

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Forestry and Wildlife

July 22, 2009

Chairperson and Members
Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

Land Board Members:

SUBJECT: REQUEST TO EXTEND THE CLOSURE OF KAHAUALEA
 NATURAL AREA RESERVE, ISLAND OF HAWAII, TO THE PUBLIC
 PURSUANT TO HAR § 13-209-4.5 FOR PUBLIC SAFETY PURPOSES

This Board Submittal outlines the status of the lava flow at Kahaualea Natural Area Reserve (NAR), island of Hawaii and requests the Board to extend the closure of this area to the public, pursuant to HAR § 13-209-4.5.

BACKGROUND:

Kīlauea Volcano has been erupting continuously since January 1983. Since July 21, 2007, Kīlauea has been erupting as fissure lava flows from vents on the State lands of Kahaualea NAR. Lava is now erupting from the lower end of the July 21, 2007 fissure located at the base of the Kupaianaha shield, known as the TEB vent and rootless shields. Currently, there is no way to predict how long the current activity will continue.

The USGS-HVO website provides updated status reports on the activity of Kīlauea. The July 2, 2009 report provided the following activity summary:

“Past 24 hours at the middle east rift zone vents and flow field: Magma continues to degas through Pu`u `O`o Crater before erupting from vents to the east. The most recent sulfur dioxide emission rate measurement was 1,400 tonnes/day on June 26, compared to the 2003-2007 average of about 1,700 tonnes/day. No incandescence has been recorded within the crater overnight since September 12, 2008.

DI inflation has slowed and appears to have nearly peaked this morning. GPS receivers on opposite sides of the crater have documented about 1 cm of

contraction over the past month and almost 5 cm over the past 3 months. Seismic tremor levels remain at low values.

Lava from the TEB vent and the rootless shield complex flows through tubes to the coast and is entering the ocean at Waikupanaha and Kupapa`u. Field workers yesterday morning observed only minor surface flow activity on the pali. Activity increased during the day and by last night, CD officials reported widespread of surface activity within, and just east of, the Royal Gardens subdivision. GOES-WEST imagery indicated a strong thermal anomaly inland of the coast that suggests surface flow activity throughout the night. The Waikupanaha and Kupapa`u ocean entries remain active with robust plumes marking their locations.”

Before the July 21, 2007 eruption, public use of Kahaualea was steadily increasing. A hiking trail (known as the Captain’s Trail) developed over years of use is widely publicized in visitor publications such as *Hawaii Revealed* and encourages people to use the trail to access Pu’u O’o, the previous eruption source. In addition, the Department hunting rules provide that the area is open to public hunting seven days a week, year-round. Over the years, in response to the number of rescues and incidents at Kahaualea, NARS staff have partnered with the Hawaii Fire Department to increase signage and make minor trail improvements to minimize the number of hikers who become lost by going off-trail. In 2007, the Hawaii County Fire Department (HCFD) responded to 9 separate incidents of lost parties in the Kahaualea NAR area. Since the closure, the Hawaii County Fire Department has only responded to one incidence of lost hikers at Captain’s trail. The Division of Conservations and Resource Enforcement cited these individuals in May 2008 and they were fined \$200 each.

Due to public safety concerns relating to unprepared visitors attempting to visit an active lava flow and an active volcanic area and the heightened risk of sulfur dioxide inhalation, and after discussions with staff from U.S. Geological Survey-Hawaiian Volcano Observatory (USGS-HVO), the Board closed Kahaualea NAR to public access effective July 25, 2007. Since that time, NARS staff has communicated with USGS-HVO staff on a regular basis about the status and condition of the area to confirm that the area continues to pose a safety risk to visitors. In May 2008, a Memorandum of Understanding between the Board and the USGS-HVO was entered into that allows USGS-HVO access to Kahaualea for the purposes of volcanic hazard monitoring and provides the Board with hazard assessments and recommendations. Staff regularly attends weekly updates at the USGS-HVO headquarters in Hawaii Volcanoes National Park. In addition, Division staff regularly monitors the signage and barricade at the Captain’s Trail, and DOCARE officers regularly patrol the area.

It does not appear that the current eruption is temporary. As a result, the Division requests the Board to continue the closure initiated July 25, 2007-July 24, 2009, and to extend it for another two years, through July 24, 2011. This closure is supported by the USGS-HVO and the County of Hawaii Civil Defense. Should conditions change during the next years so that public access can again be safely restored, the Division will return to the Board to re-open the NAR.

During the current closure, Special Use Permit Applications to conduct research, filming, cultural

practice, and other uses have been considered on a case-by-case basis.

ANALYSIS:

Hawaii Revised Statutes § 195-5 provides that the Department of Land and Natural Resources may make rules governing the use, control and protection of the areas included within the reserve system. Hawaii Administrative Rule § 13-209-4.5 provides:

The board or its authorized representative, with the approval of the commission, may close or restrict the public use of all or any portion of a natural area reserve for up to two years, when deemed necessary by the commission for the protection of the natural, geological, or cultural resources of the area or the safety and welfare of persons or property, by the posting of appropriate signs indicating the duration, extent, and scope of closure. Closures may be renewed with the approval of the board or its authorized representative and the commission.

