

TRUEPANI

Hawaii WIIN 2107 Drinking Water Project Lead Testing in Schools and Child Care Facilities **Stage 2: Final Report**

“Authorized under the Water Infrastructure Improvements for the Nation (WIIN) Act, the Lead Testing in School and Child Care Program Drinking Water Grant creates a voluntary program to assist with testing for lead in drinking water at schools and child care programs.”

<https://www.epa.gov/dwcapacity/wiin-grant-lead-testing-school-and-child-care-program-drinking-water>

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State of Hawaii
Department of Health
Environmental Health Administration
Environmental Management Division
Safe Drinking Water Branch &
Hazard Evaluation and Emergency Response Office

Prepared by:
TruePani Inc.
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Table of Contents

I. Executive Summary	3
II. Project Background	4
II. Revisions to Stage 2 Approach	4
a. Joint Site Investigation and Flush Visits.....	4
b. Principals Included in All Communications	5
c. Information on WCs and WBFs	5
d. Accelerated Follow-up Sampling Schedule	5
III. Overview of Site Investigation Activities.....	6
IV. Overview of Sampling Activities	6
a. Initial Sampling Results.....	7
b. Follow-up Sampling Results	9
c. Actions Taken for Exceedances	14
i. Immediate Actions Taken.....	14
ii. Long-Term Actions Taken.....	14
V. Financial Summary.....	14
VI. Key Takeaways & Best Practices.....	15
a. Key Takeaways	15
i. Low Levels of Lead in Water Bottle Fillers & Water Coolers	15
ii. Effectiveness of Flushing	16
iii. High Participation Rates	16
iv. Availability of Water Bottles Fillers	16
b. Best Practices	16
i. Direct and Personal Interaction with Facility Coordinators.....	16
ii. Immediate and Automated Communications	16
iii. Inter-Departmental Approach.....	17
iv. Integrating Inaccessible Buildings into Follow-up Schedule.....	17
VII. Stage 1 and Stage 2 Summary.....	17
VIII. Appendix.....	18
a. Quarterly and Monthly Reports	18
b. Public Results Website.....	18
c. Locations of Water Coolers	18

I. Executive Summary

The Safe Drinking Water Branch (SDWB) of the Hawai'i State Department of Health (HDOH) safeguards public health by protecting Hawai'i's drinking water sources from contamination and assuring that owners and operators of public water systems provide safe drinking water to the community. This mission is accomplished through the administration of the Safe Drinking Water Program, Underground Injection Control Program (UIC), Groundwater Protection Program (GWPP), and the Drinking Water State Revolving Fund (DWSRF).

On November 14, 2018, the HDOH submitted its Notice of Intent to Participate in the Water Infrastructure Improvements for the Nation (WIIN) Act Grant: Lead Testing in School and Child Care Program Drinking Water, for Federal Fiscal Year (FFY) 2019. The HDOH Hazard Evaluation and Emergency Response Office (HEER) is the lead agency. The WIIN 2107 GRANT TEAM is also comprised of HDOH's Environmental Management Division, Safe Drinking Water Branch (SDWB); State Laboratories Division, Environmental Health Analytical Services Branch (EHASB); and Family Health Services Division, Children with Special Health Needs Branch (CSHNB); as well as the Hawai'i Department of Education (HDOE) and the Hawai'i Department of Human Services (HDHS).

In early 2021, the Hawai'i State Department of Health (HDOH) executed a contract (ASO Log No. 21-117) with TruePani Inc., retaining professional services related to executing a state-wide lead in drinking water sampling program at specified Hawai'i Department of Education (HDOE) public schools and Hawai'i Department of Human Services (HDHS) childcare facilities. A full list of responsibilities was outlined in Solicitation No. SDWB 20-01. TruePani, together with the WIIN 2107 Grant Team, successfully enrolled 106 elementary schools and 189 childcare facilities across six Hawai'i islands into Stage 1 of the lead testing program. These initial 106 schools and 189 childcare facilities were chosen using the EPA's recommended prioritization; schools and childcare facilities in low-income areas (50% receiving free and reduced lunch), facilities caring for children age 6 and under, and facilities built before 1986. Between the months of May 2021 and October 2021, TruePani collected 6,210 250mL first-draw samples from the 223 facilities located on the islands of Oahu, Hawaii, Maui, Kauai, Molokai, and Lanai. All samples were analyzed by the Hawai'i Division of State Laboratories via EPA method 200.8.

In November 2021, HDOH initiated a contract extension (ASO Log No. 21-117-M1) to expand the lead testing program for the remaining 71 public elementary schools not included in Stage 1.

The State provided a list of 72 elementary schools (ES) to be included in Stage 2 of the program. TruePani's approach for the Stage 2 elementary schools was adapted from the approach used in Stage 1. To maximize the number of schools completed in a week, Site Investigation Visits and Flush Visits were combined into a single visit for most facilities. Stage 2 was executed in four phases:

- Phase 1: Stage 2 Project Setup
- Phase 2: Site Investigation / Sample Collection
- Phase 3: Sample Analysis
- Phase 4: Reporting

Between the months of June 2022 and August 2022, TruePani collected 4,459 250mL first-draw samples from the 72 facilities located on the islands of O'ahu, Hawai'i, Maui, and Kaua'i. All samples were analyzed by the Hawai'i Division of State Laboratories via EPA method 200.8.

