

Are You Emergency Ready?

From Planning to Preparation



Max Mendoza, Security & Emergency Preparedness Branch

Paula Fitzell, CEO of After-School All-Stars Hawai'i

Maria Glidden, Program Manager, After-School All-Stars Hawai'i

Agenda

- **Top Crisis Issues**
- **Response Guidelines**
- **Crisis Examples**
- **Communication**
- **Table-top exercise**
- **Q&A**



Kapolei Middle, February 2019

Top Crisis Issues

Threats

- **Social Media**
 - Instagram
 - Facebook
 - Unknown apps
- **Prank Calls**
- **Student Reporting**
- **Graffiti**



HPD Press Conference, February 2018

Top Crisis Issues

Threats

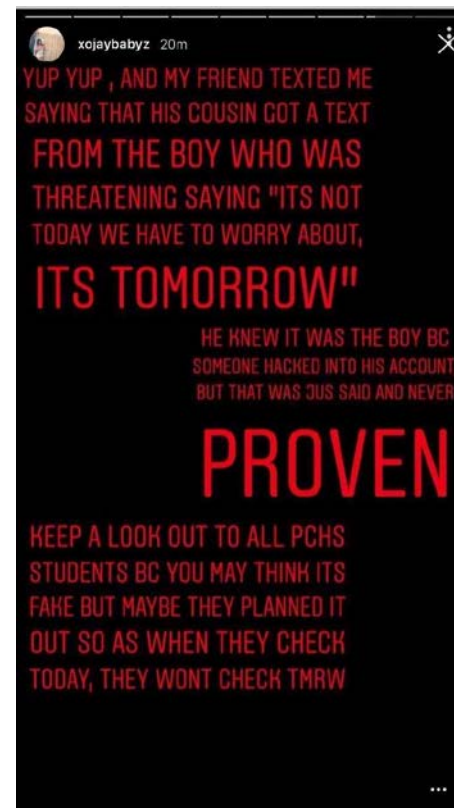
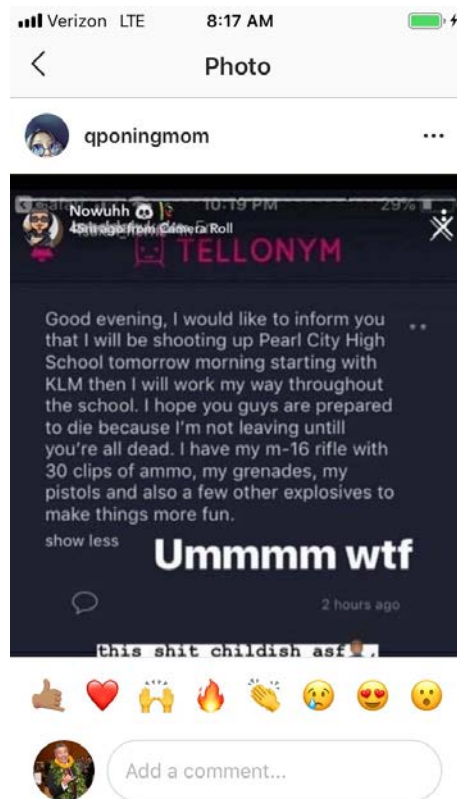
- **Response Guidelines**
 - **Call 9-1-1**
 - **Notify school and complex leadership**
 - **Complex leadership will notify Deputy, SSEPB and the Communications Branch (Comm)**
 - **Launch investigation**
 - **Coordinate with SSEPB to implement safety measure during situation**
 - **Coordinate with Comm on student, staff, parent and media communication**



Top Crisis Issues

Threats

- Crisis Example - Pearl City High, February 2019



Top Crisis Issues

Trespassing

- **Stranger Danger**
- **Homeless**
- **Police Chase**
- **Terminated Employee**
- **Custody Issues**
- **TRO**



Students encouraged to travel in pairs during after school programs.

Top Crisis Issues

Trespassing

- **Response Guidelines**
 - **Ensure “No Trespassing/Loitering” with HRS statutes (HRS 708-813 & 814) and “Visitors Report to the Office” signs are posted throughout the campus, particularly at entry points.**
 - **Approach individual suspected of trespassing (i.e. no HIDOE/school badge) and ask person to leave if person does not have official business to conduct.**
 - **Call 9-1-1 if the person refuses to leave; be prepared to declare proper emergency action (i.e. lockdown) if person is uncooperative or exhibits any signs of hostility.**
 - **Be prepared to issue Notice of Trespass if necessary; recommend issuing in the presence of law enforcement.**
 - **Comply with Emergency Notification procedures (i.e. notify CAS, CAS in turn notifies Deputy Supt., SSEPB and Comm).**



Top Crisis Issues

Trespassing

- Crisis Examples



Man attempts to kidnap 15-year-old girl in Kapolei, suspect on the run

No arrests have been made.

Tuesday, April 9th 2019, 10:11 AM HST by KITV Web Staff



Hawaii
Tribune Herald

Wednesday, July 10, 2019 | 84.2° scattered clouds

Hawaii News

Keaau schools placed on lockdown

By Michael Brestovansky | Saturday, May 4, 2019, 12:05 a.m.

Share this story   

Keaau Middle and Elementary schools went under lockdown Friday after a man brandishing a machete was seen near the middle school campus.

According to a statement from Derek Inoshita, a spokesman for the Hawaii Department of Education, an unknown man with a machete entered Keaau Middle School's campus, prompting a lockdown from 7:30 a.m. through 9:30 a.m. Students were moved to secure locations and Hawaii Police arrived to search the area.

KAPOLEI, Hawaii - Police are investigating an attempted kidnapping that happened Monday night in Kapolei.

A 15-year-old girl was approached by a male suspect around 9:55 p.m. who pushed her down and used a dangerous weapon, causing a laceration to the victim. The suspect then fled the scene.