The proposed closure is requested for the safety and welfare of the public. The Natural Area Reserves Commission approved the extended closure at their meeting of April 6, 2009.

The Division is seeking approval to close the entire NAR, TMK 311001002 Parcel 2 (16,726 acres), based primarily on information from USGS-HVO. The vent areas and lava channels are hazardous and conditions can change rapidly including collapse of existing features. Lava flows advancing through vegetation are hazardous and can produce fire and methane explosions that propel chunks of lava and rock several feet in the air. Fume emissions in the area can exceed 2000 tons per day of sulfur dioxide. Downwind exposure to these fumes can be hazardous, and have been known to reach concentrations that can be lethal. Finally, because of previous volcanic activity in Kahaualea in the 1980s and 1990s, the entire NAR is marked by old lava tubes and cracks, now partially covered by vegetation, making the holes and gaps difficult to see and extremely dangerous to anyone venturing off established trails. Based on the current volcanic activity and the known dangers, the Division recommends closing the entire NAR, rather than just a portion. Natural Area Reserve Special Use Permit Applications to conduct research, filming, cultural practice, and other uses, such as hunting, will continue to be considered on a case-by-case basis with restrictive conditions, as necessary, clearly defined.

The Division requests the Board to extend the closure of Kahaualea NAR for a term of two years commencing on July 25, 2009 through July 24, 2011, with the possibility of renewal should the current volcanic conditions continue. Should the current conditions change before July 24, 2011, so that public access can be safely accommodated, the Division will return to the Board to remove the closure. The exact duration of the closure is currently uncertain, as it is entirely dependent on the volcanic activity. The Division is concerned about posting a specific date on signage, based upon a belief that visitor publication will then re-publicize that date as a date upon which the NAR will be re-opened, building expectations and creating management problems if the closure needs to be extended. After further discussion with the Attorney General's office and the Division of Conservation and Resources Enforcement (DOCARE), the Division has installed signage indicating that the area is *Closed until further notice*, or other appropriate language indicating the duration of the closure.

RECOMMENDATION:

That the Board extend the closure of the Kahaualea NAR for an additional term of two years commencing from July 25, 2009 to July 24, 2011.

Respectfully submitted,


PAUL J. CONRY
Administrator

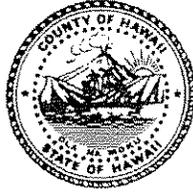
APPROVED FOR SUBMITTAL:


LAURA H. THIELEN, Chairperson

Attachments: USGS-HVO letter dated June 4, 2009
Hawaii County Civil Defense letter dated June 8, 2009
Map of Kahaualea NAR

William P. Kenoi
Mayor

William T. Takaba
Managing Director



Quince Mento
Administrator

John T. Drummond
Administrative Officer

William Hanson
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CIVIL DEFENSE AGENCY

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To: Lisa Hadway, Department of Land and Natural Resources,
Natural Area Reserve

From: Quince Mento, Civil Defense Administrator, 
Hawai'i County Civil Defense Agency

Date: June 8, 2009

Subject: Kahauale'a NAR

The Hawai'i County Civil Defense Administration (HCDA) supports the Department of Land and Natural Resources' (DLNR) recommendation to continue limiting public access to the Kahauale'a Natural Area Reserve (NAR). The attractive nuisance posed by Pu'u O'o is HCDA's primary concern; especially when accessed through "Captain's Trail" at the end of Captain's Drive in Glenwood. Numerous searches have been conducted by the Hawai'i Fire Department for people lost in the NAR while attempting to access Pu'u O'o. A Fire Department Rescue specialist nearly died when he fell into a 100' deep crack during a missing person search in the NAR.

HCDA understands there is a need for DLNR to provide limited access to the NAR and will support DLNR efforts to provide fair and reasonable access.

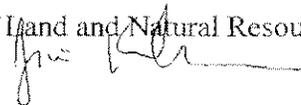




United States Department of the Interior



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To: Lisa Hadway, Dept. of Land and Natural Resources
From: Jim Kauahikaua, SIC 
Date: June 4, 2009
Subject: Current Hazard Assessment of the Kahauale'a NAR

There are several volcanic hazards present in the Kahauale'a NAR. They include volcanic gas emissions, lava flow hazards, collapse of recently constructed topographic structures, and ground cracks.