A total of 96 of the 4,459 first-draw samples (2.2%) exceeded the project action level of 15 ppb. Of the 72 facilities that were sampled, 44 (61%) had at least one drinking water source with test results above the project action level. All drinking water sources where the initial first-draw result exceeded 15 ppb were re-

sampled during a follow-up visit. Both a first-draw and 30-second flush sample were collected during follow-up visits. Follow-up visits continued into September 2022.

In total, all 96 sources that exceeded the project action level were sampled during follow-up sampling, totaling 192 additional samples collected. All sampling was completed following TruePani's Sampling and Analysis Plan, in accordance with the EPA 3T's methodology, which was approved by SDWB on April 30, 2021.

Immediate corrective actions, such as blocking off access to the source and the usage of filters, was communicated to each facility with one or more water sources with initial sample results above 15 ppb. During follow-up sampling, TruePani ensured that sources with exceedances had the appropriate signage. Long term corrective actions for impacted water sources will be determined by the individual school, childcare facility, or HDOE.

I. Project Background

Lead is a toxic metal that can be harmful to human health when ingested. Young children are particularly sensitive to the effects of lead as their bodies are still undergoing development. Lead can get into drinking water if it is present in the source water or by interaction between source water and plumbing materials containing lead (through corrosion). Common sources of lead in drinking water include solder, fluxes, pipes and pipe fittings, fixtures, and sediments.

As authorized by the Water Infrastructure Improvements of the Nation (WIIN) Act, EPA has made funds available through the Lead Testing in School and Child Care Program Drinking Water grant to assist states voluntary testing for lead contamination in drinking water. TruePani's sampling method is in accordance with the EPA 3T's for Reducing Lead in Drinking Water in Schools and Child Care Facilities, as required by the EPA for participation in the WIIN assistance.

Aligning with the objective that young children spend much of their time at school, the Hawai'i Department of Health (HDOH) participated in the Water Infrastructure Improvements for the Nation Act (WIIN) to test for lead in drinking water at schools and child care facilities across the state of Hawai'i. Stage 1 schools and child care facilities were prioritized due to their eligibility through the WIIN 2107 Lead Testing in School and Child Care Program Drinking Water grant requirements. Stage 2 schools included the remaining public elementary schools not included in Stage 1.

II. Revisions to Stage 2 Approach

a. Joint Site Investigation and Flush Visits

In Stage 1, the site investigation and sample collection phases were conducted separately over the course of a total of seven months. During the site investigation visit, a walkthrough of the facility is conducted and all drinking water sources are identified, information on the source is collected, and locations of all water sources are marked on a floorplan. A flush visit was then conducted to flush the water at each of the previously identified drinking water sources, place a bag over the source, and indicate the source was out of use until the sampling visit. The sampling visit must occur 8-18 hours after the flush visit. During this time, usually in the morning before school started, water samples were collected and water could return to regular use. TruePani's approach for Stage 2 features completion of site investigation and flush visit for sample collection on the same day, with sample collection scheduled for the morning following the site investigation/flush visit. This approach will reduce travel costs and time spent visiting facilities, as well as decrease the time between the facilities first interaction with the program and receipt of their results. Additionally, with schools returning to in-person learning, this overlapped approach reduced the time spent visiting classrooms during the academic year. All visits for initial sample collection were completed before the academic year resumed on August 1, 2022. Table 1

below is an example of a typical week schedule to complete sampling at five elementary schools. In the below table, “SI” refers to the site investigation visit.

Table 1: Example Week Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
SI – School 1	Sample – School 3	Sample – School 1	Sample – School 4	Sample – School 5
SI – School 2	Flush – School 1	Sample – School 2	SI & Flush – School 5	
SI & Flush – School 3	Flush – School 2	SI & Flush – School 4		

b. Principals Included in All Communications

In Stage 1, a Facility Coordinator was designated as a point of contact for all scheduling, updates, and results communication. Facility Coordinators were generally custodial or maintenance staff that were familiar with the facility, had access to all buildings, and could shut off/turn on water sources. However, these Facility Coordinators were not always in a position where they can inform all teachers and staff of upcoming sampling. Because the Facility Coordinator was the recipient of all TruePani communications, administrative staff did not always receive these communications. In most cases, Principals were unfamiliar with the project until the results email was released or the TruePani team arrived for follow-up sampling.

In Stage 2, TruePani’s first contact with each school was via phone call with the Principal or Assistant Principal. Principals then were able to share the contact of the head custodian or other staff that would meet the TruePani team on the day of the sampling visit. By directing milestone communications such as early program information and initial scheduling to both Facility Coordinators and Principals, Principals were able to alert their summer staff of sampling visits and were involved in carrying out the required actions for exceedances. This helped to align the facility staff that has the time and expertise to assist in sampling with those who have the power to institute corrective actions at the school.

c. Information on WCs and WBFs

During both stages of the project, TruePani annotated floorplans with all water sources, including those that were exempt from testing. This included the locations of all water coolers and water bottle fillers that were exempt due to an existing filter, broken fixtures, or inaccessible location. In Stage 2, TruePani included information in facility reports regarding the water bottle fillers that were exempt due to an existing filter. With this information, TruePani was able to generate a list of all facilities that had water bottle fillers, their locations, and whether they were exempt or sampled. The locations of WCs and WBFs could be later used to inform remediation opportunities; specifically retrofitting existing water coolers with filter attachments or guiding students to existing filtered units. This information will make it easier to organize information on water bottle fillers and water coolers that will be helpful for possible remediation opportunities. The link to information on water bottles fillers can be found in the appendix of this report.

