

Annex to 2010 Association of Bay
Area Governments
Local Hazard Mitigation Plan
Taming Natural Disasters

Contra Costa Water District

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Introduction

Contra Costa Water District (CCWD) provides water to approximately 500,000 people in Contra Costa County. In performing this service, CCWD operates and maintains a complex system of water transmission, treatment, and storage facilities to supply both treated and untreated (raw) water to its customers. CCWD employs approximately 325 people primarily in Concord and Oakley and has a budget of approximately \$218 million for fiscal year (FY) 2011.

The Contra Costa County Water District¹ was approved by the voters in 1936 as the legal entity to contract, purchase, and distribute water provided by the United States Bureau of Reclamation (USBR) through the Contra Costa Canal. The 48-mile Contra Costa Canal conveys water from the Sacramento-San Joaquin Delta, from intakes at Mallard Slough, Rock Slough, Middle River and Old River, to eastern and central Contra Costa County.

Exhibit A illustrates the CCWD service area, which encompasses most of central and northeastern Contra Costa County, covering an area of more than 137,127 acres (including the Los Vaqueros watershed area of approximately 19,100 acres). Water is provided to a combination of municipal, residential, commercial, industrial, landscape irrigation, and agricultural customers. Major untreated water municipal customers include the Cities of Antioch, Pittsburg, and Martinez. Treated water is distributed to individual customers living in the following communities in the Treated Water Service Area: Clayton, Clyde, Concord, Pacheco, Port Costa, and parts of Martinez, Pleasant Hill, and Walnut Creek. In addition, CCWD treats and delivers water to the Diablo Water District (Oakley), the City of Brentwood, Golden State Water Company (Bay Point), and the City of Antioch.

For the first 25 years of its existence, CCWD's main responsibility was the purchase and distribution of untreated water through the Contra Costa Canal. In the late 1950s, CCWD purchased the California Water Service Company's Concord-area treatment, pumping, storage, and distribution facilities. In 1968, CCWD replaced the old treatment facilities with the construction of its own Ralph D. Bollman Water Treatment Plant (Bollman WTP) in Concord. The Bollman WTP and the Randall-Bold Water Treatment Plant (Randall-Bold WTP) built in 1992 now provide treated water to approximately 360,000 people in the Central and East County areas. The Randall-Bold WTP is jointly owned with the Diablo Water District (DWD). The Randall-Bold WTP provides treated water to DWD, and by contract, to the Cities of Brentwood and Antioch, Golden State Water Company (Bay Point), and in Central County. The Multi-Purpose Pipeline, constructed in 2003, transports treated water to customers in Central County from the Randall-Bold WTP. CCWD also operates the City of Brentwood Water Treatment Plant for the City of Brentwood.

One example of how natural disasters have impacted CCWD facilities and operations was during the 1989 Loma Prieta earthquake. In 1972 the USBR constructed the Shortcut Pipeline to convey water directly from the Contra Costa Canal in Clyde west to the Martinez Reservoir. Following the 1989 Loma Prieta earthquake a major leak occurred in the Shortcut Pipeline that was suspected due to differential settlement and seismic activity. On several occasions, heavy rains and local flooding have resulted in mudslides into the Contra Costa Canal that have impaired the conveyance of water supplies.

¹ In 1981, "County" was dropped from the name.

The Regional Planning Process

CCWD has participated in various ABAG workshops, conferences, and meetings, including:

- The Water Workshop on March 25, 2009;
- Two meetings of the Lifeline and Hazards Review Committee, on September 2, 2009 and October 7, 2009; and
- The Annex Writing Workshop on August 10, 2010.

For more information on these meetings and for rosters of attendees, please see Appendix A and H in the ABAG Multi-Jurisdictional Local Hazard Mitigation Plan 2010 (MJ-LHMP). In addition, CCWD has provided written and oral comments on the multi-jurisdictional plan and provided information on facilities that are defined as “critical” to ABAG.

The Local Planning Process

The process of preparing this Local Hazard Mitigation Plan Annex (the Annex) is familiar to CCWD. CCWD complies with the requirements of the California Environmental Quality Act (CEQA), which since 1988 has required mitigation for identified natural hazards. CCWD has completed several hazard mitigation studies and projects in recent years.

Review of Existing Plans, Studies and Reports

The following documents were consulted and where applicable, information was incorporated into this Annex.

- ◆ Canal Drainage Study - 1995-1998 (Phase I & 2) (*INFR-d-1, INFR-d-2*)
- ◆ Untreated Water Facility Improvement Plan Update – 2001 (*INFR-b-1, INFR-b-7, INFR-e-1, GOVT-a-7*)
- ◆ Seismic Reliability Improvement Project – 1997 (*INFR-a-1, INFR-b-3, INFR-b-4, GOVT-a-1, GOVT-a-4*)
- ◆ Stormwater Remediation Study - 2006 (*INFR-d-1, INFR-d-2*)
- ◆ Treated Water Master Plan Update – 2007
- ◆ Treated Water Renewal/Replacement Study – 2005 (*GOVT-a-9*)
- ◆ Untreated Water Renewal/ Replacement Study – 2006 (*INFR-a-2, INFR-a-13, INFR-b-5, INFR-e-1, GOVT-a-2, GOVT-a-9*)
- ◆ Water System Vulnerability Assessment – 2003 (*INFR-a-1, INFR-a-6, HEAL-c-4, ECON-j-10, GOVT-a-1*)
- ◆ Water Treatment Plant Master Plan – 2003
- ◆ CCWD is active in research conducted by the American Water Works Association Research Foundation (AWWARF), Sandia National Laboratories, California Space Authority and USEPA (*INFR-a-7, GOVT-b-4, GOVT-c-21*)

Process for Updating Plan

With respect to this Annex, CCWD incorporated input from the Planning, Engineering, Operations and Maintenance, and Construction Departments with a focus on evaluating its existing programs and identifying gaps that may lead to disaster vulnerabilities in order to address these risks through mitigation. The planning group was formed according to CCWD standard procedures for creating project User Groups. Key staff met on several occasions to identify and prioritize mitigation strategies appropriate for CCWD. Planning and Engineering staff developed details for future mitigation actions and priorities and Operations and Maintenance provided input on existing facilities and operations. In addition to the review of existing plans, studies and reports, Planning Department staff reviewed CCWD's general priorities, ongoing mitigation projects, future projects currently in CCWD's Capital Improvement Plan (CIP), and determined appropriate CCWD staff for internal review of the Annex. The Planning Department in collaboration with representatives from the Engineering, Operations and Maintenance, and Construction Departments reviewed the findings from the hazard and risk assessment, reviewed the proposed mitigation activities, built consensus on key projects and their associated preliminary budgets, and defined potential funding sources for mitigation strategies designated as "High" priority.