Police say the victim was treated and released.

No arrests have been made.



Police arrest man suspected of breaking into Honolulu school



Hawaii News Now/Title

By HNN Staff | June 25, 2019 at 8:01 AM HST - Updated June 25 at 8:01 AM

HONOLULU, Hawaii (HawaiiNewsNow) - Honolulu police arrested a 27-year-old man suspected of breaking into a Honolulu school on Monday.

Police identified Zerron Castiglione as the person who broke into a room at Central Middle School and searched around sometime between Friday and Tuesday.

Sources say Castiglione is homeless and was found sleeping at the school.

Police arrested him around 7:35 a.m. on suspicion of second-degree burglary.

It does not appear that anything was taken.

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Top Crisis Issues

Natural & Manmade Disasters

- Hurricane
- Flood
- Fire



Waiakea High, August 2018

Top Crisis Issues

Natural & Manmade Disasters

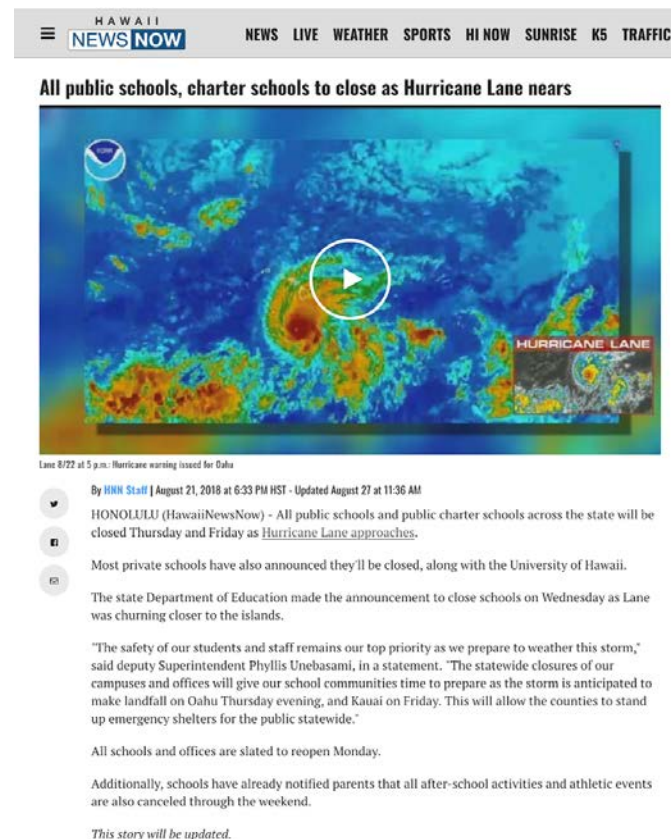
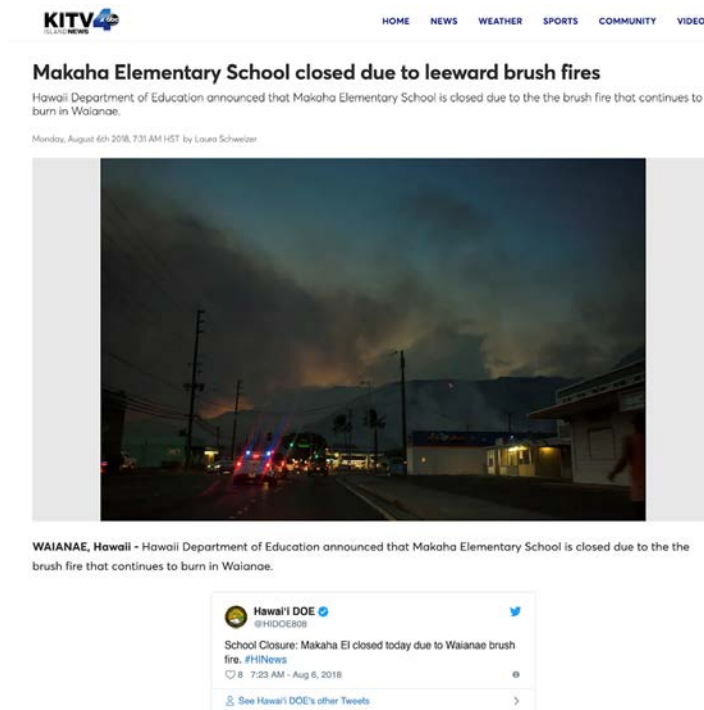
- **Response Guidelines**
 - **Stay tuned to alerts from SSEPB and other government agencies (i.e. FEMA, HI-EMA, County Civil Defense, etc.)**
 - **Secure property if it's safe to access the area**
 - **Call 9-1-1 if there is any danger to life or property**
 - **Notify school and complex leadership**
 - **Coordinate with SSEPB to implement safety measure during situation**
 - **Coordinate with Comm on student, staff, parent and media communication**



Top Crisis Issues

Natural & Manmade Disasters

- Crisis Examples



Top Crisis Issues

Active Shooter

- **Active Threat Response Systems:**
 - Run, Hide, Fight
 - Avoid, Deny, Defend: **ALERRT CRASE**
 - **ALICE**: A-Alert; L-Lockdown; I-Inform; C-Counter; E-Evacuate
 - **AlerT**: A-Assess; I-lockdown; e-evade; r-resist; T-Tell
- **ALICE & AlerT (very similar) specifically designed for K-12 environment**
- **First thing to do--Assess: Orient to your response action base upon level of contact with the threat and location**
 - **CONTACT + LOCATION = RESPONSE**
- **Hide/Deny/Lockdown: Secure your location or area when you:**
 - 1) have indirect contact with the threat; 2) can secure your location; and 3) exit leads to danger



