EXECUTIVE SUMMARY SHEET
CITY OF SAN DIEGO

DATE ISSUED:	September 22, 2011
ATTENTION:	Natural Resources & Culture Committee Agenda of September 28, 2011
ORIGINATING DEPARTMENT:	Public Utilities
SUBJECT:	Impacts of the September 8, 2011 Countywide Blackout of the Public Utilities Department
COUNCIL DISTRICT(S):	City-wide
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REQUESTED ACTION:
Information Item Only

STAFF RECOMMENDATION:
N/A.

EXECUTIVE SUMMARY:

BACKGROUND

On September 8, 2011, at approximately 3:40 PM, San Diego County suffered a massive power outage, which affected a large area stretching from Orange County to Baja California and east into parts of Arizona. Electrical power supplied by San Diego Gas and Electric (SDG&E) to the Public Utilities Department's (Department) facilities was out for approximately 4 to 12 hours, depending on the location. During this outage, the Department activated its Emergency Operations Centers and implemented its emergency operations procedures. Although the entire water and wastewater systems were affected by the power outage, the Department successfully delivered uninterrupted potable water service to over 90% of its customers and treated over 97% percent of the sewage discharged to the system

The Department operates large and complex wastewater and water systems. The overall wastewater system is comprised of the Municipal sub-system and the Metro Sub-system. The Municipal Sub-system is the municipal sewer collection system for the City's residents and consists of over 3,000 miles pipeline and 74 municipal pump stations. The Metro Sub-system is a regional sewer treatment and disposal system that serves the City and 15 other cities and public agencies. The Metro Sub-system consists of three wastewater treatment plants a biosolids processing facility, eight large pump stations and two ocean outfalls. The wastewater system covers over 450 square miles and serves a regional population in excess of 2.5 million.

The water system consists of over 3,300 miles of pipeline, 130 pressure zones, 49 water pumps stations, 32 potable water reservoirs, and three water treatment plants.

Impacts on the Department's Systems

Wastewater

The municipal collection system performed without any spills or major incidents, as did the Point Loma Wastewater Treatment Plant and the Metro Biosolids Center. The North City and South Bay Water Reclamation Plants were shut down and flow was diverted to the Pt. Loma plant. On September 8th the Department collected, conveyed and treated approximately 160 million gallons of sewage.

Sewer Spills

Unfortunately, there were two incidents of sewage spills due to the power outage at Pump Station 64 and Pump Station 1. Pump Station 64 is designed to handle a maximum daily flow of 70 million gallons and Pump Station 1 is designed to handle a maximum daily flow of 155 million gallons. During the date of the event, Pump Station 64 handled an average daily flow of 22 million gallons and Pump Station 1 handled an average daily flow of 55 million gallons. Both pump stations are equipped with redundant electrical feeds from two separate SDG&E substations. This design standard is in compliance with a Technical Bulletin titled "Design Criteria for Mechanical, Electrical, and Fluid System and Component Reliability" published by the Office of Water Program Operations at the Environmental Protection Agency, which states, *"Two separate and independent sources of electrical power shall be provided to the works from either two separate utility substations or from a single substation and a works based generator."*

With all electrical power lost, including the redundant back-up supplies, Pump Station 64 began spilling at approximately 5:50 PM until 10:52 PM, when power was restored. Based upon flow metering data, approximately 2.6 million gallons of sewage spilled from three manholes onto Sorrento Valley Road and Sorrento Valley Boulevard into the storm drain system and ultimately into the Los Penasquitos Creek, a tributary to the Los Penasquitos Lagoon. Two tankers, one 5,500 gallon and one 3,500 gallon were dispatched to the spill site to divert flow to the creek and to protect nearby businesses at risk of flooding. These tankers, along with sandbagging efforts, were successful in avoiding flooding to adjacent businesses.

Pump Station 1 began spilling at approximately 9:00 PM until 9:30 PM when power was restored. Based upon flow metering data, approximately 870,231 gallons of sewage spilled into Sweetwater River at the I-5 crossing and ultimately into San Diego Bay.

As the power outage prolonged, the Department coordinated with SDG&E to arrange for the transport of mobile generators to Pump Station 64 and 1. However, power was restored, and these generators were not delivered.

Beach Closures/Water Sampling

As a result of the two sewer spills, the beaches five miles north and south of the mouth of the Los Penasquitos Lagoon were posted for no water contact. This included the area north of Scripps Pier to the San Dieguito River Outlet. In the southern area of the City, Bayside Park in Chula Vista and the bay-side of the Silver Strand were posted.