Public Meetings

CCWD provided the opportunity for the public to comment on the DRAFT mitigation strategies selected by staff at the Board of Director's Operations and Engineering Committee Meeting held on October 22, 2009. The staff report prepared for the October 22, 2009 meeting, the publicly noticed agenda and meeting notes are included as Exhibit B to this Annex.

The DRAFT mitigation strategies were also published on the CCWD website for public viewing from October 28, 2009 to November 9, 2009. A screen shot of the website posting is included as Exhibit B to this Annex. Approximately 10 (ten) visits were recorded to the site.

No public comments were received from either the meeting or the website posting.

Upon approval by FEMA, CCWD's Board of Directors adopted the plan via an official Resolution during a public meeting on May 18, 2011.

Hazards Assessment

The ABAG Multi-Jurisdictional Local Hazard Mitigation Plan, to which this is an Annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). With the exception of tsunamis, these hazards also impact CCWD. Maps of these hazards and risks are shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>.

CCWD examined the hazard exposure of the CCWD service area based on information contained in previous CCWD studies (summarized above) and the general hazard maps developed by ABAG (<http://quake.abag.ca.gov/mitigation/Map%20Plates.pdf>).

Within CCWD's service area, which encompasses most of central and northeastern Contra Costa County and approximately 19,000 acres that comprise the Los Vaqueros watershed, the following findings are made relative to impacts to Infrastructure:

- ◆ **Earthquake faulting** – The Concord/Green Valley and the Greenville faults lie within the CCWD service area. The Concord/Green Valley fault intersects the northern and western portion of CCWD's service area in Concord, Pleasant Hill, Walnut Creek, and Martinez, while the Greenville Fault lies west of Los Vaqueros Reservoir in the eastern portion of the CCWD service area. There are other potential seismic sources such as the Coastal Range Sierra Block Zone, Mt. Diablo thrust, and more distant Calaveras, Hayward, and San Andreas faults.
- ◆ **Earthquake shaking** – The cities of Concord, Martinez, Pleasant Hill, and northeast Walnut Creek would experience very violent to very strong shaking during a magnitude 6.7 earthquake on the Concord/Green Valley fault. The remainder of the CCWD service area would experience very strong (Clayton) to strong/moderate shaking in Antioch and Oakley. During a 6.9 magnitude earthquake on the Greenville Fault, the majority of the CCWD service area, with the exception of the Los Vaqueros Watershed, would experience very strong to strong shaking with moderate shaking in the western portion of the CCWD service area. The Los Vaqueros Watershed would experience violent to very strong shaking during an earthquake of this magnitude on the Greenville Fault.
- ◆ **Earthquake-induced landslides** – The California Geological Survey has not completed mapping of this hazard in Contra Costa County. However, because few areas have been mapped as landslides, this hazard is viewed as similar to that posed by weather-related hazards.
- ◆ **Earthquake liquefaction** – The cities of Concord, Martinez, Pleasant Hill, and northeast Walnut Creek would experience moderate to high liquefaction hazard level during a magnitude 6.7 earthquake on the Concord/Green Valley fault. The remainder of the CCWD service area would experience a moderate (Clayton) to very low liquefaction hazard level in Antioch and Oakley. During a 6.9 magnitude earthquake on the Greenville Fault, the majority of the CCWD service area would experience a moderate (Concord, Pleasant Hill and northeast Walnut Creek) to very low liquefaction hazard level. Localized areas of high liquefaction hazard levels are located along the Pittsburg shoreline and western flank of the Los Vaqueros watershed. The area around Brentwood is at a moderately low liquefaction hazard level for both earthquake scenarios. CCWD has evaluated, or mitigated specific liquefaction threats.
- ◆ **Earthquake Induced Floods** – U.S. Geological Survey and other independent scientific investigations estimate the probability of a significant seismic event that would affect the levees in the Sacramento-San Joaquin Delta at about 2.5% in any year (over 50% in the next 30 years). Such an event is likely to cause a simultaneous

failure of levees on approximately 20 Delta islands. If such an event were to occur during lower flow periods (i.e., any below normal year or any year in the summer or fall), significant salinity intrusion would likely occur in the Delta, rendering the sole water source for CCWD unusable for a significant period.

- ◆ **Tsunamis** – Tsunamis are not a threat to the CCWD service area.
- ◆ **Flooding** – Portions of the CCWD service area lie within the FEMA 100-yr floodplain, but these areas generally are located along the northern most portion of Contra Costa County. In particular, flooding from Mallard Slough, Walnut Creek, Pacheco Creek, and Galindo Creek could cause damage to water transmission lines and impinge on Mallard Reservoir. The Old River and Middle River Pumping Plants, both intakes for the Los Vaqueros Reservoir and the Contra Costa Canal, are protected by levees.
- ◆ **Landslides** – Most of CCWD’s facilities are located in Flatland areas with little to no distribution of landslides or earthflows.
- ◆ **Wildfires** – The wildland urban interface creates fire-threatened communities. In the CCWD Service Area, large portions of land surrounding Martinez, Pleasant Hill, northeastern Walnut Creek, Clayton, Pittsburg, Antioch, Oakley, and Brentwood are considered fire-threatened communities. CCWD is committed to providing an adequate supply of water for fire fighting. Wildfire hazard is a major consideration for making necessary improvements to the reliability of CCWD’s untreated and treated water supplies. CCWD maintains a comprehensive fire prevention program for the Los Vaqueros Watershed, including maintaining firebreaks and conducting controlled burns.
- ◆ **Dam Inundation** - CCWD has prepared Emergency Action Plans (EAPs) for its reservoirs to address two cases: 1) dam failure during the Probable Maximum Flood (PMF) and the 2) sunny day failure to comply with USBR, California Division of Safety of Dams, and OES requirements. The EAPs show the inundation boundaries downstream of the dams for these two conditions. For the USBR-owned dams-- Contra Loma, and Martinez--CCWD has assessed the potential for loss of life. With respect to Los Vaqueros and Mallard reservoirs (the two CCWD-owned facilities), a risk assessment has not been performed.