Top Crisis Issues

Active Shooter

- **Run/Avoid/Evacuate/Evade:** Avoid the threat when you: 1) Have direct contact with the attacker; 2) cannot secure your location; and 3) have a clear path of escape
- **Defend/Fight/Counter/Resist:** As a last resort, resist when: 1) You have direct contact with the attacker; 2) cannot evacuate or evade; 3) fear for loss of life or serious injury
- **Alert/Inform/Tell:** As you are able, alert others (i.e., school security, custodians, main office, adult supervisors, etc.), and call 9-1-1



Top Crisis Issues

Active Shooter

- **Lockdown Guidelines:**
 - **Call 9-1-1**
 - **Broadcast lockdown warning (in plain language) from a safe location**
 - **Close and lock doors; lower or close any blinds; and turn off lights and computer monitors**
 - **Barricade doors using desks, filing cabinets, heavy objects, etc.**
 - **Have staff/students stay low and away from windows/doors; look for the “safe corner” in a classroom or office; and build defensible (“cocoon”) space**
 - **Find items (i.e., scissors, letter openers, etc.) that can be used to defend and have a plan if perpetrator enters the room**



Top Crisis Issues

Active Shooter

- **Lockdown Guidelines (Continued):**
 - **Keep calm and quiet**
 - **Silence video/projector/speaker equipment, cell phones, and other personal electronic devices. Prohibit texting.**
 - **Stay in safe areas until directed by law enforcement or an administrator to move or evacuate.**
 - **Remain in lockdown until an “All Clear” signal is given by proper authorities (i.e., school administrator)**



Students practice during a lockdown drill.

Crisis Communications

Before

- **Share emergency plans with parents**
- **Discuss outcomes of drills with staff, students and parents**
- **Start group text with school leadership, Complex Area Supt, Safety Director, Comm. Director**



Haleiwa EI evacuation drill.

Crisis Communications

During

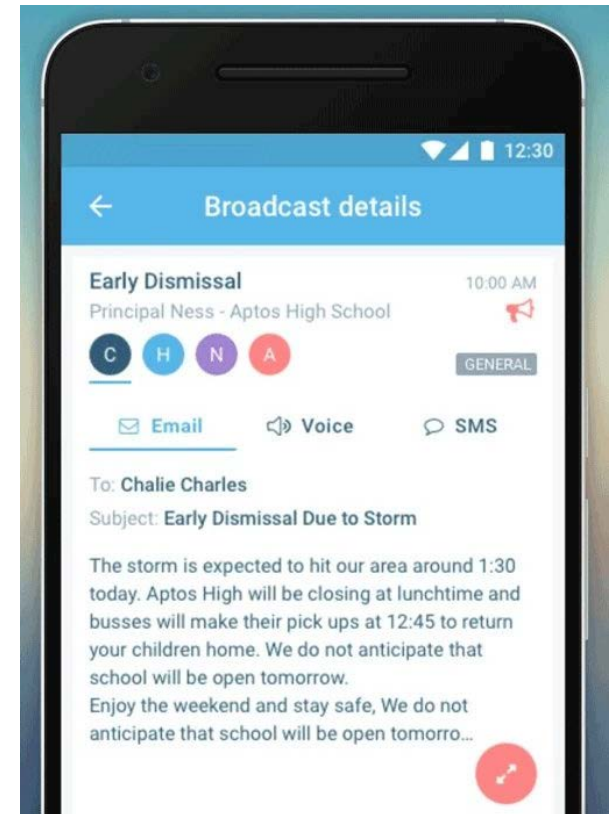
- **Keep school leadership, Complex Area Supt, Safety Director, Comm. Director informed of latest developments on group text**
- **Communicate key school-related news to parents using school messenger, websites, social media**
- **Monitor news sources**
- **Request advice or assistance when needed**



Crisis Communications

After

- **Damage assessment**
- **Determine if parent communication is needed**
- **Communicate using available channels: school messenger, websites, social media**
- **After-action reports**



Sample School Messenger alert.

Table-top Exercise

Questions

Mahalo!