Daily sampling of beach water quality began on Friday, September 9, 2011, at the direction of the San Diego County Department of Environmental Health. Samples were tested for total coliform, fecal coliform and enterococcus. The County procedures require two consecutive days of samples with clean results before the beaches can be reopened. A total of thirteen (13) sites were sampled in the northern area and four (4) in the southern area. All beaches and parks were reopened on Wednesday, September 14, 2011.

Impacts on the Water System

The water treatment plants operated with no major incidents and delivered 121 million gallons of potable water on September 8th. While the Department was able to maintain continuous, uninterrupted water service to more than 90% of our customers, there were 13 small areas throughout the City which experienced a loss of water service. The loss of water was a result of not having emergency generators at each of the pump stations. As a result of this loss of service, the Department, in consultation with the California Department of Public Health, issued a precautionary boil water order for the impacted communities. The boil water order was precautionary in nature and at no time was the water system compromised or contaminated, as confirmed by water quality testing results. The boil water advisory was lifted on September 11, 2011.

During the blackout, City staff was dispatched to connect emergency generators and portable diesel pumping systems. Water service was restored to five of the impacted areas prior to SDG&E restoring power to all areas of the City on September 9th.

Mitigation Measures

Creek Cleanup

On the afternoon of Monday, September 12, 2011, the Department was notified by Regional Water Quality Control Board staff that sewage from the Pump Station 64 spill had ponded in certain areas of Los Penasquitos Creek. That afternoon staff arrived on site and immediately began the mitigation effort to pump out the mixture of sewage and creek water. With the use of several vactors and pumper tankers, they began pumping on the east side of the Sorrento Valley Road Bridge near the Sorrento Valley Coaster Station. This location was chosen because it is an area where fouled water was slow moving or standing. In addition, the Department activated three other pumping sites. One site was west of the Sorrento Valley Road Bridge, near the train tracks. The other two were along the creek at the intersection of Estuary Way and Roselle Street. As of Wednesday, September 21, the Department had removed close to fourteen million gallons of creek water mixed with sewage.

The cleanup is ongoing. Staff is testing the quality of the water upstream of the spill site, at the pumping locations and downstream of the spill for chemical and biological indicators of wastewater contamination. The Department will continue the pump operations until the water in the creek returns to nominal levels, based on historical results. The Department has also posted warning signs at the access points along the creek to warn individuals who fish this area and may have contact with the water.

Additionally, staff has consulted with the Regional Water Quality Control Board to begin a bio-assessment of the creek. This is a comprehensive scientific evaluation of the stream biology and the first report should be completed in about a month. Follow-up bio-assessment are planned for 3-months and 6-months and should help address the extent of any adverse impacts on the ecology of the creek and its recovery.

The Department is coordinating with the San Diego Regional Water Quality Control Board, California Fish and Game, and the U.S. Fish and Wildlife Service on the cleanup.

Steps to Ensure Added Reliability

The Department takes its mission to ensure the quality, reliability and sustainability of water, wastewater and recycled water services very seriously. To that end, over the last five years, the Department has invested over $284 million in wastewater infrastructure and $426 million in water infrastructure to improve our pipelines, pump stations and treatment plants. Additionally, the Department has reduced the number of sewer spills from a high of 365 annually in 2000 to 24 for calendar year 2011 to date.

The wastewater system operates a total of 82 wastewater pump stations. Of these pump stations 60 pump stations or 73% have redundant electrical power supplies onsite. Fifty-four pump stations have onsite generators, five have dual SDG&E electrical feeds, and one has two natural gas engine driven pumps. Of the pump stations without redundant power feeds; eight are comfort stations that can be closed, eight overflow to gravity sewers, and six are low flow and can be served by portable generators.

The water system operates a total of 49 pump stations. The Department has 17 generators to provide backup power for the water pump stations in the event of an emergency. In addition, the Department has three portable diesel powered pumping systems that can be used to provide service in the event of a pump station failure.

The Department's emergency preparedness and response plans are consistent with industry standards and structured to cover expected emergency situations. The unprecedented power outage was beyond anyone's expectations and/or planning scenarios.

In the past, based on the low probability of a prolonged and widespread electrical outage, the Department has relied upon the ability of its electrical utility provider, SDG&E, to provide appropriate electrical redundancy for its system. Given the events of September 8th, and the need to maintain critical services to protect the health and safety of its customers and the environment, the Department has begun a reassessment of this approach.

The Department will study options for backup on-site power generation at the impacted wastewater and water facilities. These studies will include assessing the risk, both environmental and financial, of each anticipated failure mode. Factors to consider include, but are not limited to: (1) operational impacts and risks, (2) site constraints and feasibility, and (3) cost/benefits.

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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