CCWD has assessed all of the dams for the PMF levels. Since these reservoirs are all off-channel reservoirs, the risk of flooding during the PMF is less than for typical on-stream facilities. With respect to earthquake loading, CCWD dams have all been analyzed for the maximum credible earthquake. CCWD also has instrumentation and monitoring at all reservoirs to monitor the safety of the dams under normal, unusual (flooding), and extreme (earthquake) operating conditions.

- ◆ **Drought** – CCWD’s plans for dealing with drought are documented in the Future Water Supply Study and the Urban Water Management Plan. Both documents are updated by CCWD every 5 years and include an evaluation of water demands, conservation, water shortage contingencies and existing and potential supplies.

- ◆ **Sea Level Rise** – CCWD’s service area is adjacent to the Sacramento-San Joaquin Delta. Shoreline areas vulnerable to sea level rise exist along CCWD’s northern service area boundary starting in Martinez and extending east to Brentwood.

General hazard mapping activities since the first CCWD Annex was prepared in 2005 are less detailed and not as current as those shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>.

Past Occurrences of Disasters (natural and human-induced)

CCWD has experienced a number of different disasters over the last 50 years, including earthquakes, floods, droughts, wildfires, landslides, and severe storms. Significant incidents that have impacted CCWD in the last several years include:

- ◆ **Loma Prieta Earthquake of October 17, 1989** – As a result of the 7.1 magnitude Loma Prieta Earthquake a major leak occurred in the Shortcut Pipeline, a United States Bureau of Reclamation owned facility operated by CCWD, that conveys water from the Contra Costa Canal to the City of Martinez. The leak occurred due to differential settlement and seismic activity. A significant number of other service mains were damaged and required immediate repair.
- ◆ **Winter 1982-83, 1995-1998 Storms** – Heavy rains and flooding during storm events in these periods caused local damage and emergency repairs to facilities including the Contra Costa Canal.
- ◆ **San Joaquin Levee Break (Upper Jones Track) on June 2, 2004** - The island flooding caused salt water from the San Francisco Bay to reach CCWD water supply intakes. CCWD modified its operations to optimize the quality of water provided to customers.

Risk Assessment

CCWD also examined the hazard exposure of infrastructure based on the information on ABAG’s website at <http://quake.abag.ca.gov/mitigation/pickdbh2.html>. Of CCWD’s 103 critical facilities, those located in the CCWD Treated Water Service Area are the most vulnerable, primarily to damage caused by earthquake shaking from the Concord-Green Valley fault; liquefaction from the same fault, and liquefaction from the Greenville fault. The following results do not include impacts to the Contra Costa Canal or CCWD pipelines because ABAG’s hazard exposure model does not include linear facilities. The Canal and key pipelines, however, are crucial to providing water to our customers. As such, mitigation strategies for these linear facilities rank high even though exposure is not explicitly stated in the following analysis.

Exposure of CCWD Owned Buildings and Critical Facilities

CCWD provided a list of the critical facilities it owns to ABAG. ABAG provided a detailed assessment of the hazard exposure of each of its facilities. The following number of facilities is exposed to the various hazards analyzed.

Exposure (number of facilities)		
Hazard	CCWD Owned Critical Facilities	
	Plan Year	Plan Year
	2005	2010
<i>Total Number of Facilities</i>	97	103
Earthquake Shaking (within highest two shaking categories)	22	23
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	11	18
Liquefaction Hazard (within CGS study zone)[1]	threat-unknown	threat-unknown
Earthquake-Induced Landslides (within CGS study zone)[2]	threat-unknown	threat-unknown
Earthquake Faulting (within CGS zone)	2	2
Flooding (within 100 year floodplain)	1	5
Flooding (within 500 year floodplain)	1	1
Landslides (within areas of existing landslides)	63	64
Wildfires (subject to high, very high, or extreme wildfire threat)	21	20
Wildland-Urban Interface Fire Threat	63	71
Dam Inundation	7	7
Sea Level Rise (exposed to 16in sea level rise)[3]	No Data	0
Sea Level Rise (exposed to 55in sea level rise)[4]	No Data	0
Tsunamis[5] (within inundation area)	No Data	0
Drought[6]	No Data	No Data

[1] Liquefaction Hazard data is unavailable for specific facilities in the CCWD service area.

[2] Earthquake-Induced Landslide data is unavailable for specific facilities in the CCWD service area.

[3] Sea level rise data was not available in 2005

[4] Sea level rise data was not available in 2005

[5] Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

[6] Drought will not affect locally owned facilities directly, but CCWD plans for operational impacts caused by drought conditions.

Repetitive Loss Properties

CCWD does not manage flood and stormwater programs. These functions are within the jurisdiction of the Contra Costa County Flood Control and Water Conservation District.

Other risks

CCWD plans to work with ABAG to improve the risk assessment information being compiled by ABAG by providing information on critical infrastructure components with respect to their vulnerability to earthquake-induced landslides and liquefaction as a result of earthquakes on the Concord/Green Valley and Greenville faults. As part of a Seismic Reliability Improvement Project, CCWD reviewed the hazards identified and ranked the hazards based on past disasters and expected future impacts. The conclusion is that earthquakes (particularly shaking) and the potential for earthquake induced landslides (including unstable earth), as well as wildfires pose a significant risk for potential loss.

National Flood Insurance Program

CCWD does not participate in the National Flood Insurance Program. CCWD does not manage flood and stormwater programs. These functions are within the jurisdiction of the Contra Costa County Flood Control and Water Conservation District.

Mitigation Goals and Objectives

The goal of the ABAG MJ-LHMP is to maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters. This goal is unchanged from the 2005 plan and continues to be the goal of CCWD in designing its mitigation program.

A specific mitigation goal for CCWD is to further CCWD's mission to strategically provide a reliable supply of high quality water at the lowest cost possible, in an environmentally responsible manner.

