, the City of Torrance desires to submit an application for grant funds from said program; and

WHEREAS, the Bureau of Reclamation has been delegated the responsibility for the administration of this grant program and establishing necessary procedures; and

WHEREAS, said procedures established by the Bureau of Reclamation require the applicant to certify by resolution the identity of the official with legal authority to enter into an agreement; that the appropriate official or governing body has reviewed and supports the application submitted; the capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the application funding plan; and that the applicant will work with the Bureau of Reclamation to meet established deadlines or entering into a cooperative agreement; and

WHEREAS, the applicant will enter into a cooperative agreement or grant agreement with the Bureau of Reclamation to complete the project(s) if awarded grant funds.

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF TORRANCE HEREBY:

1. Appoints the Director of Public Works, or his designee, to act as agent with legal authority to enter into the grant agreement, conduct all negotiations, execute and submit all documents including, but not limited to, applications, agreements, payment requests and any other grant required correspondence which may be necessary for the completion of the grant program; and

2. Certifies that the City Council of the City of Torrance has reviewed and supports the proposed application; and

3. Certifies that the City of Torrance has sufficient funds available to provide the amount of funding specified in the funding plan as matching funds/in-kind contributions; and

4. Certifies that the City of Torrance will work with the Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement.

Introduced, approved, and adopted this 19th day of April, 2016.

I, the undersigned, hereby certify that the foregoing resolution number _____ was duly adopted by the Torrance City Council following a roll call vote:

APPROVED AS TO FORM:
JOHN L. FELLOWS III, City Attorney

_____
Mayor Patrick J. Furey
ATTEST:

by_____
Patrick Q. Sullivan, Assistant City Attorney

_____
City Clerk Rebecca Poirier, MMC

TORRANCE CITY COUNCIL RESOLUTION NO. 2016-__

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF TORRANCE)

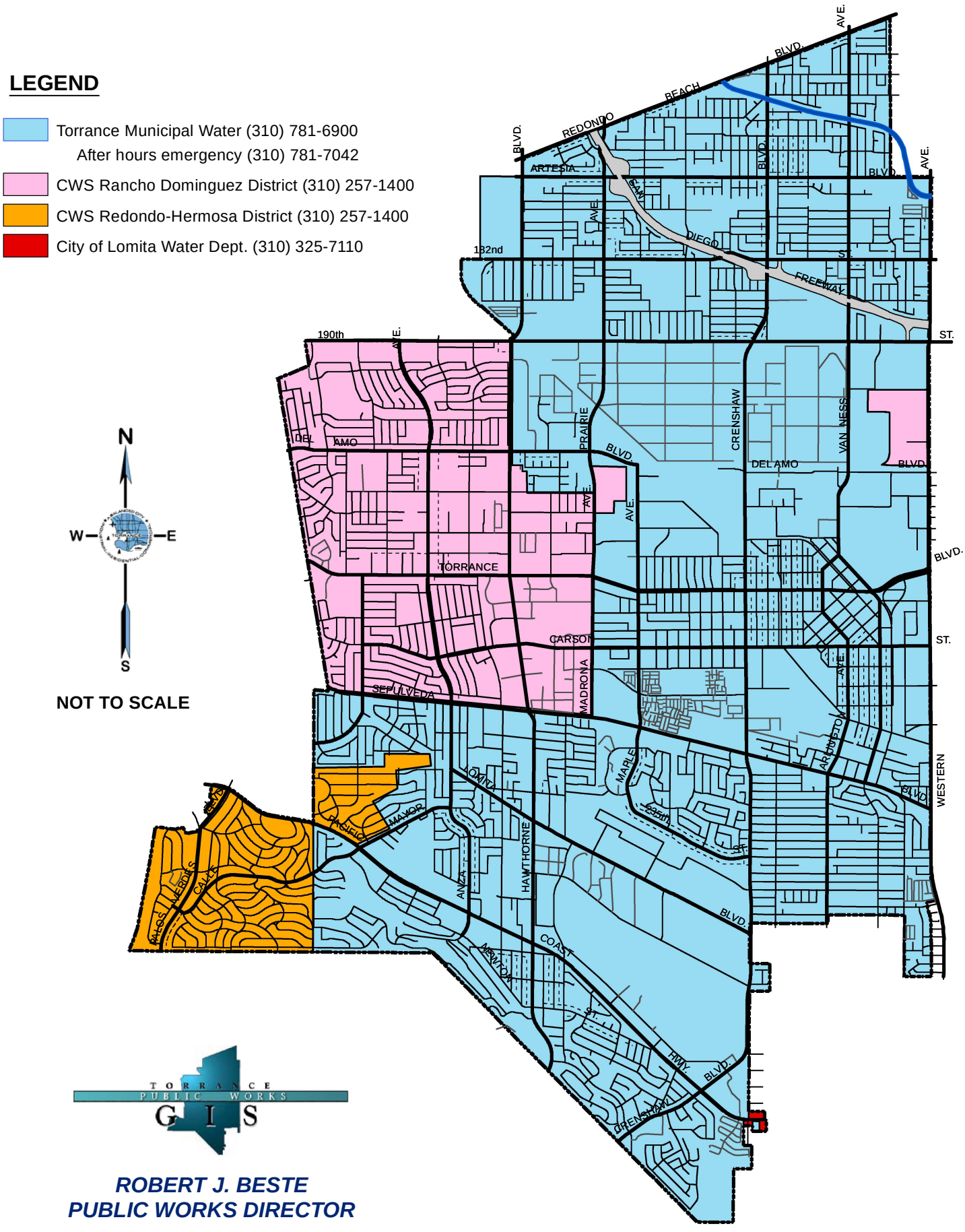
I, Rebecca Poirier, City Clerk of the City of Torrance, California do hereby certify that the foregoing resolution was duly introduced, approved, and adopted by the City Council of the City of Torrance at a regular meeting of said Council held on the 19th day of April, 2016 by the following roll call vote:

Ayes:	COUNCILMEMBERS	Ashcraft, Barnett, Goodrich, Griffiths, Rizzo, Weideman and Mayor Furey.
Noes:	COUNCILMEMBERS	
Absent:	COUNCILMEMBERS	

Date: _____

_____
Rebecca Poirier, MMC
City Clerk of the City of Torrance

CITY OF TORRANCE WATER PURVEYORS



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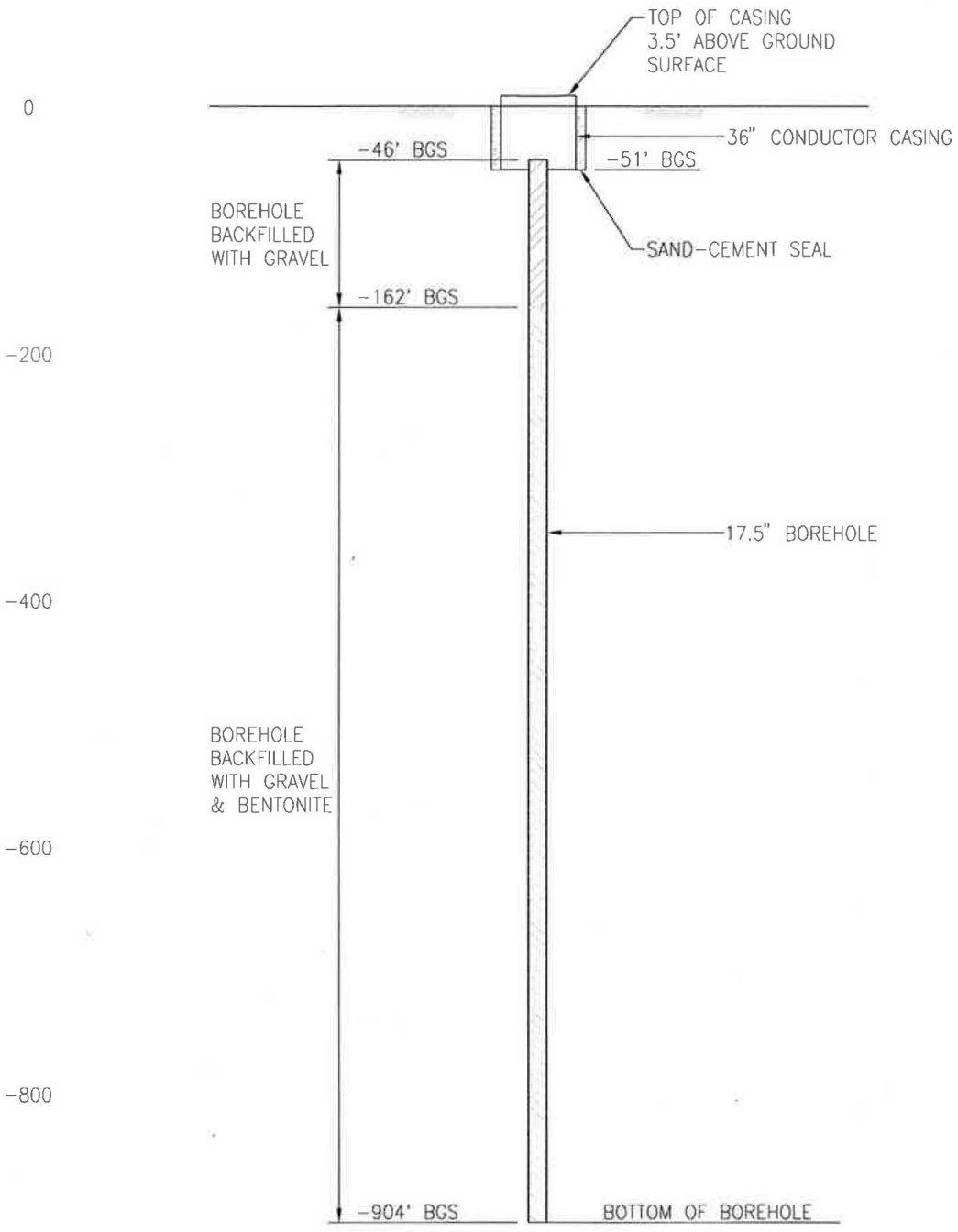
North Torrance Well Field Project