d. Accelerated Follow-Up Sampling Schedule

Due to the joint site investigation and flush visit approach, as well as fewer facilities included in Stage 2, TruePani was able to complete follow-up sampling on a much more aggressive timeline than in Stage 1. On average, follow-up sampling occurred 14 days after the results were returned to the facility. When TruePani staff arrived for follow-up sampling, the facility staff were aware of the exceedances and follow-up activities was still top of mind for the facility. No sources were permanently removed from service

between the time of results delivery and follow-up sampling. All exceedance sources were able to be sampled and immediate/temporary remediation measures were taken by the facility (hand-wash only, water temporarily disconnected, etc.)

II. Overview of Site Investigation Activities

Utilizing insights gleaned from Stage 1, TruePani developed a revised approach to optimize the allotted funding and ensure all remaining public schools could be sampled before the academic year resumed in August. In Stage 1 of the project, all site investigations were completed several months before sample collection began. For Stage 2, site investigations were combined with the flush visits for 54 of the 72 schools. In the case of a joint site investigation and flush visit, TruePani completed a site investigation and flush visit in the afternoon and returned the following morning to complete sample collection. In the case of a separate site investigation, flush visit, and sample visit, TruePani visited the school three times over three consecutive days. This greatly reduced travel costs for travel costs for the entire project, reduced the amount of time between schools enrolling in the program and receiving their results, and decreased the number of visits to each facility.

During site investigation visits, a total of 4,493 drinking water sources were identified as eligible to be sampled. No elementary schools were identified as exempt during site investigations. Table 2 provides an overview of the 72 facilities visited and the sources identified.

Table 2: Summary of Site Investigations by Island

Island	Dates of Site Investigation(s)	Elementary Schools (ES)	Sources Identified
Kaua'i	June 6 – 8, 2022	3	168
Hawai'i	June 13 – 16, 2022	5	327
Maui	June 20 – 23, 2022	6	393
O'ahu	May 31 – July 28, 2022	58	3605
Total		72	4,493

III. Overview of Sampling Activities

Between June 2022 and August 2022, TruePani facilitated the drinking water testing and analysis at 72 facilities. TruePani collected 4,459 250mL first-draw samples from drinking water sources across 72 schools across four islands. First-draw sample collection began on June 1, 2022 and was completed on July 29, 2022. Follow-up sampling of sources with lead results at or above 15 ppb began on June 22, 2022, and was completed on September 1, 2022, with first-draw and follow-up sampling carried out concurrently. 4,493 sources were identified during site investigations and 4,459 samples were collected during sample collection. The difference of 34 sources that were identified but not sampled was mostly due to kitchen sources that were exempt during the sample collection visit when staff confirmed the kitchen was not in use due to off-site food preparation. The specific reason for each source that was exempted is recorded in the “notes” section of the data. All sampling was completed following TruePani’s Sampling and Analysis Plan, in accordance with the EPA 3T’s methodology and approved by SDWB on April 30, 2021. Table 3 below summarizes the number of facilities sampled, sources collected, facilities with exceedance, and overall exceedance rates.

Table 3: Summary of Sampling Activities

	Stage 2
Number of Facilities Sampled	72
Number of Sources Sampled (First-draw)	4459
Number of First-draw Exceedances (≥ 15 ppb)	96
Exceedance Rate	2.2%
Number of Facilities with an Exceedance	44
% Facilities with an Exceedance	61%
Number of Sources Sampled During Follow-Up Sampling	96
Maximum Result (ppb)	2458

a. Initial Sampling Results

All first-draw sampling results, organized by school, are publicly available and can be found on the project website located at: <https://health.hawaii.gov/heer/environmental-health/highlighted-projects/wiin/>. TruePani also maintains a cloud-based database where results are hosted. CSV and .xlsx files containing all source location, photos, and lab analysis data are stored in the shared project OneDrive folder and will be provided to HDOH on a flash drive.

Of the 4,459 first-draw samples collected, 96 resulted in lead concentrations at or above the project action level of 15 ppb (2.2%). Lead concentrations exceeding the project action level of 15 ppb were found at 44 of the 72 facilities tested (61%). Elevated lead concentrations were most often found in classroom faucets (61.5% of the total exceedances). Table 4 below includes a breakdown of the number of sources tested by each source type, and the number of sources with results at or above 15 ppb during first-draw sample collection. Figure 1 breaks down the prevalence of various lead concentrations of initial first-draw samples.