Mitigation Activities and Priorities

Evaluation of Progress from 2005 Plan

In 2005, mitigation actions and priorities were identified. The attached list (Exhibit C) indicates each of the 2005 mitigation projects identified, along with the responsible party, action taken, and current status of progress. CCWD completed four of the five projects identified in 2005 and completed the first phase of construction for the fifth project.

Future Mitigation Actions and Priorities

Various departments within CCWD (Planning, Engineering, and Operations & Maintenance) met to review mitigation activities and priorities. Decisions on prioritizing projects were made based on a variety of criteria, not simply on an economic cost-benefit analysis. The most important criteria was the potential projects' responsiveness to CCWD's mission to strategically provide a reliable supply of high quality water at the lowest cost possible, in an environmentally responsible manner. This Annex will be provided to the CCWD Board of Directors for adoption pending approval of this LHMP by FEMA.

The following priority projects rely on standard methods for addressing seismic vulnerability, with specific attention on CCWD facilities potentially facing the greatest impact from a seismic event on the Concord/Green Valley fault. The Concord/Green Valley Fault generally traverses the CCWD Treated Water Service Area from southeast to northwest and has the potential to cause significant damage including loss of water service, loss of firefighting capability and localized flooding and damage due to uncontrolled water discharge to water infrastructure and to above ground structures from collapse and fire. Additionally, the Contra Costa Canal Replacement project would provide flood control and increase system security. These projects are candidates for Pre-Disaster Mitigation grants based on their impact to improving public health and safety following a seismic disaster. The attached list (Exhibit D) summarizes each of the mitigation projects identified, along with the responsible party, potential funding sources, timeframe and related mitigation strategy number.

1. District Center Seismic Improvements (INFR-a-1)

The purpose of this project is to protect the health and safety of employees and customers and to reduce consumption of energy and associated greenhouse gas emissions. A 2009 seismic assessment of CCWD's District Center facility identified building improvements required to ensure the building performs to a life and safety level during a seismic event.

2. Contra Costa Canal Replacement Project (INFR-a-4)

The existing berms and levees along the Contra Costa Canal are not certified to flood control standards established by the Federal Emergency Management Agency (FEMA). An engineering and geotechnical study completed in 2002 confirmed the vulnerability of the berms and levees to a significant seismic event. The soils along the sides of the Canal were not engineered for flood protection. Development in select locations along the Canal would be vulnerable without sufficient flood protection in the event of elevated water stages in the Delta.

In addition, the historically agricultural land uses adjacent to the Canal are being converted to urban development. The Contra Costa Canal Replacement project is imperative to ensure compatibility with adjacent land uses, and manage and minimize potential risks to CCWD customers and surrounding neighborhoods. There is currently a population of 10,000 in the immediate area that would be affected by failure of the facility. By 2007, ongoing rapid residential development will result in 30,000 residents endangered by this facility including three primary/secondary schools. Failure of this facility would also compromise the water supply for nearly 500,000 people.

The replacement project will remove the potential for flooding. By encasing the Canal in a buried pipeline, virtually all concerns with regard to system security and public safety are alleviated as well. Fences will be maintained along the 300-foot right of way boundary, maintenance roads will be maintained, and security personnel will patrol the area.

3. Shortcut Pipeline Rehabilitation (INFR-b-4)

The Shortcut Pipeline conveys water directly from the Contra Costa Canal in Clyde west to the Martinez Reservoir, providing water service to the City of Martinez and major industrial users, including a major Bay Area refinery. The pipeline traverses an area that in the event of a magnitude 6.7 earthquake on the Concord-Green Valley fault has a high liquefaction hazard level. Following the 1989 Loma Prieta earthquake a major leak occurred in the Shortcut Pipeline that was suspected due to differential settlement and seismic activity. Monitoring of the pipe condition has revealed it is in need of rehabilitation to ensure water conveyance during a seismic event on the Concord-Green Valley fault.

4. Bollman Water Treatment Plant Seismic Improvements (INFR-b-5)

The purpose of the Bollman Water Treatment Plant Seismic Improvements project is to rehabilitate structurally deficient facilities and improve treated water quality at the Bollman Water Treatment Plant (Bollman WTP). The Bollman WTP was constructed in 1968, which included the Clearwell and Sedimentation Basins #1 and #2 as part of the original design. Past seismic evaluations of the Clearwell and Sedimentation Basins performed in the mid-1990s indicated the structural components are potentially inadequate to resist expected lateral forces and render these facilities vulnerable to structural failure during a seismic event. This Project includes seismic retrofit of the Clearwell and Sedimentation Basin #2 to improve plant reliability during a seismic event. The Project also includes safety improvements for confined space access to improve worker safety at the Bollman WTP.

5. Port Chicago Pipeline Phase II (INFR-b-4)

The purpose of this project is to ensure reliable service to the CCWD's existing and future treated water customers by providing a new backbone transmission main recommended in the Seismic Reliability Improvement Project Study and identified in the 2007 Treated Water Master Plan update. The project includes the design and construction of approximately 10,400 feet of 24 to 36 inch diameter pipeline extending from the Port Chicago Phase I pipeline near Willow Pass Road to Cowell Road in Contra Costa County.

6. Randall-Bold WTP Operations and Control Building Seismic Improvements (INFR-a-1)

The Randall-Bold WTP was designed and constructed in the early-1990s. A previous study and a process safety management audit identified potential seismic deficiencies in the Operations Building, Control Building, and High Lift Pump Station Electrical Building, as well as anchorage deficiencies for specific equipment at Randall-Bold WTP. A seismic assessment of these specific Randall-Bold WTP facilities and equipment was performed in FY09, as part of the Seismic Assessment and Improvements Project, which verified several potential structurally deficient components of the building's lateral force resisting system and equipment anchorage.

Structural retrofit of the Randall-Bold WTP Operations and Control Building will include improvements to the roof framing and walls to meet current California Building Code design criteria. Anchorage of critical equipment, including the chemical storage tanks and process PLC cabinets, is required to ensure this equipment remains operational during a seismic event.

This project will ensure public/staff safety during a seismic event and ensure reliable service of the treatment plant equipment.

7. Treated Water Emergency Service Connections (INFR-a-3)

The purpose of this project is to provide enhanced reliability to municipal customers within the CCWD service area, specifically alternative sources of water in the event of a service disruption.