Project Site Location Map



BGS = BELOW GROUND SURFACE

SECTION - EXISTING CONDITION

NO SCALE

AECOM
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Orange, California 92868
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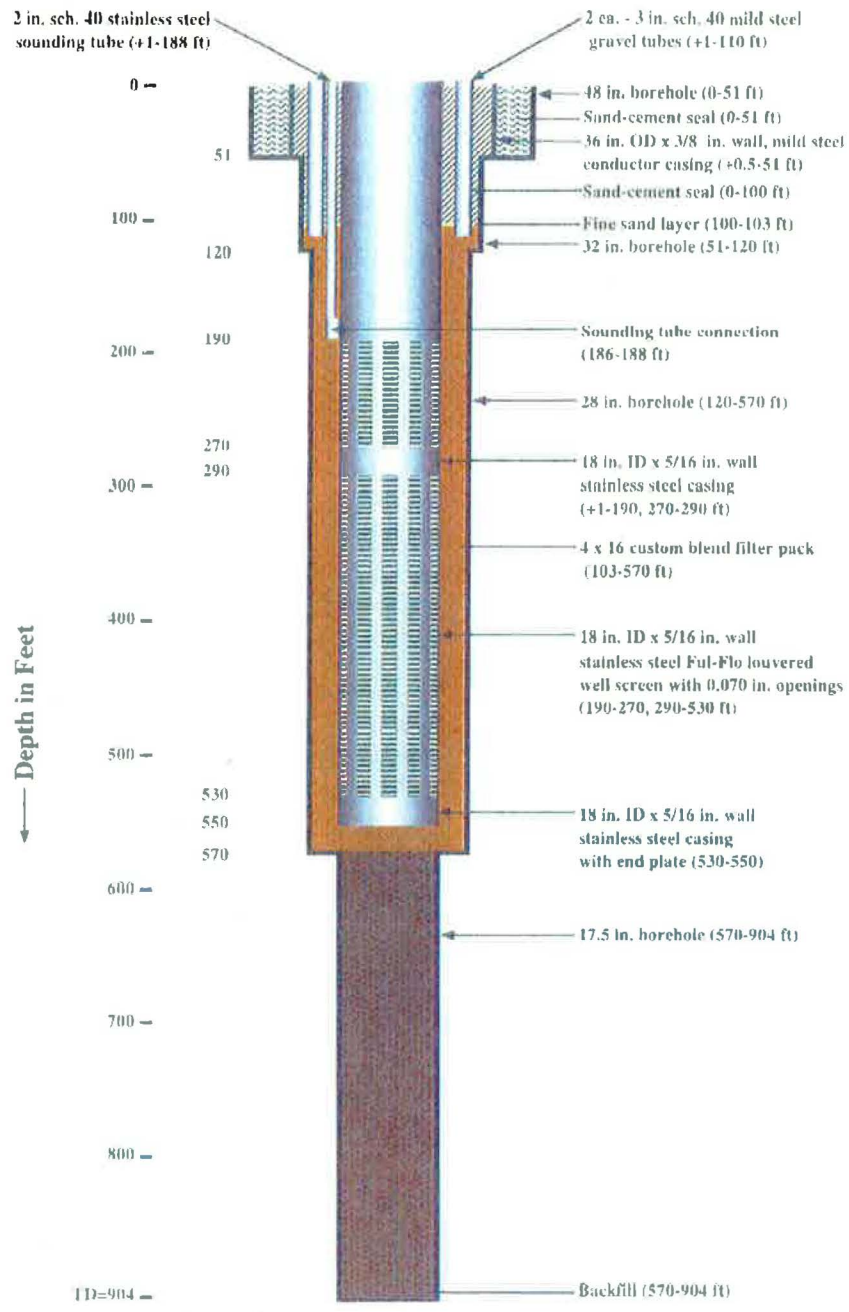
CITY OF TORRANCE
NORTH TORRANCE WELLFIELD PROJECT

WELL NO. 10

FIGURE
2.1



NOT TO SCALE

GEOSCIENCE

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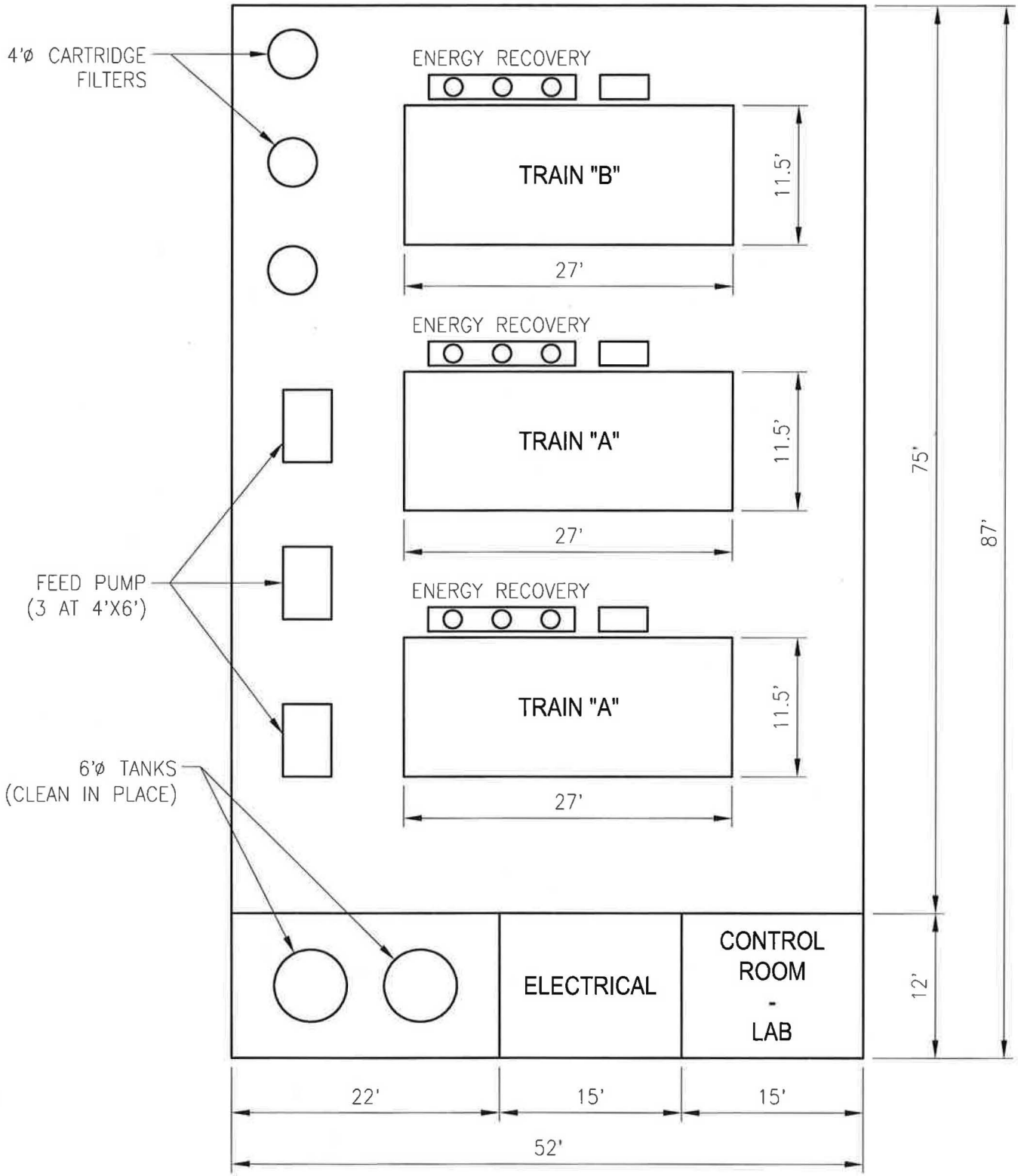
CITY OF TORRANCE
NORTH TORRANCE WELLFIELD PROJECT

WELL NO. 10

FIGURE
2.2



PLAN

SCALE: 1" = 1'-0"

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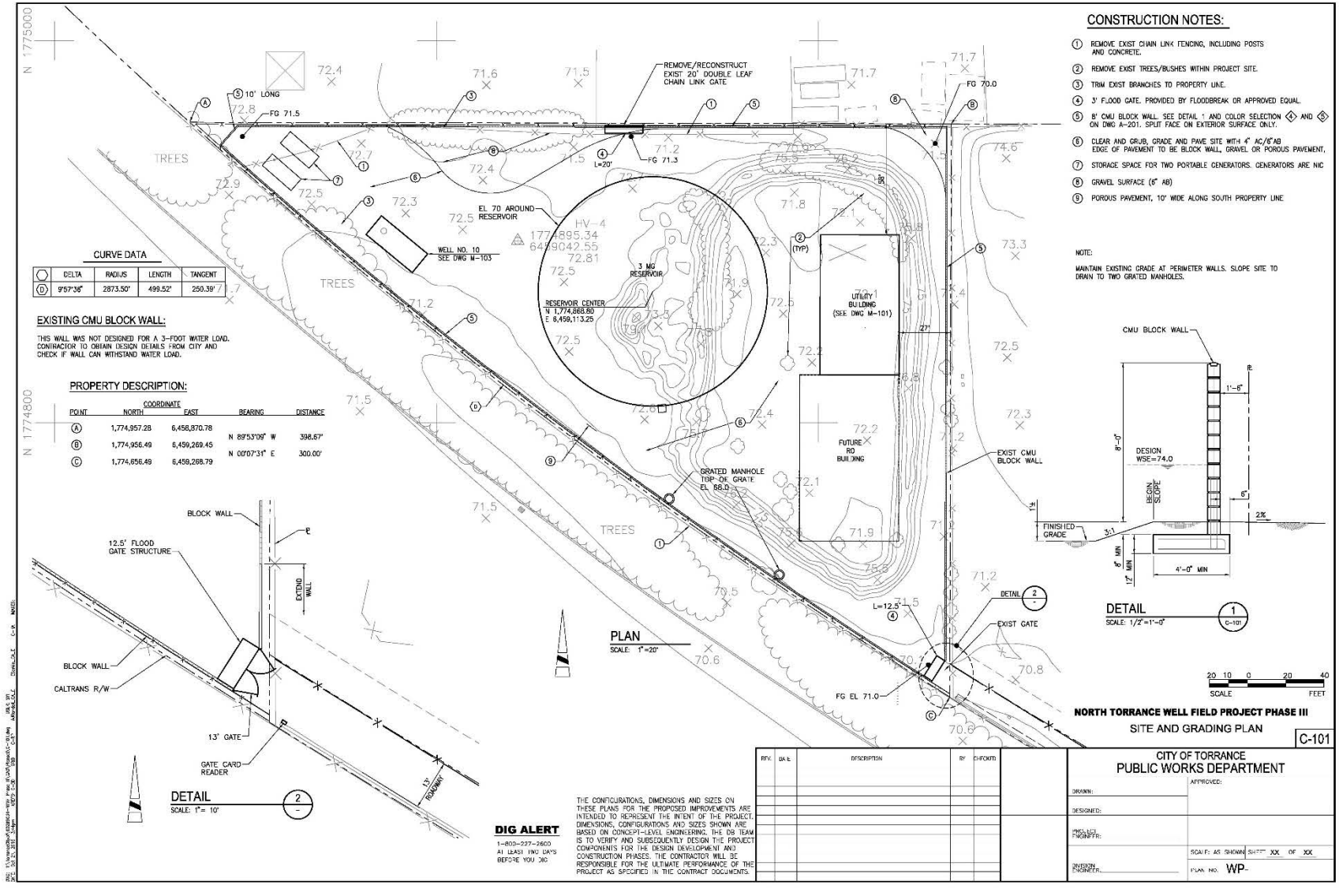
CITY OF TORRANCE
NORTH TORRANCE WELLFIELD PROJECT

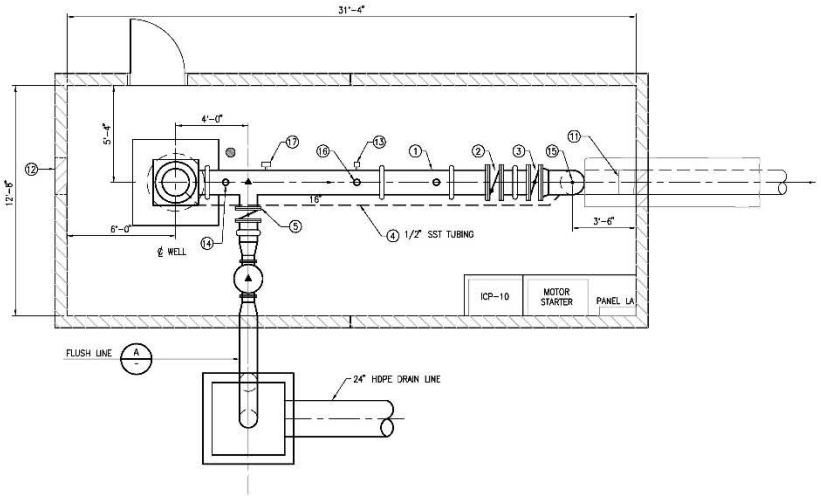
RO TREATMENT BUILDING
CONCEPTUAL PLAN

FIGURE
3.1

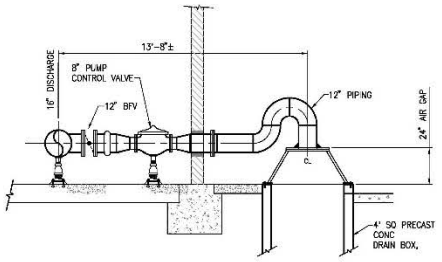
Appendix D. Site and Grading Plan -



Appendix E Well No. 10 Floor Plan



PLAN - WELL NO. 10
SCALE: 3/8" = 1'-0"



