

Supporting Information File

Two Weeks After the 2023 Maui Wildfires: Drinking Water Experiences and Needs

Andrew J. Whelton^{*1}, *Paula D. Coelho*², *Christopher Shuler*³, *Aurora Kagawa-Viviani*⁴, *Kellie D.P. Cole*⁵, *Stefanie Surdyka*⁷, *Stephanie Heffner*⁷

1. Andrew J. Whelton, Ph.D., Lyles School of Civil Engineering, Division of Environmental and Ecological Engineering, Center for Plumbing Safety, Purdue University, West Lafayette, Indiana, USA, awhelton@purdue.edu

2. Paula D. Coelho, Division of Environmental and Ecological Engineering, Purdue University, West Lafayette, Indiana, USA, coelho1@purdue.edu

3. Christopher Shuler, Water Resources Research Center and Hawai'i Sea Grant College Program University of Hawai'i at Mānoa, Honolulu, Hawai'i, USA, cshuler@hawaii.edu

4. Aurora Kagawa-Viviani, Water Resources Research Center and Department of Geography and Environment, University of Hawai'i at Mānoa, Honolulu, Hawai'i, USA, kagawa@hawaii.edu

5. Kellie D.P. Cole, Water Resources Research Center and Sustainability Science Management Program, University of Hawai'i Maui College, Hawai'i, USA; kpenman@hawaii.edu

6. Stefanie Surdyka, Davidson School of Chemical Engineering, Purdue University, West Lafayette, Indiana, USA, ssurdyka@purdue.edu

7. Stephanie Heffner, Division of Environmental and Ecological Engineering, Purdue University, West Lafayette, Indiana, USA, sheffne@purdue.edu

(*) Corresponding author: Andrew J. Whelton, Ph.D., Lyles School of Civil Engineering, Division of Environmental and Ecological Engineering, Center for Plumbing Safety, Purdue University, West Lafayette, Indiana, USA, awhelton@purdue.edu

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SI-1. Event Timeline

Time stamps provided where available. References included at the end of the document.

August 2, 2023

Hurricane Dora named by the U.S., National Hurricane Center ¹

August 6, 2023

Red flag warning issued by the Maui Environmental Management Agency (MEMA) and the Hawai'i Emergency Management Agency (HI EMA) ²

August 7, 2023

15:42 High Wind Warning Downslope Leeward issued by the MEMA ³

21:00 (Maui News) County officials meet and partially activate the Emergency Operations Center in Wailuku, two MEMA staff stay overnight ⁴

18:45 (Maui Electric) Moloka'i power outage due to downed power lines from high wind⁵

22:47 The Olinda Fire began at the Bird Conservation Center according to security footage from the Maui Bird Conservation Center ⁶

22:47 Fire first reported in Olinda, named the Olinda Fire ⁷

22:52 The Hawai'i Electric Company (HECO) received a first call of an outage in Olinda and dispatched a troubleman ⁸

August 8, 2023

00:22 Evacuations begin Olinda ⁹

00:26 Tree blocking roadway seen at 10400 Haleakalā Highway ¹⁰

03:05 Officer injured in response to Olinda Fire, transported to hospital ¹¹

03:45 An evacuation order was issued for the Makawao Auli'i Drive area in response to the Olinda Fire ¹²

04:19 An evacuation order was issued for the Kula 200 area in response to the Olinda Fire¹³

04:50 Hanamu Road in Makawao is evacuated in response to the Olinda Fire ¹⁴

05:00 West Maui transmission line tripped offline automatically, requiring manual activation per Reclose Blocking Procedure in Lahaina ¹⁵

05:00 Multiple utility poles down on Honoapiilani Highway between Keawe and Kenui St. in Lahaina ¹⁶

05:32 An evacuation order is issued for multiple streets near Kula's King Kekaulike High School in response to the Olinda Fire ¹⁷

05:15 Power outages from Lahaina to Napili, Olinda to Pi'iholo, and Kamehameha Highway Moloka'i are reported ¹⁸

06:20 Power is restored to Lahaina ¹⁹

06:21 Police evacuate 13000 block of Haleakalā Highway ²⁰

06:30 Maui Mayor Bissen arrives at the Emergency Operations Center in Wailuku ²¹

06:37 Fire first reported in Lahaina on Lahainaluna Road, named the Lahaina Fire²²

06:39 West Maui transmission line tripped offline automatically according to HECO, requiring manual activation per Reclose Blocking Procedure ²³

08:17 Maui Fire Department reporting pole #843 down on Makanoe Place. There is room to drive around. Requesting lines to be de-energized ²⁴

09:00 The Lahaina Fire is reported to be 100% contained according to Maui County ²⁵

09:00 Winds began increasing in Kula according to resident reports ²⁶

09:25 The HECO attempts to restore power to several thousand customers in West Maui and Upcountry ²⁷

09:45 The HECO addressing three main transmission lines down in Lahaina ²⁸

09:45 The HECO responds to downed powerlines in Olinda to Pi'iholo and first outages are reported in Kula ²⁹

10:00 Powerline arcing witnessed above Kula Lodge in Kula, by residents near Highway 377 ³⁰

11:00 The MEMA announces the road closure on Lahainaluna Rd from Kelawea Street to Kuialua Street ³¹

11:15 Fire first reported in Kula by residents, named the Kula Fire: Single powerful gust that knocked down trees in several areas including the Eucalyptus that landed on the powerline which shot sparks mauka (uphill) into Kulalani Gulch starting Kula fire, neighbors called fire department and began hosing down gulch. Approximately happening near 15400 Haleakalā Highway, Kula. ³²

11:27 The fire department responds to Kulalani Gulch Kualono Place according to Maui County. The fire behaves erratically from the storm, not supposed to move downhill, wind intensity, not many timestamps due to chaotic situation ³³

11:45 Firefighters tell the Ainakula neighborhood to stand by for evacuation orders ³⁴

11:36 Engine 14 unable to get through due to downed power lines ³⁵

12:27 High wind and fire alerts are issued by the U.S. National Weather Service ³⁶

13:00 Lahaina power poles sway in the wind as shown by a resident of Lahaina town's video ³⁷

13:19 According to the MEMA, Lahainaluna Road is reopened, and the following road closures were in place: Honoapiilani St from Front St. to Hokiokio, Wahee from Dickenson to Lahainaluna, Road Partially closed and blocked off from Honoapiilani / Keawe. Right hand turn lane from Honoapiilani to Keawe blocked with cones ³⁸

13:37 According to the MEMA, shelters open at Hannibal Tavares and Lahaina Civic Center for displaced residents ³⁹

14:34 According to the MEMA, structural damage self-reporting begins for Maui County
According to the MEMA, Pi'iholo and Olinda Road are evacuated in response to the Olinda Fire ⁴⁰

14:50 An officer observed multiple utility poles breaking at their base and falling into the highway, obstructing multiple lanes.⁴¹

14:55 Fire reported on Lahainaluna Rd. to the Maui Police Department ⁴²

15:52 Pi'iholo and Olinda Road are evacuated in response to the Olinda Fire ⁴³

15:27 According to the HI Department of Transportation (DOT), Haleakalā Highway is closed between Kulalani Dr. and Kualono Pl. in Kula due to a brush fire ⁴⁴

15:30 The brushfire that was contained in Lahaina reignites, and the Lahaina Fire begins ⁴⁵

15:30 According to Maui County, a shelter in place advisory, evacuation, and road closure are issued ⁴⁶

15:40 According to the MEMA, a High Wind Warning is issued with localized gusts over 65 miles per hour ⁴⁷

15:43 Acting governor, Lt. Gov Sylvia Luke, issues an emergency proclamation to activate assistance from State National Guard ⁴⁸

15:55 The HECO activates their incident management team ⁴⁹

15:56 The HECO acknowledges 600 upcountry customers are without 30 spans of power lines⁵⁰

15:56 The HECO reports that 12,400 customers are off line and there are more than 30 downed poles on the west side of Maui ⁵¹

16:17 The MEMA orders an evacuation for Kulalani Circle and Kulalani Drive, Kula ⁵²

16:26 The MEMA orders an evacuation for the Lahaina Kelaweia Mauka subdivision, Lahaina⁵³

17:05 The MEMA announces that the Hokiokio powerlines in Lahaina are cleared and opened to the bypass to let cars out of Lahaina ⁵⁴

17:06 There is a road closure of Lahaina Bypass, Kahakuloa is now restricted to Kahakuloa residents only ⁵⁵

17:33 Lahaina residents jumped into ocean water as flames approached Front Street according to resident reports ⁵⁶