Table 4: Breakdown of Results by Source Type

Source Type	Abbreviation	Number of Sources	Number of Sources with First-Draw Results ≥ 15 ppb	Percentage of Sources ≥ 15 ppb
Bathroom Faucet	BF	26	0	-
Classroom Faucet	CF	3008	59	1.96%
Drinking Fountain	DF	628	28	4.46%

Ice Machine	IM	37	0	-
Kitchen Faucet	KF	195	1	0.51%
Kitchen Pot Filler	KPF	87	7	8.05%
Nurse Sink	NS	59	1	1.69%
Water Bottle Filler	WBF	117	0	-
Water Cooler	WC	302	0	-
TOTAL		4459	96	2.2%

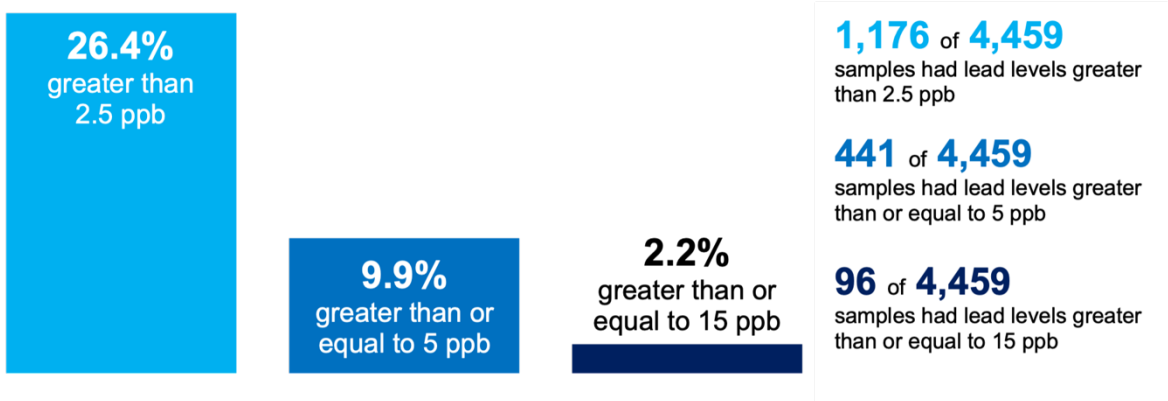


Figure 1: Prevalence of Lead in Initial First-Draw Samples

b. Follow-Up Sampling Results

Follow-up sampling was conducted for the sources at or above 15 ppb during initial sampling. Of the 96 sources with an exceedance, all 96 were able to be sampled for follow-up sampling. For these, the follow-up sampling procedure included the collection of both a first-draw and flush sample. The following figures illustrate the prevalence of lead in first-draw and flush samples.

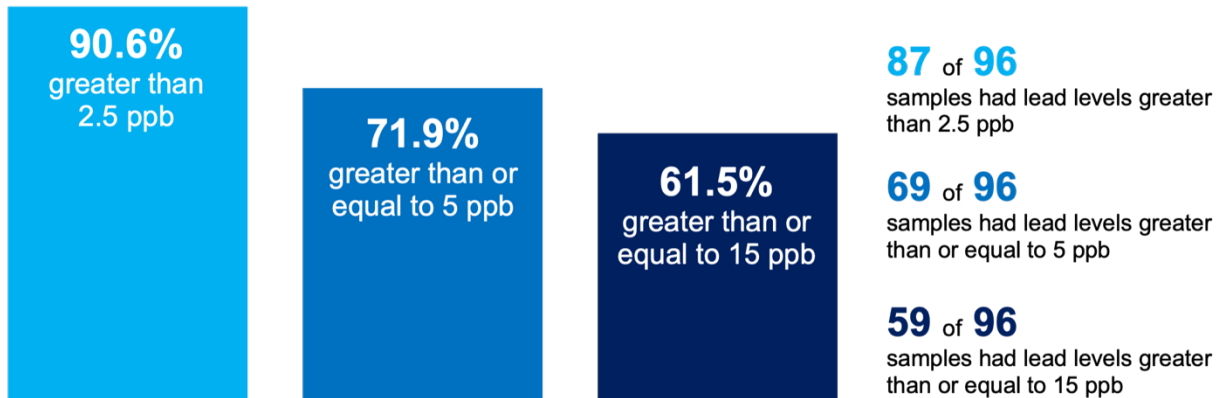


Figure 2: Prevalence of Lead in Follow-Up Flush Samples

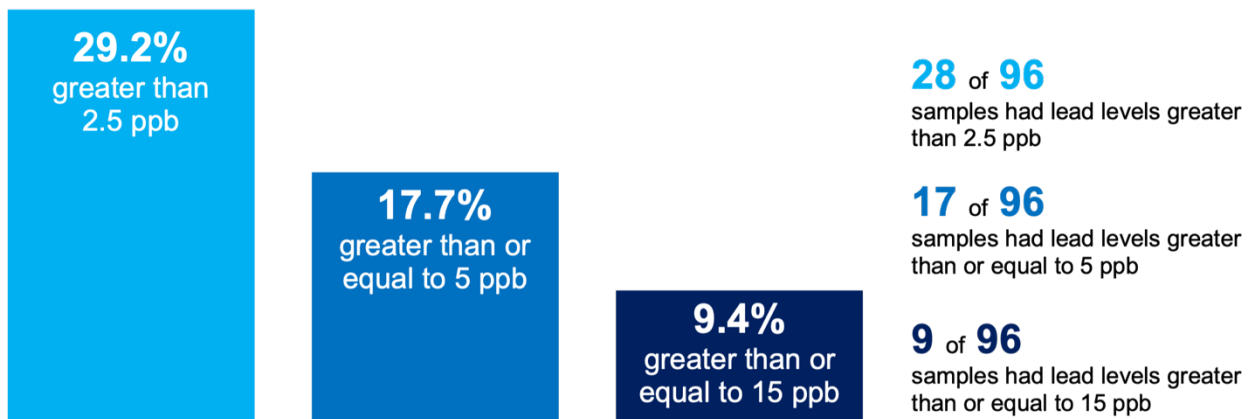


Figure 2: Prevalence of Lead in Follow-Up First-draw Samples

Table 5 lists each source that had an initial sample result above 15 ppb, the follow-up results for each exceedance, and the location of the source within the facility.