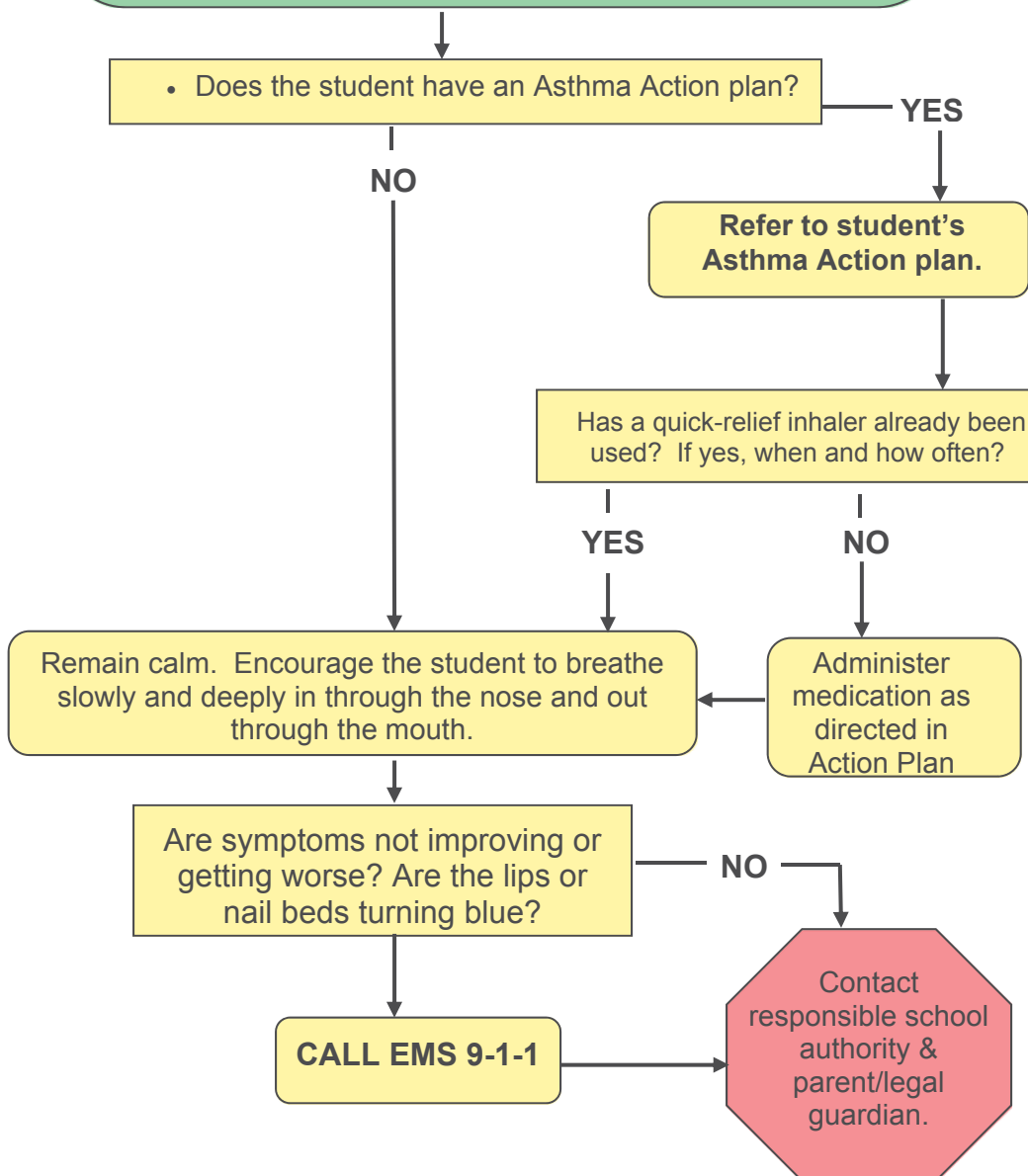


ASTHMA – WHEEZING – DIFFICULTY BREATHING

Students with a history of breathing difficulties including asthma/wheezing should be known to appropriate school staff. An Asthma Action plan should be developed. Hawaii regulations allow students to possess and use an asthma inhaler in school. Staff in a position to administer the Epi-Pen and/or Albuterol should receive instruction.

A student with asthma/wheezing may have breathing difficulties which may include:

- Uncontrollable coughing.
- Wheezing – a high-pitched sound during breathing out.
- Rapid breathing
- Flaring (widening) of nostrils
- Feeling of tightness in the chest.
- Not able to speak in full sentences.
- Increased use of stomach and chest muscles during breathing.





STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

July 16, 2018

TO: Deputy Superintendent
Complex Area Superintendents
Principals (All)

FROM: Dr. Christina M. Kishimoto
Superintendent

A handwritten signature in black ink, appearing to be "Christina Kishimoto", written over the name in the "FROM" field.

SUBJECT: **Hazards and Protective Measures from Volcanic Eruptions**

The current Kilauea volcanic eruptions have been occurring since May 4, 2018, and is expected to continue for the foreseeable future. As such, it is extremely important that our school employees and students are prepared to prevent, respond, and mitigate the effects of Kilauea's volcanic eruptions so that school operations may continue.

As a general policy, the Hawaii State Department of Education (HIDOE) follows the Federal Emergency Management Agency (FEMA), Hawaii State Emergency Management Agency (HI-EMA) and the Hawaii State Department of Health (DOH) guidance when it comes to manmade and natural disasters such as volcanic eruptions.

The DOH reports that the current eruption activity is producing dangerous sulfur dioxide (SO₂) gas and other emissions that present hazards to health, especially for the elderly, young children and babies, and people with respiratory problems. People who are downwind or close to the vents and lava flows are also at considerable risk. Be aware of the unpredictable nature of dangerous levels of SO₂ gas as it can be carried far from the fissures depending on wind speed and direction. Leaving the area of volcanic activity or sheltering-in-place are the best ways to protect school employees, students, and families. The shelter-in-place checklist and classroom kit list posted on the HIDOE intranet are references schools may use. Ultimately, it is up to the school administrators' discretion on shaping procedures for shelter-in-place and using classroom kits.

The DOH does not recommend the use of respirators or face masks for the public at current vog levels. Please refer to the HIDOE memo dated July 15, 2018, titled "Use of Respirators Including the N-95 Respirator on a Voluntary Basis."

The DOH will install ten additional permanent air-quality monitoring stations to measure atmospheric particulate matter (PM) that have a diameter of less than PM2.5 micrometers and SO₂ on Hawaii Island to enhance data collection efforts for vog conditions around the island. There are currently five permanent stations on Hawaii Island in Hilo, Mountain View, Pahala, Ocean View and Kona. The additional air quality monitoring stations will provide real-time data from different areas of the island, so emergency responders can advise residents, schools, and visitors on appropriate actions they can take to protect their health and safety. Some monitors already exist in certain places (not necessarily at schools); see <https://www.purpleair.com>. Vog and air quality conditions may be monitored online using the Hawaii Interagency Vog Information Dashboard, linked on the Civil Defense website at <https://vog.ivhnn.org/>.

Take the following precautions when vog levels are elevated: 1) Avoid outdoor activities that cause heavy breathing; 2) drink plenty of fluids to avoid dehydration; 3) avoid smoking and second-hand smoke; 4) stay indoors and close windows and doors prior to gas inundation; 5) if an air conditioner is used, set it to recirculate; 6) always keep medications on hand; 7) daily prescribed medications should be taken on schedule; and 8) contact a doctor as soon as possible if school employees and/or students experience any health problems.