The project includes the design and installation of emergency connections between CCWD and municipal customer distribution systems. The new emergency interconnections would allow the agencies to share water resources in the event of an emergency.

8. New Treated Water Emergency Storage (INFR-c-1)

The purpose of this project is to ensure reliable service to the CCWD's existing and future treated water customers by providing a new water storage facility to alleviate emergency storage and operational deficiencies in Subzone 34, as identified and prioritized in the 2007 Treated Water Master Plan update.

This project consists of the design and construction of a 1.0 million gallon buried concrete reservoir at an undetermined site in Subzone 34 in the Northgate area of Walnut Creek and an interconnection between subzones 34 and 35. The reservoir is sized to mitigate existing storage deficiencies in subzones 34 and 35, and to accommodate future growth.

On-Going Mitigation Strategy Programs

Over time, CCWD is committed to developing better hazard and risk information. To achieve that goal CCWD participates in numerous regional and local programs and cyclically updates internal studies evaluating facility hazard and risk information. This mitigation strategy can be divided into three types of activities: programmatic elements, studies and projects. The programmatic elements are things CCWD has incorporated into its regular procedures. The studies occur more infrequently but provide a detailed evaluation of specific components of the CCWD system with recommendations for improvements. The projects generally result from the study recommendations and improve CCWD's disaster-resistance.

The following list includes some of the programmatic elements, studies and projects that CCWD has developed to create a comprehensive hazard mitigation strategy. It is CCWD's priority to find additional funding to sustain this on-going strategy over time.

The items in this list reference the LHMP strategy number where they can be found in CCWD's strategy spreadsheet.

Programmatic Elements

Emergency Response:

- ◆ California Accidental Release Program (*GOVT-c-21, GOVT-d-7*)
- ◆ CCWD is participating with the County to have a County-wide radio system that will provide inter-operability (*GOVT-c-7, GOVT-c-8*)
- ◆ Drought Management Plan (*INFR-g-3*)
- ◆ Emergency Operations Plan (EOP) (*INFR-a-1, INFR-a-6, INFR-a-21, INFR-b-6, HEAL-a-5, HEAL-c-4, GOVT-a-1, GOVT-a-5, GOVT-b-2, GOVT-c-12*)
- ◆ On-going participation in Bay Area Security Information Collaborative (BASIC) (*INFR-a-3, INFR-a-19, GOVT-a-5*)
- ◆ Quarterly Operational Area meetings at Contra Costa County OES (*INFR-a-3, INFR-a-20, GOVT-c-11*)
- ◆ Receive daily reports from Electronic Disaster Information System (*INFR-a-14*)
- ◆ Semi-annual security audits (*GOVT-a-5*)
- ◆ Spill Prevention Control and Countermeasures Plans and Hazardous Materials Management Plans (WTPs), updated annually (*ECON-h-3, ECON-j-10, ENVI-a-8, ENVI-a-9, ENVI-a-10*)
- ◆ CCWD maintains its own Emergency Operations Center (items required: incident command trailers, emergency water distribution system - large diameter hose; support of deployment equipment) (*GOVT-c-10*)
- ◆ WARN signatory for mutual aid (*INFR-a-19, GOVT-c-13*)

Dam Safety:

- ◆ CA Division of Safety of Dams inspections (*INFR-a-2, INFR-a-13*)
- ◆ CCWD Dam Emergency Action Plans, updated annually (*INFR-a-1, GOVT-a-1, GOVT-a-5, GOVT-b-2, GOVT-c-12*)
- ◆ Standard Operating Procedures for Dams (*INFR-a-2*)
- ◆ USBR: Safety Evaluation of Existing Dams (SEED) (*INFR-a-2*)

Infrastructure Improvements:

- ◆ Annual Building and Facility Improvements (*INFR-b-8, GOVT-a-4, GOVT-a-7, GOVT-a-9, ENVI-a-11*)
- ◆ Los Vaqueros Watershed Improvements Program (*INFR-c-3, INFR-c-8, ENVI-a-4, ENVI-a-12*)
- ◆ Pipeline Renewal and Replacement Program (*INFR-b-3, INFR-b-7, INFR-e-1*)
- ◆ Treated Water Facility Improvement Program (*INFR-b-5, GOVT-a-7*)
- ◆ Treated Water Reservoir Rehabilitation Program (*INFR-b-5, GOVT-a-2*)
- ◆ Treatment Plant Restoration Program (*GOVT-a-7*)
- ◆ CCWD repairs and replacements of maintenance bridges over Contra Costa Canal. No jurisdiction over City, County, or Caltrans-maintained roads in the Service Area (*INFR-b-1*)
- ◆ Los Vaqueros Hydropower Project (*ENVI-b-5*)
- ◆ Mallard and Rock Slough Improvement Projects (*INFR-d-5*)
- ◆ GIS Implementation (*INFR-d-18*)

Operations:

- ◆ Bay Area Water Utilities Operations Collaborative (*GOVT-b-4*)
- ◆ California Health & Safety Code (*ENVI-a-11*)
- ◆ Cooperation and participation with Contra Costa Clean Water Program and Contra Costa Watershed Forum (*INFR-d-15*)
- ◆ Los Vaqueros Standard Operating Plan (*GOVT-c-17, GOVT-c-19*)
- ◆ Model for Inter-Regional Utility Cooperation (*GOVT-b-4*)
- ◆ Stormwater Pollution Prevention Program (*INFR-d-8, ENVI-a-13*)

Incorporation into Existing Planning Mechanisms

CCWD will use proven mechanisms to ensure that the projects and mitigation strategies identified as existing or having relatively high priorities in this Annex are implemented. The primary vehicle for project approval and implementation is CCWD's Capital Improvement Plan (CIP). On an annual basis, the CIP provides a comprehensive review of the asset investments required over a 10-year period to ensure adequate water resources, maintain high quality water, and meet the service needs of present and future customers. Projects designed to protect health and safety are designated as Priority Level 1, "must do" projects, and projects that are already under construction, and those required by legislation, regulation, and contract are also categorized as Priority Level 1. CCWD's efforts result in a series of on-going facility retrofits, improvements, and construction of new projects. For example, all five of the projects identified in the 2005 LHMP Annex (Exhibit C) were detailed in the CIP and successfully implemented within the last five years.