17:59 Pūlehu Fire begins on Pūlehu Rd heading toward Kīhei ⁵⁷

20:00 Maui County Mayor Bissen signs an emergency proclamation ⁵⁸

20:00 Residents on Olinda Road, Olinda are trapped by fallen trees, fire approaching and burning homes, then winds switch direction, sparing people and homes according to resident reports.⁵⁹

20:00 Water is seen pouring out of burned structures in Kula according to Maui Fire Department ⁶⁰

21:19 According to the MEMA, no power is at shelters Hannibal Tavares and Kīhei Community Center in Makawao and Kīhei ⁶¹

21:26 Police evacuate residents on Kaiwahine Street ⁶²

21:29 Kīhei officers escort buses to and from Coast Guard Station Maui with ocean evacuees ⁶³

21:30 Police evacuate the Kula Lodge area ⁶⁴

21:30 According to the HI DOT, state routes closed in Lahaina, Kīhei , and Makawao ⁶⁵

21:45 Water buffaloes are placed at Kula Fire Station, Kula Community Center, Rice Park, and Crater Road – Hydrant 373 ⁶⁶

22:00 Water loss from damaged and destroyed buildings is observed in Kula by residents⁶⁷

22:06 According to the MEMA, a shelter is opened at Maui High School ⁶⁸

23:19 Police coordinating with Kaanapali hotels and preparing for possible mass evacuations ⁶⁹

23:51 According to the MEMA, a shelter is opened at Maui Prep Academy ⁷⁰

22:30 Water loss is observed in Lahaina by firefighters trying to fight fires due to power outages pumping water into the system and water leaking out of burned pipes ⁷¹

22:30 An evacuation order is issued to Ainakula according to residents ⁷²

The acting Governor issues an emergency proclamation about Hurricane Dora ⁷³

The Hawaiian Tourism Authority asks all visitors to leave Maui ⁷⁴

August 9, 2023

According to Maui County, 911 service in West Maui is not available ⁷⁵

00:20 According to the MEMA, an evacuation order is issued mauka (uphill) of Pi'ilani Highway up to Maui Meadows, Kīhei ⁷⁶

00:23 According to the MEMA, an evacuation order is issued for Upper Kimo Road in Kula ⁷⁷

00:44 According to the MEMA, the Kīhei Community Center shelter in Kīhei is closed as a precautionary measure. Inhabitants are are relocated ⁷⁸

01:01 In Kula, winds slowed according to security camera footage. This allows the fire department to contain the Kula Fire ⁷⁹

01:44 According to the MEMA, an evacuation order is issued for Ka'anapali Golf Estates including Kaulapa Loop, Pu'u Anoano St, Hakui Loop, and Wekio Place ⁸⁰

02:31 According to the MEMA, extensive road closures are in place ⁸¹

03:16 A Red Flag Warning is issued by the MEMA ⁸²

03:23 The Red Flag Warning is downgraded to a Wind Advisory by the MEMA ⁸³

03:24 Police are still evacuating individuals from burn areas ⁸⁴

08:00 First fatality located and confirmed by the Maui Police Department ⁸⁵

12:40 In response to the Pūlehu Fire, an evacuation is ordered for Holopuni, Pūlehu , Lipoa to Maui Meadows and Ohukai subdivision in Kīhei ⁸⁶

14:36 Hawai'i Telcom announces they have communication loss in Maui County ⁸⁷

04:39 According to the HI DOT, approximately 1,800 people sheltered in place overnight at the Kahului Airport (OGG) with state highways still closed in some areas ⁸⁸

The Governor extends the state of emergency to all counties and air travel to Maui is discouraged ⁸⁹

In Kula, community members unearth red hot stones that cause hotspot ignition from underground according to resident reports ⁹⁰

According to the Maui County Fire Department in Kula, hotspots remain underground with occasional flareups requiring community monitoring vegetation burning underground smoldering over 100 good intent calls during smoldering period to present and 72 burning calls ⁹¹

According to resident reports, water pressure returns to some parts of Kula. Residents heard power outage and pumps outages occurred as well as depressurization from burnt lines. Unclear when water was restored and how. ⁹²

August 10, 2023

The Maui Mayor makes televised address to the communities impacted ⁹³

11:56 According to the MEMA, a Family Assistance Center is opened in Kahului to help those search for missing persons impacted by the fires ⁹⁴

President Biden issues a federal disaster declaration ⁹⁵

An inter-island flotilla of boats delivers supplies to Lahaina because the roadway access to West Maui is limited ⁹⁶

For hygiene and hydration purposes, some Kula community members bathe in and drink yellow drinking water according to Kula residents ⁹⁷

August 11, 2023

According to the HI Department of Land and Natural Resources, the Olinda Fire is 85% contained ⁹⁸

Unsafe Water Alerts (USW) are issued by the Maui County Department of Water Supply for the Upper Kula and Lahaina Public Water Systems and are posted on the MauiCounty.gov website ⁹⁹

13:17 Maui County announces deployment of their CERT (Community Emergency Response Team) ¹⁰⁰

According to the HI Department of Health (DOH), the FEMA assigns the U.S. EPA with the mission assignment to survey, remove, and dispose of hazardous materials on properties affected by the wildfires in Maui. This mission assignment is referred to as Phase 1. ¹⁰¹

August 13, 2023

New maps of Unsafe Water Advisories are created and posted by Maui County Department of Water Supply on the MauiCounty.gov website ¹⁰²

A national news report about the lack of water and dry fire hydrants for fire-fighting in Lahaina during the emergency response. Homeowners forced to fight fires with pools, hoses, and buckets ¹⁰³

The Kula Fire (also reported as the Upcountry Fire) is 60% contained ¹⁰⁴

More than 46,000 tourists left the island since the event ¹⁰⁵

August 14, 2023

The Maui Police Department suspend the placard program for West Maui travel ¹⁰⁶

According to the HI DOH, the FIRST DRINKING WATER SAMPLES ARE COLLECTED: Maui Department of Water Supply collects the first drinking water samples from their Upper Kula and Lahaina Public Water Systems ¹⁰⁷

Search and rescue continues for survivors of the Lahaina Fire ¹⁰⁸

August 15, 2023

According to the HI DOH, the FIRST DRINKING WATER SAMPLES ARE ANALYZED: Hawai'i DOH chemically analyzed drinking water samples from Maui County and obtained chemical results ¹⁰⁹

Maui County reports the containment status of the multiple fires:

Kula Fire, 75% contained, 678 acres with hotspots in gulches;

Lahaina Fire, 85% contained 2170 acres with no active threats;

Pūlehu /Kīhei Fire, 100% contained with no active threats;

Pu'ukoli'i/Ka'anapali Fire, extinguished 8/12 and remains extinguished. ¹¹⁰

According to Maui County, the road opens to Lahaina for the first time since the fire ¹¹¹

According to Maui County, the first confirmed victims of the wildfires are announced ¹¹²

August 16, 2023

The UH begins collecting drinking water samples at homes in Kula ¹¹³

August 17, 2023

National news reports are published on ash, debris, chemical exposure, and health impact concerns for residents returning to the impacted areas ¹¹⁴

August 18, 2023

The Maui County emergency manager resigns ¹¹⁵

THIS STUDY: The Purdue University disaster response team arrives in Honolulu and teams up with the University of Hawai'i experts already working in Hawai'i. The University of Hawai'i hosts a wildfire technical webinar about drinking water contamination. ¹¹⁶

August 19, 2023

THIS STUDY: The Purdue University team arrives in Maui and begins this Maui household survey ¹¹⁷

EXPANDED AREA: Maui County expands the Unsafe Water Alert area in Lahaina based on concerns that contaminated water might be outside the initial Unsafe Water Alert advisory area ¹¹⁸

August 20, 2023

A national news report is published that indicates after some prior US wildfires, in-home water filters were incapable of making the contaminated drinking water safe ¹¹⁹

August 21, 2023

President Biden visits Maui¹²⁰

The University of Hawai'i launches their Drinking Water Information Hub to serve as a community information resource and to other relevant sources of information ¹²¹

August 22, 2023

Purdue University, University of Hawai'i, Robby Seeger of EpicSwim, and experts from Paradise and Santa Rosa, California Louisville and Superior, Colorado meet with the Maui Department of Water Supply to provide drinking water system disaster response technical assistance ¹²²

Some shelters are closed and persons in those shelters are moved to temporary housing ¹²³

A helicopter is deployed to work on hot spots in response to the Kula Fire and Olinda Fire¹²⁴

Maui County reports the containment status of the multiple fires:

Olinda Fire, 85% contained. Estimated 1,081 acres;

Kula fire, 85% contained. Extinguishing hot spots in the Kula fire using hand crews and a helicopter. Fire activity is mostly located in hard-to-reach gulches. Flareups and reports of smoke have been well within the burn area, and have not posed any threat to public safety or fire expansion. Estimated 202 acres