FLUSH LINE
SCALE: 3/8" = 1'-0"
A

CONSTRUCTION NOTES:

1. 16" GE PROPELLER METER
2. 16" WAFER CHECK VALVE
3. 16" FE BUTTERFLY VALVE
4. WATER SUPPLY FOR PRELUBE. INCLUDE FLOW SWITCH AND SOLENOID-OPERATED BALL VALVE. START PRELUBE FLOW PRIOR TO PUMP START. CLOSE VALVE AFTER PUMP STARTS.
5. 12" BUTTERFLY VALVE
11. VENT FAN
12. INTAKE LOUVERS
13. ¾" SAMPLE VALVE
14. 3" AIR VACUUM VALVE FOR VERTICAL TURBINE PUMP
15. ¾" AIR RELEASE VALVE
16. 1" PITOT CONN GATE VALVE, NIPPLES AND END CAP
17. PRESSURE GAUGE AND PRESSURE SWITCH

NOTES:

1. UNLESS NOTED OTHERWISE, ALL PIPING IS TO BE STEEL, FUSION-BONDED EPOXY LINED, CEMENT MORTAR COATED. (BURIED) OR PAINTED (EXPOSED).
2. CONNECT SMALL VALVES AND GAUGES WITH TYPE 316 SCH 80 SST PIPE.

THE CONFIGURATIONS, DIMENSIONS AND SIZES ON THESE PLANS FOR THE PROPOSED IMPROVEMENTS ARE INTENDED TO REPRESENT THE INTENT OF THE PROJECT. DIMENSIONS, CONFIGURATIONS AND SIZES SHOWN ARE BASED ON CONCEPT-LEVEL ENGINEERING. THE DB TEAM IS TO VERIFY AND SUBSEQUENTLY DESIGN THE PROJECT COMPONENTS FOR THE DESIGN DEVELOPMENT AND CONSTRUCTION PHASES. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE ULTIMATE PERFORMANCE OF THE PROJECT AS SPECIFIED IN THE CONTRACT DOCUMENTS.

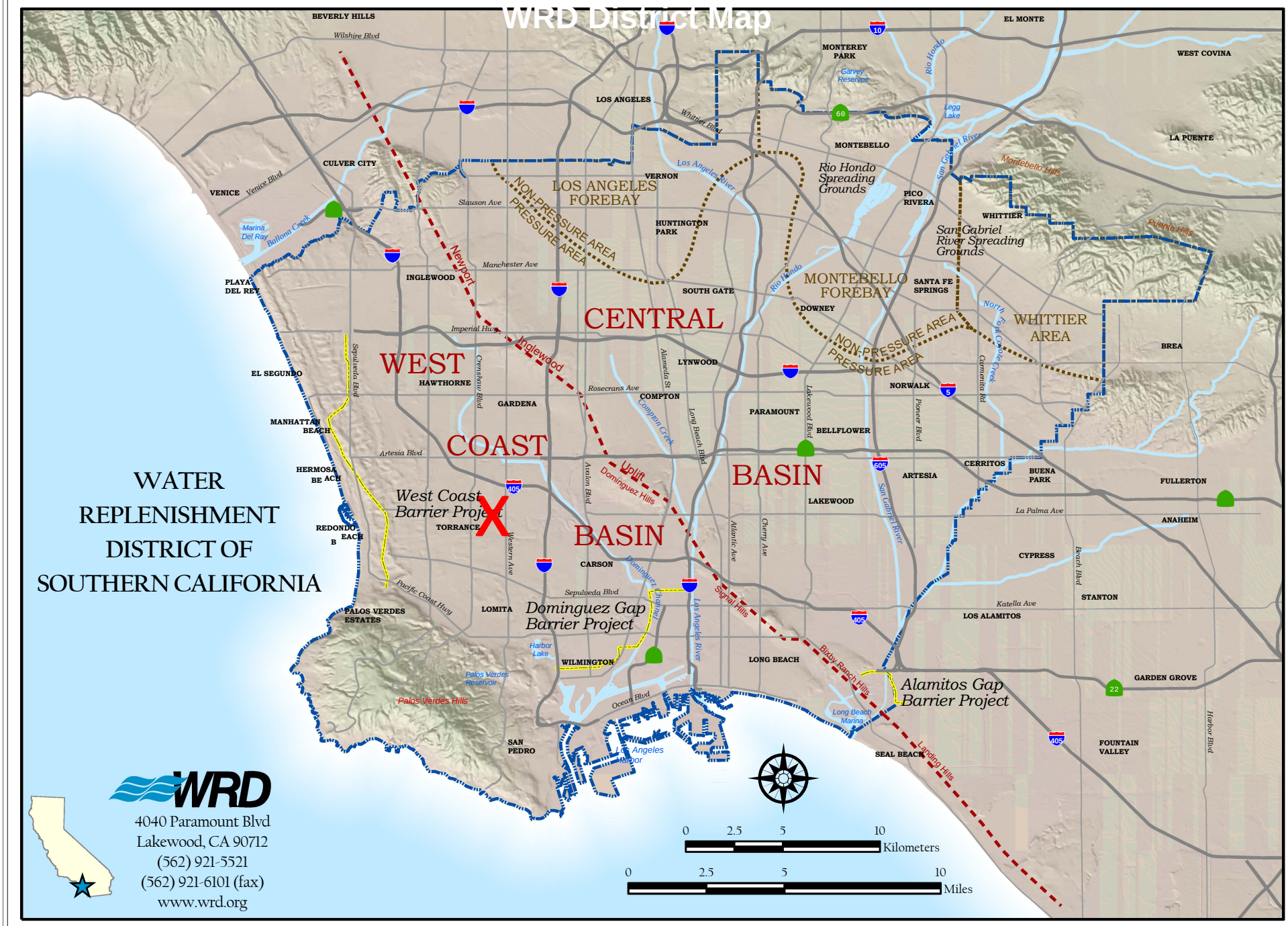
REV.	DATE	DESCRIPTION	BY	CHECKED

NORTH TORRANCE WELL FIELD PROJECT PHASE III

WELL NO. 10 FLOOR PLAN AND DETAIL — M-103

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: APPROVED:
DESIGNED:
PROJECT MANAGER:
DIVISION ENGINEER:
SCALE: AS SHOWN SHEET XX OF XX
PLAN NO. WP-



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Red 'X' above is the location of the North Torrance Well Field Project