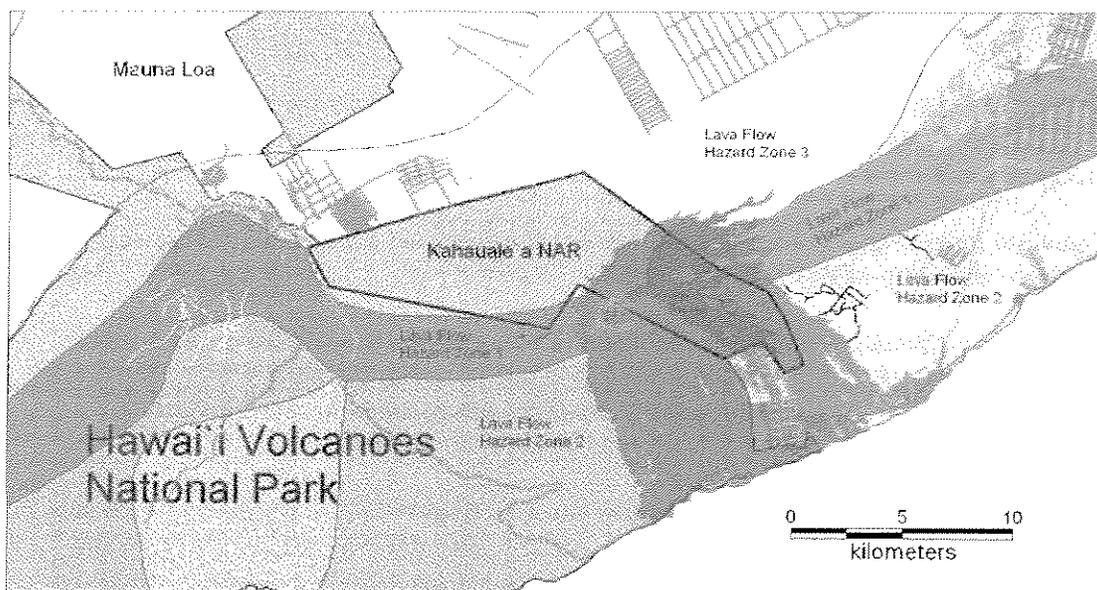


Figure 1. Map of the Kahauale'a NAR and surrounding areas. The irregular red polygon are the lava tube and flows most active since late 2007. The light blue polygon represents the lava flows emplaced since 1983.

Recent Area History: The NAR has been inundated by lava flows several times during the 26+ year eruption of middle east rift zone vents, namely the Pu'u 'Ö'ö, Kupaianaha, and the currently-active TEB vents. The entire southeastern arm of the NAR has been covered multiple times by 'a'a and pāhoehoe flows from this eruption. The currently active TEB lava tube and flow field has again covered portions of this same southeastern arm.

Throughout this eruption, Pu'u 'Ö'ö has been emitting elevated and variable amounts of volcanic gasses, the most noxious of which is sulfur dioxide. Vog is a state-wide problem

which can be most dangerous in areas near the emission sources – Pu‘u ‘Ō‘ō is one of those sources. The 2003-2007 average emission rate was 1,700 tonnes per day. For the month of July, 2008, this rate increased to over 7,000 tonnes per day. Gas emissions from the TEB vent are much lower but still significant.

During normal trade winds, these emissions immediately depart the NAR and move to the southwest through Hawai‘i Volcanoes National Park. However, during kona or weak winds, these emissions can accumulate around Pu‘u ‘Ō‘ō and/or move out into the northwestern section of the NAR. The areas in close proximity to the sources might experience high concentrations of sulfur dioxide but specific measurements have not been made. The nearest air quality site is in the adjoining Mauna Loa Estates subdivision 14 km (9 miles) to the northwest of Pu‘u ‘Ō‘ō; maximum, 15-minute-average concentrations have reached 2 ppm in that subdivision. Sulfur Dioxide concentrations in air are likely higher within the NAR which is closer to the gas source. The State of Hawaii Department of Health regards 15-minute-average sulfur dioxide concentrations above 1 ppm as Unhealthy and above 3 ppm as Very Unhealthy.

Current Hazards: The Kahauale‘a NAR consists of two hazard provinces: 1) the area north of Lava Flow Hazard Zone 1 and the flow field from the ongoing eruption, 2) the flow field of the current eruption and Lava Flow Hazard Zone 1.

1) the area north of the rift zone is mostly tube-fed pahoehoe flows at least 400-500 years old. The only volcano hazard here is ground cracks and potentially high concentrations of volcanic gases, mostly sulfur dioxide, when winds blow from the south to southeast.

There are large cracks in this area. The few that are known but not located are near the southern boundary of this area abutting the rift zone.

2) the east rift zone of Kilauea is characterized by inactive vents, fissures, and cracks. Much of the rift zone is currently unvegetated due to recent volcanic activity; there are deep cracks within the forest on either side of the unvegetated terrain. Dangerous concentrations of sulfur Dioxide can occur in areas downwind of Pu‘u ‘O‘o.

The area that is actively erupting includes the area from the north boundary of the east rift zone all the way to the far southeastern boundary. The active vents of Pu‘u ‘O‘o and TEB, located within the east rift zone, and the numerous structures built by lava flows over the active lava tube system all pose significant potential of collapse and inundation by lava. In addition, dangerous concentrations of sulfur dioxide can occur in areas downwind of Pu‘u ‘O‘o and/or the TEB vent.

If you have more questions, please feel free to contact me.