Lahaina Fire, 100% contained. Estimated 2,170 acres. ¹²⁴

Maui County reports that King Kekaulike High School reopens in Kula ¹²⁴

An hourly Maui Bus from Lahaina to Kahului is put in place ¹²⁴

August 23, 2023

Maui County reports that the U.S. EPA begins hazardous materials removal in Kula ¹²⁵

The Hawai'i Governor publicly asks tourists to return to Maui ¹²⁶

August 24, 2023

National news reports indicate that some Lahaina residents who did not evacuate have no power, donations are locally organized, some residents complain about breathing problems if breathing the air for "5 minutes" ¹²⁷

Purdue University, and other experts from Paradise, California, and Louisville, Colorado meet with Native Hawaiian households to provide advice on response and recovery in the context of insurance, government reimbursements, and water system damage assessment practices and recovery ¹²⁸

PUBLIC MEETING: The first public meeting with the Maui County Department of Water Supply and its customers is held in Kula. Elected leaders (Maui Mayor Bissen, Vice-Chair Councilwoman Yuki Lei Sigumura), Upcountry Strong/ Kula Hub (Tim Lara), Kula Lodge Team, American Red Cross, FEMA, Maui County Environmental Management, USEPA, HI DOH, and drinking water experts from Purdue University, Paradise California (site of the 2018 Camp Fire) and Louisville Colorado (site of the 2021 Marshall Fire) participate.

<https://cloud.castus.tv/vod/akaku/video/64e848a9e64143000890d1ad?page=HOME>

¹²⁹

FIRST TEST RESULTS RELEASED: For the first time, the Maui County Department of Water Supply releases drinking water chemical test results (27 samples) from the Upper Kula and Lahaina public water systems. Samples were collected August 14, six days after the evacuation. Benzene and total xylenes were some of the VOCs detected

¹³⁰

For the first time, the Maui Department of Water Supply makes the first drinking water chemical testing results from Upper Kula and Lahaina public water systems publicly available ¹³¹

Maui County provides private home testing information including phone numbers for Aecos Laboratory and Food Quality Labs. Maui County recommends homeowners ask for the "VOC Test Panel" ¹³²

Local news organization reports that a Kula resident mentions that with communications down her family was unaware the water system was unsafe, and friends and family were how she found out. She recommends written notices be sent when communications are down or spotty. ¹³³

August 25, 2023

The new MEMA Director is announced ¹³⁴

August 26, 2023

14:34 According to the MEMA, firefighters respond to Kaanapali Hillside from Anapuni Loop to West Mahipulu, Ka'anapali ¹³⁵

According to the MEMA, the Ka'anapali Fire evacuation order is lifted ¹³⁶

August 27, 2023

THIS STUDY: Purdue University, University of Hawai'i, and Louisville Colorado experts conduct inspection of agricultural water systems at the request of the Hawai'i Department of Agriculture in and around the burn area ¹³⁷

The Hawai'i DOH issues a factsheet about VOCs in drinking water, then updates the sheet in September 2023 ¹³⁸

August 28, 2023

The Governor announces that, at this 20 day mark, the search for survivors ends ¹³⁹

August 29, 2023

Schools in Lahaina remain closed since the fire ¹⁴⁰

Maui County delivers solar showers to Upcountry Unsafe Water Alert areas ¹⁴¹

National news report published that the search for fire victims on land ends, now moves to nearshore waters ¹⁴²

September 5, 2023

Maui County announces that solar showers are being made available to residents in the Upcountry Unsafe Water Alert areas ¹⁴³

September 7, 2023

According to Maui County, the number of potable water tanker sites is reduced to two locations in Kula ¹⁴⁴

Filipinos in Lahaina say they've been overlooked in wildfire response ¹⁴⁵

September 9, 2023

Maui County announces a reminder that USW alert remains in effect for the Upper Kula public water system ¹⁴⁶

September 11, 2023

Hawai'i DOH announces that toluene was detected in the Upper Kula public water system ¹⁴⁷

September 12, 2023

Maui County removes a portion of Upper Kula public water system from the Unsafe Water Alert advisory ¹⁴⁸

The HI DOH releases air testing results for Lahaina and Upcountry for the first time ¹⁴⁹

September 13, 2023

Maui County warns that sewer service remains inactive since the wildfires for many properties in the fire impacted areas and that toilet flushing and other activities should not be conducted. Lift stations and power systems were damaged. ¹⁵⁰

September 17, 2023

The UH begins returning drinking water results to homeowners ¹⁵¹

September 19, 2023

CWRM Posts an update on water resources in the Lahaina Aquifer Sector Area ¹⁵²

September 20, 2023

According to Maui County, the Olinda Fire is 90% contained. Estimated 1,081 acres. ¹⁵³

According to Maui County, the Kula Fire is 96% contained. Estimated 202 acres ¹⁵³

According to Maui County, the Lahaina Fire is 100% contained. Estimated 2,170 acres ¹⁵³

September 23, 2023

Lahaina residents begin to be allowed to return to their properties for supervised visits ¹⁵⁴
According to Maui County, the Lauiniupoko beach park opens ¹⁵⁵

September 25, 2023

According to Maui County, the first phase of residential reentry in Lahaina begins ¹⁵⁶

According to Maui County, the Olinda Fire is 95% contained. Estimated 1,081 acres ¹⁵⁷

According to Maui County, the Kula Fire is 96% contained. Estimated 202 acres ¹⁵⁷

According to Maui County the Lahaina Fire is 100% contained. Estimated 2,170 acres ¹⁵⁷

September 26, 2023

The HI Department of Education announces that school begins October 16 in Lahaina, the first day back since the fire in August ¹⁵⁸

September 27, 2023

The HI DOH revised and reissued a fact sheet about how residents can protect themselves from wildfire debris hazards ¹⁵⁹

October 6, 2023

Maui County announces that a portion of Upper Kula and Lahaina removed from Unsafe Water Alert advisory ¹⁶⁰

October 7, 2023

According to the HI DOH, phased reopening begins for tourism on the west side ¹⁶¹

October 9, 2023

Maui County approves the use of Soiltac for wildfire impact areas ¹⁶²

Maui County announces that a portion of Upper Kula and Lahaina public water systems are removed from Unsafe Water Alert advisory ¹⁶³

October 12, 2023

Maui County proposes three billing categories for drinking water customers in the fire impact areas ¹⁶⁴

October 13, 2023

Maui County removes Upper Kula public water system area UK3 from the unsafe water advisory ¹⁶⁵

October 15, 2023

The Hawai'i DOH releases results of Kula ash and debris chemical testing ¹⁶⁶

October 18, 2023

The Hawai'i DOH revised and reissued a factsheet about wildfire ash health risks ¹⁶⁷

October 27, 2023

Maui County removes water meters from burned homes ¹⁶⁸

October 31, 2023

Maui County removes the Unsafe Water Advisory lifted for all areas of Upper Kula Water System. USW alerts still in place for parts of the Lahaina public water system ¹⁶⁹

November 3, 2023

According to the U.S. EPA, hazardous material removal begins in the Lahaina impact area¹⁷⁰

November 5, 2023

The MEMA issues a new red flag warning ¹⁷¹

November 16, 2023

Maui County announces that the Lahaina underground parking garage flooded since August wildfires begins to be drained ¹⁷²

November 21, 2023

Maui County announces that a portion of the Lahaina public water system removed from Unsafe Water Alert advisory ¹⁷³

November 29, 2023

Maui County asks Lahaina customers within and near the burn zone to reduce toilet flushing, bathing, washing clothes and cleaning dishes ¹⁷⁴

November 30, 2023

Maui County experiences the first significant rainfall event since the wildfires ¹⁷⁵

December 1, 2023

The U.S. EPA completes removal of hazardous materials for Phase 1 in ALL wildfire impacted areas ¹⁷⁶

December 10, 2023

The HI DOH releases results of Lahaina ash and debris chemical testing ¹⁷⁷

December 12, 2023

According to Maui County, all zones now reopened in Lahaina ¹⁷⁸

December 13, 2023

More than 6,200 residents displaced by the wildfires, comprising 2,623 households, remain spread across 33 hotels and condominiums ¹⁷⁹

December 14, 2023

Maui County announces that a portion of the Lahaina public water system is removed from Unsafe Water Alert advisory area ¹⁸⁰

January 5, 2024

The Governor extends the emergency proclamation ¹⁸¹

January 18, 2024

The first property impacted by the Lahaina fire is cleared of debris ¹⁸²

January 19, 2024

Maui County announces that a portion of the Lahaina public water system is removed from the Unsafe Water Alert advisory area ¹⁸³