Table 5: Initial Sampling Exceedances

Source ID	Source Type	Facility Name	Room Number	Initial Result	Follow-Up First-Draw Result	Follow-Up Flush Result
311-21	DF	Aina Haina Elementary School	C18	15 ppb	7 ppb	<2.5 ppb
312-9	CF	Hahaione Elementary School	A104	31 ppb	11 ppb	<2.5 ppb
312-17	DF	Hahaione Elementary School	D101	36 ppb	18 ppb	<5 ppb
313-4	CF	Hokulani Elementary School	ADMIN LOUNGE	26 ppb	31 ppb	<2.5 ppb
313-17	DF	Hokulani Elementary School	B11	18 ppb	15 ppb	6 ppb
314-11	CF	Kāhala Elementary School	B9	41 ppb	8 ppb	<2.5 ppb
314-12	CF	Kāhala Elementary School	B8	99 ppb	8 ppb	<2.5 ppb
314-13	CF	Kāhala Elementary School	B7	772 ppb	49 ppb	<2.5 ppb
314-53	CF	Kāhala Elementary School	E25	392 ppb	91 ppb	<2.5 ppb
314-54	CF	Kāhala Elementary School	E26	93 ppb	125 ppb	<5 ppb
315-18	CF	Koko Head Elementary School	F26	24 ppb	<5 ppb	<2.5 ppb
315-53	KPF	Koko Head Elementary School	KIT	2458 ppb	118 ppb	164 ppb
317-34	DF	Ma'ema'e Elementary School	D-12	15 ppb	<2.5 ppb	<2.5 ppb
317-61	CF	Ma'ema'e Elementary School	J-34	23 ppb	<5 ppb	<2.5 ppb
320-7	DF	Nu'uaniu Elementary School	B1	21 ppb	<5 ppb	<2.5 ppb
320-10	DF	Nu'uaniu Elementary School	C1	40 ppb	15 ppb	<2.5 ppb
320-16	DF	Nu'uaniu Elementary School	E1	37 ppb	42 ppb	8 ppb
320-19	DF	Nu'uaniu Elementary School	F1	23 ppb	<5 ppb	<2.5 ppb
323-3	NS	Kamilo'iki Elementary School	ADMIN	1685 ppb	458 ppb	15 ppb
324-8	DF	Āliamanu Elementary School	A1	15 ppb	14 ppb	<2.5 ppb
325-66	CF	Inouye Elementary School	H1	16 ppb	6 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Result	Follow-Up First-Draw Result	Follow-Up Flush Result
326-4	CF	Hickam Elementary School	C13	16 ppb	21 ppb	<2.5 ppb
326-63	CF	Hickam Elementary School	KWORK ROOM	30 ppb	17 ppb	<2.5 ppb
328-53	CF	Mokulele Elementary School	C10	17 ppb	21 ppb	<2.5 ppb
329-4	CF	Nimitz Elementary School	C104	490 ppb	24 ppb	<2.5 ppb
331-18	DF	Red Hill Elementary School	C3	17 ppb	<2.5 ppb	<2.5 ppb
331-20	CF	Red Hill Elementary School	C1	50 ppb	5 ppb	<2.5 ppb
331-40	CF	Red Hill Elementary School	B8	15 ppb	<5 ppb	<2.5 ppb
332-139	KPF	Solomon Elementary School	KIT	15 ppb	<5 ppb	<2.5 ppb
333-19	CF	Scott Elementary School	A1	46 ppb	<2.5 ppb	<2.5 ppb
333-21	CF	Scott Elementary School	B8	15 ppb	<5 ppb	<2.5 ppb
333-22	CF	Scott Elementary School	B9	16 ppb	<5 ppb	<2.5 ppb
333-23	CF	Scott Elementary School	B10	16 ppb	<5 ppb	<2.5 ppb
333-24	CF	Scott Elementary School	B11	17 ppb	<5 ppb	<2.5 ppb
333-25	CF	Scott Elementary School	B12	19 ppb	<5 ppb	<2.5 ppb
333-55	CF	Scott Elementary School	F39	23 ppb	27 ppb	<2.5 ppb
334-16	DF	Shafter Elementary School	C4	54 ppb	30 ppb	5 ppb
334-35	DF	Shafter Elementary School	CAF	31 ppb	<5 ppb	<2.5 ppb
335-3	CF	Mililani Waena Elementary School	P2	26 ppb	20 ppb	<2.5 ppb
335-32	CF	Mililani Waena Elementary School	D LOUNGE	33 ppb	38 ppb	<5 ppb
336-3	CF	Webling Elementary School	AWORK ROOM	17 ppb	15 ppb	<2.5 ppb
336-23	CF	Webling Elementary School	C5	17 ppb	<5 ppb	<2.5 ppb
336-30	CF	Webling Elementary School	B3	15 ppb	<5 ppb	<2.5 ppb
338-8	KPF	Mililani Mauka Elementary School	KIT	67 ppb	20 ppb	<5 ppb
341-34	CF	'Ewa Beach Elementary School	B12	38 ppb	10 ppb	<2.5 ppb
342-14	CF	Iroquois Point Elementary School	D1	46 ppb	11 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Result	Follow-Up First-Draw Result	Follow-Up Flush Result
