

The October 2006 earthquake caused extensive damage to the Department of Water Supply's water systems in North and South Kona, North and South Kohala, Hamakua, and North Hilo. Types of earthquake damage include pipe breaks and structural damage to facilities like Waimea Water Treatment Plant, storage tanks, and Waikoloa Reservoir Numbers 1 and 2. Most of the earthquake impact repair projects are underway, and in some cases, complete. The current status of repairs are summarized in the table below for your information.

The majority of these projects are eligible for Federal Emergency Management Agency (FEMA) reimbursement. The reimbursement process lengthens repair project timelines, however, FEMA support can enhance repair design and implementation, and may cover significant portions of total cost (up to 75%). It is important to note the cost estimates are based on the repair scope of work initially determined by FEMA Project Criteria for each Project. The actual costs may be higher when designs are complete and contractors' bids are received. Amounts marked by the asterisk (\*) are the actual costs and not estimates.

For further information, please contact Public Information and Education Specialist Kanani Aton at 961-8050, extension 204.

Project #	District Name	Location	Damage Description	Repair Description	DWS Cost Estimate	Project Status
DWS-1	South Kohala	Waikoloa Reservoir No. 2 (50 MG)	Cracks in internal slope, seepage and boils at external embankment slope.	Install a new geosynthetic liner on internal slope, upgrades to the external embankment slope.	\$1,859,046.00*	Under construction. Scheduled completion date: 11/9/09.
DWS-1A	South Kohala	Waikoloa Reservoir Nos. 1 & 2	Non-destructive void investigation.	N/A	\$19,986.00	Investigation complete.
DWS-2	South Kohala	Waikoloa Reservoir No. 1 (50 MG)	Cracks in internal slope, seepage and boils at external embankment slope.	Repair of cracks on internal slope, upgrades to the external embankment slope.	\$8,650.00	Design and repair to begin after construction completion of Reservoir #2.
DWS-4	South Kona	Waipunaula Steel Tank (0.25 MG)	Leakage at base weld and bulging of lower tank wall a.k.a. "elephants foot."	Reinforcement of steel tank with composite wrap for failure mitigation.	\$62,895.00*	Repair complete.
DWS-5A	South Kohala	Water Treatment Plant Clearwater Reservoir (4.0 MG)	Roof moved/cracked; separation from pavement; hairline cracks on tank wall 1/3 way around. Cracks and leakage through interior wall joints.	Removed and repaired piping, added straps to secure piping to roof. Divers patched internal wall cracks to stop leakage.	\$116,888.00	Repair complete.
DWS-6	North Kohala	Kynnersley Steel Tank (0.1 MG)	Leakage through welds at tank base and wall.	Welded panels on tank to stop leakage. (temporary repair)	\$8,477.00	Temporary repair complete. Tank scheduled for replacement.
DWS-8	North Kohala	Makapala Concrete Tank (0.05 MG)	Entire tank shifted 2" on foundation, roof shifted 3/4" relative to tank wall; leakage at base seal. Pipe, waterline, and airvalve damaged downstream of Makapala Tank.	Drained tank and patched interior seal with quickset cement material.	\$2,315.00	Temporary repair complete. Tank scheduled for replacement.
DWS-9	North Kohala	Makapala Concrete Tank (0.05 MG)	See DWS-8 description above.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$174,981.00	Project under design to repair existing tank. See tentative schedule below.
DWS-10	North Kohala	Medeiros Concrete Tank (0.025 MG)	Slight shift of entire tank on foundation; leakage at base seal all around tank.	Seal leaks from exterior with epoxy/foam injection. Construct concrete collar around tank base for seismic resistance.	\$36,196.00	Project under design. See tentative construction schedule below.

