SARA STEINER
P.O. Box 1081
Pahoa, Hawaii 96778
(808) 936-9546
pahoatoday@gmail.com
Self-represented Plaintiff

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT

STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; DIRECTOR ZENDO KERN *official capacity,* PUNA GEOTHERMAL VENTURE *a for profit corporation;* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Relief)** (1) VERIFIED HRS § 343 COMPLAINT WITH (2) DEMAND FOR INJUNCTION ON ANY FURTHER BUILDING AND OPERATING PERMITS FOR PUNA GEOTHERMAL VENTURE EXPANSION DUE TO FAILURE TO PREPARE A COMPREHENSIVE ENVIRONMENTAL IMPACT STATEMENT; EXHBITS; DECLARATIONS; SUMMONS

(1) VERIFIED HRS § 343 COMPLAINT WITH (2) DEMAND FOR INJUNCTION ON ANY FURTHER BUILDING AND OPERATING PERMITS FOR PUNA GEOTHERMAL VENTURE EXPANSION DUE TO FAILURE TO PREPARE A COMPREHENSIVE ENVIRONMENTAL IMPACT STATEMENT

PLAINTIFF, Sara Steiner, hereby pleads to the Environmental Court of the Third Circuit, State for (1) An Order VACATING Defendants COUNTY OF HAWAII PLANNING DEPARTMENT and the Director of Planning Department, ZENDO KERN'S acceptance of Puna Geothermal Venture's "PGV'" Final Environmental Impact Statement "FEIS" as it is incomplete. After two rounds of comments in an 18-month time period, the Defendant Puna Geothermal Venture's Final EIS failed to reply substantively relating to Plaintiff's environmental concerns pursuant to Hawaii Revised Statutes "HRS" § 343 *et seq.* and Hawaii Administrative Rules "HAR" 11-200.1 *et seq.*

Defendant PGV's FEIS has not provided complete disclosure of PGV's harmful environmental impacts to government agencies needed to make an informed decision therefore Defendants PLANNING DEPARTMENT and KERN cannot be fully aware of the harm that will be caused by 35 more years of unmonitored impacts on our community.

Because lawfully no action can implement without the acceptance and approval of a lawful EIS, Plaintiff further makes a (2) a Motion for Permanent Injunction on any further Puna Geothermal Venture expansion for:

a) any and all County of Hawaii Grubbing, Grading, Building and Geothermal Resource Permits "GRP", issued or pending for PGV expansions for failure of Defendant Puna Geothermal Venture's Final Environmental Impact Statement to comply with the Hawaii State Constitution, HRS § 343 and HAR 11-200.1 *et seq* , and;

b) Any and all other pending Orders or Applications that were Prematurely Pre-Approved at the County or State level without waiting for a lawful EIS to be accepted, are hereby VOID AND REJECTED, for example: PUC Orders Approving Docket 2019-0333 In Re HELCO Amended Purchase Agreements with PGV, and

c) Any application to amend or modify the State of Hawaii Department of Health Clean Air Branch's Noncovered Source Permit No. 0008-02-N for PGV expansion Projects 1 and 2, listed as the agency with "Discretionary Consent" in PGV FEIS are hereby VOID AND REJECTED.

d) Any and all other relief available to Plaintiff to protect the residents surrounding Puna Geothermal Venture from ongoing harms caused by permitting a geothermal plant on a live volcano.

THEREFORE, WE CONTINUE TO THE VERIFIED COMPLAINT:

PLAINTIFF HAS STANDING TO BRING COMPLAINT AND HEREBY ALLEGES:

1. Sara Steiner has been a resident of the Big Island, Puna District since January 1, 1985.

2. Plaintiff has attended decades of meetings about Puna Geothermal impacts, written hundreds of letters to all sorts of government agencies and legislators, been a Plaintiff in several lawsuits against PGV and/or Hawaii government agencies relating to PGV permits, and attempted for the last 7 years in good faith to be a participant in a twice-dismissed State of Hawaii Department of Health contested case about issuing PGV further permission to Air Pollute the Puna countryside (from 2015-2022) with an appeal filed in November 2022 still languishing in Environmental Court of the Third Circuit [Civil No 19-1-000091].

3. Plaintiff has more than exhausted all channels of communications with County and State elected and appointed officials relating to the safety of PGV operations since the 2018 eruption and copies of many letters I sent to government agencies have been documented in PGV's FEIS Appendix on pages 1047-1051 and the Declaration of Robert Petricci pg 14-15.

4. You can see the total lack of concern about seismic monitoring of PGV in the State of Hawaii response letters [PGV Apx 1052-1053 and 1064].

5. The response (most addressees did not reply to my valid concerns) has been totally underwhelming and Plaintiff no longer has faith in *any* of the government agencies regulating PGV and was compelled to file this Complaint to protect my family and community.

6. Plaintiff attended public meetings and made written comments on PGV's Scoping EIS "EISPN" in June 2022, as well as the Draft EIS "DEIS" in June of 2023 and therefore has standing to bring this Complaint.

7. It would take hundreds of pages for Plaintiff to document the disregard to all of mine and others' questions, and many items like prior Hydrogen Sulfide Health Studies are not truthfully discussed and Plaintiff reserves the rights to bring all issues out at trial.

8. Plaintiff notes there are major discrepancies in PGV's purported electrical contributions over the years brought up by Larry Wood and reserves the right to elaborate on the true contributions of PGV to the electric grid at trial.

9. The State of Hawaii's Environmental Notice released February 8, 2024, states in pertinent part:

> Acceptability: The Accepting Authority must be satisfied that the FEIS meets three criteria (process, content, **response to comments**) to accept it. Whether the FEIS is accepted or not accepted, notice of the Acceptance Determination is published in this bulletin. **The public has 60 days from publication to legally challenge the acceptance of a FEIS.** For both Applicant and Agency actions, the Applicant or the proposing Agency can prepare a Revised DEIS after a non-acceptance determination.

DEFENDANTS

10. Defendant HAWAII COUNTY PLANNING DEPARTMENT "PLANNING DEPARTMENT" is a government agency located in the County of Hawaii and is the official agency designated to be the accepting agency for PGV's FEIS.

11. Defendant ZENDO KERN's *official capacity* is the Director of the Hawaii County Planning Department, and as such he is the responsible party to properly vet the FEIS (130 pages) and the FEIS Appendix (1,475 pages) and either accept or deny the FEIS within 30 days, or it is deemed accepted. Defendant KERN is a resident of the County of Hawaii.

12. Defendant PUNA GEOTHERMAL VENTURE, "PGV" is a foreign for-profit entity who pays royalties to the State and County of Hawaii to use the state-owned geothermal resource located many thousands of feet underground in the middle of the Lower East Rift Zone of

Kilauea Volcano and is sued herein as the Applicant for approval of Projects 1 and 2 and is therefore deemed a necessary party.

JURISDICTION AND VENUE

13. Pursuant to HRS § 604A, the Environmental Court has exclusive original jurisdiction over all Chapter 343 proceedings; also, proceedings of a civil nature should be brought in the circuit court where the claim within the jurisdiction for relief arise.

14. Plaintiff and Defendants PLANNING DEPARTMENT, KERN and PGV are all physically located in this jurisdiction and the claims for relief arose here on Hawaii Island, therefore all are subject to the Third Circuit venue.

COMPLAINT AND DEMAND FOR INJUNCTION IS TIMELY FILED

15. This Complaint is timely filed pursuant to HRS § 343-7, within 60 days of the Publication of Defendants PLANNING DEPARTMENT and ZENDO KERN'S acceptance and of PGV's FEIS in the Environmental Bulletin on February 8, 2024,

16. Plaintiff's Demand for Permanent Injunction is filed ahead of the anticipated issuance of County of Hawaii building permits and application for State of Hawaii Department of Health's Noncovered Source permit No. 0008-02-N including any and all requests for modifications or amendments relating to the Phase I and II expansion of PGV.

17. Plaintiff has requested to be notified of any Hawaii County Building or Grubbing or grading Permits after PGV's FEIS was accepted and as of this date of filing this Complaint there have been no notifications of PGV application.

18. Plaintiff has requested to be notified of any PGV applications to modify their State of Hawaii Department of Health Clean Air Branch Noncovered source permit and as of the date of filing there have been no notifications.

CLAIMS FOR RELIEF

COUNT I – DEFENDANTS PLANNING DEPARTMENT AND KERN'S ACCEPTANCE OF DEFENDANT PGV'S FEIS IS A VIOLATION OF HRS § 343

19. The Hawaii Public Utility Commission "PUC" ordered PGV to perform an environmental assessment in 2021 in their docket No. 2019-0333, but instead of waiting for the EIS, the PUC prematurely approved several Amended Purchase Power Agreements between HELCO and PGV, contingent on acceptance and approval of a lawful EIS.

20. Plaintiff's instant injuries arise from Defendants PLANNING DEPARTMENT and KERN accepting a seriously deficient FEIS from Defendant PGV in violation of Hawaii Environmental Laws and Rules surrounding acceptance and approval of an environmental impact statements.

21. HRS § 343-1 provides **(emphasis added):**

> The legislature finds that **the quality of humanity's environment is critical to humanity's well-being**, that **humanity's activities have broad and profound effects upon the interrelations of all components of the environment**, and that an **environmental review process will integrate the review of environmental concerns with existing planning processes** of the State and counties **and alert decision makers to significant environmental effects which may result from the implementation of certain actions. The legislature further finds that the process of reviewing environmental effects is desirable because environmental consciousness is enhanced**, cooperation and coordination are encouraged, and **public participation during the review process benefits all parties involved and society as a whole.**
>
> It is the purpose of this chapter to establish a system of environmental review which will **ensure that environmental concerns are given appropriate consideration** in decision making along with economic and technical considerations.

22. HRS § 343-2 provides in pertinent part **(emphasis added):**

> **"Acceptance"** means a formal determination that the document required to be filed pursuant to section 343-5 fulfills the definition of an environmental impact statement, **adequately describes identifiable environmental impacts**, and satisfactorily responds to comments received during the review of the statement.

> **"Approval" means a discretionary consent required from an agency prior to actual implementation of an action.**
>
> **"Discretionary consent" means a consent, sanction, or recommendation from an agency for which judgment and free will may be exercised by the issuing agency, as distinguished from a ministerial consent.**
>
> **"Environmental impact statement"** or "statement" means an informational document **prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action** ...
>
> **"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource,** curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, **or adversely affect the economic welfare, social welfare, or cultural practices of the community** and State.

23. Despite the PGV FEIS stating the "Discretionary Consent" rests with the State of Hawaii Department of Health, it was determined that the County of Hawaii Planning Department was the most knowledgeable to accept and approve the EIS.

24. Defendant PGV's FEIS was originally released to the public on **January 8, 2024**, in The (State of Hawaii's) Environmental Notice with a statement that if it FEIS not accepted as complete by the Defendant PLANNING DEPARTMENT by February 8, 2024 (30 days) it is automatically deemed accepted [Exhibit "1"].