342-16	DF	Iroquois Point Elementary School	B4	23 ppb	17 ppb	<2.5 ppb
342-19	CF	Iroquois Point Elementary School	B1	47 ppb	15 ppb	<2.5 ppb
342-40	DF	Iroquois Point Elementary School	P5	128 ppb	6 ppb	<2.5 ppb
342-44	DF	Iroquois Point Elementary School	P7	37 ppb	10 ppb	29 ppb
342-49	DF	Iroquois Point Elementary School	P13	48 ppb	10 ppb	<2.5 ppb
344-24	CF	Manana Elementary School	J2	28 ppb	15 ppb	<2.5 ppb
346-5	CF	Palisades Elementary School	LIB	16 ppb	16 ppb	<2.5 ppb
346-44	CF	Palisades Elementary School	DMULTI PURPOS E	44 ppb	70 ppb	<5 ppb
347-38	CF	Pearl City Highlands Elementary	E29	213 ppb	305 ppb	27 ppb
348-71	CF	Holomua Elementary School	D104	22 ppb	30 ppb	<2.5 ppb
348-108	CF	Holomua Elementary School	Admin	36 ppb	14 ppb	<2.5 ppb
349-11	CF	Kapolei Elementary School	TB8	484 ppb	8 ppb	<2.5 ppb
349-12	CF	Kapolei Elementary School	TB7	35 ppb	<5 ppb	<2.5 ppb
351-10	DF	Momilani Elementary School	202	16 ppb	15 ppb	<5 ppb
356-2	DF	'Aikahi Elementary School	C2	19 ppb	5 ppb	5 ppb
356-46	DF	'Aikahi Elementary School	A4	16 ppb	15 ppb	<2.5 ppb
357-3	DF	Enchanted Lake Elementary School	K2	18 ppb	<5 ppb	<2.5 ppb
359-28	CF	Kainalu Elementary School	F15	41 ppb	80 ppb	<5 ppb
360-47	DF	Kāne'ohe Elementary School	C18	18 ppb	<2.5 ppb	<2.5 ppb
360-48	DF	Kāne'ohe Elementary School	C18	21 ppb	<5 ppb	<2.5 ppb
362-8	CF	Maunawili Elementary School	E13	19 ppb	14 ppb	<2.5 ppb
362-55	KF	Maunawili Elementary School	KIT	31 ppb	29 ppb	<2.5 ppb
363-6	CF	Mokapu Elementary School	P7	28 ppb	<2.5 ppb	<2.5 ppb
363-25	CF	Mokapu Elementary School	C4	18 ppb	15 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Result	Follow-Up First-Draw Result	Follow-Up Flush Result
363-76	KPF	Mokapu Elementary School	KIT	528 ppb	3232 ppb	41 ppb
364-30	CF	Sunset Beach Elementary School	D101	113 ppb	854 ppb	10 ppb
364-43	CF	Sunset Beach Elementary School	APCNC	38 ppb	8 ppb	<2.5 ppb
365-3	CF	Waimānalo Elementary School	B11	60 ppb	516 ppb	17 ppb
368-20	CF	Ahuimanu Elementary School	P1	16 ppb	14 ppb	<2.5 ppb
369-21	DF	DeSilva Elementary School	D101	15 ppb	<2.5 ppb	<2.5 ppb
369-43	DF	DeSilva Elementary School	D101	40 ppb	40 ppb	<5 ppb
374-4	CF	Kamehameha III Elementary School	P18	15 ppb	<2.5 ppb	<2.5 ppb
375-3	DF	Kula Elementary School	F203	19 ppb	<2.5 ppb	<2.5 ppb
375-7	DF	Kula Elementary School	F102	15 ppb	29 ppb	6 ppb
375-8	DF	Kula Elementary School	F102	28 ppb	28 ppb	<5 ppb
375-13	KPF	Kula Elementary School	KIT	32 ppb	40 ppb	9 ppb
375-22	CF	Kula Elementary School	E1	16 ppb	21 ppb	<2.5 ppb
375-28	CF	Kula Elementary School	C1	16 ppb	27 ppb	<2.5 ppb
375-45	CF	Kula Elementary School	B1	47 ppb	90 ppb	19 ppb
375-46	CF	Kula Elementary School	B1	39 ppb	69 ppb	17 ppb
375-47	DF	Kula Elementary School	B1	54 ppb	73 ppb	20 ppb
376-18	CF	Nāhi'ena'ena Elementary School	B102	26 ppb	39 ppb	<2.5 ppb
376-21	CF	Nāhi'ena'ena Elementary School	B101A	28 ppb	8 ppb	<2.5 ppb
376-22	CF	Nāhi'ena'ena Elementary School	B101A	62 ppb	75 ppb	<2.5 ppb
377-5	CF	Kamali'i Elementary School	DUPLICATING/ COPY ROOM	22 ppb	19 ppb	<2.5 ppb
377-43	CF	Kamali'i Elementary School	F7	15 ppb	<5 ppb	<2.5 ppb
379-33	CF	Pu'u Kukui Elementary School	H101	15 ppb	14 ppb	13 ppb
379-72	CF	Pu'u Kukui Elementary School	E101	27 ppb	<2.5 ppb	<2.5 ppb