CITY OF TORRANCE - NTWF

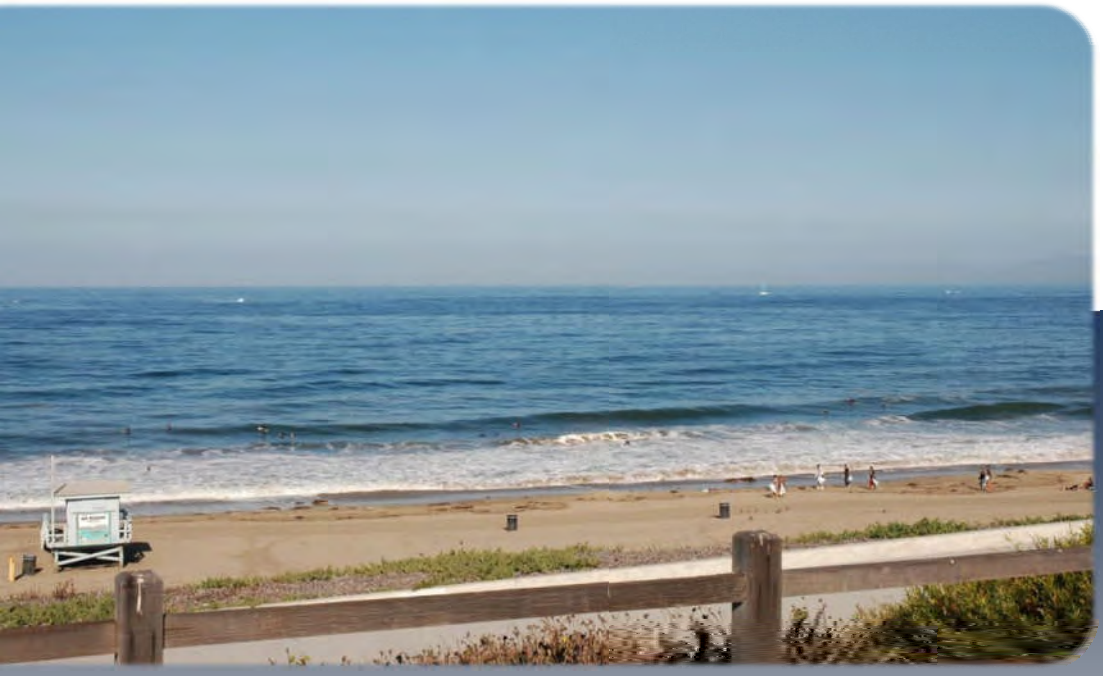
ENGINEER'S OPINION OF CONSTRUCTION COST ESTIMATE

TABLE 9.1

Item Description	Approximate Quantity		Unit Cost	Total Cost	Subtotal
Miscellaneous					
Mobilization/demobilization		l. s.	$ 400,000	$ 400,000	
Modify Well No. 9		l. s.	25,000	25,000	
Well No. 9 drain line, 24" RCP/conn to CB	450	l. f.	220	99,000	
Demolish McMaster Park facilities		l. s.	200,000	200,000	
Restore McMaster Park		l. s.	20,000	20,000	
Subtotal:					$ 744,000
Sitework					
Clear and grub project site		l. s.	$ 38,000	$ 38,000	
Remove existing chain link fencing		l. s.	1,000	1,000	
Chain link fencing	860	l. f.	22	19,000	
Chain link gate	2	ea.	14,000	28,000	
Masonry wall	1,200	l. f.	202	242,000	
Site grading and paving		l. s.	78,000	78,000	
School parking lot modifications		l. s.	90,000	90,000	
Access roadways		l. s.	100,000	100,000	
Flood gates	2	ea.	75,000	150,000	
Soil removal for1-foot grade change	2,223	yd	15	33,000	
Excavate soil to lower reservoir 20 ft	8,237	yd	15	124,000	
Shoring cost to lower reservoir 20 ft	800	sq ft	40	32,000	
Landscaping and irrigation		l. s.	20,000	20,000	
Subtotal:					$ 955,000
Well No. 10					
Compolete well construction		l. s.	$ 700,000	$ 700,000	
Building		l. s.	50,000	50,000	
Pump and motor		l. s.	150,000	150,000	
Piping		l. s.	92,000	92,000	
Electrical and instrumentation		l. s.	105,000	105,000	
Subtotal:					$ 1,097,000
Well No. 11					
Well construction		l. s.	$ 850,000	$ 850,000	
Building		l. s.	50,000	50,000	
Pump and motor		l. s.	150,000	150,000	
Piping		l. s.	92,000	92,000	
24" RCP drain line	150	l. f.	160	24,000	
Electrical and instrumentation		l. s.	260,000	260,000	
Subtotal:					$ 1,426,000
Utility Building					
Building		l. s.	$ 300,000	$ 300,000	
Engine/generator and fuel tank		l. s.	530,000	530,000	
Electrical (incl security cameras)		l. s.	700,000	700,000	
Instrumentation		l. s.	80,000	80,000	
Chemical storage and feed equipment		l. s.	150,000	150,000	
Booster pumps	3	es	110,000	330,000	
Booster pump piping	3	es	52,000	156,000	
Restroom		l. s.	22,000	22,000	
Plumbing		l. s.	20,000	20,000	
Laboratory		l. s.	10,000	10,000	
HVAC+AC for elec & control rooms		l. s.	10,000	10,000	
Subtotal:					$ 2,308,000
Prestressed Conctete Reservoir (3 mg)		l. s.	$ 2,000,000	$ 2,000,000	$ 2,000,000
Piping					
Connect 16" pipe at Well No. 9		l. s.	$ 5,000	5,000	
16" pipe from Well No. 9	1,565	l. f.	150	235,000	
Flush valve vault for Well No. 9		l. s.	85,000	85,000	
20" pipe from Well No. 11 to site	882	l. f.	180	159,000	
16" pipe from Well No. 10	225	l. f.	150	34,000	
24" pipe to reservoir	60		220	13,000	
12" flush line from Well No. 10		l. s.	25,000	25,000	
24" pipe from reservoir to BPS	55	l. f.	220	12,000	
24" pipe from BPS to system	1,006	l. f.	220	221,000	
Connect to existing 12" pipe in Yukon		l. s.	4,000	4,000	
18" pipe to system	751	l. f.	170	128,000	
Connect to exiting 12" pipe at Yukon/182nd		l. s.	4,000	4,000	
24" flush lines from Well Nos. 10 and 11	290	l. f.	220	64,000	
30" RCP/HDPE overflow/drain line	1,558	l. f.	270	421,000	
Drain line manholes	7	ea	5,000	35,000	
48" jacked steel casing for 30" drain line	261	l. f.	2,500	653,000	
30" trench casing for 18" water line	185	l. f.	100	19,000	
Connect two drain lines to overflow w/24" RCP		l. s.	40,000	40,000	
Connect 24" drain line to manhole		l. s.	6,000	6,000	
6" VCP sewer ine	1,390	l. f.	50	70,000	
Sewer manholes	8	ea	5,000	40,000	
Connect 6" VCP sewer line to manhole stubout		l. s.	2,000	2,000	
Fiber optic pull boxes	4	ea	700	3,000	
Fiber optic cable/conduit from wells to plant	1,600	l. f.	50	80,000	
Subtotal:					$ 2,358,000
				SUBTOTAL:	$ 10,888,000
				DESIGN COST (10%):	$ 1,089,000
				CONSTRUCTION MANAGEMENT/ADMIN (10%):	$ 1,089,000
				CONTINGENCY (15%):	$ 1,633,000
				TOTAL PROJECT COST:	$ 14,699,000
				LESS PHASE I COST:	$ 1,228,000
				LESS ESTIMATED PHASE II COST:	$ 1,900,000
				LESS WELL 11 CONSTRUCTION COST:	$ 1,426,000
				ESTIMATED PHASE III PROJECT COST:	**$ 10,145,000**

2010

City of Torrance
Urban Water Management Plan



July, 2011

SECTION 2: WATER SOURCES & SUPPLIES

2.1 INTRODUCTION

TMW's water supply sources consist of imported water purchased from MWD, groundwater produced from the West Coast Basin, water produced from the Goldsworthy Groundwater Desalter, and recycled water produced at West Basin's Recycling facility in El Segundo.

2.2 WATER SUPPLY SOURCES

Imported Water

TMW has access to imported MWD water from the Colorado River and the Sacramento-San Joaquin River Delta in Northern California (see **Figures 2.1** & **2.2**). These two water systems provide Southern California with approximately 2 million acre-feet (MAF) of water annually for urban uses. The Colorado River supplies about 4.4 MAF annually for agricultural and urban uses with approximately 3.85 MAF apportioned for agriculture in Imperial and Riverside Counties. The remaining unused portion (600,000 - 800,000 AF) is used for urban purposes in MWD's service area.

Figure 2.1: Parker Dam at Colorado River

In addition to the Colorado River, the Sacramento-San Joaquin River Delta provides a significant amount of supply annually to Southern California. The Delta is located at the confluence of the Sacramento and San Joaquin Rivers east of the San Francisco Bay and is the West Coast's largest estuary. The Delta supplies Southern California with over 1 MAF of water annually.

Figure 2.2: Sacramento-San Joaquin Delta

The use of water from the Colorado River and the Sacramento-San Joaquin Delta continues to be a critical issue. In particular, Colorado River water allotments have been debated among the seven basin states and various regional water agencies at both the federal and state levels. The use of Delta water has been debated as competing uses for water supply and ecological habitat have jeopardized the Delta's ability to meet either need and have threatened the estuary's ecosystem.

In order to provide Southern California imported water, MWD utilizes two separate aqueduct systems (one for each source of supply) to obtain its supplies. These two aqueduct systems convey water from each source into two separate reservoirs whereupon MWD pumps the water to one of its five treatment facilities. One of these

aqueduct systems is known as the Colorado River Aqueduct (CRA) as shown below in **Figure 2.3**. The CRA was constructed as a first order of business shortly after MWD's incorporation in 1928. The CRA is 242 miles long and carries water from the Colorado River to Lake Matthews and is managed by MWD.

Figure 2.3: Colorado River Aqueduct

In addition to the CRA, MWD receives water from northern California via the California Aqueduct shown below in **Figure 2.4**. Also known as the State Water Project, the California Aqueduct is 444 miles long and carries water from the Delta to Southern California and is operated by the Department of Water Resources.

Figure 2.4: California Aqueduct

The previously mentioned aqueducts supply Southern California with a significant amount of its water and are crucial to its sustainability. In addition to these two water systems, there are also many other aqueducts that are vital to the State. The major aqueducts in California are shown in **Figure 2.5** on page 2-3. Overall, about 67 percent of imported water comes from the SWP and 33 percent comes from the CRA.

Imported Water Purchases

As a wholesale agency, MWD distributes imported water to its 26 member agencies throughout Southern California as shown in **Figure 2.6** on Page 2-4. TMW is one of 15 primarily retail agencies served by MWD and receives imported water from five interconnections ranging in capacity from 2,245 gpm to 11,220 gpm. The interconnections are capable of serving up to 100 percent of TMW's water needs if necessary. **Table 2.1** presents TMW's recent imported water purchases from fiscal year 2005-2010. Imported water over this time period has accounted for over 90 percent of TMW's potable water supply totals.

Table 2.1
Purchases from MWD
FY 2005-2010

Year	Purchases (AF)
2010	16,471
2009	19,352
2008	19,306
2007	21,100
2006	21,338
2005	20,046
Average:	**19,602**

TMW's tier 1 rate allocation from MWD in 2005 was 20,967 AFY and the current (2010) limit is 20,967 AFY. As indicated by **Table 2.1**, TMW's imported water purchases for 2006 exceed their Tier 1 rate allocation due to the inactivity of Well #6.