25. Defendant KERN's acceptance of PGV's FEIS was published 30 days later on **February 8, 2024, stating there are no significant environmental or cultural or health effects to be found from PGV's expansion Projects 1 and 2** [Exhibit "2"].

26. Plaintiff fails to see how Defendants HAWAII COUNTY PLANNING DEPARTMENT and ZENDO KERN were able to review the 130-page FEIS *and* the 1475-page Appendix in 12

days as evidenced by the date on KERN's January 22, 2024 letter of acceptance printed in the Environmental Notice.[1]

27. Plaintiff fails to see how Defendants PLANNING DEPARTMENT and KERN could even see without a microscope, much less review the 68 pages of substantive Comments and Responses presented by Defendant PGV in a miniscule 5.88 font in twelve days [FEIS Apx 1193-1262].

28. Plaintiff (and other Declarants) expended much time reviewing drafts versions and submitting substantive comments to the Draft EIS which we expected to be answered substantively in the FEIS, as noted in the individual Declarations filed with this Complaint.

29. Plaintiff believes 12 days is not enough time for Defendants PLANNING DEPARTMENT and KERN to do their due diligence and instead KERN arbitrarily approved PGV's FEIS without careful consideration of the numerous commenters concerns and investigation of peer-reviewed proof appended to their comments.

30. Defendant PGV's FEIS does not adequately describe identifiable impacts that were brought to their attention in very detailed and specific comments by Plaintiff and others.

31. Instead of expanding Hawaii's environmental consciousness by discussing the true impacts of geothermal power on an active rift zone as required by law, the FEIS states throughout the document that "PGV has all their required permits and operates and complies with all rules and laws" and/or "the USGS and EPA have determined that PGV did not influence

---

[1] PGV Final EIS available at: https://files.hawaii.gov/dbedt/erp/Doc_Library/2024-01-08-HA-FEIS-Puna-Geothermal-Venture-Repower-Project.pdf.
FEIS Appendix is available at: https://files.hawaii.gov/dbedt/erp/Doc_Library/2024-01-08-HA-FEIS-Puna-Geothermal-Venture-Repower-Project-Appendices.pdf

the 2018 eruption" and/or "this FEIS uses the best-available peer-reviewed science", which is not a discussion of impacts.

32. Instead of giving the planners and general public actual area maps and details of the antithetic faults, fractures and hidden or suspected faults on the active volcanic rift zone Defendant PGV is built on and operates, the FEIS gives a few USGS-generated lava flow maps (depicting non-existent roads and water wells on fresh lava) and 2 computer-generated suggestions of cross-sections of the Kilauea Lower East Rift Zone "LERZ" and their well fractures [FEIS Apx pg 2-5, 6-10, 14].

33. PGV's FEIS and responses to commenters matter-of-factly states that "the EPA (United States Environmental Protection Agency) says PGV operations do not harm the environment" referencing the EPA's response to Plaintiff and Declarant Wood's testimony in opposition to the EPA blankly granting PGV permission to drill up to 30 EPA Class V Underground Injection Control permit.

34. The EPA's rebuttal (EPA2021b) was drafted in response to comments opposing the EPA's issuance of permission for PGV to drill up to 30 geothermal wells by Declarant Larry Wood.

35. The EPA rebuttal which is cited as bible throughout PGV's FEIS is not a "peer-reviewed" report, has no scientific citations and is not reproduced in the FEIS or Appendix for review by government agencies or the general public.

36. The EPA rebuttal look suspiciously like the University of Hawaii Professor Don Thomas' comments submitted for PGV's Scoping EIS[FEIS Apx 206-210]; Mr. Thomas submitted substantially those same comments to the EPA in rebuttal of Wood's opposition to issuing any further UIC permits.

37. Instead of discussing cumulative impacts of geothermal operations, Defendant PGV's FEIS further states as bible that in 2020 the Hawaii Volcano Observatory "HVO"/United States Geological Service "USGS" has determined unequivocally that Humans have not influenced the 2018 Kilauea eruption.

38. Nowhere in the 2020 Have humans report is it discussed what happens when you inject millions of gallons a day of effluent into the same rock formation for 30-years in a rift zone experiencing tectonic dilation and I requested the FEIS discuss this problem many times.

39. Plaintiff brought up multiple times in comments that the 2020 USGS Have humans report failed to mention PGV was injecting cold water into their wells during the 2018 Kilauea eruption, it is not an authoritative report on humans affecting the 2018 Kilauea eruption.

40. Plaintiff notified the drafters of PGV's EIS that even the students of ex-Ormat Vice President Charlene Wardlow realized that water and lava do not mix, discussed how phreatomagmatic explosions are generated and also wondered why it was hard to force the water down as the pressure and temperature was rising in KS-14 well [FEIS Apx 337-341].

41. Plaintiff is concerned PGV's FEIS fails to discuss or show the actual fractures caused by Defendant PGV's geothermal operations as shown in these images PGV supplied to the EPA in 2019 [FEIS Apx 10, 243-244].

42. Nowhere is there an actual plan in PGV's FEIS showing the location with actual GPS coordinates of the tops and bottoms of PGV's 22 currently existing wells. Some with multiple re-drills. In fact, PGV's FEIS states PGV only has 21 wells...

43. Nowhere in PGV's FEIS are the current operating pressures listed for PGV's individual wells, instead we are arbitrarily told throughout the document without any shred of proof "they operate at low pressure" to "lessen the propensity to create fractures".

44. Instead of giving details about fractures, faults and geothermal-induced seismic impacts on an active volcano, PGV's FEIS responds to commenters stating many times "It is also noted that the Project is sited in its location due to the presence and availability of geothermal resources."

45. Instead of discussing the lack of Emergency Response Plans and Public Roads, the FEIS states many times: "Those who site homes in Lava Zone 1 assume the risk that seismic activity and other volcanic hazards may damage the residences."

46. Instead of the FEIS showing and explaining in detail about PGV's geological location in a Lava Zone 1, and to thoroughly discuss how intelligent it is for the State and County to locate a major power producer where it can be knocked offline for years at a time, we are told:

> "PGV (and its parent company, Ormat) is well aware of the inherent risks associated with geothermal development. Ormat has many power plants at or near geothermal resources that are derived from volcanic activity, similar to Hawai'i. Some of these locations are in the Philippines, Indonesia, New Zealand, Africa, and South America." [FEIS Apx 420].

47. Defendant PGV acknowledges they have geothermal plants around the world – but yet won't discuss the Environmental Impact Statements of their own plants in America [FEIS Apx 422-423].

48. Attached Declarations of Amelung, Wood and Cole have provided alternative peer-reviewed proof that geothermal operations during the 2018 lava flow impacted the environment underneath PGV to the drafters of PGV's FEIS and that the Hilina Slump is very unstable and influenced by earthquakes and eruptions.

49. In direct opposition to Defendant PGV's lack of geologic details about where their plant is located, Declarant Larry Wood has provided a very detailed map of the area with faults and fissure lines [FEIS Aps 229, 233, 1084] .

50. Wood also provided maps to the drafters of PGV's FEIS showing earthquakes from a peer-reviewed study of relocated USGS/HVO earthquakes a month after the "Have humans" was released [FEIS Apx 566, 569].[2]

51. Wood's map shows earthquakes directly under Defendant PGV's injection wellfield during the 2018 eruption, while PGV was injecting cold water and saltwater beginning May 9 into an erupting volcano causing a large cluster of earthquakes under the plant [FEIS Apx 1023, 1090, 1094, 1100] [Declaration Larry Wood].

52. University of Miami Professor Falk Amelung is concerned that the subsidence along the 2018 Fissure line is currently being exacerbated by Defendant PGV's operations and requests PGV release their secret seismic data [Declaration Amelung].

53. Professor Amelung reviewed the FEIS and it did not address his concerns and he has additionally provided to Defendants PLANNING DEPARTMENT and KERN even more recent InSar radar maps showing the Lower Flank of the 2018 Fissure line is subsiding while the upper flank is raising and having seismic monitoring available to the public would allow people to be study the problem [*Id,*].

54. HRS § 343 demands that no action to implement this project may take place pending a "final statement" – meaning a LAWFUL FEIS that discloses the well-documented NEGATIVE impacts of geothermal wells underground.

55. HRS § 343 compliance must be achieved "prior to a governmental approval" of a proposed action (*Molokai Homesteaders v Cobb;* 63 Haw. 453, 466, 629 P.2d 1134 (1981) and

---

[2] Matoza, R. S., Okubo, P. G., & Shearer, P. M. (2020). Comprehensive high- precision relocation of seismicity on the Island of Hawai'i 1986–2018. Earth and Space Science, 7, e2020EA001253. https://doi.org/10.1029/2020EA001253

before an agency decision is rendered on the project (*Pearl Ridge Estates Comm. Assn v Lear Siegler, Inc;* 65 Haw. 133, 648 P.2d 702.

COUNT II – DEFENDANT PGV'S FEIS DOES NOT COMPORT WITH HAR § 11-200.1

56. HAR 11-200.1-1 provides in part **(emphasis added)**:

> c) Exemption notices, EAs, and **EISs are meaningless without the conscientious application of the environmental review process as a whole, and shall not be merely a self-serving recitation of benefits and a rationalization of the proposed action.** In preparing any exemption notice, EA, or EIS, proposing agencies and applicants are to make every effort to:
> (1) **Convey the required information succinctly in a form easily understood, both by members of the public and by government decision-makers, giving attention to the substance of the information conveyed** rather than to the particular form or length of the document;
> (2) Concentrate on important issues and to ensure that the document remains essentially self-contained, **capable of being understood by the reader without the need for undue cross-reference;** and
> (3) **Conduct any required consultation as mutual, open and direct, two-way communication, in good faith, to secure the meaningful participation of agencies and the public in the environmental review process.**

57. I brought up several times the fact that Defendant PGV's EISPN and Draft EIS and Appendices were very difficult to navigate back and forth, there are no actual page numbers listed and the need for cross-referencing is constant.

58. PGV drafters claim they added page numbers to the FEIS [FEIS Apx 1045, 1200] but they aren't actual sequential page numbers and there are no page numbers whatsoever given in the FEIS for 1,475-page Appendix [List of Appendices, FEIS 8-9].

59. Numbering pages with Chapter and Section numbers such as "3.13.2 located on page 3-72" or numbering Appendix pages into sections like "D-365" makes it very difficult for anyone attempting to find anything.

60. You have to cite an actual sequential page number in any document you want examined in a court of law..

61. PGV's response to DEIS commenters in the FEIS Appendix is provided in a miniscule 5.88 size font.

62. This is 6 pt font – 5.88 font is even smaller than this, it is not an appropriate size font for any document designed to be read by anyone.

63. The drafters of PGV's FEIS and Appendix made it intentionally difficult for government agencies and the regular public to navigate and that is a violation of HAR 11-201.1.

64. Defendant PGV's FEIS reads like an advertisement for geothermal power, and this was brought to the attention of the drafters of the document during both rounds of comments by Plaintiff (and others) it was not corrected in the FEIS and is a violation of HAR 11-200.1-1.