Source ID	Source Type	Facility Name	Room Number	Initial Result	Follow-Up First-Draw Result	Follow-Up Flush Result
380-31	KPF	Hanalei Elementary School	KIT	379 ppb	141 ppb	<5 ppb
380-32	KPF	Hanalei Elementary School	KIT	47 ppb	40 ppb	<5 ppb

c. Actions Taken for Exceedances

i. Immediate Actions Taken

Once sample analysis was completed, results were sent to each facility via email. For sources with results above 15 ppb, Facility Coordinators were instructed to immediately block off access to the fixture by either disconnecting the water flow or covering the source and attaching a “Do Not Use” sign.

Following the release of results to the public page, each facility was provided a customized email outlining the sources with elevated lead results, immediate corrective actions, signage to post near affected sources, and further information on lead exposure. Corrective action communications were sent to the designated Facility Coordinator, and in the case of schools, the principal was also included. The following corrective action recommendations were included:

- Flushing the water before use until a uniform temperature is reached (no less than 30 seconds)
- Using a filter to remove lead and periodically replacing filter cartridges
- Frequent cleaning of aerators
- Using the identified fixture for handwashing only and using bottled water for drinking/cooking
- Replacing the faucet or plumbing with certified lead-free materials

ii. Long-Term Actions Taken

The long-term corrective actions for sources with lead results above 15 ppb will ultimately be determined by the individual school, childcare facility, or HDOE. Several facilities chose to permanently disconnect or remove one or more of their affected sources from service due to lack of usage or availability of other drinking water sources nearby. Although removal of an affected source is an immediate and cost-effective solution to eliminate lead exposure, permanent removal of a source is likely only an option for facilities with alternative drinking water sources.

For facilities with a water bottle filler (WBF) or water cooler (WC), a potential long-term solution is to retrofit the existing unit with a filter attachment. This approach is often less expensive than purchasing and installing a new unit, however not all models of water coolers can be retrofitted with a filter attachment. Because water coolers have an attached electric chiller unit, they represent locations with both an existing water pipe and an electric outlet. These locations represent a possible opportunity to add a new filtered unit in a building. Facilities can encourage the use of these centrally located WCs and WBFs that have been affixed with a filter, especially for those classrooms or locations with affected drinking water sources. Of the 89 schools with exceedances, 84 schools have at least one WC or WBF. The locations of all sampled water coolers and water bottle fillers, as well as exempted water coolers and water bottle fillers, are available in Section VII. Appendix.

IV. Financial Summary

In November 2021, modifications to ASO Log No. 21-117 “Lead Testing in School and Child Care Program Drinking Water Grant Workplan for the State of Hawai’i” were submitted. The total budget for Stage 1 was \$580,519 and was increased by \$263,563.29 under ASO Log No. 21-117-M1. This contract total, as outlined by ASO Log No. 21-117, went into effect via retroactive contract modification. As of October 7, 2022, all work outlined in the contract was completed, invoiced, and paid for, totaling \$263,563.29.

Table 6: Contract Total and Remaining Balance

ASO Log No. 21-117-M1 Contract Total	\$ 263,563
Final Amount to be Paid for Stage 2	\$ 263,563

Throughout the project, TruePani tracked labor, travel and direct expense costs, and tax estimates by county, for reporting and general excise tax (GET) purposes. Table 7 displays a breakdown of costs by county and category.

Table 7: Project Costs by County

County	Labor, Travel & Direct Expenses	Percent of Cost
Honolulu County	\$ 213,486	81%
Maui County	\$ 21,085	8%
Hawaii County	\$ 18,449	7%
Kauai County	\$ 10,543	4%
Total	\$ 263,563	100%
GET to be Paid	\$ 7,387	

Travel expenses, direct costs, and estimated taxes were weighted equally between schools. They were then distributed by island, based on the number of facilities. General Excise Tax (GET) payments were made to the Hawai’i Department of Taxation through the Hawai’i Tax Online website.

V. Key Takeaways & Best Practices

a. Key Takeaways

Many of the key takeaways identified in Stage 1 were consistent with those of Stage 2. Below is a summary of the key takeaways seen across both stages, with Stage 2 data included.

i. Low Levels of Lead in Water Bottle Fillers & Water Coolers

During Stage 2, TruePani sampled 117 water bottler fillers (WBF), two of which had results above the laboratory reporting limit of 2.5 ppb, none were at or above 15 ppb. Of the 302 water coolers (WCs) that were sampled, none had lead levels above the action level. Furthermore, only eight water coolers had any level of quantifiable lead above the method detection limit.

ii. Effectiveness of Flushing

During the follow-up visit for confirmatory testing of the sources with levels above the action level, TruePani collected 96 follow-up and first-draw samples. Based on the results from follow-up flush samples, flushing reduced the lead levels below 15 ppb at 87 of the 96 sources (91%) and below 5 ppb at 68 of 96 sources (71%). Flushing is often effective in reducing lead levels but cannot be considered a permanent solution.