January 23, 2024

The HI DOH announces increased air quality monitoring during debris removal ¹⁸⁴

February 16, 2024

Maui county announces portions of the Lahaina public water system are removed from Unsafe Water Alert advisory area ¹⁸⁵

More than 2,700 people participate in county surveys on possible permanent disposal sites for toxic debris ¹⁸⁶

March 5

Recent work indicates that USEPA oversaw 17,248 feet of sewer line inspections. First, local contractors cleared debris such as sediment, rocks (small and large), rags and oil and grease from the lines. After clearing, a robotic camera was lowered into the lines to assess conditions. To date, USEPA has cleared and inspected 69,582 feet of sewer line during the daytime. To date, a total of 86,830 feet of sewer lines has been cleared and inspected. ¹⁸⁷

Table SI-1. Census Data for Kula and Lahaina, Hawai‘i

US Census Information	Kula	Lahaina	Maui County
Population (2020)	6,942	12,702	164,754
Population per square mile (2020)	201	1632.2	141.8
Age and Sex, %			
Persons under 5 years	4.1	7.6	5.3
Persons under 18 years	20.6	22.9	20.9
Persons 65 years and over	25.4	16.7	20.7
Female persons	52	49.2	50.1
Race and Hispanic Origin, %			
White	55.2	26.8	34.6
Black or African American	0	0.1	0.9
American Indian and Alaska Native	0.3	0.3	0.6
Asian	19.9	37.9	28.6
Native Hawaiian and Other Pacific Islander	5	8.5	10.4
Two or more races	14	24.3	24.9
Hispanic or Latino	6.8	13.1	12
White alone, not Hispanic or Latino	51.4	23.5	29.8
Housing			
Owner-occupied housing unit rate, % (2018-2022)	67.8	51.8	65.3
Median Value of owner-occupied housing units	\$1,144,00	803,000	800,100
Families and Living Arrangements			
Households, % (2018-2022)	2,480	3,562	54,728
Persons per household	2.64	3.53	2.96
Language, Education, and Income			
Language other than English spoken at home, %	13	37.2	22.1
Bachelor's degree or higher, %	39.1	24.8	30.1
Median household income (2022)	\$93,452	\$83,443	\$95,379
Persons in poverty, %	11.2	11.7	9

Source:

<https://www.census.gov/quickfacts/fact/table/kulacdphawaii,mauicountyhawaii,lahainacdphawaii/PST045223?>

CDPs were for Kula and Lahaina and are census designated places

SI-3. Survey Instrument

1. PROPERTY CHARACTERISTICS

What is your name?

What is your email address (so we can send results)?

What is the address (so we can validate location)?

How many people from each category live in the home?

_____ Less than 1 year old

_____ 1 to 17 years old

_____ 18 to 64 years old

_____ 65+ years old

Do you own or rent the home?

Own Rent Other: _____

How long have you lived at the home in years?

Was your home damaged by the wildfire? If yes, please explain

Do you have home/renter's insurance? Yes No

2. INCIDENT

Where were you when you learned about the fire?

From whom and how did you learn that there was a fire?

What day/time did you evacuate the area?

What day/time did you first visit/ return to your home?

Did your home lose power during or since the fire? If so, when and how long?

Did fire damage anything on your property? If so what?

3. DRINKING WATER SOURCE AND SYSTEM

How is water provided to your home?

Water company Private well

Private cistern Other: _____

Before the fire, did you have drinking water treatment devices or systems installed at home?

Yes No

If yes, please explain _____

Since the fire, have you installed or purchased in-home drinking water treatment devices or systems?

Yes No If yes, please explain _____

After returning home, did you notice any changes with the water such as taste/odor/it's color/clarity? If yes, please describe

After returning home, did you notice low or no water pressure? If yes, please describe:

Is your home in a drinking water advisory/unsafe water alert area? Yes No

What day/time did you first find out about the alert?

How did you first find out about the alert?

Since you learned about the alert, have you used water from your plumbing? Yes No

If yes, for what activities?

If your home is not in the alert area or before it got issued, have you used water from your plumbing? Yes No

If yes, for what activities?

Since the fire, have you used bottled water at home due to drinking water concerns? If yes, for what activities?

Did you pay for this bottled water? Where did you obtain the bottled water?

Did you obtain emergency drinking water from "water buffalos" which are public water dispensing stations?

Yes No

Since the fire, have you flushed your plumbing (i.e., like run faucets, hose spigots)? If so, please explain.

4. PROXIMITY TO DAMAGED OR DESTROYED BUILDINGS

Approximately how far away from your home is a building that was damaged or destroyed by the fire?

Do you know someone whose building was damaged or destroyed by the fire? Yes No

5. ADVICE AND SUPPORT

Since the fire, who has provided you advice about your drinking water?

- A state agency or representative
- Maui County Health Department
- Department of Water Supply
- In-home water treatment company
- Water testing laboratory
- Other, please explain: _____

Which one do you most trust right now?

- A state agency or representative
- Maui County Health Department
- Department of Water Supply
- In-home water treatment company
- Water testing laboratory
- Other, please explain: _____

Who do you think is the most responsible for determining which water tests are needed after the fire for determining if the utility pipes are safe?

- The local water utility
- Maui County Health Department
- Hawai'i Department of Health (DOH)
- Other, please describe: _____

Who do you think is the most responsible for determining which water tests are needed after the fire for determining if the homeowner plumbing is safe?

- The homeowner
- Homeowner insurance company
- The local water utility
- Maui County Health Department
- Hawai'i Department of Health (DOH)
- Other, please describe: _____

Since the fire, have you conducted water testing? If yes, please explain (When? Who? For what? How many times?):

6. IMPORTANT REMAINING HOME QUESTIONS

As of today, what (3 to 5) questions do you have about drinking water safety that you want answered?

What is your age? _____

Diagram of property water system

Building ID: _____

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85. —. First Fatality located and confirmed. *MPD's Preliminary After-Action Report*. [Online] August 8, 2023. [Cited: February 27, 2024.] chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://selfreliancecentral.com/wp-content/uploads/2024/02/pre_aar.pdf.
86. Maui County. In response to the Pulehu Fire, an evacuation is ordered for Holopuni, Pulehu, Lipoa to Maui Meadows and Ohukai subdivision. *Lahaina and Upcountry Maui Fires Combined*

Update No. 3, 12:40 p.m. [Online] August 9, 2023. [Cited: February 16, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12641>.

87. Maui Now. Hawai'i Telcom announces they have communication loss. *Hawaiian Telcom customers on Maui affected by intermittent service outages.* [Online] August 9, 2023. [Cited: February 16, 2024.] <https://mauinow.com/2023/08/09/hawaiian-telcom-customers-on-maui-affected-by-intermittent-service-outages/>.

88. HI DOT. Approximately 1800 people sheltered in place overnight at the Kahului Airport (OGG) with state highways still closed in some areas. *Twitter @DOTHawaii.* [Online] August 9, 2023. [Cited: February 16, 2024.] <https://twitter.com/DOTHawaii/status/1689285226223067136>.

89. State of Emergency extended to all counties and airtravel to Maui is discouraged. *State of Hawaii Governor.* [Online] August 9, 2023. [Cited: February 16, 2024.] <https://governor.hawaii.gov/newsroom/office-of-the-governor-news-release-emergency-proclamation-for-maui-air-travel-and-hurricane-dora/>.

90. Residents, Anonymous. Community begins unearthing red hot stones that cause hotspot ignition from underground. Kula : Interviewed by Author, August 9, 2023.

91. Christopher Stankis, Maui Fire and Public Safety Public Information Officer. In Kula, hotspots remain underground with occasional flare ups requiring community monitoring vegetation burning underground, smoldering over 100 good intent calls during the smoldering period to present and 72 burning calls. Kula : Interviewed by Author, January 18, 2024.

92. Resident, Anonymous. Water turned back on in Kula. Kula : Interviewed by Author, August 9, 2023.

93. County of Maui. The Maui Mayor makes televised address to the communities impacted. *Mayor Richard Bissen offers a public message in light of recent tragedies.* [Online] August 9, 2023. [Cited: February 16, 2024.] <https://www.facebook.com/watch/?v=1353705898828259>.

94. MEMA. A Family Assistance Center is opened in Kahului to help those searching for missing persons impacted by the fires. *Twitter @Maui_EMA.* [Online] August 9, 2023. [Cited: February 16, 2024.] https://twitter.com/Maui_EMA/status/1689757750279262208.

95. The White House. President Biden issues a federal disaster declaration. *President Joseph R. Biden, Jr. Approves Hawaii Disaster Declaration.* [Online] August 10, 2023. [Cited: February 16, 2024.] <https://www.whitehouse.gov/briefing-room/presidential-actions/2023/08/10/president-joseph-r-biden-jr-approves-hawaii-disaster-declaration-3/>.