65. Defendant's PGV did not include Robert Peticci's comments in the FEIS which were already confirmed as being received by Stantec on July 7, 2023 but then 6-months later, January 8, 2024 the Defendant's FEIS is released without Petricci's comments [Declaration Robert Petricci].

66. Mr. Petricci's comments were sent to the Planning Department, PGV's Mike Kaleikini and others on June 22, 2023, and it is obvious that other commenters sent comments directly to the Planning Department which were published in PGV's FEIS Appendix [*Id.*].

67. In opposition to the July 7, 2023, confirmation the comments were received, the March 4, 2024 reply from Stantec states Petricci's comments "were not received in the allotted time" so therefore they aren't printed in the FEIS or responded to by Defendant, [*Id.*].

68. The email address given to submit comments to Michele Lefebvre in Defendant PGV's proposed EIS changed several times through the comment period, the EISPN and Scoping letter and documents state the email as michele.lefebvre@stantec.com [FEIS Apx 31,77].

69. Commenters on the Draft EIS were then told to send their comments to a different email michele.lefebvre@stantecgs.com [FEIS Apx pg 1, 3, 77] although the FEIS also gives her email as michele.lefebvre@stantec.com on page 10.

70. You will notice the July 2023 and March 2024 emails from Michele Lefebvre are sent from yet a third email address, michele.lefebvre@cardno-gs.com, but yet her stantecgs.com email is still listed in her contact information at the end of the emails reproduced in Petricci's Declaration.

71. When PGV's EIS preparer changes her email a minimum of 3 times in 2 years, and then does not print comments after confirming they were received, that is a violation of HAR 11-200.1-1.

72. **HAR 11-200.1-2** states in pertinent part **(emphasis added)**:

> **"Effects" or "impacts"** as used in this chapter are synonymous. Effects may **include ecological effects (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems),** aesthetic effects**, historic effects, cultural effects, economic effects, social effects, or health effects, whether primary, secondary, or cumulative, whether immediate or delayed. Effects may also include those effects resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.**
>
> **"Impacts" means the same as "effects"....**
>
> **"Primary impact", "primary effect", "direct impact", or "direct effect" means effects that are caused by the action and occur at the same time and place.**
>
> "Program" ....A program may include: a number of separate projects in a given geographic area which, if considered singly, may have minor impacts, **but if considered together, may have significant impacts;**
>
> **"Secondary impact", "secondary effect", "indirect impact", or "indirect effect" means an effect that is caused by the action and is later in time or farther removed in distance, but is still reasonably foreseeable.** An indirect effect may include a growth-inducing effect **and other effects related to induced changes** in the pattern of land use, population density or growth rate, and related effects on air, water, **and other natural systems, including ecosystems**.
>
> **"Significant effect" or "significant impact" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource...**are contrary to the State's environmental policies or long-term environmental goals and guidelines as established by law, **adversely affect the**

> economic welfare, **social welfare, or cultural practices of the community** and State, or are otherwise set forth in section 11-200.1-13.

73. Defendant PGV's FEIS did not discuss any of Plaintiff's (or Declarant Larry Wood's) offers of peer-reviewed proof that PGV significantly affected the 2018 eruption starting May 9, 2018 when they began "cooling the resource" and then "quenching their wells" by pumping cold water into a hot volcano and that is a violation of HAR 11-200.1-2.

74. The FEIS refuses to consider Professor Amelungs concerns about subsidence with attached InSar documentation and unbelievably states "The Draft EIS does not address or consider the findings which have not been published in peer-reviewed scientific journals or from similar sources [FEIS Apx pg 1197].

75. Plaintiff notes that PGV's FEIS fails to discuss "Detailed Effects, Impacts and Primary, Secondary, Indirect or Indirect Effects" of PGV's multiple geothermal wells circulating millions of gallons a day into an active volcanic rift zone, instead it denies any negative effects.

76. The FEIS does not discuss the reasoning behind US BLM Induced Seismicity Screening Worksheet Guidance Document or why it would be important to cite geothermal plants where they are not located in the middle of faults, near large faults in areas of high natural seismicity and large natural earthquakes on active volcanoes. [FEIS Aps 249-265]

77. Unbelievably, there is not one (1) mention of the Hilina Slump in the 130-pg PGV FEIS.

78. Plaintiff questioned the following [FEIS Apx 1236]:

> In my initial comments I gave you examples of multiple geothermal plants on the mainland and how they are to be seismically monitored and how their Environmental Impact Statements recognize that injection wells cause seismicity. Why is the USGS involved with monitoring geothermal plants on the mainland but not in Hawaii?. Those concerns were not addressed in the DEIS and I am asking you to compare seismic monitoring programs for Ormat geothermal plants on the mainland with existing seismic monitoring programs here in Hawaii at the PGV location in the final EIS. It doesn't matter if they are EGS or not, injection wells induce seismicity.

This was the response, showing how Defendant PGV limits the scope of the information in their FEIS:

> Substantive scoping comments received following publication of the EISPN were considered in the development of the Draft EIS. Responses those comments are included in Appendix D of the Draft EIS. Where USGS decides to conduct monitoring is outside the scope of analysis for this environmental review. **The scope of the EIS for the Project focuses on and analyzes the proposed change of equipment and the permits needed for its construction and operation.** Induced seismicity is discussed in Section 3.1.1.4 of the Draft EIS. The text explains that EGS reservoir stimulation, hydrofracturing, and other processes intended to open existing fractures or create new fractures can generate seismic activity and may be used at some geothermal power project sites. However, as stated in the Draft EIS, PGV does not operate an EGS system or utilized hydrofracturing processes.

79. Plaintiff provided the drafters of PGV's FEIS examples of how Environmental Impact Statements for Newberry Geothermal plant in California looks, what the contents of their sections relating to induced-seismicity should cover and also detail how they will mitigate earthquakes [PGV FEIS Apx 266-312].

80. Instead of examining the examples of comprehensive EIS's provided and amending their EIS appropriately Defendant PGV states Bottle Rock and Casa Diablo geothermal plant EIS's are "beyond the scope of this EIS" but don't mention Newberry Geothermal plant [FEIS Apx 472].

81. Plaintiff inquired about the spacing of geothermal wells and if it is typical to gang 10 wells on a well pad 50' apart and how come PGV is only allowed 14 wells in their Department of Health Air Pollution Permit, but PGV has already drilled 22 wells [FEIS Apx 1237]. This is the boilerplate response:

> As described in Sections 2.1.1 and 2.2.2 of the Draft EIS, all PGV wells are permitted under the EPA's UIC permit and HIDOH's UIC permit for the project. No additional permits to construct wells are needed for the Proposed Action. The Project as analyzed in the Draft EIS for proposed facility upgrades does not propose additional wells beyond those already authorized.

82. Plaintiff demands PGV release their seismic monitoring like geothermal plants in the mainland and PGV responds;

> "Potential impacts from geologic hazards associated with the Project are discussed in Section 3.1 of the Draft EIS. **While PGV monitors seismicity in the area for internal purposes,** the official agencies primarily responsible for monitoring seismicity and informing the public of such events are the USGS Hawai'i Volcanoes Observatory, with support by the Hawai'i County Civil Defense Agency." [FEIS Apx 419].

83. PGV's FEIS won't discuss monitoring PGV's induced seismicity, they think they don't need too: "The Proposed Action which includes the upgrade of equipment would occur in accordance with existing permits, **which does not specifically require seismic monitoring"** [FEIS Apx 1237].

84. **HAR 11-200.1-3** states in pertinent part **(emphasis added):**

> (5) When the document is a draft EIS, the proposing agency or applicant shall:
> (A) Sign and date the draft EIS;
> (B) **Indicate that the draft EIS and all ancillary documents were prepared under the signatory's direction or supervision and that the information submitted, to the best of the signatory's knowledge fully address document content requirements as set forth in subchapter 10.**

85. The drafters hired by Defendant PGV to draft a comprehensive FEIS have stated they did not prepare all parts of the Appendix personally.

86. Plaintiff notes several other names besides Michele Lefebvre presenting comments for publication from the Hawaii County Planning Department.

87. You will notice that many of the public comments posted in the Appendix come from the Planning Department internet email [FEIS Apx pg 116] are presented in the FEIS from a person named "Ashley Mori"[*Id.* 152, 178, 199].

88. I see where someone named "Ashley DeVera" is named on submitted comments to FEIS received by the Hawaii County Planning Department from Jim Albertini of Malu Aina on June 7, 2023 [*Id.* pg 683].

89. I see where someone named "Jacklyn Araujo" from the Hawaii Planning Department prepared comments, not limited to Eileen O'Hara and Malama O' Puna [pg 685] Araujo's name is on the comments submitted on pg 688 (McGuire), 689 (Burns), 690-736 (Ohana Ho'opakele), pg 736 (Kim) and others.

90. Araujo also provided the email comments sent in June 2023 from Kuykendall/Wakelin beginning on page 736; clearly stating it was sent to the email michele.lefebvre@stantec.com. not michele.lefebvre@stantecgs.com...

91. **HAR 11-200.1-6** in pertinent part provides **(emphasis added):**

> **(2) Any comments received during the comment period must be considered in the same manner as set forth in this chapter and chapter 343, HRS,** for that notice, document, or determination type, in addition to comments received in any other comment period associated with the publication of the notice, document, or determination.

92. As discussed above, the FEIS Appendix did not contain Declarant Petricci's comments despite confirmation by Michele Lefebvre in July 2023 that they were timely received and other comments sent to michele.lefebvre@stantec.com in June, 2023 were published, therefore the FEIS is not in compliance with HAR 11.200.1-6.

93. **HAR 11-200.1-13** provides **(emphasis added):**

> (a) In considering the significance of potential environmental effects, **agencies shall consider and evaluate the sum of effects of the proposed action on the quality of the environment.**
>
> (b) In determining whether an action may have a significant effect on the environment, **the agency shall consider every phase of a proposed action, the expected impacts, and the proposed mitigation measures. In most instances,**

an action shall be determined to have a significant effect on the environment if it may:

(4) **Have a substantial adverse effect on the economic welfare, social welfare or cultural welfare of the community** and the State;

(5) **Have a substantial adverse effect on public health;**

(7) **Have a substantial degradation of environmental quality;**

(8) **Be individually limited but cumulatively have a substantial adverse effect upon the environment or involves a commitment for larger actions;**

(9) **Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat;**

(10) **Have a substantial adverse effect on air or water quality or ambient noise levels;**

(11) **Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area** such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, **geologically hazardous land,** estuary, fresh water, or coastal waters.

(13) **Require substantial energy consumption or emit substantial greenhouse gases.**

94. Plaintiff brought up specific violations of HAR 11-200.1-13 listed above to the drafters of PGV's FEIS [FEIS Apx 425-426].

95. Defendant PGV's FEIS is in VIOLATION of HAR 11-200.1-13 (a) and (b) 4, 5, 7, 8. 9, 10, 11 and 13 for failure to disclose the true impacts of Defendant PGV's operations, much less truthfully declare how they would be mitigated [FEIS 110-111].