iii. High Participation Rates

Of the 72 eligible facilities in the state, 100% were contacted successfully during the initial communications. 100% of facilities completed the program from site investigation through follow-up sampling (or completion of the project). This high participation rate is likely the result of multi-agency collaboration at the beginning of the project to ensure that participants were aware of the project before TruePani's initial communications.

iv. Availability of Water Bottle Fillers

TruePani collected information on water bottle fillers across both stages of the project. All water bottle fillers were noted on floorplans but some were exempt if they had a filter, were broken, or inaccessible. The number of exempt and sampled water bottle fillers was collected throughout the project. In Stage 1, a total of 54 water bottle fillers were identified at 106 schools, for an average of 0.5 per school. In Stage 2, a total of 182 water bottle fillers were identified at 72 schools, for an average of 2.5 per school. It is worth noting that the primary difference between the Stage 1 and Stage 2 schools was the fact that Stage 1 schools serve >50% of students on free and reduced lunch, and were built before 1986. Stage 2 schools did not fall within this prioritization criteria.

b. Best Practices

Best Practices that were identified in Stage 1 were also employed during Stage 2. These best practices are summarized below but can be found in more detail in Stage 1 Final Report.

i. Direct and Personal Interaction with Facility Coordinators

TruePani's user-centered approach to interacting with Facility Coordinators allowed for the development of a personal connection to each facility. Understanding that the time of a Facility Coordinator is valuable, TruePani's continuous but flexible outreach took as much burden from facility personnel as possible. Instead of having to remember dates and set reminders, the Facility Coordinator was contacted directly by a familiar name, given the information they needed, and invited once again to reach out in a way convenient to them for any questions or concerns.

ii. Immediate and Automated Communications

Oftentimes when TruePani would enter occupied classrooms for sampling, educators would show concern that their classroom water source had elevated lead levels and would be curious about the status of nearby drinking water sources. As TruePani would immediately post results to the user-friendly public page once received, TruePani would be able to direct curious individuals to the results page whenever questions would arise regarding sample results. This practice ensured that information was accessible to all individuals, beyond just facility managers and administration. By updating the public webpage as results were received, rather than in rounds or by geography, TruePani was able to immediately address the interest of the public and provide results in real time.

iii. Inter-Departmental Approach

The Hawai'i WIIN 2107 Drinking Water Project team took an inter-departmental approach by including relevant departments in meetings from the onset of the contract. The team was comprised of individuals from the Hawai'i Department of Health, Safe Drinking Water Branch, Hazard Evaluation and Emergency Response Office, Environmental Management Division, Department of Human Services (Stage 1), Department of Education, Laboratories Division, and TruePani. This approach ensured that all parties were aligned with major milestones, events affecting progress, results communication, and remediation. Additionally, by hosting a bi-weekly team meeting, project updates were always communicated in a timely manner and respective departments maintained engagement with the project.

iv. Integrating Inaccessible Buildings into Follow-up Schedule

As sampling occurred during the summer recess, there were occasions where whole buildings were under construction or other summer maintenance was scheduled that caused buildings to be inaccessible. In Stage 2, TruePani implemented a process for sampling buildings that were not sampled during the initial sampling visit due to inaccessibility. When TruePani returned for follow-up sampling at or nearby a school with an inaccessible building, TruePani would return and collect both a first-draw and flush sample from the sources. In the case that the first-draw sample returns at or above 15 ppb, the flush sample would be analyzed (replacing the need for a *third* visit to the facility for follow-up collection). This approach is especially important for situations in which a kitchen, or other location where students receive a large volume of drinking water, was inaccessible during the initial visit.

VI. Stage 1 and Stage 2 Summary

Over the course of the Stage 1 and Stage 2 of the Hawai'i WIIN 2107 Drinking Water Project, TruePani visited 367 schools and child care facilities across the state. Of these 367 facilities, 295 facilities were visited for initial first-draw water sampling visits. 72 child care facilities were not visited for water sampling visits as no drinking water sources were identified during site investigations. Overall, 10,669 initial first-draw samples were collected over the course of the project. The below table is a summary of Stage 1 and Stage 2, as well as separated by facility type.

Table 8: Summary of Stage 1 and Stage 2

	Stage 1 Elementary Schools	Stage 1 Child Care Facilities	Stage 2	Elementary Schools ONLY	Stage 1 + Stage 2
Number of Facilities Sampled	106	117	72	178	295
Number of Sources Sampled (First-Draw)	5888	322	4459	10,347	10,669
Number of First-Draw Exceedances (>=15 ppb)	290	5	96	386	391
Exceedance Rate	4.9%	1.6%	2.2%	3.7%	3.7%
Number of Facilities with an Exceedance	89	4	44	133	137
% Facilities with an Exceedance	84%	6%	61%	74%	46%
Number of Sources Sampled During Follow-Up Sampling	277	5	96	373	5
Maximum Result	2054	55	2458	2458	2458

VII. Appendix

a. Quarterly and Monthly Reports

[Monthly Reports](#)
[Quarterly Reports](#)

b. Public Results Website

<https://health.hawaii.gov/heer/environmental-health/highlighted-projects/wiin/results/>

c. Locations of Water Coolers

<https://airtable.com/shrHye008Lvw5VjN3>