Volcanic activity in Kilauea crater could also result in an ash plume. Schools that are affected by ashfall should do the following: 1) Close doors and windows; 2) place damp towels at door thresholds and other draft sources; 3) protect sensitive electronics; 4) disconnect drainpipes/downspouts from gutters to stop drains from clogging; 5) school employees and students that have bronchitis, emphysema or asthma must stay inside; and 6) schools must follow their respective emergency action plans.

The following website provides additional information on preparing for ashfall:
http://www.ivhnn.org/images/pamphlets/Preparedness_Guidelines_English_WEB.pdf.

School employees and students may also notice clumps of glistening, golden threads blowing in the winds; this is called Pele's hair. Use personal protective equipment such as eye protection, gloves, and long sleeve shirts when cleaning up Pele's hair. Finally, Pele's hair is non-respirable, so school employees and students may go outdoors; however, only when absolutely necessary.

Active volcanoes on Hawaii Island can cause earthquakes throughout the day. During an earthquake, drop, cover, then hold on. If inside, stay there until the shaking stops and you are sure it's safe to exit outdoors. Stay away from glass, windows, or anything that may fall. If you are outdoors, find a clear spot away from buildings, trees, and power lines and drop to the ground. If near slopes, cliffs or mountains, be alert for falling rocks and landslides.

Deputy Superintendent, et al.
July 16, 2018
Page 3

The attachments provide guidance on the prevention, response, and mitigation to air quality incidents involving vog and SO₂. The Hawaii County has provided a Sulfur Dioxide Action Plan for schools, as well as recommended actions specific to air-quality condition levels.

If you have any questions or need more information, please contact Orasa Fernandez, Safety and Security Specialist or Maynard "Max" Mendoza, Director, Safety, Security, and Emergency Preparedness Branch, at (808) 586-3457, or via Lotus Notes.

CMK:mm

Attachments: 1) Air Quality and Vog, Final

2) Schools Sulfur Dioxide Action Plan, 6-19-2018

3) DOH Guidance on SO₂ Advisory Levels

4) Asthma – Wheezing – Difficulty Breathing

5) Frequently Asked Questions

6) School Closure Requests & Approval Flow Chart

7) HIDOE Memo - Use of Respirators Including the N-95 Respirator on a Voluntary Basis

c: Dann Carlson, Assistant Superintendent, Office of School Facilities and Support Services
Complex Area Business Managers
Administrative Services Assistants
Safety, Security, and Emergency Preparedness Branch

INCIDENT:

VOG/SO₂ – AIR QUALITY

BEFORE:

- **Identify** “sensitive population” groups. (i.e., school employees and students with known respiratory disorders).
- **Identify** Safe Rooms in each school building.
- **Ensure** Safe Rooms are equipped with operable air cleaners.
 - Ensure designated person (i.e., head custodian) evaluates filters for air cleaners periodically and replaces them as necessary.
- **Train** Staff/Teachers on Shelter in Place procedures.

DURING:

- **Assess** situation.
 - **Listen** and **monitor** for Air Quality alert and classification (see “References/Resources” below for Department of Health air sampling data website).
 - **Observe** current conditions: Visible smoke, haze, odors, etc.
 - **Monitor** wind conditions.
 - **Look** for or **pay attention** to reports/complaints from students or staff with known respiratory disorders.
 - **Refer** and **follow** required actions as described in color charts below:
 - Schools Sulfur Dioxide Action Plan
 - DOH Guidance on Short-term SO₂ Advisory Levels
 - Asthma – Wheezing – Difficulty Breathing
 - Frequently Asked Questions on Vog from Kilauea Volcano
 - Hawaii County Civil Defense Toxic Gas Exposure Policy
- **Notification.**
 - **Inform** Administration immediately of any reactions by students or staff.
 - **Notify School Health Aide** to monitor and evaluate sensitive individuals.
 - **Administrator** to activate **Crisis Management Team**, if necessary.
 - **Administrator** to activate **Shelter in Place** or type of response procedure.

- **Maintain communication** and/or **consult** with Hawaii County Civil Defense or Public Safety representative regarding situation at the school.
- **Maintain communication** and/or **consult** with Complex Area Superintendent regarding situation at the school.
- **Notify parents** in extreme cases.

➤ **Sheltering.**

- **Crisis Management Team** to direct Students, Staff, and Visitors to designated safe rooms.
- **Crisis Management Team** to assist classes with special education students.
- **Health Aide** to monitor and evaluate complaints or concerns while sheltering.
 - **Ensure** Student/Staff who may maintain/utilize prescribed medications for respiratory disorders should have access to those medications, if possible and as appropriate.
- **Teachers/Staff** to take attendance – account for all students.
 - **Inform** Admin of missing/additional students.
 - **Monitor** any health complaints or concerns while sheltering.
 - **Ensure** all persons **remain** in safe room until “all clear” is given.
- **Keep** telephone lines clear and log in all incoming/outgoing calls.
- **Refer** all requests for information to the Principal or designee.
- **Close** all doors to the outside and close windows tightly.
- **Seal** gap under doorways with heavy or damp towels and close any obvious gaps around windows with blue tape, if necessary.
- **Set** all window air conditioners or room ventilation systems to 100% recycle (re-circulate) or turn off the air-conditioner or ventilation system to avoid bringing air particulates into the room via these devices.
 - If necessary, contact designated person (i.e. Head Custodian) to access mechanical rooms to turn off ventilation, or arrange

ahead of time to have access and instructions to temporarily turn off ventilation to the safe room.

- **Operate** the room air cleaner(s) with HEPA filters (to trap fine particulates), that have been designated for the shelter room.
- **Run a fan** in the room to moderate effects of rising temperature, as necessary, while sheltering.
 - **Monitor** Carbon Dioxide (CO₂) levels. If indoor CO₂ levels become very elevated during temporary sheltering (in the range of 1,500 to 2,500 ppm CO₂), inform Administrator and await further instructions.
- **Administrator to consult** with Civil Defense as to the “all clear” report, if necessary.