96. **HAR 11-200.1-23** specifically states that "acceptance of a required statement shall be a condition precedent to the use of state or county lands or funds in implementing the proposed action ".

97. Defendants PLANNING DEPARTMENT and KERN "accepted" Defendant PGV's FEIS without ensuring that Plaintiff's comments were **substantively** responded to, therefore PGV'S FEIS IS INVALID.

98. **HAR 11-200.1-26** provides in pertinent part **(emphasis added):**

> (a) **In accordance with the content requirements of section 11-200.1-27, the proposing agency or applicant shall respond within the final EIS to all substantive written comments** received pursuant to section 11-200.1-25. **In deciding whether a written comment is substantive, the proposing agency or applicant shall give careful consideration to the validity, significance, and relevance of the comment to the scope, analysis, or process of the EIS, bearing in mind the purpose of this chapter and chapter 343, HRS.** Written comments deemed by the proposing agency or applicant as non-substantive and to which no response was provided shall be clearly indicated.
>
> (d) **In responding to substantive written comments, proposing agencies and applicants shall endeavor to resolve conflicts or inconsistencies in information and address specific environmental concerns identified by the commenter, providing a response that is commensurate with the substantive content of those comments. The response shall describe the disposition of significant environmental issues raised (for example, the response may point to revisions to the proposed action to mitigate anticipated impacts or objections raised in the comment). In particular, the issues raised when the proposing agency's or applicant's position is at variance with recommendations and objections raised in the comments shall be addressed in detail, giving reasons why specific comments and suggestions were not accepted, and factors of overriding importance warranting an override of the suggestions. The response shall indicate changes that have been made to the text of the draft EIS.**

99. There were no substantive discussions or revisions or changes made to Defendant PGV's FEIS despite the numerous environmental concerns and actual harm to residents being brought to their attention by Plaintiff and dozens of commenters.

100. There was no effort to resolve the conflict and inconsistencies of PGV's FEIS brought to the attention of PGV during 2 rounds of comments, the FEIS is a sham document compared to Newberry Geothermal's EIS [FEIS Apx 266-312] which discloses actual geology and seismicity and monitoring and how they would mitigate various hazards.

101. There are discrepancies in the amount of power PGV actually has produced over the decades, and data shows PGV only reached it's quota one year out of 30 years in operation [Declaration Larry Wood].

102. There was no discussion of how Hydrogen Sulfide monitors placed uphill and upwind would pick up measurements of a gas heavier-than-air.

103. Declarant Christopher Biltoft also made substantive comments about the lack of Hydrogen Sulfide modeling and regulation and his concerns were not discussed in PGV's FEIS as noted in his declaration.

104. PGV's FEIS relies on 2 documents that are not even reproduced in the FEIS; the 2020 USGS Have Humans Influenced Volcanic Activity on the Lower East Rift Zone OF Kilauea Volcano and a 2021 comment the US EPA made to Declarant Larry Wood [FEIS 69] which is not peer-reviewed and does not contain citations of proof.

105. PGV's FEIS does not discuss geothermal operations water impacts brought up by commenters Kuykendall & Wakelin [FEIS Apx 153-177, 737-985].

106. PGV's FEIS does not address the preliminary Dr. Edelstien's report (funded to study geothermal impacts on native Hawaiians) provided by Ohana Ho'opakele and Pele Defense Fund [FEIS Apx 1227,1251-1252].

107. Defendant PGV's FEIS does not comply with HAR 11-200.1-26.

108. **HAR 11-200.1-27** provides in pertinent part **(emphasis added):**

> (a) The final EIS, at a minimum, shall contain the information required in this section. **The contents shall fully declare the environmental implications of the proposed action and shall discuss all reasonably foreseeable consequences of the action. In order that the public can be fully informed and the accepting authority can make a sound decision based upon the full range of responsible opinion on environmental effects, an EIS shall include responsible opposing views, if any, on significant environmental issues raised by the proposal.**

(b) The Final EIS shall consist of:
(1) The draft EIS prepared in compliance with this subchapter, **as revised to incorporate substantive comments received during the review processes in conformity with section 11-200.1-26, including reproduction of all comments and responses to substantive written comments;**

109. Defendant PGV's FEIS did not discuss the US BLM protocols for determining where to locate injection wells and none of the protocols mention the safety of siting a geothermal plant on an active volcano already sliding into the ocean.

110. Plaintiff provided examples of what a comprehensive Environmental Impact Statement looks like –for the Newberry Geothermal Plant in California which show with precise details maps of exactly where the proposed project sits in relation to the fractures and faults of the **dormant** Newberry volcano it is located on and also you notice seismic monitoring of the area is provided and mitigation actions are disclosed.

111. Defendant PGV's FEIS does not discuss any commenters opposing views or if it is too dangerous to locate a geothermal plant on an active volcano.

112. Plaintiff requested to know the exact contents of the geothermal resource since the 2018 lava flow, including the total amount of Hydrogen Sulfide and compare that with other geothermal plant data, as PGV's concentration of H2S is substantially higher than other geothermal plants [FEIS Apx 1032].

113. Declarant Wood brought up the fact that during the 2018 eruption " The majority of microseismic events recorded took place at depths of 1.5 to 3.5 km below the geothermal plant, consistent with injection depths (DEIS pg37). How can anyone use that statement to infer uncertainty about whether the injection caused the earthquakes? Anyone with a logical mind would use that fact to infer that the earthquakes were caused by the injection activities [FEIS Apx 1202].

114. Instead of discussing what PGV did during the 2018 eruption, PGV's drafters of their EIS claim yet again: Comment noted; Section 3.1.1.6 of the Draft EIS states, "...consistent with EPA UIC response to comment for this Project as well as the 2020 USGS Open-File Report: 2020-1017, there is no evidence to support claims that human activity triggered or influenced the 2018 Lower Puna eruption (USGS 2020; EPA 2021a)."

115. In opposition to discussing negative aspects of the project brought up by Plaintiff and others, we see where PGV's FEIS printed the recommended pro-geothermal rhetoric word-for-word into their FEIS from the State Energy Office Michael Glick [618-625].

116. **HAR 11-200.1-28** states in pertinent part **(emphasis added):**

> (a) Acceptability of a final EIS shall be evaluated on the basis of whether the final EIS, in its completed form, represents an **informational instrument that fulfills the intent and provisions of chapter 343, HRS, and adequately discloses and describes all identifiable environmental impacts and satisfactorily responds to review comments.**
>
> (b) A final EIS shall be deemed to be an acceptable document by the accepting authority **only if all of the following criteria are satisfied:**
>
> (1) **The procedures for assessment, consultation process, review, and the preparation** and submission of the EIS, from proposal of the action to publication of the final EIS, **have all been completed satisfactorily as specified in this chapter;**
>
> (3) **Comments submitted during the review process have received responses satisfactory to the accepting authority, including properly identifying comments as substantive and responding in a way commensurate to the comment, and have been appropriately incorporated into the final EIS.**

117. The Procedure for assessment, consultation, review and preparation was not followed properly by Defendant PGV's FEIS as detailed throughout the Complaint.

118. Robert Petriccis comments were not included in the FEIS.

119. Plaintiff notes Kuykendall/Wakelin comments on water quality and results of recent testing and Pele Defense Funds comments with Dr. Edelstien's remarks about Native Hawaiian Cultural and Psychosocial Impacts are not discussed substantively in this Complaint.

120. Defendants PLANNING DEPARTMENT and KERN did not ensure the FEIS adequately disclosed and describes the identifiable environmental impacts brought up by Plaintiff and others before they accepted it, a violation of HAR 11-200.1-28.

COUNT III - PLAINTIFF HAS A CONSTITUITONAL RIGHT THAT THE STATE AND COUNTY OF HAWAII PROTECT HER HEALTH AND ENVIRONMENT

121. ALL DEFENDANTS are hereby reminded that the Hawaii State Constitution, Article IX, Section 9 guarantees Hawaii residents the right to a clean and healthy environment.

122. Also, "The Hawaii Constitution, Art. IX, § 9, provides that: The State shall have the power to preserve and develop the cultural, creative and traditional arts of its various ethnic groups."

123. "The Hawaii Constitution, Art. XII,§ 7, provides that: The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights."

124. "Act 50, Session Laws of Hawaii 2000, amended, codified at§ 343-2 of the Hawaii Revised Statutes, was enacted to implement the above-quoted provisions of the Hawaii Constitution. Act 50 states that: Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

125. Plaintiff directs the Environmental Court to notice that since the inception of geothermal in Hawaii, Plaintiff (and many individuals) have had to resort to Hawaii Courts to try and obtain relief from PGV impacts for decades because the government agencies tasked with protecting us fail to do their jobs as evidenced by a Hawaii Judiciary search for Puna Geothermal Venture.

126. The significant potential impacts of PGV's induced seismicity have never been formally studied since Catherine Kenedi's 3-year study from 2006-2009, Defendant PGV keeps it's seismic impact data SECRET and that is UNCONSTITUIONAL.

127. Defendants PLANNING DEPARTMENT. KERN and PGV Constitutionally may not condemn Plaintiff and community to another 35 years of horrid gassings with deadly Hydrogen Sulfide gas.

128. Defendants PLANNING DEPARTMENT, KERN and PGV Constitutionally may not condemn Plaintiff and community to another 35 years of PGV weakening the underground Kilauea Lower East Rift Zone by circulating millions of gallons of acidic effluents and chemicals causing microearthquakes in the surrounding bedrock which trespass past Defendant PGV's leasehold property line.

COUNT IV - THERE ARE NO ROADS AND NO EFFECTIVE EMERGENCY RESPONSE PLAN TO EVACUATE RESIDENTS FROM PGV AREA THEREFORE NO PERMITS TO BUILD OR POLLUTE THE AIR SHOULD BE ISSUED

129. Plaintiff notes that Defendants PLANNING DEPARTMENT, KERN and PGV been notified numerous times by Plaintiff and Declarants that there are no working seismometers surrounding PGV.

130. Plaintiff notes that Defendants PLANNING DEPARTMENT, KERN and PGV been notified numerous times by Plaintiff and Declarants no working Hydrogen Sulfide monitors in the areas down wind and downhill of PGV to protect the residents.

131. Plaintiff notes that Defendants PLANNING DEPARTMENT, KERN and PGV been notified numerous times by Plaintiff and Declarants is no working Civil Defense Agency ERP for the PGV operations since 2016, and there are no escape routes for residents living in the landlocked areas since 2018.

132. PGV's Scoping EIS gave the date of 4th Quarter 2023 for the top of Pohoiki Road to be opened [FEIS Apx 60].

133. PGV's FEIS gives a date of 1st Quarter, 2024 to open Pohoiki Road on page 103.

134. At PGV's quarterly meeting in January the County Rep for Recovery gave us a date of 2nd quarter, 2024.

135. As of the filing of this Complaint, the 2nd quarter of 2024 is upon us and a drive-by of upper Pohoiki Road shows there are still no signs of activity, no flags or survey markers visible.