The asset investments are conceived and developed by the CCWD's Planning, Engineering, Construction, Operations and Maintenance, and Watershed and Lands Departments, and consist of both administrative and emergency projects with varying degrees of priority. The asset investments provide the basis for development of CCWD's annual operating budget and are subject to Board approval/resolution. In addition, CCWD may, in the course of reviewing the infrastructure mitigation strategies that have not yet been considered, identify activities with high or very high priorities and may seek funding support for initiation of those activities.

Plan Update Process

Planning Department staff will review the information in this Annex annually, as part of the CIP update process. CCWD is committed to updating the Annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The Planning Department is responsible for updating the information in this Annex and will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, CCWD again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted. Other agencies will then work together to identify another regional forum for developing a multi-jurisdictional plan.

The studies, reports and plans referenced in the process of preparing this Annex were all generated through a public process which solicited public input through the use of User Groups and public meetings. The District's master plans and studies are typically updated on a five-year cycle and contain much of the information that forms the basis of this Annex. The public will continue to be involved whenever the source documents or this Annex is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, CCWD will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics. To increase public participation in developing this Annex in the future, CCWD will consider the use of internet forums to make the public aware of the Annex update.

Mitigation Plan Point of Contact

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Title: Principal Engineer

Mailing Address: P.O. Box H2O, Concord, Ca 94524

Telephone: 925-688-8310

Email: jquimby@ccwater.com

Alternate Point of Contact

Name: Emily Corwin

Title: Assistant Engineer

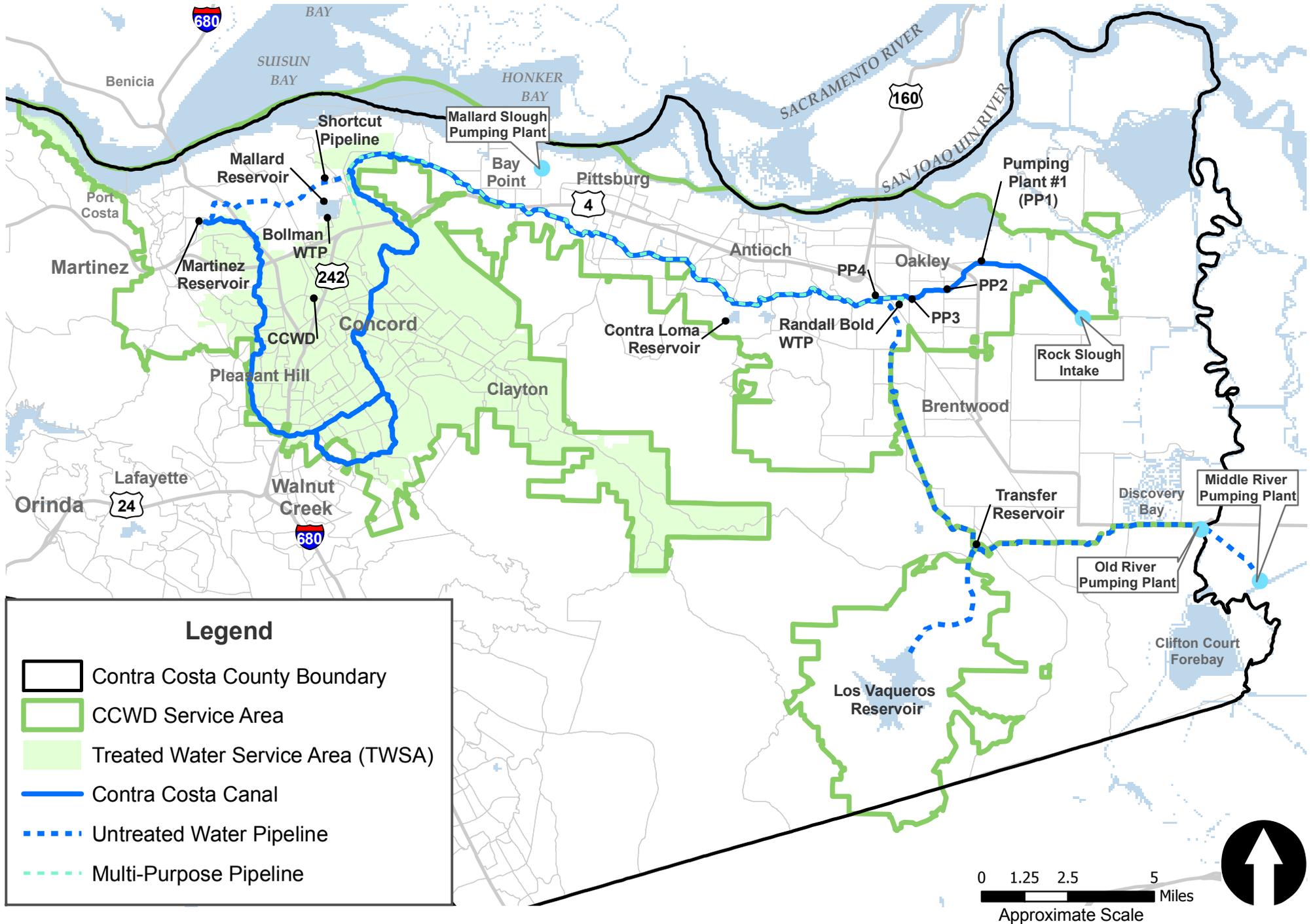
Mailing Address: P.O. Box H2O, Concord, Ca 94524

Telephone: 925-688-8283

Email: ecorwin@ccwater.com

Exhibit A - Jurisdiction Boundary Map

CONTRA COSTA WATER DISTRICT SERVICE AREA MAP



Legend

-  Contra Costa County Boundary
-  CCWD Service Area
-  Treated Water Service Area (TWSA)
-  Contra Costa Canal
-  Untreated Water Pipeline
-  Multi-Purpose Pipeline

0 1.25 2.5 5
Miles
Approximate Scale

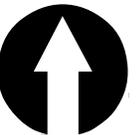


Exhibit B - Public Meeting Announcements

gvr

OPERATIONS AND ENGINEERING COMMITTEE MEETING
OCTOBER 22, 2009 - 8:30 A.M.