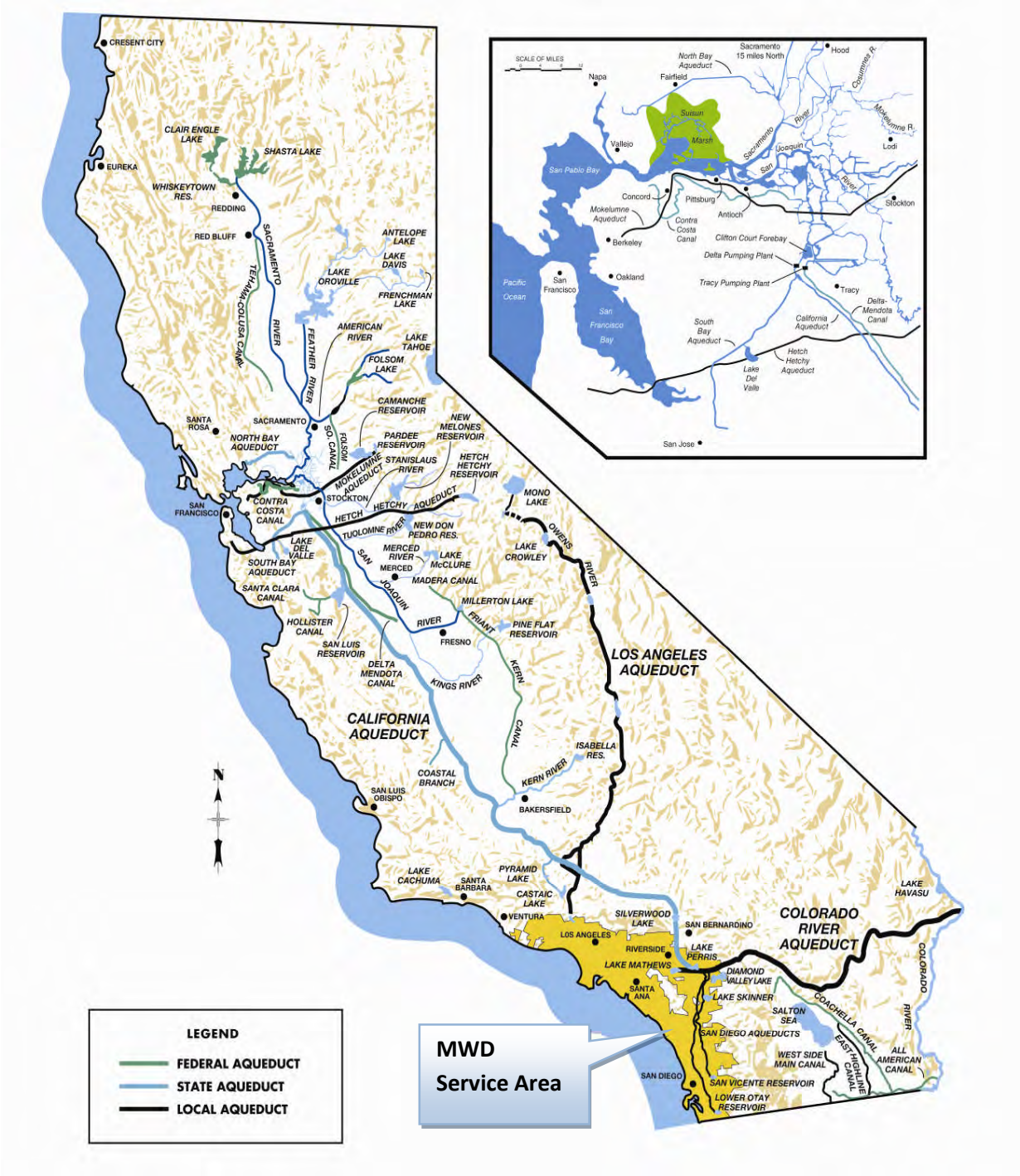


Figure 2.5: Aqueduct Systems in California

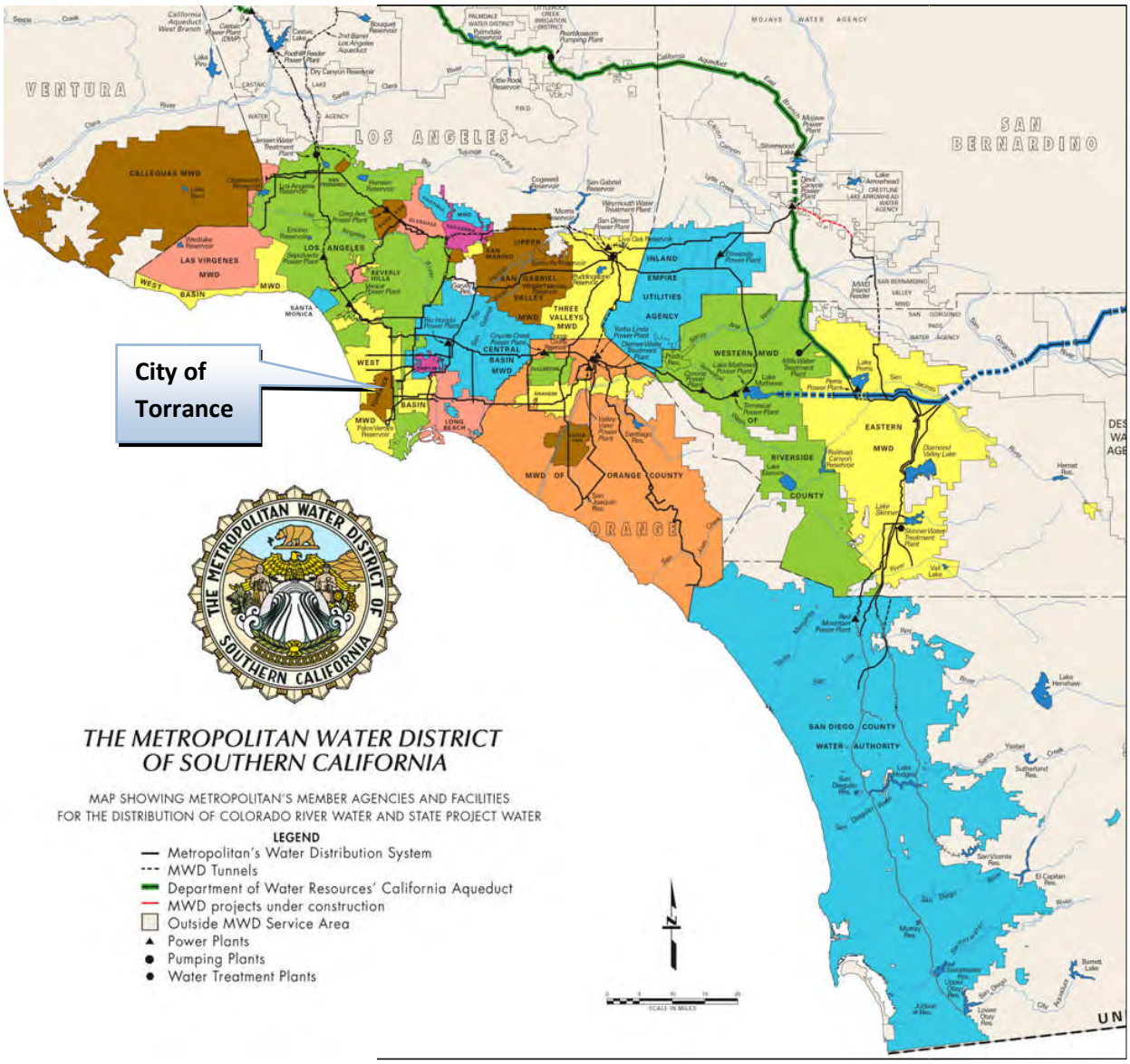


Figure 2.6: MWD Service Area Map (City of Torrance Shown in Brown)

Groundwater

TMW obtains its groundwater supply from the West Coast Groundwater Basin. The basin is located in western Los Angeles County and overlies the entire City of Torrance and all or portions of eleven (11) other cities in the region. The Basin has a surface area of 160 square miles of flat to hilly terrain. The basin is bounded by the Ballona Escarpment (Bluffs) to the North, consolidated rocks of the Palos Verdes Hills and the Pacific Ocean to the South, the Newport-Inglewood fault to the East, and the Pacific Ocean to the West. Adjacent groundwater basins include the Santa Monica, Central, and Orange County Basins as shown in **Figure 2.7** below.

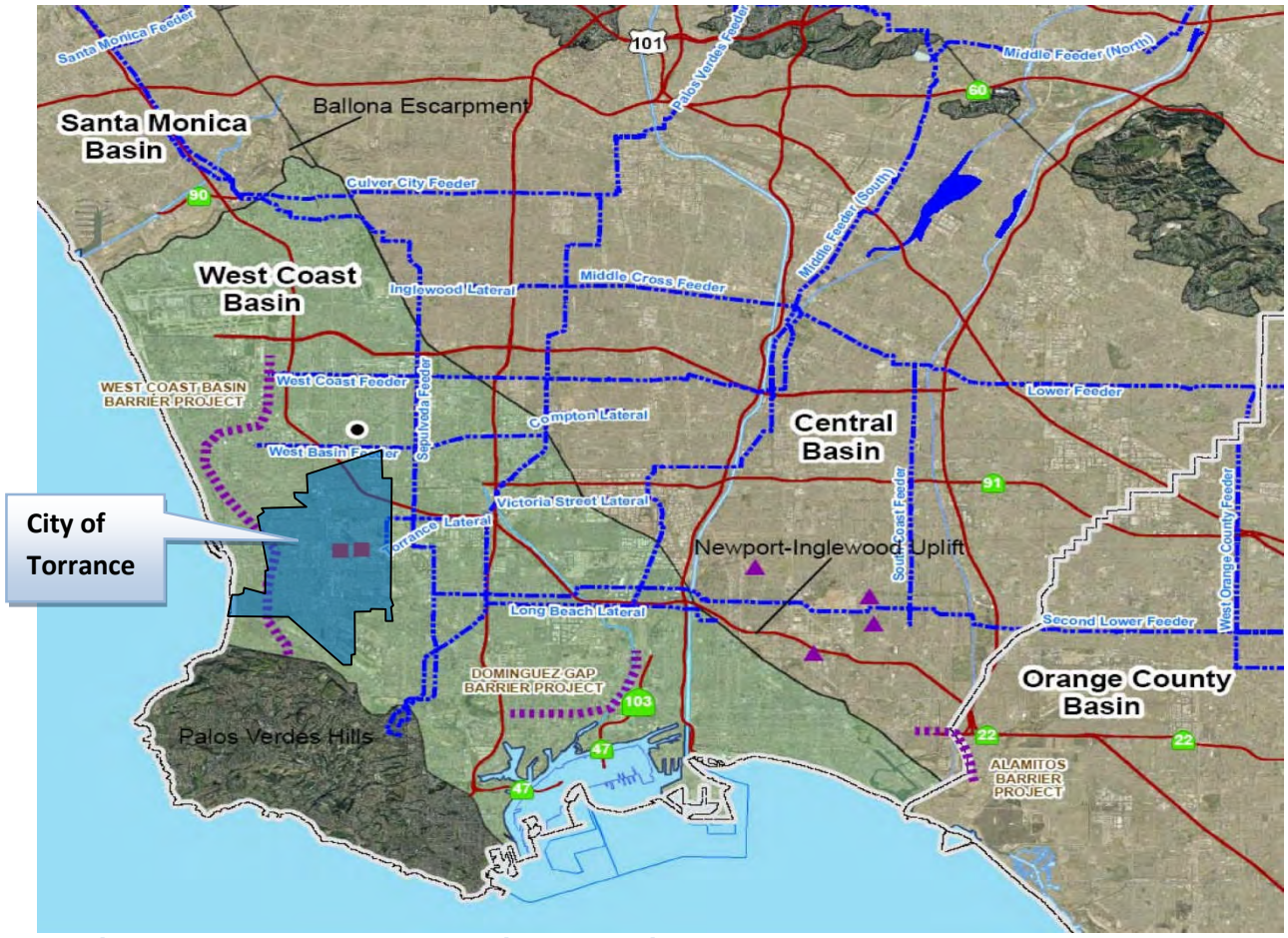


Figure 2.7: West Coast Groundwater Basin

Water-bearing deposits of the Basin include unconsolidated and semi-consolidated marine and alluvial sediments deposited over time. Key production aquifers include the Gardena, Gage, Lynwood, and Silverado aquifers. Groundwater is mainly confined, although the Gage and Gardena aquifers are unconfined where water levels have dropped below the Bellflower aquiclude. The Silverado aquifer, which underlies most of the basin, is the most productive aquifer, yielding up to 90 percent of the groundwater extracted annually with a thickness of 250-550 feet. No domestic supplies are produced from the upper aquifers due to contamination in the upper zone.

Groundwater in the Basin is replenished naturally by percolation from precipitation, receiving an average annual precipitation of 14 inches, by subsurface inflows from the Central Basin to the East, and by infiltration of surface inflows from the Los Angeles and San Gabriel Rivers. Since the basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, natural replenishment to the basin's water-bearing formations is limited to only a small portion of basin soils. However, the basin receives additional replenishment provided by artificial re-charge from the Water Replenishment District's (WRD's) injection wells.

Groundwater flow in the basin is generally from the Ballona Escarpment in the North (see **Figure 2.9**) and the Central Basin to the East towards the Pacific Ocean in the West and Palos Verdes Hills (see **Figure 2.8** below) in the South. Typical flow patterns are southward and westward.

Figure 2.8: Palos Verdes Hills

The total storage in the basin is estimated to be approximately 6.5 million acre-feet (MAF). Unused storage is estimated to be approximately 1.1 MAF. In 2006, a natural safe yield of the Basin (natural replenishment only) was estimated by WRD to be about 26,000 AFY. As a result of artificial recharge activities, the adjudicated rights stand at 64,468.25 AFY.

Groundwater levels in the basin are generally at or above mean sea level (MSL), although low water levels in portions of aquifers underlying the Pacific Ocean allow for seawater intrusion to occur. WRD estimates that up to 7,100 AFY of seawater enters portions of aquifers on the West Coast Basin.

Figure 2.9: Ballona Creek & Escarpment (Bluffs)

Due to seawater intrusion, there are a two seawater intrusion barriers in the West Coast Basin: the West Coast Basin Barrier Project and the Dominguez Gap Barrier Project. These seawater intrusion barriers inject a combined average of 24,000 AFY along the coastline and the Dominguez Channel to protect the basin from seawater intrusion.

Due to the natural replenishment of the basin and existing additional artificial recharge by WRD, there are no spreading basins in the West Coast Basin. In an effort to eliminate long-term overdraft conditions, WRD closely monitors the groundwater basins for fluctuations in groundwater levels. WRD utilizes a groundwater model developed by the United States Geological Survey (USGS) to study and better understand the Basin's reaction to pumping and recharge. WRD works closely with the Los Angeles County Department of Public Works, Metropolitan, and LACSD on current and future replenishment supplies.

The West Coast Basin is an adjudicated basin and the management of water resources and operations in the basin is provided by WRD, DWR, the LA County Department of Public Works, and the Regional Water Quality Control Board. The California Department of Health Services provides additional oversight of the Basin's groundwater quality and help monitor contaminant levels.