136. There is no mention whatsoever in Defendant PGV's FEIS of the thousands of people who live in the landlocked areas from Pohoiki through Kalapana up to Pahoa (Leilani Estates) and all use the same Highway 130, which has NO alternate escape roads.

137. The safety of the residents should be taken as the highest priority and no permits should be issued as there are no escape routes in the area.

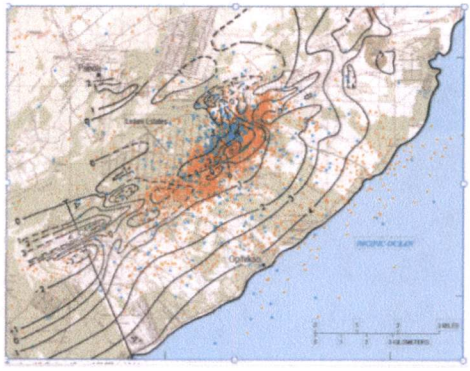
COUNT V - THERE IS NO REALTIME SEISMIC MONITORING OF PGV'S INTENTIONAL MICROFRACTURES AVAILABLE FOR PUBLIC OR GOVERNMENT OFFICALS TO STUDY AND DETERMINE THERE IS NO IMPACTS TO THE VOLCANO THEREFORE NO PERMITS SHOULD BE ISSUED

138. The FEIS failed to consider the impacts of up to 30 geothermal wells (amount permitted by the US EPA in 2021) circulating millions of gallons of acidic effluent a day in a highly fractured and unstable Rift Zone on an Active Volcano, therefore Defendants PLANNING DEPARTMENT and KERN are unable to make an informed decision on geothermal impacts to an active volcano experiencing tectonic dilation at the exact injection spots.

139. The FEIS failed to provide information on PGV's wells, their depths, their GPS coordinates top and bottom, and there is no data on individual wells' production or injection pressures, or how much that pressure increases from the surface to over a mile underground, therefore Defendants PLANNING DEPARTMENT and KERN are unable to make an informed decision on the actual underground impacts of Defendant PGV.

140. This FEIS acknowledges that geothermal plants cause earthquakes yet denies that PGV causes earthquakes because the EPA said so.

141. A USGS compilation of 3 years and 3 months of earthquakes recorded under PGV shows that there are thousands of earthquakes a year generated by geothermal operations, yet Defendant PGV refuses to admit they impact the underground.



142. PGV kept the seismometer array from Catherine Kenedi and they are holding that data from 2009-2018 as proprietary and will not share with the public or government agencies to study their impact prior to the 2018 eruption.

143. Several times in the FEIS and comments it is acknowledged PGV installed a new seismometer array in January 2022 but they refuse to share the data with USGS or the public despite many requests.

144. Declarants Benjamin Cole brought up the fact that the Hilina Slump is located in the same District as PGV, that there is evidence of a new detachment of the Hilina Slump 3.5km below the ground since the 2018 eruption and provided [Declaration of Benjamin Cole].

145. Plaintiff notified the drafters of PGV's EIS that the South Flank of Kilauea is naturally slipping into the ocean along the rift zones **without any help from PGV operations pressurizing the ground and causing microearthquakes** [FEIS Apx 241, 426, 550].

146. In response to slipping South Flank questions, Stantec replies to some imaginary question [FEIS Apx 1201:

> Research, development, and operations of the existing PGV Facility are conducted in accordance with applicable permits, federal, state, and local regulations. As stated by the EPA, the amount of pressure needed to physically inject, fracture, and transport solid rock in the subsurface is extremely unlikely to be achieved given the permitted injection pressures at PGV's wells and also very unlikely to occur in a short time period (such as those experienced between injection on May 9 and the opening of Fissure 17 on May 12) (EPA 2021b). Section 3.1.1.3 addresses earthquakes in the vicinity of the Project Area. As discussed in the response to comment 5, Section 3.1.1.6 of the Draft EIS discuses the studies prepared by the USGS and EPA in 2020 and 2021, respectively, following the 2018 eruption, which concluded that there is no evidence that human activities triggered or influenced the 2018 eruption.

147. There was not one (1) mention of the Hilina Slump in the entire 130-page FEIS, so ALL DEFENDANTS are unable to make an informed decision to allow 35 more years of micro earthquakes to destabilize the Kilauea Volcano and potentially the Hilina Slump.

148. Professor Falk Amelung of the University of Miami, a Declarant, noted that obtaining that data could prove or disprove the underground impacts caused by PGV operations [Exhibit "1"; pgs 4-8].

149. Declarant Amelung also sent a Response to the lack of response to his comments to the Hawaii County Planning Department and notes additional concerns of geothermal injections cooling the rock and affecting dike propagation from uprift and also he has attached newer InSar

radar which shows that the 2018 Fissure line along PGV's property line is cracking apart and the south side is subsiding faster than the north side [Declaration Amelung].

150. There was no discussion of phreatomagmatic explosions in the 130-page EIS, therefore Defendants PLANNING DEPARTMENT and KERN are unable to make an informed decision whether the harms caused by PGV injecting water into erupting volcanoes outweigh the benefits of PGV's variable output to the electric grid.

151. In response to lack of Emergency Response or questions of what constitutes a proper response to a lava flow, Defendant PGV clearly states that they aren't responsible for notifying or evacuating residents, all burden and responsibility of responding to emergencies (Iselle, 2018 Kilauea Eruption) falls on the State and County Civil Defense Agencies (aka taxpayers)

COUNT VI - THERE IS NO MEANINGFUL DISCUSSION OF HYDROGEN SULFIDE IN PGV'S FEIS, NO MONITORING OR MODELING OF PGV'S SOURCE H2S EMISSIONS AVAILABLE IN THE FEIS FOR PUBLIC OR GOVERNMENT OFFICALS TO STUDY AND DETERMINE THERE IS NO IMPACT THEREFORE NO FURTHER PERMITS SHOULD BE ISSUED

152. Plaintiff took a tour of the PGV facility around November, 2023, and as soon as we drove over the lava channel into PGV's compound I was assailed by the smell of rotten eggs and saw leaking pipes as we were driven through the facility.

153. Declarants Larry Wood and Benjamin Cole were in attendance as well and smelled it. Mike Kaleikini, PGV's representative said he couldn't smell the rotten eggs and he didn't happen to bring a H2S meter with him on the tour.

154. Plaintiff believes it is a side effect of too much exposure to H2S that your nose becomes de-sensitized to it. Also, in large concentrations you don't smell anything.

155. Declarant Christopher Biltoft discussed very serious deficiencies in Defendant PGV's FEIS relating to Hydrogen Sulfide – but was given boilerplate responses [Declaration Biltoft].

156. The FEIS correctly states "Discretionary consent required DOH noncovered source permit [FEIS pg 2].

157. The FEIS **incorrectly** states the noncovered source permit is required "for Phase 2, upgrades to 60 MW" [*Id.*].

158. The truth is PGV needs to amend their existing DOH noncovered source permit to expand to Phase 1, 48MW, as notified by DOH in their "standard" response to the EISPN on page 119 of the FEIS Appendix, which notes:

> If your proposed project Requires an Air Pollution Control Permit You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch. Permit applicationforms can be found here: https://health.hawaii.gov/cab/permit-application-forms/

159. Despite the State of Hawaii approving PGV's Noncovered Soure Permit to Pollute Lower Puna with Hydrogen Sulfide in October 2022, PGV has not filed any permit amendments to expand for the Projects.

160. Defendant PGV did however apply to the DOH after October 2022 to change the numbers of wells allowed from 14, remove images of well pads and well locations and instead want to just give lists of wells and pads and also states in the FEIS response to commenters they will add wells and pads as necessary because they have all the permits already.

161. There is no denying that Hydrogen Sulfide "H2S" is a deadly gas that can kill a human or animals in seconds. The FEIS incredibly admits that H2S emissions should be below 5ppb to keep the rotten egg smell from permeating the neighborhood but says PGV is allowed to gas residents up to 25 ppb at any given time, instant or rolling averages.

162. Why PGV's 3 perimeter Hydrogen Sulfide Monitors are located upwind and uphill and therefore do not register heavier-than-air gas flowing downwind and downhill was not discussed in the FEIS [FEIS Apx 227-228] other than to say PGV complies with all permits to pollute.

163. Plaintiff provided copies of a couple pages out of a book on Hydrogen Sulfide by Dr. Kaye Kilburn, who came to Puna in 2013 to study the effects of H2S on Puna Residents and included his findings in "Brain Robber What You Don't Know About Rotten Egg Gas Could Kill You Or Make You Wish You Were Dead"[*Id.* 1070-1080].

164. The FEIS downplays the deadly nature of Hydrogen Sulfide and did not mention of Mr. Kilburn's book or the PGV employees and nearby residents he interviewed, some who recovered, some who suffered and died.

165. PGV's FEIS uses Hilo data for their air modeling because they have none from Puna.

166. Plaintiff questions how rolling hourly and daily averages protect the residents from Hydrogen Sulfide, but no answer is given and the lack of Hydrogen Sulfide source monitors leaves no record to protect the residents, it protects the government and PGV [Declaration Robert Petricci].

167. My daughter, Declarant Jasmine Steiner, has lived near PGV almost her entire life, and describes that experience and how it affected her and her daughter in her attached Declaration.

CONCLUSION - THE EVIDENCE OVERWHELMINGLY SUPPORTS A PERMANENT INJUNCTION AGAINST COUNTY DEFENDANTS ISSUING ANY BUILDING PERMITS TO PGV FOR FAILURE TO PROVIDE ADEQUATE SAFEGUARDS TO PROTECT PUBLIC AND ENVIORNMENT

168. [Courts] evaluate standing using the 'injury in fact' test requiring '(1) an actual or threatened injury, which (2) is traceable to the challenged action, and (3) is likely to be remedied by favorable judicial action.'...However, in cases involving native Hawaiian and environmental interests, we have been especially concerned that the doctrine of standing not serve as a barrier to

a plaintiff's legitimate claims.' *Pele Defense Fund v Paty,* 73 Haw. 578, 614, 837 P.2d 1247, 1268 (1992).

169. Our 'fundamental policy [is] that Hawaii's state courts should provide a forum for cases raising issues of broad public interest, and that the judicially imposed standing barriers should be lowered when the 'needs of justice' would best be served by allowing a plaintiff to bring claims before the court.' *Life of the Land v The Land Use Comm'n [(Life of the Land II);* 63 Haw. 166, 176, 623 P. 2d 431, 441 (1981).

170. It is common knowledge that geothermal operations cause microfractures underground as admitted throughout Defendant PGV's FEIS and Plaintiff provided a geologic map of a "suspected" hidden fault to the drafters of PGV's FEIS reproduced in the FEIS Apx on page 1069, yet the faults and fractures PGV is built on were not discussed in the FEIS.

171. With no seismic monitoring available to the public, Defendants PLANNING DEPARTMENT and KERN are unable to see how PGV affects the Kilauea Volcano therefore they cannot make an informed decision to issue any further building or operating permits for PGV [Declaration Amelung].