CONTRA COSTA WATER DISTRICT
ANTE ROOM
1331 CONCORD AVENUE
CONCORD, CALIFORNIA



AGENDA

- | | |
|---|-------------|
| 1. Local Hazard Mitigation Plan Update | Planning |
| 2. District Solar Power Program Update | Engineering |
| 3. Golf Club Road Bridge Main Relocations | Engineering |
| 4. Six Month Operations & Engineering Committee Policy Calendar | GM |
| 5. Public Comments | |

Proposed dates: November 19, December 10, December 17

Committees of the Board review and study issues that may appear on the Board agenda and may include a recommendation to the Board. The Directors appointed to the Operations & Engineering Committee are Chair President Joseph L. Campbell and Director John Burgh. Please contact the District Secretary at (925) 688-8024 if you would like to discuss any of the items on the agenda with a member of the Committee.

**CONTRA COSTA WATER DISTRICT
Staff Report**

DATE: October 22, 2009
TO: Operations and Engineering Committee
FROM: *for* Walter J. Bishop 
SUBJECT: Local Hazard Mitigation Plan Update

INTRODUCTION

The Contra Costa Water District (CCWD) participated in the 2005 Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area (LHMP). The LHMP included a review of the natural hazards that could potentially impact the Bay Area and identified strategies or actions to mitigate the damage from those events. The planning effort was coordinated through the Association of Bay Area Governments (ABAG) and included other water utilities, cities, and special districts. In addition to facilitating regional emergency preparedness, completion of the LHMP allows CCWD to receive hazard mitigation grant funds from the Federal Emergency Management Agency (FEMA). The LHMP must be updated every five years and an update is currently being prepared. The purpose of this report is to summarize CCWD's hazard planning activities and mitigation strategies that will be covered in the updated plan.

RECOMMENDED ACTION

Receive and comment on the Draft Local Hazard Mitigation Plan Update.

DISCUSSION

The Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area was completed in 2005 and is currently being updated. The plan facilitates regional emergency preparedness and provides the opportunity for participants to receive funding from FEMA for hazard mitigation grant funds. The plan update is being coordinated through ABAG and will include a description of the natural hazards most likely to impact the Bay Area and strategies to mitigate the potential impacts. Earthquakes and related weather hazards have the greatest potential to impact CCWD operations. The hazard mitigation strategies identified by CCWD are based on an evaluation of the water system, potential natural hazards, and findings from various risk assessments and planning documents. CCWD's mitigation strategies were compiled from previous studies and ongoing programs such as the Seismic Reliability Improvement Program, Water System Vulnerability Assessment, Emergency Generator Project, Canal Drainage Study, Untreated Water Facilities Improvement Program, Emergency Operations Plan and Dam Emergency Operations Plans. The findings from these studies will be summarized in the updated plan.

CCWD has evaluated and prioritized projects at the critical facilities in preparing the mitigation strategies. The following six eligible projects would help mitigate the effect of natural disasters and would be submitted for funding as the grants become available:

- District Center Seismic Improvements
- Randall-Bold Seismic Improvements
- Bollman Sedimentation Basin Seismic Improvements
- Contra Costa Canal Replacement Project
- Shortcut Pipeline Rehabilitation
- Port Chicago Pipeline Phase II

In addition to being presented to the O&E Committee, the draft mitigation strategies will be posted on CCWD's website for public comment, as required by FEMA. CCWD's Updated Plan will be finalized by December 2009. The Federal Government typically appropriates \$150 million annually for use throughout the Country, and California has been successful in getting about 5% to 10% of these funds annually. Grant applications are typically due the first week of December.

FISCAL IMPACT

The District's updated plan is being completed by CCWD staff and was included in the Planning Department's adopted FY10 operating budget. The 2010-2019 Capital Improvement Program and Financial Plan includes the projects that will be eligible for grant funding under this program. The receipt of federal grants could offset capital project costs that would otherwise be funded by rate revenue.

**REPORT OF THE
OPERATIONS AND ENGINEERING COMMITTEE MEETING
October 22, 2009**

Attendees:

Directors: Joseph L. Campbell, President and Chair, and Director John Burgh

Staff: Walter Bishop, Steve Welch, Desiree Castello, Rachel Lenci, Jeff Quimby, Scott Weddle, James Larot and Goolu Lashkari

1. Local Hazard Mitigation Plan Update

The Contra Costa Water District (CCWD) participated in the 2005 Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) for the San Francisco Bay Area. The planning effort was coordinated through the Association of Bay Area Governments (ABAG) and included other water utilities, cities, and special districts. In addition to facilitating regional emergency preparedness, completion of the LHMP allows CCWD to receive hazard mitigation grant funds from the Federal Emergency Management Agency (FEMA). The LHMP must be updated every five years and an update is currently being prepared. The plan update is being coordinated through ABAG and will include a description of the natural hazards most likely to impact the Bay Area and strategies to mitigate the potential impacts. Earthquakes and related weather hazards have the greatest potential to impact CCWD operations. The hazard mitigation strategies identified by CCWD are based on an evaluation of the water system, potential natural hazards, and findings from various risk assessments and planning documents. CCWD's mitigation strategies were compiled from previous studies and ongoing programs such as the Seismic Reliability Improvement Program, Canal Drainage Study, Untreated Water Facilities Improvement Program, and Treated Water Master Plan. Staff reviewed CCWD's mitigation strategies and high priority projects with the O&E Committee. The strategies and high priority projects will be included in the Multi-Jurisdictional LHMP.

2. District Solar Power Program Update

The District is continuing to strengthen its commitment to environmental stewardship and reducing its vulnerability to increasing energy costs by installing new solar energy facilities at the Bailey, Lime Ridge and San Miguel Pump Stations. All are located in the City of Concord. The solar facilities will be designed, constructed, and maintained under a power purchase agreement with a solar firm named Solar Power Partners. Combined with the District's solar facility at Ygnacio Pump Station completed in 2008, the District will generate over 850 kilowatts of solar energy, making the District one of the largest solar power generators in Contra Costa County. The District will obtain renewable energy credits for the solar facilities which can be used for future District projects as needed. In addition to renewable energy credits, the District will also save over 15 percent in energy costs compared to PG&E rates. Design and permitting for the facilities is under way, and construction is expected to start in April 2010 and be completed by July 2010.