Project #	District Name	Location	Damage Description	Repair Description	DWS Cost Estimate	Status
DWS-11	South Kohala	Kanehoa Tank (0.1 MG)	Damage: Slight shift of tank roof, leakage through wall and base seal.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$164,601.00	Project under design. See tentative construction schedule below.
DWS-12	South Kohala	Hunts Tank - Mauna Kea Beach Hotel (0.3 MG)	Tank roof shifted relative to tank walls.	Install seal at roof-to-wall connection.	\$14,283.00	Project under design. See tentative construction schedule below.
DWS-13	South Kohala	Mauna Kea Uplands Tank (0.5 MG)	Leakage through base seal, spalling of plaster coating, hairline cracks all-around, entire tank shifted apprx. 1".	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$382,730.00*	Under construction. Estimated completion date: 2/15/2010.
DWS-14	South Kohala	Mud Lane Tank (0.02 MG)	Leakage through base seal. Settling of soil caused tank to tilt.	Attached guy wires to tank wall and anchor to ground around tank.	\$100,000.00	Project under design. See tentative construction schedule below.
DWS-15	South Kohala	South Kohala Resort Tank (0.5 MG)	Leakage through base seal of tank. Small hairline cracks all around tank wall.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$560,250.00*	Under construction. Scheduled completion date: 2/15/2010.
DWS-16	South Kohala	Lalamilo 610' Tank (1.0 MG)	Leakage through base seal of tank. Hairline cracks at footing.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$497,390.00*	Under construction. Scheduled completion date: 2/15/2010.
DWS-17	South Kohala	Puu Nani Tank (0.1 MG)	Leakage through base seal of tank.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$185,940.00	Under construction. Scheduled completion date: 2/15/2010.
DWS-18	North Kona	Kona Acres #1 Tank (0.1 MG)	Leakage through base seal and walls and vertical hairline cracks.	Drain tank (provide temporary bypass) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$281,673.00*	Under construction. Scheduled completion date: 3/9/2010.
DWS-19	North Kona	Kona Acres #2 Tank (0.1 MG)	Leakage through base seal and walls and vertical hairline cracks.	Drain tank (provide temporary bypass) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$282,095.00*	Under construction. Scheduled completion date: 3/9/2010.
DWS-20	North Kona	Puukala Tank (0.3 MG)	Leakage through base seal and vertical hairline cracks.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$480,166.00*	Under construction. Scheduled completion date: 3/9/2010.

DWS-21A	North Kona	Kailua View Tank (0.1 MG)	Water flowing through base seal, one leak worsened 3 weeks after earthquake, blisters on wall, cracking at panel seams, vertical hairline cracks.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$263,839.00*	Under construction. Scheduled completion date: 2/15/2010.
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Project #	District Name	Location	Damage Description	Repair Description	DWS Cost Estimate	Status
DWS-21B	North Kona	Pines Offsite Tank (0.1 MG)	Leakage through base seal and vertical hairline cracks.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$362,541.00*	Under construction. Scheduled completion date: 2/15/2010.
DWS-22	Hamakua	Paauilo Camp Tank (0.1 MG)	Leakage through base seal approx. 50% around perimeter	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$179,246.00	Project under design. See tentative construction schedule below.
DWS-53	North Kona	Kaloko Mauka #4 Tank (0.1 MG)	Leakage through base seal.	Drain tank (provide temporary storage) and replace interior base seal. Construct concrete collar around tank base for seismic resistance.	\$204,026.00*	Under construction. Scheduled completion date: 3/9/2010.
DWS-54	North Kona	Kaloko Station Tank (0.3 MG)	Leakage through base seal.	Seal leaks from exterior with epoxy/foam injection. Construct concrete collar around tank base for seismic resistance.	\$275,135.00*	Under construction. Scheduled completion date: 3/9/2010.
DWS-58	Hamakua	Kapulena Tank (0.05 MG)	Leakage through base seal.	Seal leaks from exterior with epoxy/foam injection. Construct concrete collar around tank base for seismic resistance.	\$63,733.00	Project under design. See tentative construction schedule below.
DWS-59	North Kohala	Hawi Tank (0.3 MG)	Leakage through base seal.	Seal leaks from exterior with epoxy/foam injection. Construct concrete collar around tank base for seismic resistance.	\$98,559.00	Project under design. See tentative construction schedule below.
DWS-60	Hamakua	Honokaa Camp 10 (0.02 MG)	Leakage through base seal.	Seal leaks from exterior with epoxy/foam injection. Construct concrete collar around tank base for seismic resistance.	\$45,378.00	Project under design. See tentative construction schedule below.
DWS-61	South Kohala	Lalamilo 319 Tank (1.0 MG)	Leakage through base seal.	Seal leaks from exterior with epoxy/foam injection. Construct concrete collar around tank base for seismic resistance.	\$378,865.00*	Under construction. Estimated completion date: 2/15/2010.

\* Actual cost or bid price



	2008				2009												2010									
	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10
WAIKOLOA RESERVOIR #2 REPAIRS (PW #638)	Finalize design documents and bid award process																									
					Construction																					
	Design Complete: 9/15/2008 Out to Bid: 11/13/2008 Contract Award: 11/25/2008 Pre-Con meeting: 1/15/2009																Final Inspection and Project Closeout									
WAIKOLOA RESERVOIR #1 REPAIRS (PW #8)																	Inspection, Design, & Bid Award									
																	Construction									
MISCELLANEOUS STRUCTURAL REPAIRS (PW #85, 105, 330, 345, 573)	Finalize design documents																									
																	Bidding and Contract Award									
	Design Complete: 9/15/2009 Out to Bid: 10/15/2009 Contract Award: 11/15/2009 Pre-Con meeting: 12/15/2009																Construction of Water Treatment Plant Projects (PW #330, 573)									
																	Construction of Palisades Rock Wall (PW #85)									
																Construction of Pines Offsite Drywell (PW #105)										