96. Washington Post. An inter island flotilla of boats deliver supplies to Lahaina because the roadway access to West Maui is limited. *Native Hawaiians organize aid for Maui fire victims as government lags.* [Online] August 12, 2023. [Cited: February 16, 2024.] <https://www.washingtonpost.com/nation/2023/08/12/maui-fires-lahaina-native-hawaiians-disaster-relief-boats/>.

97. Residents, Anonymous. For hygiene and hydration purposes, some Kula community members bathe in and drink yellow drinking water. Kula : Interviewed by Author, August 10, 2023.
98. DLNR. The Olinda Fire is 85% contained. *08/19/23-UPCOUNTRY COMPLEX FIRE – OLINDA SECTION, MAUI*. [Online] August 19, 2023. [Cited: February 16, 2024.] <https://dlnr.hawaii.gov/blog/2023/08/21/nr23-128/>.
99. Maui County. Unsafe Water Alerts (USW) issued by DWS for Upper Kula and Lahaina Public Water Systems. *Unsafe water advisory issued for Upper Kula and Lahaina areas affected by wildfires*. [Online] August 11, 2023. [Cited: February 16, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12680>.
100. —. Maui County announces deployment of CERT (community emergency response team). <https://www.mauicounty.gov/1899/Community-Emergency-Response-Team>. [Online] August 11, 2023. [Cited: February 16, 2024.] <https://docs.google.com/spreadsheets/d/1N2aYojG2J7vx-WcL05tF19GZO-TzvRb3DGSiXkNSqU8/edit#gid=0>.
101. HI DOH. FEMA assigns EPA with the mission assignment to survey, remove, and dispose of hazardous materials on properties affected by the wildfires in Maui. This mission assignment is referred to as Phase 1. *DOH ADVISES CAUTION FOR RESIDENTS RETURNING TO WEST MAUI AREA*. [Online] August 11, 2023. [Cited: February 16, 2024.] <https://health.hawaii.gov/news/newsroom/doh-advises-caution-for-residents-returning-to-west-maui-area/>.
102. Maui County. New maps of Unsafe Water Advisories by DWS are issued and posted on MauiCounty.gov website. <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12695>. [Online] August 13, 2023. [Cited: February 16, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12695>.
103. National news report about the lack of water and dry fire hydrants for fire-fighting in Lahaina during the emergency response. Homeowners are forced to fight fires with pools, hoses and buckets. <https://www.nytimes.com/2023/08/13/us/lahaina-water-failure.html>. [Online] August 13, 2023. [Cited: February 17, 2024.] <https://www.nytimes.com/2023/08/13/us/lahaina-water-failure.html>.
104. Maui News Now. The Kula Fire (also reported as the Upcountry Fire) is 60% contained. *Upcountry Updates: Fire about 60% contained; shelter open; water unsafe in impacted areas*. [Online] August 14, 2023. [Cited: February 17, 2024.] <https://mauinow.com/2023/08/14/upcountry-updates-fire-about-60-contained-shelter-open-water-unsafe-in-impacted-areas/>.
105. Hawaii News Now. More than 46,000 tourists have left the island since the event. *Hawaii Tourism Authority: Visitors have ‘largely heeded call’ to leave Maui*. [Online] August 13, 2023. [Cited: February 17, 2024.] <https://www.hawaiinewsnow.com/2023/08/13/hawaii-tourism-authority-visitors-have-largely-heeded-call-leave-maui/>.

106. Maui County. Maui Police Department suspends placard program for travel into West Maui. *Maui County Press Releases*. [Online] August 14, 2023. [Cited: February 17, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12699>.
107. HI DOH. FIRST SAMPLES COLLECTED: Maui DWS collects the first drinking water samples from their Upper Kula and Lahaina Public Water Systems. *News Releases from Department of Health | Maui Department of Water Supply releases first test results from Lāhainā, Upper Kula water systems (hawaii.gov)*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://health.hawaii.gov/news/newsroom/maui-department-of-water-supply-releases-first-test-results-from-lahaina-upper-kula-water-systems/>.
108. Maui News Now. Search and rescue continues for survivors of the Lahaina Fire. *Maui wildfire updates for Aug. 14: Placard system SUSPENDED; deaths rise to 99 souls : Maui Now*. [Online] August 14, 2023. [Cited: February 22, 2024.] <https://mauinow.com/2023/08/14/maui-wildfire-updates-for-aug-14-west-maui-placard-system-announced-unsafe-water-maps-released/>.
109. HI DOH. FIRST SAMPLES ANALYZED: Hawaii DOH chemically analyzed drinking water samples from Maui County and obtained chemical results. *News Releases from Department of Health | Maui Department of Water Supply releases first test results from Lāhainā, Upper Kula water systems (hawaii.gov)*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://health.hawaii.gov/news/newsroom/maui-department-of-water-supply-releases-first-test-results-from-lahaina-upper-kula-water-systems/>.
110. Maui County reports the containment status of the multiple fires: Kula Fire, 75% contained, 678 acres with hotspots in gulches; Lahaina Fire, 85% contained 2170 acres with no active threats; Pulehu/Kihei Fire, 100% contained with no active threats, Pu'uk. *8/15 County of Maui Wildfire Disaster Update as of 8:30 pm*. [Online] August 15, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12711>.
111. Maui County. The road opens to Lahaina for the first time since the fire. *News Flash • Governor Green announces opening of road to Lah (mauicounty.gov)*. [Online] August 15, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12705>.
112. —. The first confirmed victims of the wildfires are announced. *News Flash • County releases first confirmed identifications (mauicounty.gov)*. [Online] August 15, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12707>.
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114. National news reports on ash and debris chemical exposure and health impact concerns for residents returning to the impact areas. *The burn zone on Maui is laden with toxins, officials say : NPR*. [Online] August 17, 2023. [Cited: February 22, 2024.] <https://npr.org/2023/08/17/1194466944/the-burn-zone-on-maui-is-laden-with-toxins-officials-say>.

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116. University of Hawaii. THIS STUDY: Purdue University disaster response team arrives in Honolulu and teams up with University of Hawaii experts already working in Hawaii. University of Hawaii hosts a wildfire technical webinar about drinking water contamination. *After the Fire: The Importance of Scientific Support in Protecting Health and Recovery – UHM Water Resources Research Center (hawaii.edu)*. [Online] August 18, 2023. [Cited: February 22, 2024.] <https://www.wrrc.hawaii.edu/after-the-fire-the-importance-of-scientific-support-in-protecting-health-and-recovery/>.
117. Purdue University. THIS STUDY: Purdue University team arrives in Maui and begins Maui household survey. *What's in the water? UH, Purdue researchers are sampling Kula system*. [Online] August 26, 2023. [Cited: February 22, 2024.] <https://www.mauinews.com/news/local-news/2023/08/whats-in-the-water-uh-purdue-researchers-are-sampling-kula-system/>.
118. Maui County. EXPANDED AREA: Maui County expands the Unsafe Water Alert area in Lahaina based on concerns contaminated water may be outside the initial Unsafe Water Alert advisory area. *Unsafe Water Advisory for Lahaina water system expanded*. [Online] August 19, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12732>.
119. Associated Press. News report that after some prior US wildfires, in-home water filters may be incapable of making the contaminated drinking water safe. *Maui water is unsafe even with filters, one of the lessons learned from fires in California* | AP News. [Online] August 19, 2023. [Cited: February 22, 2024.] <https://apnews.com/article/wildfire-water-contamination-maui-hawaii-fires-c547955833ceaf86af8c3f1553f1f546>.
120. ABC News. President Biden visits Maui. *President Biden, first lady visit Maui to hear from survivors after devastating wildfires - ABC News (go.com)*. [Online] August 21, 2023. [Cited: February 22, 2024.] <https://abcnews.go.com/Politics/president-biden-lady-visit-maui-after-wildfires/story?id=102408000>.
121. Lahaina News. University of Hawaii launches Drinking Water Information Hub to serve as a community information resource and to other relevant sources of information. *Safety of Maui drinking water focus of UH research* | News, Sports, Jobs - Lahaina News. [Online] September 12, 2023. [Cited: February 22, 2024.] <https://www.lahainanews.com/news/local-news/2023/09/12/safety-of-maui-drinking-water-focus-of-uh-research/>.
122. Purdue University. Purdue University, University of Hawaii, Robby Seeger, and experts from Paradise and Santa Rosa, California Louisville and Superior, Colorado meet with Maui DWS to provide drinking water system disaster response technical assistance. *Purdue professor 'brings the world' to help after Maui, Hawaii, wildfires*. [Online] September 25, 2023. [Cited: February 22, 2024.] <https://stories.purdue.edu/purdue-professor-brings-the-world-to-help-after-maui-hawaii-wildfires/>.