172. With no meaningful Hydrogen Sulfide monitoring or Air modeling available to the government agencies or public, Defendant's PLANNING DEPARTMENT and KERN can't make an informed decision that the geothermal plant does not affect the residents surrounding PGV.

173. Puna Geothermal Venture's impact on Lower Puna is a Public Nuisance and a danger to the residents and the stability of the Kilauea Volcano.

174. Plaintiff and Declarants have provided peer-reviewed proof that Defendant PGV's operations are a clear and present danger to the community and the stability of the volcano that were not discussed in the FEIS.

175. If PGV's FEIS is allowed to stand as lawful, that means PGV will be allowed to intentionally expose the community for another 35 years of a clear and present danger of being randomly gassed by Hydrogen Sulfide as testified to by dozens of commenters during both rounds of public meetings and written comments.

THEREFORE, Plaintiff prays this Honorable Court grant:

i. An Order ruling for Plaintiff that Defendant PGV's FEIS does not comport with the HRS § 343 and HAR 11-200.1 *et seq* and is therefore REJECTED AS INSUFFICIENT.

ii. An Order Permanently Injuncting the County of Hawaii from issuing any further permits for grubbimg, grading or building of Defendant PGV, Phase 1& 2 for failure to disclose known harms and discuss them in a lawful EIS.

iii. An Order VACATING all Amended Purchase Power Agreements made by the Hawaii Public Utility Commission in Docket No. 2019-0333 without waiting for a lawful EIS to be accepted and approved.

iv. An Order voiding any applications to amend or modify PGV's Discretionary State of Hawaii Department of Health Air Pollution NSP permit to Phase 1 and 2 for failure to provide a legal EIS.

v. Any further relief the Court deems proper to protect the Puna residents and environment from further harm from Hawaii government agencies issuing blank checks to for-profit entities who do not respect or protect the residents and environment first and foremost.

PLAINTIFF CERTIFIES UNDER PENALTY OF PERJURY THAT THE ABOVE HRS § 343 COMPLAINT FOR INJUNCTION IS FILED IN THE BEST INTERESTS OF JUSTICE FOR THE RESIDENTS SURROUNDING AND ENVIRONMENT UNDERNEATH PUNA GEOTHERMAL VENTURE.

DATED: Pahoa, Hawaii, April 4, 2024.

Sara Steiner, Self-Represented Plaintiff

The Environmental Notice

January 8, 2024

Josh Green, M.D., Governor
Mary Alice Evans, Interim Director

The Environmental Notice provides public notice for projects undergoing environmental review in Hawai'i as mandated under Section 343-3, Hawai'i Revised Statutes, the Environmental Impact Statement Law. Along with publishing Environmental Assessments and Environmental Impact Statements for projects in Hawai'i, The Environmental Notice also includes other items related to the shoreline, coastal zone, and federal activities.

The macadamia nut is threatened by the macadamia felted coccid which is an invasive plant-feeding pest. photo from the project's Draft EA

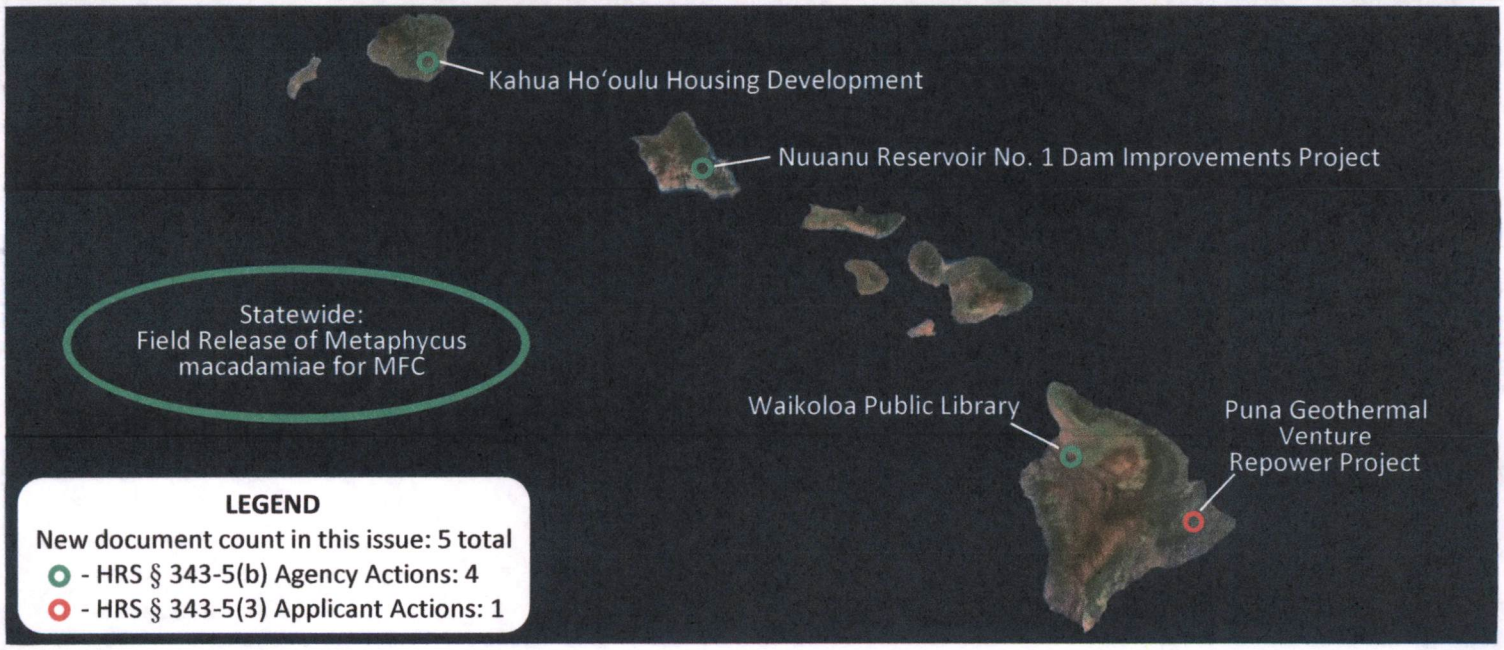
EXHIBIT "1"

Table of Contents

Announcements

- The Environmental Advisory Council (EAC) is seeking new members. To learn more about the work of the EAC, visit their website. To apply to be on the EAC, submit this online application under Department of Business, Economic Development & Tourism - Environmental Advisory Council.
- The 2024 ERP Publication Calendar is attached to the end of this issue or may be accessed online!
- Please use our Contact Us page if you have any questions for Environmental Review Program or Environmental Advisory Council or if you would like to schedule any trainings. s

Statewide Map of New EA/EIS Documents and Determinations



STATEWIDE EAs/EISs

Proposed Statewide Field Release of Metaphycus macadamiae for MFC – Draft EA (AFNSI)

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds (2) Propose any use within any land classified as a conservation district
District(s)	Statewide
Permit(s)	USDA-APHIS-PPQ; Board of Agriculture (HDOA Plant Quarantine Branch)
Proposing/ Determining Agency	State of Hawai'i, Department of Agriculture Janis Matsunaga, (808) 973-9536, janis.n.matsunaga@hawaii.gov 1428 S. King St., Honolulu, HI 96814
Consultant	None
Status	Statutory 30-day public review and comment period starts. Comments are due by February 7, 2024. Please click on title link above to read the document, then send comments to the proposing/determining agency at hdoa.ppc@hawaii.gov.

The Hawai'i Department of Agriculture proposes the Statewide field release of Metaphycus macadamiae, a host-specific minute parasitoid wasp, in the State of Hawai'i for biological control of Acanthococcus ironsidei, the macadamia felted coccid (MFC). MFC, a serious pest of macadamia trees, is native to Australia and continues to threaten the macadamia nut industry in Hawai'i. MFC feeding causes leaves to be distorted, early flower drop, and branch die-back, leading to the death of trees and a substantial reduction in nut production. If MFC is not controlled sustainably and at the landscape level soon, it may spread throughout the State and will continue to devastate Hawai'i's macadamia nut industry. M. macadamiae is a monophagous parasitoid of MFC and does not pose any risk to native and beneficial species, thus making this natural enemy of MFC safe to release in the environment to control MFC in Hawai'i.

O'AHU EAs/EISs

Nuuanu Reservoir No. 1 Dam Improvements Project – Draft EA (AFNSI)

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds
District(s)	Honolulu
TMK(s)	(1) 1-9-001:001
Permit(s)	USACE CWA Section 404 Jurisdictional Determination; HDOH Clean Water Act Section 401 Water Quality Certification; NPDES Permit; DLNR Dam Safety Permit; HRS Chapter 6E-8 Compliance with SHPD; DLNR OCCL Conservation District Use Permit; CCH DPP Grading, Grubbing and Stockpiling Permits; CCH DPP Erosion Control Plan and approval; Hawaii Telecom Approval; HECO Approval
Proposing/ Determining Agency	Board of Water Supply Everest Akana, (808) 748-5745, EAkana@hbws.org 630 S Beretania Street, Honolulu, HI 96843
Consultant	HDR inc.; 1001 Bishop Street Ste 400, Honolulu, HI 96813 Linda Fisher, (808) 697-6200, linda.fisher@hdrinc.com
Status	Statutory 30-day public review and comment period starts. Comments are due by February 7, 2024. Please click on title link above to read the document, then send comments to the proposing/determining agency and copy the consultant.

The purpose and need for the proposed action is to meet DLNR dam safety criteria for the Nu'uanu Reservoir No. 1 and dam. To meet the proposed purpose and need, improvements to Nu'uanu Reservoir No. 1 are required. The remaining recommended priority maintenance and improvements identified in the DLNR Dam Safety Program inspection report and the Phase 1 Investigation Report at Nu'uanu Reservoir No. 1 need to be carried out in order to meet this need. The proposed physical improvements at Nu'uanu Reservoir No. 1 and dam include the following:

- Construct a new outlet works pipe structure and discharge valve through the bottom of the embankment.
- Reconstruct the upstream and downstream embankments to meet slope and stability requirements.
- Construct a new concrete spillway to meet requirements.
- Install new monitoring and data recording instrumentation.
- Update, maintain, and implement the Operations and Maintenance Manual.

HAWAIʻI EAs/EISs

Puna Geothermal Venture Repower Project – Final EIS, Appendices, and audio recording of comment meeting

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds
District(s)	Puna
TMK(s)	3) 1-4-001: 001, 002, and 019
Permit(s)	DOH non-covered source permit (for Phase 2, upgrades to 60 MW), Building Permit (County), Grading Permit (County)
Approving Agency	County of Hawai'i Planning Department April Surprenant, (808) 961-8288, planning@hawaiicounty.gov 101 Pauahi Street, Suite 3, Hilo, HI 96720
Applicant	Puna Geothermal Venture; P.O. Box 30, Pāhoa, HI 96778 Michael Kaleikini, (808) 369-9094, mkaleikini@ormat.com
Consultant	Stantec Consulting Services Inc.; P.O. Box 191, Hilo, HI 96721 Michele Lefebvre, (808) 791-9872, michele.lefebvre@stantecgs.com
Status	Final EIS has been submitted and is pending acceptance by the accepting authority

Puna Geothermal Venture is currently authorized for and operating a geothermal power plant in the Puna District and proposes to replace the current 12 operating power-generating units with up to four energy converters. The project would increase the production of renewable energy at the existing facility (within the current site fence line) using new, more efficient units on a smaller land footprint compared to the existing units. The project would increase power production from 38 to 46 megawatts in Phase 1 and further increase production to 60 megawatts in Phase 2. The overall property size would remain the same. Most of the existing infrastructure and buildings would remain for the Project including administration buildings, the control room, maintenance areas, well pads, and the gathering system. The proposed new units would continue to safely supply reliable power from renewable geothermal resources with more efficient and quieter equipment.