The key characteristics of the West Coast Basin are summarized below in **Table 2.2**:

Table 2.2
West Coast Basin
Summary of Characteristics

Item	Amount
Max. Depth to Groundwater	2,000 ft.
Thickness of Groundwater Table	180-1,050 ft.
Storage	6.5 MAF
Natural Safe Yield	26,300 AFY
Adjudicated Rights	64,468 AFY
Spreading Basins (Total)	0
Seawater Intrusion Barriers	2
Desalters	2

Groundwater Production

TMW maintains one active well (Well #9) and one standby well (Well #7) for groundwater extraction. Well #6 has been de-activated in late 2010 and has been replaced by new Well #9. Well #7 is used only on an as-needed basis for fire flow demands or other emergencies. Each of TMW's wells are equipped with flow meters to measure water production. Water production is recorded monthly by TMW water staff and reported annually to the Department of Water Resources (DWR). Over the past five years, groundwater extraction has ranged from 0 AF to 1,487 AF (average of 878 AF). **Table 2.3** displays TMW's groundwater supplies from fiscal year 2005-2010:

Table 2.3
Groundwater Production (Well #6)
FY 2005-2010

Year	Production (AF)
2010	1,106
2009	675
2008	1,487
2007	884
2006	0
2005	1,118
Average:	**878**

Groundwater represents only a small portion of TMW's overall water supply (about 5 percent) due to the City's Well #7 water quality issues and lack of well capacity. With planned wells in the northern portion of the City, however, TMW intends to increase its groundwater production to its adjudicated right of 5,640 AFY.

Goldsworthy Desalter (Groundwater)

The Robert W. Goldsworthy Desalter began operation in 2001 under the direction of WRD. The desalter facility was constructed to treat brackish groundwater resulting from a saline plume located in the Basin and currently treats up to approximately 2.75 MGD. The plant treats saline water using microfiltration and reverse osmosis. The product water meets all the state and federal drinking water standards and is used as

drinking water for the City. As of February 2010, TMW operates the facility.

The desalted water received by TMW is used as a supplemental potable water supply source. Over the past five years TMMW purchased an average of 1,494 AF of groundwater annually from the Desalter. **Table 2.4** summarizes the past sales to TMW from fiscal year 2005-2010:

Table 2.4
Goldsworthy Desalter Production
FY 2005-2010

Year	Production (AF)
2010	1,181
2009	646
2008	1,271
2007	2,005
2006	1,779
2005	2,082
Average:	**1,494**

The pumping and treatment of this groundwater aids in halting the migration of the saline plume, and is a groundwater quality mitigation project. In addition, the utilization of this groundwater creates a new source of supply, expands the availability of local water supplies, reduces TMW's reliance on imported supplies from MWD, and further drought-proofs the community

Recycled Water

TMW has significant industrial and commercial water customers which cannot alter their water consumption characteristics during drought periods. To enhance water supply reliability in the City and the region, TMW contracts with West Basin Municipal Water District (WBMWD) for the delivery of recycled water for non-potable industrial and landscape irrigation uses to supplement its water supply. WBMWD developed a regional water recycling program known as the West Basin Water Recycling Project. West Basin's transformation from imported water wholesaler to a leader in conservation and water recycling can be traced back to California's severe drought period between the late '80s and early '90s. In 1992, West Basin received state and federal funding to design and build a world-class, state-of-the-art water recycling treatment facility in the City of El Segundo, with its own visitor's education center (see **Figure 2.10** below).

Figure 2.10: Edward C. Little Recycling Facility

West Basin's water recycling facility, known as the Edward C. Little Water Recycling Facility (ELWRF -see **Figure 2.11**) receives secondary effluent from the Hyperion Wastewater Treatment Plant. Secondary effluent is pumped from Hyperion to the ELWRF via the Hyperion Secondary Effluent Pump Station (HSEPS), which is owned and maintained by West Basin. The ELWRF was completed in 1998 and has been expanded several times to meet the increasing needs of the region. The facility currently provides up to 57 million gallons per day (mgd) to various customers in WBMWD's service area, including several cities and private industrial customers.

The ELWRF is one of the largest water

recycling facilities of its kind in the United States and was recognized by the National Water Research Institute in 2002 as one of only six National Centers for Water Treatment Technologies. The ELWRF is the only treatment facility in the country that produces five different qualities of "designer" or custom-made recycled water that meet the unique needs of West Basin's municipal, commercial and industrial customers. The five types of designer water include: Tertiary Water (Title 22), Nitrified Water, Softened Reverse Osmosis Water, Pure Reverse Osmosis Water, and Ultra-Pure Reverse Osmosis Water. West Basin's customers use recycled water for a wide variety of industrial and irrigation needs.

Figure 2.11: Edward C. Little Recycling Facility

To meet the increasing needs of its customers and to provide additional supply capacity to the region, WBMWD is proposing the Phase V Expansion of the ELWRF. The proposed project would increase treatment capacity from the existing 57 mgd to 63 mgd and would include expanding the Title 22 (pretreatment and filtration processes) recycled water system, the microfiltration (MF) treatment system, the reverse osmosis (RO) treatment system and ultraviolet (UV) disinfection treatment systems to meet the proposed increase in capacity, installation of ozone pretreatment process for the MF treatment system, and the upgrade to the support facilities that manage the waste-handling processes and various ancillary process capacities. The initial study and negative declaration for the project was prepared in March 2011 and is included in Appendix G.

Recycled Water Purchases

TMW purchases recycled water produced at the ELWRF from WBMWD through the Water Recycling Project. Recycled water purchases in the City include direct

purchases by TMW and purchases by Exxon Mobil. Overall, about 95 percent of the recycled water used within the City is attributable to Exxon Mobil. **Table 2.5** below lists the past recycled water purchases in the City from 2005-2010:

Table 2.5
Recycled Water Purchases from WBMWD
FY 2005-2010

Year	ExxonMobil (AF)	TMW (AF)
2010	6,161	272
2009	5,599	278
2008	6,180	311
2007	5,774	284
2006	6,161	258
2005	6,767	182
Average:	**6,107**	**264**

Over the past five years, recycled water has accounted for about 23 percent of the overall water supply in TMW's service area.

2.3 WATER SUPPLY SUMMARY

Over the past five years, TMW's lack of groundwater pumping facilities has limited the City's groundwater supplies to less than one fifth (approximately 14 percent) of their adjudicated pumping right. Imported water, therefore, has accounted for over 90 percent of TMW's total potable water supply. Overall water use in the City, however, is balanced by the use of recycled water used by TMW and Exxon Mobil. TMW benefits immensely from Exxon Mobil's use of recycled water purchased directly from WBMWD as this saves about 6,000 - 6,500 AFY of potable water which would have otherwise been used to support Exxon Mobil's industrial processes.

2.4 PROJECTED SUPPLY OUTLOOK

TMW understands the need to discover and support local water supply projects in an effort to decrease dependence on imported supplies. As part of this process, TMW is in the process of upgrading its groundwater supply facilities to include the addition of at least two new wells in the North Torrance Well Field in the northern part of the City. These wells will help TMW to extract their adjudicated pumping right of 5,640 AFY. WRD is upgrading the Goldsworthy Desalter to increase its near term capacity to about 2,400 AFY. TMW intends to purchase 2,400 AFY of this treated supply to augment its water supply. As a result of these improvements, TMW expects to reduce their dependency on imported water. TMW expects MWD will maintain the City's Tier 1 limit of 20,967 AFY and understands that this limit may change. The use of recycled water is expected to increase gradually over time with additional conversions of landscape customers to recycled supplies and possible use of additional recycled water at the ExxonMobil Refinery.

Table 2.6
Projected Water Supply Availability

Year	Potable (AF)	Recycled (AF)
2015	29,007	6,650
2020	29,007	6,650
2025	29,007	7,150
2030	29,007	7,150
2035	29,007	7,150

Overall, TMW's supply reliability is expected to increase through the implementation of planned improvements to its groundwater facilities, WRD's Goldsworthy Desalter expansion, through

continued access to imported water, and through continued and planned use of recycled water. TMW will also continue to benefit indirectly from regional conservation efforts and also through MWD's efforts to augment its supplies and improve storage capacities. **Section 5: Reliability Planning** discusses reliability issues and compares the projected water supplies to projected demands for normal, dry, and multiple dry years through 2035.

2.5 ALTERNATE WATER SOURCES

This section provides an overview of alternative water sources (non-potable supplemental supplies) and their potential uses. Alternative water sources including additional recycled water and desalinated seawater may provide a major portion of TMW's supply in the future.

Additional Recycled Water

TMW currently benefits from the use of recycled wastewater purchased from WBMWD as mentioned in the previous section. Additionally, TMW benefits indirectly from regional uses of recycled water in the West Coast Basin and in its service area. As a result of using recycled water since 1995, TMW has identified potential recycled water users in a Recycled Water Master Plan. If the City were to expand its use of recycled water, the City would realize additional benefit.

Graywater

Graywater systems have been used in California to provide a source of water supply for subsurface irrigation and also as a means to reduce overall water use. Graywater consists of water discharged from sinks, bathtubs, dishwashers, and clothes washers. Graywater systems typically consist of an underground tank and pumping system. Graywater is currently legal for subsurface irrigation in the State of California. However, strict regulations, permit requirements, and the high cost of installation have impeded implementation of professional graywater systems. Graywater systems also have potential unintended consequences of undocumented and noncompliant use of graywater discharge. The promotion of graywater systems as a means to reduce the City's overall water use is not recommended since the use of graywater is currently limited to subsurface irrigation and therefore the overall service area-wide reduction in water use (in AF) would be minimal at best. With the recent passage of Senate Bill 1258, however, graywater use is expected to be expanded to include use for toilet flushing, and may have its place as a potential water supply. The City does not currently have a formal program in place to support graywater use.

Desalinated Seawater

Seawater desalination is a process whereby seawater is treated to remove salts and other constituents to develop both potable and non-potable supplies. There are over 10,000 desalination facilities worldwide that produce over 13 million AFY. Desalinated water can add to Southern California's supply reliability by diversifying its water supply sources and mitigating against possible supply reductions due to water shortage conditions. With its Seawater Desalination Program (SDP), the MWD facilitates implementation and provides financial incentives for the development of seawater desalination facilities within its service area.

Currently, WBMWD maintains a temporary ocean-water desalination demonstration plant at SEA LAB in Redondo Beach (see

Figure 2.12). The demonstration project uses limited quantities of full-scale equipment to refine operating parameters and perform additional water quality testing, processing 500,000 gallons of ocean water per day. Roughly 250,000 gallons of drinking-quality water will be produced by the demonstration facility on a daily basis. WBMWD anticipates that a full-scale ocean-water desalination facility could produce 20 million gallons daily, enough to meet the needs of 40,000 South Bay households annually.

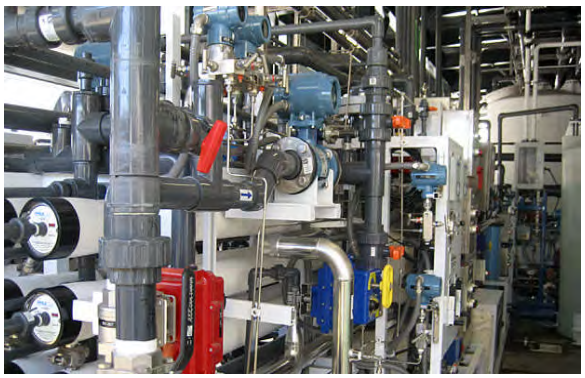


Figure 2.12: WBMWD Desalination Plant

Although the Torrance City boundaries extend to the ocean, that portion of the City is served by California Water Service Company (CWS) and thus an oceanfront facility would not be an option for TMW. Additionally, the economics of building and operating an oceanfront desalinization plant would prohibit its construction in the City. Most oceanfront plants are constructed adjacent to existing power plants, and take advantage of the existing discharge and energy resources of the power plant. If WBMWD develops a fullscale desalination facility, TMW may choose to pruchase desalinated supplies from WBMWD.