➤ **Closing of School** (if necessary).

- **Recommend** to the **CAS** whether or not to close school. Should school be closed, inform CAS on how personnel will be accommodated.
 - **Refer** to “**DOE School Closure Requests**” chart in References/Resources below.
- **Contact** DOE Communications & Community Affairs Office for assistance on media relations and parent communication, if necessary.
- **Consolidate** all students in one area to ease fears, or arrange for pick up directly from designated safe rooms, as appropriate for sensitive individuals.
- **Traffic Control** personnel will direct parents to park. Parents will be directed to the assembly area. Student control personnel will use microphone or bullhorn to announce names of students to be picked up.
- **Keep** students in the assembly area if parents do not pick them up.

AFTER:

➤ **Actions** to return to **normalcy**.

- Provide clear information to Teachers & Staff addressing all concerns.

- Communicate with parents (phone call, in person, letter, and/or meetings).
- Communicate with external groups (PTSA, SCBM)
- Release final statement to press, as appropriate.
- Publicly express appreciation to all parties who help handle the situation.
- **Conduct** investigation immediately.
 - Conduct interviews simultaneously.
 - Obtain facts of incidents.
 - What, what, when, where, how, why.
 - Initiate a damage/injury survey.
- **Process** and **submit** the necessary report forms.
- **Contact HIOSH** if there had been an employee death, 3 or more hospitalized, or more than \$25,000 damage.
 - **Contact** DOE Safety, Security, and Emergency Preparedness Branch
- **Evaluate** the effectiveness of actions taken and **recommend** changes accordingly.

REFERENCES/RESOURCES:

- Air Quality Guide for Particle Pollution
 - https://www3.epa.gov/airnow/air-quality-guide_pm_2015.pdf
- DOH Guidance on SO2 Advisory Levels
 - <http://www.hiso2index.info/assets/FinalSO2Exposurelevels.pdf>
- Hawaii County Civil Defense Toxic Gas Exposure Policy
 - <http://records.hawaiicounty.gov/Weblink/1/doc/93292/Page1.aspx>
- Reporting Work-Related Incidents to HIOSH
- Schools Sulfur Dioxide Action Plan
- Hawaii Ambient Air Quality Data
 - <http://hawaii.envi-beta.com/>
- SO2/VOG and Other Air Particle Pollution real-time air sampling data:
 - <http://weather.hawaii.edu/vmap/current/index.cgi>
- SO2/VOG real-time air sampling data:
 - <http://www.hiso2index.info/>

Frequently Asked Questions on Vog from Kilauea Volcano





BARON SEKIVA/HAWAII247.COM

Vog shrouds Hilo Bay, 1/17/2010.

Introduction

Ongoing volcanic activity at the summit and East Rift Zone of Kīlauea Volcano, on the Island of Hawai‘i, creates the potential for airborne health hazards to residents and visitors. At the levels of volcanic emissions occurring over recent years, individuals with pre-existing respiratory conditions are the primary group at risk of experiencing health effects from vog exposures, but healthy people may also experience symptoms.

General information, advice, and data resources are provided in this fact sheet; however, it is very important to listen to your own body and take measures to protect yourself if you feel your health is being affected by vog.

What is vog?

The term ‘vog’ refers to the hazy air pollution caused by the volcanic emissions from Kīlauea Volcano, which are primarily water vapor (H_2O), carbon dioxide (CO_2), and sulfur dioxide (SO_2) gas. As SO_2 is released from the summit and east rift eruptive vents, it reacts in the atmosphere with oxygen, sunlight, moisture, and other gases and particles and, within hours to days, converts to fine particles, which scatter sunlight, causing the visible haze that is observed downwind of Kīlauea. Areas far downwind (e.g., the west side of Hawai‘i Island and other islands in the state) are mostly affected by the fine particles; however, areas closer to the eruptive vents, including the communities ranging from Ocean View to Hilo, can be exposed to both SO_2 gas and fine particles during periods of vog.

SO_2 is a colorless, irritating gas that has an acrid odor like fireworks or a struck match. It is also emitted from other sources, such as fossil fuel power plants and motor vehicles.

Fine particles consist of particulate matter less than 2.5 micrometers in diameter and are referred to as ‘ $PM_{2.5}$ ’. These particles are smaller than the width of a human hair. $PM_{2.5}$ in vog is mainly composed of acid and neutral sulfate particles. Other sources of $PM_{2.5}$ include vehicle exhaust and smoke from fires.

Vog contains mostly SO_2 and acid particles, in contrast to urban, industrial, and other pollution sources, which also contain additional toxic contaminants, such as ozone and hydrocarbons.

What is laze?

When molten lava flows into the ocean, it reacts vigorously with sea water to create large steam plumes laden with hydrochloric acid. These acidic ‘laze’ plumes mainly create a local hazard for



USGS

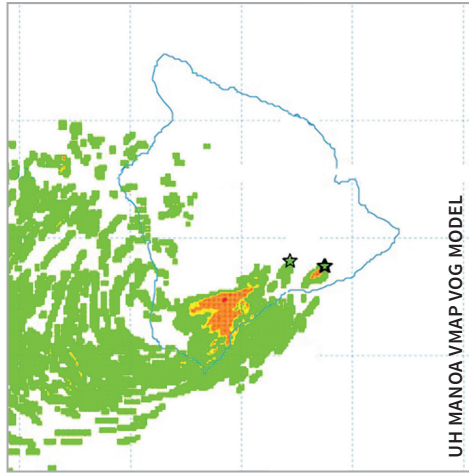
people visiting the coastal entry. Inhaling or contacting acid gases and liquids can irritate the skin, eyes and respiratory tract, and may cause breathing difficulties, particularly for people with pre-existing respiratory diseases.