123. Maui Now. Some shelters are closed and persons in those shelters are moved to temporary housing. *Lahaina wildfire recovery Day 20: land search is complete, survivors are no longer expected*. [Online] August 28, 2023. [Cited: February 22, 2024.]

<https://mauinow.com/2023/08/28/lahaina-wildfire-recovery-day-20-land-search-is-complete-survivors-are-no-longer-expected/>.

124. Maui County. "A helicopter is deployed to work on hot spots in response to the Kula Fire and Olinda Fire and containment update . Maui County reports the containment status of the multiple fires: Olinda Fire, 85% contained. Estimated 1,081 acres; Kula fire, 85% cont. 8/23 *County of Maui Wildfire Disaster Update*. [Online] August 23, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12756>.

125. —. The USEPA begins hazardous materials removal in Kula. *News Flash • 8/23/2023 — U.S. EPA begins hazardous waste rem (mauicounty.gov)*. [Online] August 23, 2023. [Cited: February 22, 2024.]

<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12757#:~:text=The%20U.S.%20Environm%20Protection%20Agency%20%28EPA%29%20on%20Wednesday,includin%20paints%2C%20cleaners%2C%20solvents%2C%20oils%2C%20batteries%2C%20and%20pesticides..>

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<https://www.forbes.com/sites/willmcgough/2023/08/23/hawaii-travel-update-governor-asks-tourists-to-come-back-to-maui/?sh=32ec080c551f>.

127. Hawaii News Now. National news reports that some Lahaina residents who did not evacuate have no power, donations are locally organized, some residents complain about breathing problems if breathing the air for "5 minutes". *The air is bad and the power is off, but these Lahaina families aren't going anywhere (hawaiinewsnow.com)*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://www.hawaiinewsnow.com/2023/08/25/air-is-bad-power-is-off-these-lahaina-families-arent-leaving-their-homes/>.

128. *Purdue University, and other experts from Paradise, California, and Louisville, Colorado meet with Native Hawaiian households to provide advice on response and recovery in the context of insurance, government reimbursements, and water system damage assess*. Lahaina, August 24, 2023.

129. Maui County. PUBLIC MEETING: The first public meeting with the DWS and community is held in Kula. Elected leaders (Maui Mayor Bissen, Vice-Chair Councilwoman Uki Lei Sigumura), DWS, Upcountry Strong/ Kula Hub (Tim Lara), Kula Lodge Team, American Red Cross, FEMA, Maui. <https://www.mauicounty.us/press-release/kula-community-meeting-tomorrow-night-on-water-safety/>. [Online] August 23, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.us/press-release/kula-community-meeting-tomorrow-night-on-water-safety/>.

130. HI DOH. FIRST TEST RESULTS RELEASED: For the first time, DWS releases their first public test results (27 samples) from Upper Kula and Lahaina Public Water Systems. Samples were collected August 14, 6 days after the evacuation. Benzene and total xylenes were some. *News Releases from Department of Health | Maui Department of Water Supply releases first test results from Lāhainā, Upper Kula water systems (hawaii.gov)*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://health.hawaii.gov/news/newsroom/maui-department-of-water-supply-releases-first-test-results-from-lahaina-upper-kula-water-systems/>.
131. Maui County. For the first time, DWS makes first test results from Upper Kula and Lahaina Public Water System publicly available. *News Flash • Long-Term Monitoring Program samples for 11/29/ (mauicounty.gov)*. [Online] August 23, 2023. [Cited: February 22, 2022.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12755>.
132. —. Maui County provides private home testing information including phone numbers for Aecos Laboratory and FoodQuality Labs. Maui County recommends homeowners ask for the "VOC Test Panel". *Water Quality Laboratory Information*. [Online] August 24, 2023. [Cited: February 22, 2023.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12760>.
133. Honolulu Civil Beat. Local news reports that a Kula resident mentions that with communications down her family was unaware the water system was unsafe, and friends and family were how she found out. She recommends written notices be sent when communications are down or spotty. *What About The Water?' Upcountry Residents Want Answers After Maui Fires Prompt Advisories - Honolulu Civil Beat*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://www.civilbeat.org/2023/08/what-about-the-water-upcountry-residents-want-answers-after-maui-fires-prompt-advisories/>.
134. Maui County. The new Maui Emergency Management Agency Director is announced. *News Flash • Darryl Oliveira hired as interim director of Ma (mauicounty.gov)*. [Online] August 25, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12769>.
135. MEMA. Firefighters respond to Kaanapali Hillside from Anapuni Loop to West Mahipulu. *Twitter @Maui_EMA*. [Online] August 26, 2023. [Cited: February 22, 2024.] https://twitter.com/Maui_EMA/status/1695595600182710487.
136. —. The Ka'anapali Fire evacuation order is lifted. *Twitter @Maui_EMA*. [Online] August 26, 2023. [Cited: February 22, 2024.] https://twitter.com/Maui_EMA/status/1695639217467252849.
137. *THIS STUDY: Purdue University, University of Hawaii, and Louisville Colorado experts conduct inspection of agricultural water systems at the request of the Hawaii Department of Agriculture in and around the burn area*. Maui, August 27, 2023.
138. Hawaii DOH issued a factsheet about VOCs in drinking water, then updated September 2023. *Volatile Organic Compounds (VOCs) Fact Sheet*. [Online] August 27, 2023. [Cited: February 2024, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12781>.

139. Maui Now. At this 20 day mark, the search for survivors ends. *Lahaina wildfire recovery Day 20: land search is complete, survivors are no longer expected*. [Online] August 28, 2023. [Cited: February 22, 2024.] <https://mauinow.com/2023/08/28/lahaina-wildfire-recovery-day-20-land-search-is-complete-survivors-are-no-longer-expected/>.
140. Hawaii News Now. Schools in Lahaina remain closed from the fire. *DOE announces tentative timeframe to welcome students back to West Maui schools (hawaiinewsnow.com)*. [Online] August 29, 2023. [Cited: February 22, 2024.] <https://www.hawaiinewsnow.com/2023/08/30/doe-announces-tentative-timeframe-welcome-students-back-west-maui-schools/>.
141. Maui County. Maui County delivering solar showers to Upcountry Unsafe Water Alert areas. *News Flash • 8/29 County of Maui distributing more than 1,00 (mauicounty.gov)*. [Online] August 29, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12788>.
142. ABC NEWS. National news reports that the search for fire victims on land ends, now moves to nearshore waters. *Maui wildfire victims search on land ends, moves to the ocean - ABC News (go.com)*. [Online] August 29, 2023. [Cited: February 23, 2024.] <https://abcnews.go.com/US/maui-officials-search-wildfire-victims-ocean-land-search/story?id=102648231>.
143. Maui County. Maui County announces that solar showers are being made available to residents in the Upcountry Unsafe Water Alert areas. *News Flash • 09/05 Solar shower bags available today for Upc (mauicounty.gov)*. [Online] September 5, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12814>.
144. —. Reduction of potable water tanker locations down to two sites in Kula. *Location of potable water tankers in Upper Kula and Lahaina as of 10/30/2023*. [Online] September 7, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12824>.
145. NBC News. Filipinos in Lahaina say they've been overlooked in wildfire response. [Online] September 7, 2023. [Cited: February 27, 2024.] <https://www.nbcnews.com/news/asian-america/filipinos-maui-hawaii-wildfires-rcna102375>.
146. Maui County. Maui County announces a reminder that USW alert remains in effect for the Upper Kula public water system. *News Flash • 09/09 Unsafe Water Advisory reminder for Upper (mauicounty.gov)*. [Online] September 9, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12831>.
147. HI DOH. Hawaii DOH announces toluene detected in the Upper Kula Public Water System. *News Releases from Department of Health | Trace amount of toluene detected in Upper Kula water system (hawaii.gov)*. [Online] September 11, 2023. [Cited: February 23, 2024.] <https://health.hawaii.gov/news/newsroom/trace-amount-of-toluene-detected-in-upper-kula-water-system/>.

