EXECUTIVE SUMMARY SHEET
CITY OF SAN DIEGO

DATE ISSUED:	August 1, 2011
ATTENTION:	Natural Resources & Culture Committee Agenda of August 3, 2011
ORIGINATING DEPARTMENT:	Public Utilities Department
SUBJECT:	Water Distribution System Water Loss
COUNCIL DISTRICT(S):	Citywide
STAFF CONTACT:	Jim Fisher, Assistant Director, Water Operations Branch, Public Utilities Department

REQUESTED ACTION:
Information Item Only

STAFF RECOMMENDATION:
N/A

EXECUTIVE SUMMARY:
The purpose of this report is to inform the public and Committee of information and data related to the City of San Diego's water distribution system, with a focus on water losses within its potable water distribution system and the City of San Diego's efforts to monitor and manage these losses.

The City of San Diego Public Utilities Department (Department) supplies potable water to approximately 1.3 million City residents. In addition, the Department provides potable water to the City of Del Mar and the California American Water Company, which, in turn, serves the cities of Coronado and Imperial Beach and portions of south San Diego. The Department provided, on the average, approximately 171 million gallons per day to its customers during FY 2011. The Department's extensive potable water distribution system, one of the most complex in the nation, includes over 3,300 miles of water lines, 49 water pump stations, 130 pressure zones; and more than 24,000 fire hydrants, 48,000 valves, 275,000 service connections and meters, and 200 million gallons of potable water storage capacity in 32 standpipes, elevated tanks, and reservoirs.

Distribution system water losses are typically defined as water that is "unaccounted for." "Unaccounted for water" is typically defined as total water delivered into the distribution system minus the sum of all metered flow from the system and all unmetered authorized uses. The water industry generally uses the amount of "unaccounted for water" as a way to evaluate and audit the overall management of the water system.

"Unaccounted for Water" Industry Standards
A number of organizations have specified goals for utilities to use in managing "unaccounted for water." In 1991, the California Urban Water Conservation Council (CUWCC) established a best management practice (BMP) for water agencies in California. It identified a 10% benchmark for "unaccounted for water." The International Water Association (IWA) and the American Water Works Association (AWWA) subsequently developed standard methods and terminology to

perform water audits and to assist water utilities in tracking their distribution system losses. In September 2009, the CUWCC amended the water loss and control BMP to reflect this newer IWA/AWWA methodology.

The Department's "unaccounted for water" losses are currently approximately 9% which compares to a national average of approximately 14% among water utilities, as reported by US EPA. The following list provides comparisons for a variety of similar or local water utilities, as a percent of water delivered into the distribution system:

- City of San Diego (Population 1,300,000): 9.3% (2010)
- East Bay Municipal Water District (Population 1,300,000): 10% (2010)
- San Francisco Public Utilities Commission (Population 845,913): 9% (2010)
- Sweetwater Authority (Population 183,000): 5% (2010)
- Philadelphia Water Department (Population 1,670,000): 31.2% (2003)
- Albuquerque Bernalillo County Water Utility Authority (Population 845,913): 12.5% (2008)
- City of Phoenix: (Population 1,512,900): 5.1% (2007)

"Unaccounted for water" occurs in all water distribution systems and is comprised of the following major factors:

- Meter inaccuracies
- Leaks/breaks on infrastructure
- Illegal fire hydrant usage and/or theft

It is often difficult to precisely identify the amount associated with each factor. However, industry standards, Department data collection/tracking and studies serve as a guideline in accurately estimating these volumes.

<u>"Unaccounted for Water" Attributable to Water Meters</u>
According to AWWA manual *M6–Water Meters*, meters have an inherent variation of 2 to 3 percent in registration over the entire range of flows, except very lows flows just above those that the meter will not register. In addition, in *M6–Water Meters*, AWWA recommends replacement of meters with accuracy limits less than 96 percent. Based on testing information, it is estimated that approximately 33 to 40 percent (3 to 5 percent register inaccuracy) of the City's "unaccounted for water" is attributable to water meters.

The Department has 275,020 meters within its potable water distribution system, comprising of 273,703 small meters (2-inch or smaller) and 1,317 large meters (3-inch and larger). The Department's meters are replaced based on established criteria and as required. Small meters are replaced on a 24-year cycle or when there is an identified failure. This cycle is revisited periodically and validated based on our assessment in accordance with AWWA manual *M6-Water Meters*. Currently, approximately 72% of the small meters are 20 years old or less, with the oldest small meter being installed in 1982.

Large meters are tested annually and repaired as necessary. Due to the costs of large meters and the availability of parts, the Department repairs and recalibrates large meters to industry acceptable efficiencies when possible. If unable to repair a large meter and bring it back to industry acceptable efficiencies, then replacement is required. Currently, approximately 98% of large meters are 20 years old or less, with the oldest large meter being installed in 1954. Since 2008, approximately 18% of large meters have been replaced.

Based on the replacement criteria identified above, the following summarizes the number of meters replaced for FY2008-FY2011:

	Small Meters	Large Meters	Total Meters
FY2008	8,598	33	8,631
FY2009	8,277	25	8,302
FY2010	10,471	75	10,546
FY2011	12,939	118	13,057

In addition, based on the above parameters, the Department estimates there are 27,957 meters to replace during FY2012.

"Unaccounted for Water" Attributable to Leaks/Breaks

The Department has made it a priority to proactively and aggressively inspect and repair leaks, and to minimize response times to main breaks and fire hydrant knock-overs. The Department's goal is to repair reported distribution service leaks within 3 working days. This challenging goal was achieved 83% of the time during FY 2011. Also, the Department has a goal to respond to fire hydrant knock-overs within 1 hour. This goal was achieved 98% of the time during FY 2011.

In addition, the Department's Capital Improvement Program has a main replacement program to replace aged infrastructure. More specifically, the Department has replaced 48.6 miles of old cast iron pipe over the past 3 years. The Department still has approximately 90 miles of cast iron to replace over the next 5 to 7 years. The Department's other infrastructure, such as asbestos cement pipe (approximately 2,100 miles in the system) is also reaching its useful life and is experiencing an increase in breaks/leaks which will also require replacement.

EQUAL OPPORTUNITY CONTRACTING:

N/A.

FISCAL CONSIDERATIONS:

N/A.

PREVIOUS COUNCIL/COMMITTEE ACTION:

None.

COMMUNITY PARTICIPATION AND PUBLIC OUTREACH EFFORTS:

N/A.

KEY STAKEHOLDERS:
The key stakeholders are the City of San Diego Public Utilities Department customers.

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