What is volcanic ash?

Volcanic ash is made of tiny rock and glass particles (less than 2 mm wide), which can be inhaled by people in downwind communities. Substantial volcanic ash emissions from Kīlauea have been rare in recent years. Rockfalls from the vent walls of Halema‘uma‘u Crater and spattering of the lava lake continue to produce minor, local ash emissions that do not generally pose a health hazard, so are not discussed further here.

How much vog is there and where does it go?

In any location, vog concentrations are primarily dependent on the amount of volcanic emissions, the distance from the source vents, and the wind direction and speed on a given day. In the Hawaiian Islands, the predominant wind direction is from the northeast (trade winds). Consequently, the areas southwest of Kilauea are most frequently affected by vog on Hawai'i Island. When trade winds are absent, which occurs most often during winter months, East Hawai'i, the entire island, or the entire state can be impacted by vog.



▲ Forecast of vog plume location on the Island of Hawai'i during trade winds. Colors indicate health advisory levels.

Sulfur dioxide emissions from Kilauea Volcano have decreased substantially since the beginning of the 2008 Halema'uma'u eruption, resulting in less vog for the island and state. In general, SO_2 and $\text{PM}_{2.5}$ are below levels considered to cause serious health effects for the general population. However, some individuals may experience symptoms from both $\text{PM}_{2.5}$ and SO_2 exposures, depending on location.

Levels of health concern for SO_2 and $\text{PM}_{2.5}$ concentrations over the last several years, as defined by the U.S. Environmental Protection Agency (EPA) and/or Hawaii Department of Health (HDOH):

- In areas close to the eruptive vents (e.g., Hawai'i Volcanoes National Park (HVNP) and surrounds): under certain wind conditions, SO_2 can reach levels considered 'unhealthy' for the general population.

- Downwind areas relatively near Kilauea (approximately ranging from Ocean View to Hilo): under certain wind conditions, SO_2 can reach levels considered 'unhealthy for sensitive groups'.
- In most areas: $\text{PM}_{2.5}$ concentrations only occasionally reach levels considered 'unhealthy for sensitive groups'.

The County of Hawai'i, HDOH, USGS Hawaiian Volcano Observatory, and several other federal agencies worked together to form a short-term SO_2 color code advisory system, designed to alert people to volcanic SO_2 pollution on Hawai'i Island. The same color code system is used by EPA for $\text{PM}_{2.5}$ 24-hour advisories. The advisory websites are listed on the back cover of this document.

Advisory levels color key ▶

ADVISORY LEVELS

GOOD
MODERATE
UNHEALTHY FOR SENSITIVE GROUPS
UNHEALTHY
VERY UNHEALTHY
HAZARDOUS



What are the health effects of sulfur dioxide gas (SO₂) and fine particles (PM_{2.5}) from volcanic emissions?

Individuals vary in their sensitivity, and vog exposure may worsen symptoms for people who have pre-existing health conditions. Sensitive groups include:

- people with asthma or other respiratory conditions
- people with cardiovascular disease
- older adults
- infants and children
- new or expectant mothers

SO₂: Physically active asthmatics are most likely to experience serious health effects from SO₂. Even short-term exposures can cause narrowing of the airways (bronchoconstriction), causing asthma symptoms. Potential health effects increase as SO₂ levels and/or breathing rates increase. At SO₂ levels considered 'unhealthy' for the general population, even non-asthmatics may experience breathing difficulties. Short-term SO₂ exposure is connected to increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in the 'sensitive groups'. No one knows the long-term health effects of exposure to volcanic SO₂.

Short-term health symptoms include:

- eye, nose, throat, and/or skin irritation
- coughing and/or phlegm
- chest tightness and/or shortness of breath
- headache
- increased susceptibility to respiratory ailments
- some people also report fatigue and/or dizziness

PM_{2.5}: Both long- and short-term particle exposures have been linked to various health problems. High levels of particle pollution are linked to increased hospital admissions and emergency room visits, and even to death from existing heart or lung disease. Low levels of PM_{2.5} are not considered as problematic for asthmatics as low levels of SO₂ gas.

Particle pollution can cause temporary health symptoms such as:

- eyes, nose and/or throat irritation
- coughing and/or phlegm
- chest tightness and/or shortness of breath

See https://airnow.gov/index.cfm?action=particle_health.index for more information.

Will staying indoors protect me from vog?

Staying indoors, with doors and windows closed, can help reduce vog exposures over a short time period (hours), depending on how well your house is sealed from the outside environment. Over the long term, outdoor air gradually seeps into a home, even if closed up. The house should be opened up again when vog levels decrease.

Air conditioning (AC) can provide comfort, but is not designed to filter out SO₂ gas or PM_{2.5} from the air. However, AC dehumidifies the air, and some vog components may be pulled out of the air along with the moisture. During periods of vog, temporarily set the unit to the 'air recirculation' or 'closed vent' setting to prevent the unit from pulling outdoor air into the home.

Do room air cleaners work?

A room air cleaner can be effective in reducing levels of SO₂ and/or PM_{2.5} from the air. People living close to the volcano are exposed to both SO₂ and PM_{2.5}, so they may want to seek protection by using a specialized air cleaner which has both a HEPA (PM_{2.5}) filter and an acid gas (SO₂) filter. Those living further from the eruptive vents can use an air cleaner designed to filter fine particles only (HEPA) since they are not exposed to substantial amounts of SO₂.

Quality room air cleaners can be expensive and are designed for a room that can be closed off from the rest of the house and the outdoors. Periodic filter replacement and other maintenance is required for air cleaners to perform as designed. For more information, see the EPA 'Guide to Air Cleaners in the Home': <https://www.epa.gov/indoor-air-quality-iaq/guide-air-cleaners-home>.

Should I use a respirator or face mask during vog episodes?