Waikoloa Public Library – Draft EA (AFNSI)

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds
District(s)	South Kohala
TMK(s)	(3) 6-8-041:020
Permit(s)	Chapter 343, HRS Compliance; Dust Control Plan; Noise Permit (if necessary); National Pollutant Discharge Elimination System (NPDES) construction site stormwater discharge permit; Americans with Disabilities Act (ADA) Compliance; Section 6E, HRS Review; Grading, Grubbing, and Stockpiling Permits; Building Permit (electrical, plumbing, civil); Certificate of Occupancy; and Plan Approval
Proposing/ Determining Agency	Department of Accounting and General Services Brian Isa, (808) 586-0484, brian.s.isa@hawaii.gov 1151 Punchbowl Street, Room 430, Honolulu, HI 96810
Consultant	PBR HAWAII; 1001 Bishop Street, ASB Tower, Suite 650, Honolulu, HI 96813 Bradley Furuya, (808) 954-6348, bfuruya@pbrhawaii.com
Status	Statutory 30-day public review and comment period starts. Comments are due by February 7, 2024. Please click on title link above to read the document, then send comments to the proposing/determining agency and copy the consultant.

The proposed Project includes a new, approximately 12,000 square foot public library, approximately 3,000 square foot Early Learning Center (ELC), 71-stall surface parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian's office. The ELC, connected to the library, will have two classrooms, each capable of accommodating roughly 20 students.

Mitchell D. Roth
Mayor

Deanna S. Sako
Managing Director

West Hawai'i Office
74-5044 Ane Keohokālole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

Zendo Kern
Director

Jeffrey W. Darrow
Deputy Director

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

January 22, 2024

Mary Alice Evans, Director
Office of Planning and Sustainable Development
Environmental Review Program
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

SUBJECT: Acceptance of the Final Environmental Impact Statement for the Puna Geothermal Venture Repower Project

Dear Director Evans,

With this letter, the County of Hawai'i Planning Department, **accepts** the Final Environmental Impact Statement (FEIS) for the "Puna Geothermal Venture Repower Project" as having fulfilled the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and Title 11, Chapter 200.1, Hawaii Administrative Rules (HAR). The procedures for assessment, consultation, review, preparation, and submission of the FEIS have been completed satisfactorily. The requirements have been satisfied, and comments submitted during the comment period have received satisfactory responses and have been appropriately incorporated into the FEIS.

The economic, social, and environmental impacts that would likely occur, should this project be implemented, are adequately described in the statement. The analysis, together with the comments made by reviewers, provide useful information to policy makers and the public.

My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws.

Sincerely,

Zendo Kern
Zendo Kern (Jan 22, 2024 10:31 HST)

ZENDO KERN
Planning Director, County of Hawai'i

EXHIBIT "2"
FROM Environmental Notice 2-8-2024

Mitchell D. Roth
Mayor

Deanna S. Sako
Managing Director

West Hawai'i Office
74-5044 Ane Keohokālole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

Zendo Kern
Director

Jeffrey W. Darrow
Deputy Director

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

January 31, 2024

Mary Alice Evans, Director
Office of Planning and Sustainable Development
Environmental Review Program
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

SUBJECT: Supplement to Acceptance of the Final Environmental Impact Statement for the Puna Geothermal Venture Repower Project

With this letter, the County of Hawai'i Planning Department, requests that the Office of Planning and Sustainable Development Environmental Review Program (OPSD-ERP) publish this supplement to the County's January 22, 2024 letter accepting the Final Environmental Impact Statement (FEIS) for the "Puna Geothermal Venture Repower Project" as having fulfilled the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and Title 11, Chapter 200.1, Hawaii Administrative Rules (HAR).

The County of Hawai'i Planning Department would like to acknowledge that one of the public comment letters provided during the Draft Environmental Impact Statement (DEIS) comment period printed incorrectly in the FEIS package, which was published in *The Environmental Notice* on January 8, 2024. The error occured as a result of a merging issue when combining the FEIS appendix files in Adobe Acrobat. The program substituted the fonts and printed the characters incorrectly, resulting in illegible text. This occurred to the text in Mr. Falk Amelung's Public Comment Letter 10, which was provided during the DEIS comment period as an attachment to an email. The attachment received was legible; it was only after combining the files into the larger appendix document that it appeared incorrectly.

We note that Mr. Amelung's comment letter was provided twice during the comment period. Public Comment Letter 10 was emailed as an attachment by Mr. Amelung. Public Comment Letter 19 is a scan of the same letter that was hand delivered by Ms. Sara Steiner at the June 1, 2023, public comment meeting. Thus, Mr. Amelung's comment letter appears as two distinct letters in Appendix D to the FEIS: as Public Comment Letter 10 on page D-405 (.PDF page 519), and again as Public Comment Letter 19 on page D-441 (.PDF page 555). The text of Public Comment Letter 19 did not experience an Adobe Acrobat conversion error and appears correctly in the FEIS.

The contents of Public Comment Letter 10 and Public Comment Letter 19 are identical. This is also noted in the comment response table. Responses to Public Comment Letter 10 start on page D-1082 (.PDF page 1196), and the response to Letter 19 on page D-1087 (.PDF page 1201) refers to the responses to Letter 10 since the letters are identical. The content of Letter 10 is reproduced in the Appendix D comment response table word for word from the submitted public comment letter. Enclosed please see Letter 10 as it was submitted. HAR § 11-200.1-27(b)(1) requires the Final EIS to include, among other things, "reproduction of all comments and responses to substantive written comments[.]" Since the same letter was submitted twice during the public comment period it appears twice in Appendix D of the FEIS. The Adobe Acrobat version with text conversion issue of Public Comment Letter 10 is reproduced in the comment response table and responses to such are sufficient, the County of Hawai'i Planning Department's determination that the contents of the FEIS are adequate and acceptable is affirmed.

The County understands that the Applicant's consultant will be sending a notification letter with the above information to Mr. Amelung.

My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws. The County appreciates OPSD-ERP publishing this supplement with the County's January 22, 2024, acceptance letter for the record.

Sincerely,

Zendo Kern
Zendo Kern (Jan 31, 2024 15:33 HST)

ZENDO KERN
Planning Director

Enclosure: Public Comment Letter 10, Submitted by Falk Amelung

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE

Division of Marine Geology and Geophysics

4600 Rickenbacker Causeway

Miami, Florida 33149-1031

Phone: 1 305 421-4949

May 30, 2023

To:
Scott Glenn, Acting Director
Office of Planning and Sustainable Development
Environmental Review Program
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813
HI_Climate@hawaii.gov

cc: Zendo Kern, Hawaii County planning department (planning@hawaiicounty.gov)

Comments on the Draft Environmental Impact Statement of the Puna Geothermal Venture Repower project.

Dear Mr. Glenn,

I am a professor of Geophysics at the University of Miami and a previous Hawai'i resident. I am writing to bring to your attention four items that are not sufficiently addressed in the Draft Environmental Impact Statement (draft EIS) which are explained in detail below. In essence, the PGV should be mandated to operate dedicated seismic monitoring with open data access to be able to investigate whether and how PGV operations impact the volcano.

I have a long-term interest in studying the Hawaiian volcanoes using geophysical methods (see publication listing below). My expertise regarding the PGV comes from a pending research proposal with the Department of Energy to study (i) how geothermal exploitation affected the propagation of the 2018 dike from Kilauea volcano that erupted in the vicinity of the PGV, and (ii) the subsidence in the PGV area (see item 4). The proposal was submitted to DOE in January 2023.

As a clean energy advocate I am concerned about Hawai'i reaching its climate goals. What will be the future of geothermal energy if another eruption occurs and PGV operations are found to be responsible for focusing the magma?

Please don't hesitate to contact me for additional information. Also please be so kind to confirm that you have received this letter.

Best regards

Falk Amelung

Falk Amelung, Professor of Geophysics
Phone: 1 305 421-4949 ● Fax: 1 305 421-4632 ● E-mail: famelung@earth.miami.edu

Item 1: Lack of seismic monitoring. The draft EIS lacks a plan to monitor the seismic activity in the PGV area. Although PGV does not inject water at pressures sufficient to fracture the rock (PGV is not an enhanced geothermal system), PGV's operations nevertheless can induce seismicity. This is because the east rift zone is likely under tectonic extension driven by seaward motion of Kilauea volcano's south flank. The injection of water is associated with local increases in pore fluid pressure which in the widely accepted Coulomb Failure model acts to reduce the stress threshold for faults to rupture. Pore fluid pressure increases therefore can lead to the spontaneous generation of seismicity (see section 3.1.1.4 in the draft EIS). Most of these induced earthquakes are small (magnitude -2 to 2) and not detectable by the island-wide seismic network operated by the U.S. Geological Survey's (USGS) Hawaii Volcano Observatory (HVO). However they could be detected by seismographs located inside boreholes in and near the PGV area. Precise local seismic data combined with sub daily production and injection data could demonstrate that PGV operations are safe and answer many questions regarding the induced seismicity such as the seismic swarms during the 2018 eruption (see next item).

I therefore recommend the operation of a bore-hole seismic network at PGV.

Geothermal projects in California and Nevada all have excellent seismic monitoring networks (e.g. 48 stations at The Geysers, 16 stations at Coso and 8 stations at the Salton Sea). Community acceptance of these projects is partly based on studies by independent scientists showing that induced seismicity is within expectations.

Although PGV does not use EGS methods, seismic monitoring should be mandated because of PGV's location within an active volcanic rift zone.

The draft EIS does not describe the current state of seismic monitoring in the PGV area. I was informed that PGV operates a borehole seismic network but these data are not shared because they are proprietary. If true, this should give us some pause. Why are these data not openly available and used to demonstrate that the induced seismicity is within expectations?

Item 2: Hazards from propagating dikes and 2018 co-eruption seismicity. The geological hazards section of the draft EIS addresses the hazards from subaerial lava flows but not the hazards from dikes propagating underground. The 2018 dike from Kilauea volcano propagated from the Pu'O'o area down the lower east rift zone and erupted in the PGV area. When the pressure in the production wells had risen to unusual high values (2000 psig or 13.8 MPa) heavy mud was injected in order to "kill" the well (Spielmann et al., 2020). The draft EIS does not discuss whether this was an appropriate response measure and what are the lessons, if any, for the next eruption.