148. Maui County removes a portion of Upper Kula removed from Unsafe Water Alert advisory. *News Flash • 09/12 Notice: Amended Unsafe Water Advisory for (mauicounty.gov)*. [Online] September 12, 2024. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12844>.
149. HI DOH. HI DOH releases air testing results for Lahaina and Upcountry for the first time. *News Releases from Department of Health | DOH releases preliminary, unvalidated data from Maui air sampling (hawaii.gov)*. [Online] September 12, 2023. [Cited: February 23, 2024.] <https://docs.google.com/spreadsheets/d/1N2aYojG2J7vx-WcL05tF19GZO-TzvRb3DGSiXkNSqU8/edit#gid=0>.
150. Maui County. Maui County warns that sewer service remains inactive since the wildfires for many properties in the fire impacted areas and that toilet flushing and other activities should not be conducted. Lift stations and power systems were damaged. *News Flash • 09/13 Sewer service inactive for many standing (mauicounty.gov)*. [Online] September 13, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12846>.
151. WRRC. *UH begins returning drinking water results to homeowners*. September 17, 2023.
152. Commission on Water Resource Management. CWRM Posts an update on Water Resources in the Lahaina Aquifer Sector Area. *Update on Water Resources in the Lahaina Aquifer Sector Area Agenda Item C-1*. [Online] September 13, 2023. [Cited: February 27, 2024.] <chrome-extension://efaidnbmninnibpcajpcgclclefindmkaj/https://files.hawaii.gov/dlnr/cwrmsubmittal/2023/sb20230919C1.pdf>.
153. Maui County. Containment Announcement: Olinda fire: 90% contained. Estimated 1,081 acres. Kula fire: 96% contained. Estimated 202 acres. Lahaina fire: 100% contained. Estimated 2,170 acres. *9/20 MAUI WILDFIRE DISASTER UPDATE*. [Online] September 20, 2023. [Cited: February 23, 2024.] <https://docs.google.com/spreadsheets/d/1N2aYojG2J7vx-WcL05tF19GZO-TzvRb3DGSiXkNSqU8/edit#gid=0>.
154. Associated Press. Lahaina residents begin to be allowed to return to their properties for supervised visits. *Lahaina residents brace for what they'll find as they return to devastated properties in burn zone | AP News*. [Online] September 20, 2023. [Cited: February 23, 2024.] <https://apnews.com/article/lahaina-maui-wildfire-reentry-9ae428c3af31f3ebb224157aeb4efff4>.
155. Maui County. Lauiniupoko beach park opens. *Popular Lauiniupoko Beach Park reopens after county staff who lost homes work on project*. [Online] September 23, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12886>.
156. —. The first phase of residential reentry in Lahaina begins. *News Flash • 09/25 Residents in Zone 1C return to their Laha (mauicounty.gov)*. [Online] September 25, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12891>.
157. —. Containment announcement: Olinda fire: Increased to 95% contained. Estimated 1,081 acres. Kula fire: 96% contained. Estimated 202 acres. Lahaina fire: 100% contained. Estimated

2,170 acres. *9/25 MAUI WILDFIRE DISASTER UPDATE*. [Online] September 25, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12890>.

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Table SI-1. Census Data for Kula and Lahaina, Hawai‘i

US Census Information	Kula	Lahaina	Maui County
Population (2020)	6,942	12,702	164,754
Population per square mile (2020)	201	1632.2	141.8
Age and Sex, %			
Persons under 5 years	4.1	7.6	5.3
Persons under 18 years	20.6	22.9	20.9
Persons 65 years and over	25.4	16.7	20.7
Female persons	52	49.2	50.1
Race and Hispanic Origin, %			
White	55.2	26.8	34.6
Black or African American	0	0.1	0.9
American Indian and Alaska Native	0.3	0.3	0.6
Asian	19.9	37.9	28.6
Native Hawaiian and Other Pacific Islander	5	8.5	10.4
Two or more races	14	24.3	24.9
Hispanic or Latino	6.8	13.1	12
White alone, not Hispanic or Latino	51.4	23.5	29.8
Housing			
Owner-occupied housing unit rate, % (2018-2022)	67.8	51.8	65.3
Median Value of owner-occupied housing units	\$1,144,00	803,000	800,100
Families and Living Arrangements			
Households, % (2018-2022)	2,480	3,562	54,728
Persons per household	2.64	3.53	2.96
Language, Education, and Income			
Language other than English spoken at home, %	13	37.2	22.1
Bachelor's degree or higher, %	39.1	24.8	30.1
Median household income (2022)	\$93,452	\$83,443	\$95,379
Persons in poverty, %	11.2	11.7	9

Source:

<https://www.census.gov/quickfacts/fact/table/kulacdphawaii,mauicountyhawaii,lahainacdphawaii/PST045223?>

CDPs were for Kula and Lahaina and are census designated places

SI-3. Survey Instrument

1. PROPERTY CHARACTERISTICS

What is your name?

What is your email address (so we can send results)?

What is the address (so we can validate location)?

How many people from each category live in the home?

_____ Less than 1 year old

_____ 1 to 17 years old

_____ 18 to 64 years old

_____ 65+ years old

Do you own or rent the home?

Own Rent Other: _____

How long have you lived at the home in years?

Was your home damaged by the wildfire? If yes, please explain

Do you have home/renter's insurance? Yes No

2. INCIDENT

Where were you when you learned about the fire?

From whom and how did you learn that there was a fire?

What day/time did you evacuate the area?

What day/time did you first visit/ return to your home?

Did your home lose power during or since the fire? If so, when and how long?

Did fire damage anything on your property? If so what?

3. DRINKING WATER SOURCE AND SYSTEM

How is water provided to your home?

Water company Private well

Private cistern Other: _____

Before the fire, did you have drinking water treatment devices or systems installed at home?

Yes No

If yes, please explain _____

Since the fire, have you installed or purchased in-home drinking water treatment devices or systems?

Yes No If yes, please explain _____

After returning home, did you notice any changes with the water such as taste/odor/it's color/clarity? If yes, please describe

After returning home, did you notice low or no water pressure? If yes, please describe:

Is your home in a drinking water advisory/unsafe water alert area? Yes No

What day/time did you first find out about the alert?

How did you first find out about the alert?

Since you learned about the alert, have you used water from your plumbing? Yes No

If yes, for what activities?

If your home is not in the alert area or before it got issued, have you used water from your plumbing? Yes No

If yes, for what activities?

Since the fire, have you used bottled water at home due to drinking water concerns? If yes, for what activities?

Did you pay for this bottled water? Where did you obtain the bottled water?

Did you obtain emergency drinking water from "water buffalos" which are public water dispensing stations?

Yes No

Since the fire, have you flushed your plumbing (i.e., like run faucets, hose spigots)? If so, please explain.

4. PROXIMITY TO DAMAGED OR DESTROYED BUILDINGS

Approximately how far away from your home is a building that was damaged or destroyed by the fire?

Do you know someone who's building was damaged or destroyed by the fire? Yes No

5. ADVICE AND SUPPORT

Since the fire, who has provided you advice about your drinking water?

- A state agency or representative
- Maui County Health Department
- Department of Water Supply
- In-home water treatment company
- Water testing laboratory
- Other, please explain: _____

Which one do you most trust right now?

- A state agency or representative
- Maui County Health Department
- Department of Water Supply
- In-home water treatment company
- Water testing laboratory
- Other, please explain: _____

Who do you think is the most responsible for determining which water tests are needed after the fire for determining if the utility pipes are safe?

- The local water utility
- Maui County Health Department
- Hawaii Department of Health (DOH)
- Other, please describe: _____

Who do you think is the most responsible for determining which water tests are needed after the fire for determining if the homeowner plumbing is safe?

- The homeowner
- Homeowner insurance company
- The local water utility
- Maui County Health Department
- Hawaii Department of Health (DOH)
- Other, please describe: _____

Since the fire, have you conducted water testing? If yes, please explain (When? Who? For what? How many times?):

6. IMPORTANT REMAINING HOME QUESTIONS

As of today, what (3 to 5) questions do you have about drinking water safety that you want answered?

What is your age? _____

Diagram of property water system

Building ID: _____

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120. ABC News. President Biden visits Maui. *President Biden, first lady visit Maui to hear from survivors after devastating wildfires - ABC News (go.com)*. [Online] August 21, 2023. [Cited: February 22, 2024.] <https://abcnews.go.com/Politics/president-biden-lady-visit-maui-after-wildfires/story?id=102408000>.
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<https://mauinow.com/2023/08/28/lahaina-wildfire-recovery-day-20-land-search-is-complete-survivors-are-no-longer-expected/>.

124. Maui County. "A helicopter is deployed to work on hot spots in response to the Kula Fire and Olinda Fire and containment update . Maui County reports the containment status of the multiple fires: Olinda Fire, 85% contained. Estimated 1,081 acres; Kula fire, 85% cont. 8/23 *County of Maui Wildfire Disaster Update*. [Online] August 23, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12756>.