The HDOH does not recommend the use of respirators or face masks for the general public at current vog levels. 'Sensitive groups' such as children or people with pre-existing respiratory conditions should be especially cautious because respirators/masks typically do not fit children, and the breathing resistance caused by respirators/masks can worsen respiratory disorders.

Respirators/masks may not protect people with beards or mustaches. Many commonly available paper dust masks, bandanas, or surgical masks may not provide any significant protection from either SO₂ or PM_{2.5}.

Safe occupational use of respirators requires correct mask and/or filter cartridge selection, fit testing, physician screening, and training on correct use, maintenance and storage.

Are water catchment systems affected by vog?

Water from catchment systems in vog-prone areas can become acidic and leach harmful contaminants, such as lead, copper, and zinc, from roofing and plumbing materials, especially on older homes. Catchment water used for drinking or food preparation should be carefully monitored. Methods for adjusting water catchment pH include adding baking soda to the tank, or using an inline pH adjusting filter. Subsidized water testing for lead and copper is available through a special program: <http://health.hawaii.gov/sdwb/raincatchment/>.



Volcanic ash can also get into the water, causing contamination, and interfere with common water treatment methods such as filtration and chlorination. Guidelines for maintaining water catchment systems can be found at <http://www.ctahr.hawaii.edu/hawaii-rain/guidelines.html>. For health and safety reasons, in general, the HDOH does not recommend using catchment water for drinking or preparing food. County water spigots can be used instead as a safer water supply.

Is it safe to visit the volcano if I have a respiratory condition?

At Hawai'i Volcanoes National Park (HVNP), elevated vog levels, and haze conditions at the coast, are most common when trade winds are absent. Current air quality and wind conditions can be checked online prior to visiting the park. People with pre-existing respiratory conditions should have their medications available when visiting the park, as SO₂ and other acid gas concentrations can reach unhealthy levels quickly, in some areas of the park. Pay attention to park warnings and follow park advisories.



Please see helpful **links** on back cover

What can I do to protect myself from vog?



Prepare for vog exposure:

- **Understand the hazard:** Get familiar with key air monitoring websites and the SO₂ and PM_{2.5} advisory codes/levels.
- **Learn about wind conditions:** Be aware of winds that could carry vog to your area. This will help you to better track and predict when you might be affected by vog.
- **Keep medications handy:** If you have asthma or other respiratory conditions, keep your medication available and use as prescribed. If you don't have medications, but feel you might need them, call your doctor.

See **links** on back cover for wind and air monitoring websites

Protective actions when vog is a problem:



- **Seek medical assistance as necessary:** Assume that asthma could get worse during periods of high vog. If you are having asthma symptoms, such as trouble breathing, wheezing, increased coughing, or chest tightness, contact your doctor or seek other medical assistance.



- **Take care of yourself:**
 - **Do not smoke:** Also, avoid secondhand smoke.
 - **Stay hydrated:** Drink plenty of liquids to help loosen congestion. Warm or hot liquids in particular may help some people.
 - **Manage congestion or irritation:** Over-the-counter nasal sprays or eye drops can help reduce upper respiratory symptoms for some people.



• Reduce your exposure to vog:

- **Limit strenuous activities:** Outdoor exercise or exertion increases your chances of being affected by SO₂ gas and/or PM_{2.5}. When vog levels are elevated, reduce strenuous activity, if possible.
- **Stay indoors:** When vog levels rise, go indoors and close all doors and windows to the outside. Eliminate sources of indoor pollutants (e.g., smoking, candles/incense, and improperly vented fuel-burning stoves) and beware of becoming overheated as a result of closing up your house. If your house is not well-sealed, it may still offer some protection. Alternatively, consider visiting indoor areas that are better-sealed and/or have air conditioning (e.g., commercial buildings or businesses).
- **Reduce indoor vog with an air cleaner:** If doors and windows in your house, or in one room of it, can be closed, the use of an appropriate air-cleaning device can help reduce the levels of both SO₂ and PM_{2.5} (if you live near the source vents), or just PM_{2.5} (if you live farther from the vents).
- **Leave the area if appropriate:** If indoor areas have poor air quality, consider temporarily relocating to a less impacted part of the island.
- **Restrict vog from entering your vehicle:** If driving through the dense volcanic plume near Hawai'i Volcanoes National Park, to minimize air infiltration, temporarily close your windows and vents, and turn your fan and air conditioner off.

For recommendations on **what to do** at specific SO₂ and PM_{2.5} advisory levels see:

<http://www.hiso2index.info/assets/FinalSO2Exposurelevels.pdf>
and <https://www.airnow.gov/index.cfm?action=pubs.aqguidepart>



More Information

- **Vog dashboard** (comprehensive information including links below): www.ivhhn.org/vog
- **UH Mānoa VMAP Vog Forecast Model** (SO₂ and sulfate particle forecasts based on wind model):
<http://weather.hawaii.edu/vmap/>
- **HDOH Hawai'i short-term SO₂ monitoring and advisory** (SO₂ gas data from island-wide monitoring stations):
www.hiso2index.info/
- **U.S. EPA AirNow current PM_{2.5} conditions:**
www.airnow.gov (select Hawaii State at top of page)
- **NPS HVNP air quality monitoring and advisory** (SO₂ and PM_{2.5} data from within the National Park):
www.hawaiiiso2network.com



Acknowledgements

This fact sheet was updated in August 2016 following the findings from surveys conducted by Dr. Claire Horwell, Durham University, UK, on community protection from vog, and two interagency workshops supported by UH Hilo Center for the Study of Active Volcanoes, Hawai'i County Civil Defense Agency, and the National Park Service. The fact sheet updates were prepared by Hawaii Department of Health (John Peard); USGS Hawaiian Volcano Observatory (Tamar Elias); and International Volcanic Health Hazard Network (Claire Horwell).

Graphic Design by Klineworks