Stormwater Recycling in Santa Monica

The City of Santa Monica completed its Santa Monica Urban Runoff Recycling Facility (SMURRF - see **Figure 2.13**) in 2002. The primary objectives of the facility was to eliminate contamination of the Santa Monica Bay caused by urban runoff and to provide cost-effective treatment for producing high-quality water for reuse in landscape irrigation and indoor plumbing. The SMURRF project was funded by City of Santa Monica, City of Los Angeles, State Water Resources Control Board, Metropolitan Water District, federal ISTEA Grant funds and Los Angeles County Proposition "A" Grants and is operated jointly by the cities of Santa Monica and Los Angeles.

Figure 2.13: SMURRF in Santa Monica

The Torrance City boundaries extend to the ocean similar to Santa Monica. However, this portion of the City is served by California Water Service Company (CWS) and thus an oceanfront stromwater treatment facility is not practical for TMW. In addition, the construction and maintenance costs associated with a stormwater recycling plant would prohibit TMW from considering such a facility as a means to provide an alternative water supply.

2.6 TRANSFERS OR EXHCHANGES

TMW owns rights to extract 5,640 AF of groundwater annually. However, the City

currently only uses approximately 1,600 AFY of its adjudicated water rights due to water quality problems and lack of well capacity. As a result, TMW has leased some of its rights to the Roman Catholic Archdiocese of Los Angeles since 2004. In addition, MWD and WRD are exploring exchange and/or transfer options that would benefit the region. TMW maintains four two-way emergency inter-connections to adjacent water purveyor systems. These connections have the ability to transfer approximately 9,900 gpm. There are two 8-inch connections to the City of Lomita, one 8-inch connection to California Water Service Company (CWSC), and one 12-inch connection to the CWSC system. Each has a two-way interconnection, allowing water transfers to and from the City, depending on the emergency situation. However, records show that these connections have not been used recently. There are also two 10-inch one way metered interconnections that can only flow from the City to CWSC.

2.7 PLANNED SUPPLY PROJECTS

The City continually reviews options that have potential to provide its customers with adequate and reliable supplies. Trained staff continues to ensure the City's water quality is safe and the quantity of water supply meets present demands and will meet future needs. The City's planning approach to water supply projects is performed such that projects are implemented in an environmentally and economically responsible manner. TMW consistently coordinates its long-term water shortage planning with MWD.

TMW's water demand within its service area could remain relatively constant over the next 20 years due to minimal growth combined with water use efficiency measures and the potential use of recycled water. Water conservation measures described in **Section 6** and possible increased use of recycled water use described in **Section 8** have the potential to reduce potable demand. Any new water supply projects will be to replace or upgrade existing facilities and capacities rather than to support population growth and new development. The projects that have been identified to improve TMW's water supply reliability and enhance the operations of TMW's facilities and includes distribution system improvements, security improvements, and water production and storage improvements. The improvement projects include:

- **Replacement of Well #6 with Well #9:** Well #6 had reached the end of its service life and was replaced by Well #9. The new Well #9 increases TMW's extraction capacity from 1,500 AFY to 1,800 AFY. However, with the construction of the North Torrance Well Field, Well #9 will produce its full design yield of approximately 2,500 AFY.

- **Walteria and Ben Haggott Reservoir Rehabilitation:** Both reservoirs will be rehabilitated to improve water quality and water circulation.

- **North Torrance Groundwater Well Development Program:** The City is in the planning stage for the development of a well field in north Torrance. A preliminary design report regarding the project was recently completed in April 2011 to define project parameters, evaluate options, assess design considerations and provide cost estimates. Water quality and treatment considerations

will need to be evaluated for prospective well sites as well as modeling to ensure the saline groundwaters do not migrate inward. The City is also investigating several potential sites to increase storage throughout the distribution system. The City will be able to pump up to its full groundwater rights with the construction of the north Torrance wells. It is anticipated that the City will finalize their preliminary design study for this project by the end of 2011 and proceed with initiating project development in 2012.

- **Goldsworthy Desalter Project**: The water Replentnishment District (WRD) has received grant funding from the United States Bureau of Reclaimation (USBR) to conduct a feasibility study for the expansion of the Goldsworthy Desalter Project. It is projected that this study will be completed in early 2012 and this will provide the requisite information to seek potential grant funding for the proposed expansion. The expansion would produce an additional 2,500 AFY of potable water to the City. The project includes additional treatment facilities, a new well, and disposal system. If funding is secured the project is anticipated to be online four years after funding is granted. The well may be designed as an aquifer storage and recovery facility, so that it could also be used for conjunctive use storage. Because funding is uncertain at this time, this project is not included in the projections as a new water supply for the City. It is, however, a potential project for sometime in the future.

- **Well #7 and Well #8**: Due to significant water quality problems, TMW is not currently producing water from either of these facilities. Pilot studies have indicated that the only viable alternative would be reverse osmosis treatment, which is not cost effective. These facilities will remain as a standby emergency water sources for the foreseeable future.

SECTION 7: CONTINGENCY PLANNING

7.1 INTRODUCTION

Water supplies may be interrupted or reduced significantly in a number of ways including droughts, earthquakes, and power outages which hinder a water agencies ability to effectively deliver water. Drought impact increase with the length of a drought, as carry-over supplies in reservoirs are depleted (see **Figure 7.1** on Page 7-3) and water levels in groundwater basins decline. The ability to manage water supplies in times of drought or other emergencies is an important part of water resources management for a community.

As the City receives imported water from MWD and extracts groundwater from the West Coast Basin, the City's response to an emergency will be a coordinated effort of its own staff in conjunction with other local and regional water agencies. During water shortage emergencies, the City will implement its Water Supply Shortage Response Plan which imposes greater than a 30 percent reduction in the total water supply.

7.2 RESPONSE PLAN

In 1991, the Torrance City Council adopted an Emergency Water Conservation Program, under Ordinance 3320, which established four stages of water shortage severity based on predicted or actual water supply reductions. In March 2009 the City adopted an updated Water Conservation Ordinance (Ordinance 3717). The City implements certain initiatives to optimize water supply during water shortages or drought conditions. In the event of a water shortage, City Council will implement the appropriate water conservation stage by resolution.

The objectives of the response plan are to:

1. Prioritize essential uses of available water
2. Avoid irretrievable loss of natural resources
3. Manage current water supplies to meet ongoing and future needs
4. Maximize local municipal water supplies
5. Eliminate water waste city-wide
6. Create equitable demand reduction targets
7. Minimize adverse financial effects

The following priorities for use of available water are listed in order from highest to lowest priority:

1. Health and Safety including: consumption and sanitation for all water users; fire suppression; hospitals, emergency care, nursing and other convalescent homes and other similar health care facilities; shelters and water treatment
2. Institutions, including government facilities and schools such as public safety facilities, essential government operations, public pools and recreation areas
3. All non-essential commercial and residential water uses
4. Landscaped areas, including parks, cemeteries, open spaces, government-facility landscaped areas and green belt areas
5. New water demand

Stages of Action

The City has a legal responsibility to provide for the health and safety water needs of the community. The City will manage water supplies to minimize the social and economic impacts of water shortages. The Water Supply Shortage Response Plan is designed to provide a minimum of 70 percent of normal supply (30 percent reduction in supply) during a severe or extended water shortage. The City's two potable water sources are local groundwater (including desalted water) and imported MWD deliveries. Rationing stages may be triggered by a shortage in one source or a combination of sources, and shortages may trigger a stage at any time. **Table 7.1** shows the stages of action the City will take in the case of an emergency water shortage, as declared by the Water Shortage Response Plan and supported by City Ordinance 3717.

Table 7.1
Ordinance 3717 Water Conservation and Water Supply Shortages

Shortage Level	Restriction Type	Total Water Supply Reduction Percentage
Baseline	Mandatory	In effect at all times
Level 1	Mandatory	Up to 15%
Level 2	Mandatory	15%-30%
Level 3	Mandatory	More than 30%

During water shortages, the City Council may declare by resolution that a Level 1, Level 2, or Level 3, water shortage stage exists and that the actions outlined in Ordinance 3717 are necessary. The type of event which may prompt the City Council to declare a water supply shortage may be a result of MWD declaring a need for extraordinary water conservation. Water Supply Shortages may be caused by: a drought; a state or local emergency; a natural disaster that critically impacts the water treatment or water distribution system; a localized event that critically impacts the water supply; water quality; water treatment or water distribution system; the City's wholesale water agency (MWD) requests extraordinary water conservation efforts in order to avoid mandatory water allocations; and when MWD implements a mandatory water allocation program.

Metropolitan Water District WSDM Plan

In addition to the provisions of the City's Water Shortage Response Plan, the City will also work in conjunction with MWD to implement conservation measures within the framework of MWD's Water Surplus and Drought Management (WSDM) Plan. The WSDM Plan was developed in 1999 by MWD with assistance and input with its member agencies. The plan addresses both surplus and shortage contingencies.

The WSDM Plan guiding principle is to

minimize adverse impacts of water shortage and ensure regional reliability. The plan guides the operations of water resources (local resources, Colorado River, SWP, and regional storage) to ensure regional reliability. It identifies the expected sequence of resource management actions MWD will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

Figure 7.1: Severe Droughts Highlight the Importance of Conservation Ordinances

7.3 THREE-YEAR MINIMUM SUPPLY

MWD modeling, as discussed above, results in 100 percent reliability for full-service demands through the year 2035. MWD's 2010 Regional UWMP demonstrates their demand/supply balance in multiple dry years, single dry years, and average years in **Tables 5.2** and **5.3** in Section 5. Under the worst-case supply scenario, MWD would curtail deliveries of potable water to the City by about 30 percent for three years consecutively. During this time period, the City's local water supply sources are expected to remain at or near normal levels as groundwater in the West Coast Basin is expected to be drought-proof for short term drought periods of 3 years (due to artificial recharge in the basin). The City can expect the ability to extract its adjudicated right of

5,640 AFY from its wells while extracting an additional 2,400 AFY from its Goldsworthy Desalter over a drought period of up to three years. Recycled water will continue to be fully available to meet water demands. Thus, the City can expect to meet its water needs over a three year dry period based on the supplies listed below in **Table 7.2**:

Table 7.2
Projected 3-yr Minimum Water Supply (AF)

Source	2011	2012	2013
Imported	18,571	17,458	13,822
Desalter	1,500	1,800	1,800
Ground	1,500	1,500	1,500
Recycled	6,500	6,500	6,500
Total	**28,071**	**27,258**	**23,622**

7.4 CASTROPHIC INTERRUPTIONS

A water shortage emergency could be a catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions.

The City's Emergency Response Plan includes a Water Distribution Sample Action Plan to be followed in the case of a water shortage emergency. The initial effort includes a safety/damage assessment, where the extent of damage to each department will be determined. Primary consideration at the department level will be given to what is the status of its personnel and the facilities that it needs for its operations. This includes any facility critical to the department's operations whether or not it is a City facility. Each department will then identify which facilities will be available and which faculties need to be inspected by a building inspector. The Department Safety/Damage Assessment team will do a walk through or may drive to assigned areas. The information gathered will be provided to the Planning Section of the Department Operation Center and then the City Emergency Operations Center (EOC) Planning Section. The water facilities classified as Critical Facilities in the Emergency Operations Plan will be initially inspected by TMW and other personnel as needed.