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<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12757#:~:text=The%20U.S.%20Environmental%20Protection%20Agency%20%28EPA%29%20on%20Wednesday,includin%20paints%2C%20cleaners%2C%20solvents%2C%20oils%2C%20batteries%2C%20and%20pesticides..>

126. Forbes. The Hawaii Governor publicly asks tourists to return to Maui. *Hawaii Travel Update: Governor Asks Tourists To Come Back To Maui (forbes.com)*. [Online] August 23, 2023. [Cited: February 22, 2024.]

<https://www.forbes.com/sites/willmcgough/2023/08/23/hawaii-travel-update-governor-asks-tourists-to-come-back-to-maui/?sh=32ec080c551f>.

127. Hawaii News Now. National news reports that some Lahaina residents who did not evacuate have no power, donations are locally organized, some residents complain about breathing problems if breathing the air for "5 minutes". *The air is bad and the power is off, but these Lahaina families aren't going anywhere (hawaiinewsnow.com)*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://www.hawaiinewsnow.com/2023/08/25/air-is-bad-power-is-off-these-lahaina-families-arent-leaving-their-homes/>.

128. *Purdue University, and other experts from Paradise, California, and Louisville, Colorado meet with Native Hawaiian households to provide advice on response and recovery in the context of insurance, government reimbursements, and water system damage assess*. Lahaina, August 24, 2023.

129. Maui County. PUBLIC MEETING: The first public meeting with the DWS and community is held in Kula. Elected leaders (Maui Mayor Bissen, Vice-Chair Councilwoman Uki Lei Sigumura), DWS, Upcountry Strong/ Kula Hub (Tim Lara), Kula Lodge Team, American Red Cross, FEMA, Maui. <https://www.mauicounty.us/press-release/kula-community-meeting-tomorrow-night-on-water-safety/>. [Online] August 23, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.us/press-release/kula-community-meeting-tomorrow-night-on-water-safety/>.

130. HI DOH. FIRST TEST RESULTS RELEASED: For the first time, DWS releases their first public test results (27 samples) from Upper Kula and Lahaina Public Water Systems. Samples were collected August 14, 6 days after the evacuation. Benzene and total xylenes were some. *News Releases from Department of Health | Maui Department of Water Supply releases first test results from Lāhainā, Upper Kula water systems (hawaii.gov)*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://health.hawaii.gov/news/newsroom/maui-department-of-water-supply-releases-first-test-results-from-lahaina-upper-kula-water-systems/>.
131. Maui County. For the first time, DWS makes first test results from Upper Kula and Lahaina Public Water System publicly available. *News Flash • Long-Term Monitoring Program samples for 11/29/ (mauicounty.gov)*. [Online] August 23, 2023. [Cited: February 22, 2022.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12755>.
132. Maui County. Maui County provides private home testing information including phone numbers for Aecos Laboratory and FoodQuality Labs. Maui County recommends homeowners ask for the "VOC Test Panel". *Water Quality Laboratory Information*. [Online] August 24, 2023. [Cited: February 22, 2023.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12760>.
133. Honolulu Civil Beat. Local news reports that a Kula resident mentions that with communications down her family was unaware the water system was unsafe, and friends and family were how she found out. She recommends written notices be sent when communications are down or spotty. *What About The Water?' Upcountry Residents Want Answers After Maui Fires Prompt Advisories - Honolulu Civil Beat*. [Online] August 24, 2023. [Cited: February 22, 2024.] <https://www.civilbeat.org/2023/08/what-about-the-water-upcountry-residents-want-answers-after-maui-fires-prompt-advisories/>.
134. Maui County. The new Maui Emergency Management Agency Director is announced. *News Flash • Darryl Oliveira hired as interim director of Ma (mauicounty.gov)*. [Online] August 25, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12769>.
135. MEMA. Firefighters respond to Kaanapali Hillside from Anapuni Loop to West Mahipulu. *Twitter @Maui_EMA*. [Online] August 26, 2023. [Cited: February 22, 2024.] https://twitter.com/Maui_EMA/status/1695595600182710487.
136. MEMA. The Ka'anapali Fire evacuation order is lifted. *Twitter @Maui_EMA*. [Online] August 26, 2023. [Cited: February 22, 2024.] https://twitter.com/Maui_EMA/status/1695639217467252849.
137. *THIS STUDY: Purdue University, University of Hawaii, and Louisville Colorado experts conduct inspection of agricultural water systems at the request of the Hawaii Department of Agriculture in and around the burn area*. Maui, August 27, 2023.
138. Hawaii DOH issued a factsheet about VOCs in drinking water, then updated September 2023. *Volatile Organic Compounds (VOCs) Fact Sheet*. [Online] August 27, 2023. [Cited: February 2024, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12781>.

139. Maui Now. At this 20 day mark, the search for survivors ends. *Lahaina wildfire recovery Day 20: land search is complete, survivors are no longer expected*. [Online] August 28, 2023. [Cited: February 22, 2024.] <https://mauinow.com/2023/08/28/lahaina-wildfire-recovery-day-20-land-search-is-complete-survivors-are-no-longer-expected/>.
140. Hawaii News Now. Schools in Lahaina remain closed from the fire. *DOE announces tentative timeframe to welcome students back to West Maui schools (hawaiinewsnow.com)*. [Online] August 29, 2023. [Cited: February 22, 2024.] <https://www.hawaiinewsnow.com/2023/08/30/doe-announces-tentative-timeframe-welcome-students-back-west-maui-schools/>.
141. Maui County. Maui County delivering solar showers to Upcountry Unsafe Water Alert areas. *News Flash • 8/29 County of Maui distributing more than 1,00 (mauicounty.gov)*. [Online] August 29, 2023. [Cited: February 22, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12788>.
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147. HI DOH. Hawaii DOH announces toluene detected in the Upper Kula Public Water System. *News Releases from Department of Health | Trace amount of toluene detected in Upper Kula water system (hawaii.gov)*. [Online] September 11, 2023. [Cited: February 23, 2024.] <https://health.hawaii.gov/news/newsroom/trace-amount-of-toluene-detected-in-upper-kula-water-system/>.

148. Maui County removes a portion of Upper Kula removed from Unsafe Water Alert advisory. *News Flash • 09/12 Notice: Amended Unsafe Water Advisory for (mauicounty.gov)*. [Online] September 12, 2024. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12844>.
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150. Maui County. Maui County warns that sewer service remains inactive since the wildfires for many properties in the fire impacted areas and that toilet flushing and other activities should not be conducted. Lift stations and power systems were damaged. *News Flash • 09/13 Sewer service inactive for many standing (mauicounty.gov)*. [Online] September 13, 2023. [Cited: February 23, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12846>.
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157. Maui County. Containment announcement: Olinda fire: Increased to 95% contained. Estimated 1,081 acres. Kula fire: 96% contained. Estimated 202 acres. Lahaina fire: 100% contained. Estimated 2,170 acres. *9/25 MAUI WILDFIRE DISASTER UPDATE*. [Online]

September 25, 2023. [Cited: February 23, 2024.]
<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12890>.

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159. HI DOH. The Hawaii DOH revised and reissued a fact sheet about how residents can protect themselves from wildfire debris hazards. The Hawaii DOH revised and reissued a fact sheet about how residents can protect themselves from wildfire debris hazards. *Hazard Advisory (hawaii.gov)*. [Online] September 27, 2023. [Cited: February 23, 2024.] <chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://health.hawaii.gov/mauiwildfires/files/2023/08/Hazards-Advisory.pdf>.

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<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12926>.

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<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12937>.

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<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12936>.

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<https://www.mauicounty.gov/CivicAlerts.aspx?AID=12942>.

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169. Maui County. For Upper Kula Public Water System, DWS lifts the last USW alerts. USW still in place for parts of Lahaina public water system. *News Flash • Unsafe Water Advisory lifted for all areas of U (mauicounty.gov)*. [Online] October 31, 2023. [Cited: February 27, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=12999#:~:text=The%20Department%20of%20Water%20Supply%20has%20lifted%20the,safe%20for%20unrestricted%20use%20effective%20October%2031%2C%202023..>

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173. Maui County. Lahaina underground parking garage flooded since August wildfires begins to be drained. *News Flash • 11/16/2023 Work to drain underground parking ga (mauicounty.gov)*. [Online] November 16, 2023. [Cited: February 27, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=13045>.

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175. Maui County. Lahaina customers within and near the burn zone are asked to reduce toilet flushing, bathing, washing clothes and cleaning dishes. *County Wastewater Reclamation Division prepares for kona low weather system, asks for West Maui sewe*. [Online] November 29, 2023. [Cited: February 27, 2024.] <https://www.mauicounty.gov/CivicAlerts.aspx?AID=13054>.

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Unsafe Water Ad (mauicounty.gov), January 19, 2024. [Cited: March 1, 2024.]
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<https://www.mauicounty.gov/CivicAlerts.aspx?AID=13282>.

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