3. Golf Club Road Bridge Main Relocations

The City of Pleasant Hill (City) will replace its seismically unstable bridge on Golf Club Road over Grayson Creek in the summer of 2011. Construction of the new bridge will require the relocation of the District's 24-inch transmission main and 8-inch distribution main. Before construction of the new bridge, the 24-inch steel pipeline will be relocated to the south of the bridge, under the creek, inside a 36-inch steel casing during the summer of 2010. This new pipeline alignment will be within a new permanent easement that will be provided by the City. The City will pay for all relocation costs. The District will also install valves on the 8-inch pipeline to isolate the portion at the existing bridge by March 2010. After completion of bridge construction, the 8-inch pipeline will be reconstructed within a steel sleeve in the bridge roadway deck. The 8-inch pipeline located within the public right-of-way will be relocated by the District. The agreement between the District and the City for the 24-inch pipeline relocation is scheduled for Board approval in December 2009, with award of the construction contract anticipated in May 2010.

4. Six Month Operations and Engineering Committee Policy Calendar

The six-month policy calendar for the O&E Committee was reviewed.

5. Public Comments

None

6. Schedule Next Meeting/Adjournment

The next two meetings of the O&E Committee were scheduled for November 19, 2009 and December 17, 2009 at 8:30 a.m. Both meetings will be held in the District Center Ante Room.

Frequently Asked Questions

[Water Quality Data](#)
[Recent Results](#)
[Definitions](#)

[Alternative Intake Project Begins Construction - Most Significant Delta Water Quality Project in a Decade](#)

[Meet Your Water Purveyor](#)
[Safe Drinking Water Guidelines](#)

[Where Your Water Comes From](#)
[Water Quality Notifications](#)

[How to Get Involved](#)

Water Quality

CCWD Participating in Bay Area Hazard Mitigation Plan District accepting comments through Nov. 6

CCWD is participating in the development of the Bay Area Multi-Jurisdictional Local Hazard Mitigation Plan, an effort sponsored by the Association of Bay Area Governments (ABAG).

CCWD has identified numerous strategies to respond to hazards potentially impacting the District. [These strategies are identified in the attached spreadsheet.](#)

The District will be accepting comments on the Mitigation Strategies through November 6, 2009.

Questions or comments?

Please contact:
Emily Corwin
Junior Engineer
Contra Costa Water District
925-688-8283

ecorwin@ccwater.com

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Exhibit C - Status of Mitigation Projects and Strategies

STATUS OF MITIGATION PROJECTS AND STRATEGIES

Exhibit C to 2010 Contra Costa Water District (CCWD) Annex

No.	Mitigation Project	2010 MJ-LHMP Strategy Number	Responsible Agency	Action Taken	Status	Comments
1	Seminary and San Miguel Pump Station Generators	INFR-a-8	CCWD	Installed 300 kW generators at the San Miguel and Seminary Pump Stations.	Completed	The San Miguel Emergency Generator installation was completed in 2007 and the Seminary installation was completed in 2010.
2	O&M/Administration Buildings Emergency Generator	INFR-a-11	CCWD	In FY 09 purchased and installed a 750 kW generator, with accompanying infrastructure, to serve the O&M and Administration buildings.	Completed	
3	TWRI - Fault Crossing Project	INFR-a-4	CCWD	Project completed in FY 08	Completed	
4	Midhill Reservoir II Project	INFR-a-4	CCWD	Project completed in Fy 09	Completed	
5	Contra Costa Canal Replacement	INFR-a-4	CCWD	Approximately 1,900 feet of the 4 mile project length was completed in 2010.	In Progress (First phase completed)	CCWD continues to seek funding to implement the remainder of the mitigation project.

Exhibit D - 2010 Mitigation Projects

2010 MITIGATION PROJECTS

Exhibit D to 2010 Contra Costa Water District Annex

No.	Mitigation Project	2010 MJ-LHMP Strategy Number	Applies to New or Existing Assets	Hazard Mitigated	Responsible Agency	Implementation	Estimated Cost	Anticipated Funding Source	Anticipated Schedule
1	District Center Seismic Improvements	INFR-a-1	Existing	Earthquake	CCWD	A 2009 seismic assessment identified building improvements required to ensure the building performs to a life and safety level during a seismic event.	\$1.9M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	Project planning is in progress. Design expected in 2012 and construction complete by 2015, pending funding availability.
2	Contra Costa Canal Replacement Project	INFR-a-4, INFR-d-5, GOVT-a-2	Existing	Multi-Hazard	CCWD	A portion of the canal replacement project was completed in 2009. CCWD is currently pursuing outside funding for remaining phases.	2010-2017, est. \$81.7M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	Implementation will begin as soon as funding is awarded.
3	Shortcut Pipeline Rehabilitation	INFR-b-4	Existing	Earthquake	CCWD and USBR	Initial phases of the project will focus on valves in need of replacement and repair.	\$10.5M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	Project planning is in progress and implementation will continue in phases, with completion expected in 2017.
4	Bollman Water Treatment Plant Seismic Improvements	INFR-b-5	Existing	Earthquake	CCWD	Initial phases will focus on seismic improvements to the sedimentation basins and clearwell.	\$1.3M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	Fiscal Year (FY) 11 / FY 12
5	Port Chicago Pipeline Phase II	INFR-b-4	New	Earthquake	CCWD	Project identified in the Seismic Reliability Improvement Project and 2007 Treated Water Master Plan Update.	\$8.5M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	FY 19
6	Randall-Bold Seismic Improvements	INFR-a-1	Existing	Earthquake	CCWD	Seismic improvements identified in a 2009 Seismic Assessment.	\$1.5M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	FY 11 / FY 12
7	Treated Water Emergency Service Connections (CIP pg VII-33)	INFR-a-3	Existing	Earthquake, Life Safety, Wildfire, Flooding, Drought	CCWD	Project implementation will enhance system reliability for municipal customers.	\$0.5M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	FY 13 / FY 14
8	Treated Water Emergency Storage - 34 Reservoir	INFR-c-1	New	Wildfires	CCWD	Identified and prioritized in the 2007 Treated Water Master Plan Update.	\$5.1M	FEMA (e.g. Pre-Mitigation Grant), USACE, Proposition 50 or 84, Rate Payers	FY 20 / FY 21