During a disaster, the City will also work cooperatively with Metropolitan through their Member Agency Response System (MARS) to facilitate the flow of information and requests for mutual-aid within Metropolitan's 5,100-square mile service area. Metropolitan's Palos Verdes reservoir and the three imported transmission mains are in close proximity to the City of Torrance, and, therefore, the possibility of Metropolitan being entirely unable to deliver water to the City is unlikely. The City's Water Master Plan contains analysis showing that the City's T-8 connection provides sufficient excess capacity to offset the shutdown of one of the three Metropolitan pipelines serving the City. By adjusting the inflow from the connections still in service, the loss of one pipeline could adequately be offset. However, should the Palos Verdes Feeder be out of service connections T-1 and T-8 can be adjusted to compensate. In the event of groundwater supply loss, all supply could be imported from Metropolitan, and it is confirmed that the necessary capacity is available to do so.

Additional emergency services in the State of California include the Master Mutual Aid Agreement, California Water Agencies Response Network (WARN) and Plan

Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement and is planned out of the California Office of Emergency Services. WARN includes all public agencies that have signed the agreement to WARN and provides mutual aid assistance. It is managed by a State Steering Committee. Plan Bulldozer provides mutual aid for construction equipment to any public agency for the initial time of disaster when danger to life and property exists.

7.5 PROHIBITIONS

In accordance with the City's updated Water Conservation Ordinance 3717 enacted in March of 2009, the City has prescribed a number of water use restrictions which are continuously and permanently enforced as part of the City's Municipal Code. Additional water use restrictions are mandated where the severity of restrictions are based on severity of the water shortage.

Mandatory Prohibitions

The City of Torrance's three phase approach to implementing water conservation and prohibiting wasteful use during a water shortage includes, but is not limited to, the following:

Permanent Baseline Requirements

- Landscape irrigation is prohibited between the hours of 10 a.m. & 4 p.m.
- No washing down hard or paved surfaces
- No excessive water flow or runoff from any lawn or landscaped surface.
- Restaurants serve drinking water upon request only.

Level 1

- Notification to water users of water shortage status and that a 15% reduction of water use is required.
- Landscape irrigation is prohibited between the hours of 9 a.m. and 5 p.m.
- Duration of landscape watering is limited to 15 minutes per day.
- Sequence of landscape watering cycle is limited to 3 days per week.
- All water leaks in water user's plumbing or distribution system must be repaired within 7 days of notification by the City.

Level 2

- Notification to water users of water shortage status and that a 15% to 30% reduction of water use is required.
- Landscape irrigation is prohibited between the hours of 8 a.m. and 6 p.m.
- Duration of landscape watering is limited to 10 minutes per day.
- Sequence of landscape watering cycle is limited to 2 days per week.
- All water leaks in water user's plumbing or distribution system must be repaired within 4 days of notification by the City.

Level 3

- Notification to water users of water shortage status and that a minimum 30% reduction of water use is required.
- Landscape irrigation is prohibited with some exceptions based on critical facilities related to public health, safety, and essential City

operations.
- All water leaks in water user's plumbing or distribution system must be repaired within 2 days of notification by the City.
- The City reserves the right to discontinue water service to customers who willfully violate provisions of level 3 restrictions.

Additional water conservation provisions are set forth in City Ordinance 3717 such as the use of rain sensors and evapo-transpiration sensors for large landscape areas, requirement of reticulating water systems for commercial car washes, building permit stipulations, and recycled water feasibility study for all new development. The City's specific prohibitions on water use can be found in the City's Municipal Code (Appendix G).

Penalties or Charges

Violation of the regulations and restrictions on water use in accordance with Ordinance 3717 may result in penalties punishable by a fee and a possible jail sentence. According to Ordinance 1317, any person who violates any provision of the water conservation ordinance is guilty of a misdemeanor punishable by imprisonment in the county jail for not more than 30 days, or by a fine not exceeding $1,000, or by both fine and imprisonment.

- **First Violation:**
  City will deliver written notice of violation via mail.

- **Second Violation**
  City will deliver written notice of violation via mail.

- **Third Violation:**
  If the third violation is within a 12 month period then the City shall add a penalty to the next billing period water bill in the sum of $100.

- **Fourth Violation:**
  If the fourth violation is within a 12 month period then the City shall add a penalty to the next billing period water bill in the sum of $250.

- **Fifth and subsequent Violations:**
  The City shall add a penalty to the next billing period water bill in the sum of $500. In addition, the City shall install a flow restriction device restricting flow to one gallon per minute for water services for not less than 48 hours. In addition to any fines and the installation of a water flow restrictor, the City has the option to disconnect and/or terminate a customer's water service.

7.6 FISCAL IMPACTS

As water consumption decreases, the revenue generated through water sales also decreases. To continue operation, the City must generate sufficient revenue when faced with decreasing water sales revenue. Based on the City's total water revenue and operating expenses, demand reductions will result in negative net cash provided by operating activities. As a result, rate increases may be imposed.

Other than rate increases, other measures to overcome impacts of reduced water supply and consequential revenue shortfall will include the following:

1. Reduce the current fiscal year operation and maintenance expenses.
2. Defer Capital Improvement

Projects

3. Reduce future projected operation and maintenance expenses.
4. Increase the fixed readiness-to-serve charge to establish a substantial firm revenue base.
5. Increase commodity charge and water adjustment rate to cover revenue requirements.

TMW has recently implemented a 5 Year Rate Plan to adjust rates starting in calendar 2011 through calendar 2015. Any changes in Municipal rates are now subject o modified Proposition 218 Notification Protest Ballot and Public Hearing Process. Any adjustment from the approved 5 Year plan would need to implemented in accordance with Proposition 218 requirements.

A combination of the measures outlined above may be used to offset or diminish the effects of lost revenues. Capital construction projects may be deferred, as appropriate. The base water rate could be increased to cover the general operation, maintenance, system upgrades, and capital expenditures. An increase in the base rate would be temporarily employed and then return to pre-shortage rates when conditions improve. The measures will be subject to Proposition 218 requirements.

7.7 COUNCIL ORDINANCE

In March of 2009, the City Council adopted Ordinance No. 3717, which implemented a new Article 4 to Chapter 6 of Division 7 of the Torrance Municipal Code. The Ordinance addresses water conservation, establishes a water conservation program, and the stages for declaring water shortage emergency conditions. The Ordinance establishes a phased approach to water conservation and enforcement, and consists of three conservation levels or phases in increasing order of severity. The water conservation levels and related water use restrictions are described above. The specific language of Ordinance No. 3717 may be viewed in Appendix G.

Additionally, during an extended water shortage, the City Council will adopt by resolution the water shortage implementation stage. A Draft Resolution to implement the Water Conservation Program Stage of Action is included in Appendix H.

7.8 MECHANISMS TO DETERMINE ACTUAL REDUCTIONS IN WATER USE

The City will continue to use multiple measures to determine actual water consumption reductions, as follows:

- Normalized/averaged water use baseline
- More frequent review of production
- More frequent meter reading at customer locations
- More frequent leak detection and repair
- More frequent meter checking and repair
- System water audit
- Automated sensors and telemetry
- Monitor utility actions that impact usage
- Penalties for customers with excessive water use

Leak detection is enhanced at customer's premises through an Automated Meter Reading system that is presently being implemented on a phased basis.

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2.6 Other Supply Reliability Risks

Metropolitan provides water to a broad and heterogeneous service area with water supplies from a variety of sources and geographic regions. Each of these demand areas and supplies has its own unique set of benefits and challenges. Among the challenges Metropolitan faces are the following:

Supplies

- The region and Colorado River Basin have been experiencing drought conditions for multiple years.
- Endangered species protections and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints particularly important because pumping restrictions impact many water resource programs – SWP supplies and additional voluntary transfers, Central Valley storage and transfers, in-region groundwater storage and in-region surface water storage.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Difficulty and implications of environmental review, documentation, and permitting for multi-year transfer agreements, recycled water projects and seawater desalination plants.
- Public perception of recycled water use for replenishment.

Operations and Water Quality

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues like the quagga mussels within the Colorado River Aqueduct. Controlling the spread and impacts of the quagga mussels will require more extensive maintenance and reduced operational flexibility.
- Salt and concentrate balance from variety of sources.

Demand

- Uncertain population and economic growth
- Uncertain location of growth
- Uncertain housing stock and density

The challenges posed by continued population growth, environmental constraints on the reliability of imported supplies, and new uncertainties imposed by climate change demand that Metropolitan assert the same level of leadership and commitment to taking on large-scale regional solutions to providing water supply reliability. New solutions are available in the form of dramatically improved water-use efficiency, indirect potable use of recycled water, and large-scale application of ocean desalinization.

Climate Change

Climate change adds its own new uncertainties to the challenges of planning. Metropolitan's water supply planning has been fortunate in having almost one-hundred years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. But, weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere, as experienced in Australia. These changes in weather significantly affect water supply planning, irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gasses. As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change.

Potential Impacts

While uncertainties remain regarding the exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners. These include:

- Reduction in Sierra Nevada snowpack;
- Increased intensity and frequency of extreme weather events; and
- Rising sea levels resulting in
  - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
  - Potential pumping cutbacks on the SWP and Central Valley Project (CVP).

Other important issues of concern due to global climate change include:

- Effects on local supplies such as groundwater;
- Changes in urban and agricultural demand levels and patterns ;
- Impacts to human health from water-borne pathogens and water quality degradation;
- Declines in ecosystem health and function; and
- Alterations to power generation and pumping regimes.

Metropolitan's Activities Related to Climate Change Concerns

An extended Colorado River drought put climate change on Metropolitan's radar screen in the mid-1990s. In 2000, Metropolitan's Board received a briefing on the potential impacts of climate change on water supply by leading experts in the field. Metropolitan then hosted a California Water Plan meeting on climate change and a held Drought Preparedness Workshop on similar issues. In March 2002, the Board adopted policy principles on global climate change as related to water resource planning. The Principles stated in part that 'Metropolitan supports further research into the potential water resource and quality effects of global climate change, and supports flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts.'

<u>Knowledge Sharing and Research Support</u>
Metropolitan is an active and founding member of the Water Utility Climate Alliance (WUCA). WUCA consists of ten nationwide water providers collaborating on climate change adaptation and green house gas mitigation issues. As a part of this effort, WUCA pursues a variety of activities on multiple fronts.

WUCA monitors development of climate change-related research, technology, programs and federal legislation. Activities to date include such things as:

- Letter of support for Western Water Assessment's continued funding as a Regional Integrated Sciences and Assessments team under the National Oceanic and Atmospheric Administration (NOAA)
- Letter of support for the 2009 Kerry-Boxer Water Utilities Mitigation and Adaptation Partnerships congressional bill addendum
- Regular communication and consultations with federal agencies on the U.S. Environmental Protection Agency's Climate Ready Water Utility Working Group
- NOAA Climate Service and January 2010 International Climate Change Forum

In addition to supporting federal and regional efforts, WUCA released a white paper entitled "Options for Improving Climate Modeling to Assist Water Utility Planning for Climate Change" in January 2010. The purpose of this paper was to assess Global Circulation Models, identify key aspects for water utility planning and make seven initial recommendations for how climate modeling