The injection of heavy mud during an eruption can be debated. It led to high pressure at the bottom of the well and potentially to a hydraulic fracture. In fact, the day when the mud was injected a seismic swarm was detected and the eruption transitioned to erupt hotter, less viscous lava (Neal et al., 2018). This is consistent with the generation of a hydraulic fracture. Whether the pressure was enough to fracture the rock or not, it almost certainly was above the allowable limit for a non-enhanced geothermal system. Precise seismic data (which may exist, see item 1) would allow us to study how the injection of the heavy mud affected the course of the eruption.

The draft EIS should contain a discussion on how a propagating dike can affect the wells. It also should contain an eruption response plan considering whether the injection of heavy mud during an eruption can have unintended consequences. Alternatively the wells could be filled prior to the arrival of the dike.

Item 3: Impact of geothermal exploration on dike propagation. The draft EIS lacks a discussion on how geothermal exploration affects the trajectory of dikes propagating through Kilauea's east rift zone. The draft EIS cites a USGS study which concludes that there is no evidence that humans have influenced the volcanic processes in the lower east rift zone (Kauahikaua & Truesdell, 2020). This study, however, only considers *the origin of the dike* (which at 25 km was too far to be affected by the PGVoperations), but not *the location of the eruption of the dike.* Was it coincidence that the 2018 dike erupted in the PGV area? Given the length of Kilauea's lower east rift zone the random probability of a dike to erupt in the PGV area is about 10-20%.

There is a mechanism of how geothermal exploration can affect dike propagation. The extraction of heat leads to the formation of cooling contraction cracks. These cracks make the rock mechanically weak, which can lead to the arrest of dikes. This effect should be estimated in the draft EIS.

An alternative explanation for the eruption of the dike in the PGV area is the presence of the dacitic magma bodies which is the reason why the site was selected for geothermal exploitation in the first place.

Item 4: Subsidence from geothermal exploration in the lower Puna area. In the draft EIS it is stated that there have been no significant changes in patterns or trends of deformation due to human activity in the PGV area, based on the Kauahikaua & Truesdell (2020) study mentioned above (section 3.1.1.3). This statement is not correct.

I processed InSAR time series data based on >100 Sentinel-1 SAR images which show for the 2021-2022 period a linear 50-200 meter-wide ground displacements feature in the area of the eruptive fissure at a rate of 2-3 cm/yr (~1 inch/yr) in direction of the satellite (Fig. 1). A displacement time-series starting after the 2018 eruption shows that ground displacements started in fall 2020 when PGV resumed production. This suggests that displacements represent subsidence due to water extraction and/or cooling of the hot rock.

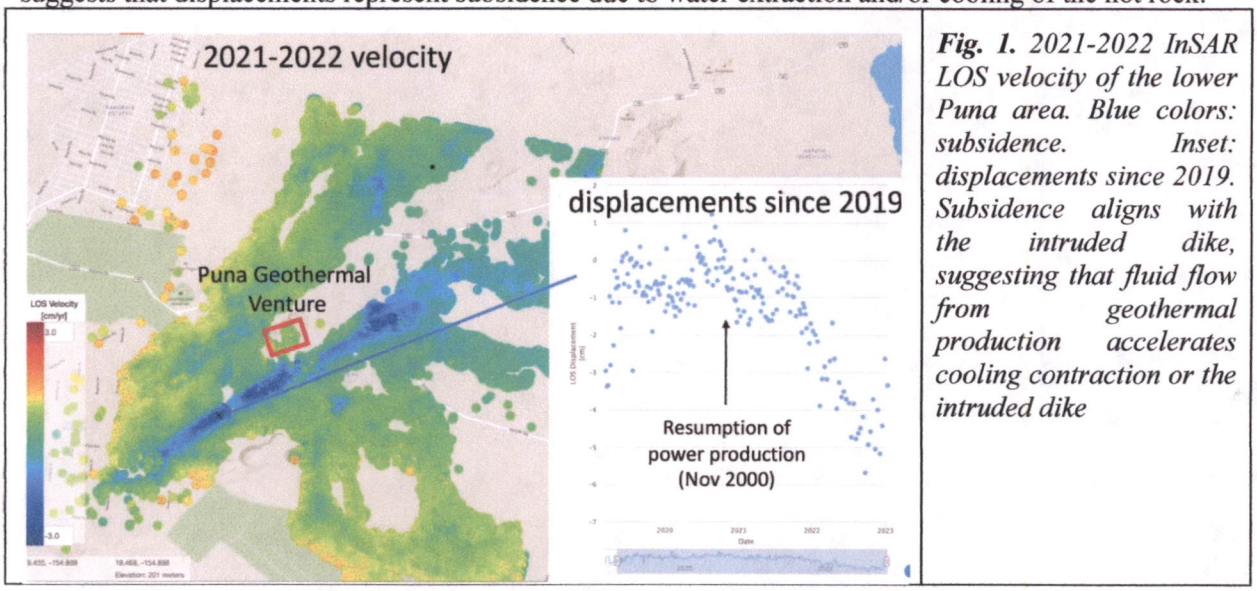


Fig. 1. *2021-2022 InSAR LOS velocity of the lower Puna area. Blue colors: subsidence. Inset: displacements since 2019. Subsidence aligns with the intruded dike, suggesting that fluid flow from geothermal production accelerates cooling contraction or the intruded dike*

The significance of the observed subsidence will not be known unless the proposed research project is conducted. Nevertheless, it is proof that PGV operations affect a larger area and highlight the need for high-quality seismic monitoring.

These data can be viewed at

https://insarmaps.miami.edu/start/19.4963/-154.8161/11.5323?flyToDatasetCenter=false&startDataset=S1_IW12_087_0527_0531_20190106_XXXXXXXX_N19428_N19512_W154924_W154847_noCorrPS&minScale=-3&maxScale=3&refPointLat=19.50517&refPointLon=-154.88401&pointLat=19.46892&pointLon=-154.89778&startDate=20200107&endDate=20230109

Attachment: Selected publications on the Hawaiian volcanoes by F. Amelung

Varugu, B., Amelung, F. Southward growth of Mauna Loa's dike-like magma body driven by topographic stress. Sci Rep 11, 9816 (2021). https://doi.org/10.1038/s41598-021-89203-6

Farquharson, J, F. Amelung; Extreme rainfall triggered the 2018 rift eruption at Kīlauea Volcano, Hawaii (2020), Nature, 580(7804), 491-495.

Shuangyu Ge, Guoqing Lin, Falk Amelung, Paul G. Okubo, Don Swanson (2019), The accommodation of the south flank's motion by the Koa'e fault system, Kīlauea, Hawai'i: insights from the June 2012 earthquake sequence, DOI:10.1029/2018JB016961

Baker, S., and F. Amelung (2015), Pressurized magma reservoir within the east rift zone of Kīlauea Volcano, Hawai'i: Evidence for relaxed stress changes from the 1975 Kalapana earthquake, Geophys. Res. Lett., 42, doi:10.1002/2015GL063161.

Lin, G., Shearer, P. M., Matoza, R. S., Okubo, P. G., & Amelung, F. (2014). Three-dimensional seismic velocity structure of Mauna Loa and Kilauea volcanoes in Hawaii from local seismic tomography. Journal of Geophysical Research: Solid Earth, 119(5), 4377-4392.

Lin, G., F. Amelung, P. M. Shearer, and P. G. Okubo (2015), Location and size of the shallow magma reservoir beneath Kīlauea caldera, constraints from near-source *Vp*/*Vs* ratios, Geophys. Res. Lett., 42, doi:10.1002/2015GL065802.

Lin, G., Amelung, F., Lavallée, Y., & Okubo, P. G. (2014). Seismic evidence for a crustal magma reservoir beneath the upper east rift zone of Kilauea volcano, Hawaii. *Geology*, G35001-1.

Amelung, F., S.H. Yun, T. Walter, Paul Segall and S.-W. Kim. Stress control of deep rift intrusion at Mauna Loa volcano, Hawaii. Science 316: 1026-1030 [DOI: 10.1126/science.1140035], 2007.

Plattner, C., Amelung, F., Baker, S., Govers, R., & Poland, M. (2013). The role of viscous magma mush spreading in volcanic flank motion at Kīlauea Volcano, Hawai 'i. Journal of Geophysical Research: Solid Earth, DOI: 10.1002/jgrb.50194

Baker, S. and F. Amelung (2012), Top-down inflation and deflation at the summit of Kīlauea Volcano, Hawaii observed with InSAR, J. Geophys. Res., doi:10.1029/2011JB009123

Walter T. R., F. Amelung, Volcano-earthquake interaction at Mauna Loa volcano, Hawaii, J. Geophys. Res., 111, B05204, doi:10.1029/2005JB003861, 2006.

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Monday, January 22, 2024 4:41:24 PM

Action Name

Puna Geothermal Venture Repower Project

Type of Document/Determination

Final environmental impact statement (FEIS) acceptance or non-acceptance

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

Puna, Hawai'i

Tax Map Key(s) (TMK(s))

(3) 1-4-001: 001, 002, and 019

Action type

Applicant

Other required permits and approvals

Building Permit (County), Grading Permit (County)

Discretionary consent required

DOH noncovered source permit (for Phase 2, upgrades to 60 MW)

Approving agency

County of Hawaii Planning Department

Agency contact name

April Surprenant

Agency contact email (for info about the action)

planning@hawaiicounty.gov

Email address or URL for receiving comments

planning@hawaiicounty.gov

Agency contact phone

(808) 961-8288

Agency address

101 Pauahi Street
Suite 3
Hilo, HI 96720
United States
Map It

Accepting authority

County of Hawaii Planning Department

Applicant

Puna Geothermal Venture

Applicant contact name

Michael Kaleikini

Applicant contact email

mkaleikini@ormat.com

Applicant contact phone

(808) 369-9094

Applicant address

P.O. Box 30
Pahoa, HI 96778
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Stantec Consulting Services Inc.

Consultant contact name

Michele Lefebvre

Consultant contact email

michele.lefebvre@stantecgs.com

Consultant contact phone

(808) 791-9872

Consultant address

P.O. Box 191
Hilo, HI 96721
United States
Map It

Action summary

Puna Geothermal Venture is currently authorized for and operating a geothermal power plant in the Puna District and proposes to replace the current 12 operating power-generating units with up to four energy converters. The project would increase the production of renewable energy at the existing facility (within the current site fence line) using new, more efficient units on a smaller land footprint compared to the existing units. The project would increase power production from 38 to 46 megawatts in Phase 1 and further increase production to 60 megawatts in Phase 2. The overall property size would remain the same. Most of the existing infrastructure and buildings would remain for the Project including administration buildings, the control room, maintenance areas, well pads, and the gathering system. The

proposed new units would continue to safely supply reliable power from renewable geothermal resources with more efficient and quieter equipment.

Attached documents (signed agency letter & EA/EIS)

- LPGV-FEIS-Acceptance-Signed.pdf

Action location map

- PGV_Parcels.zip

Authorized individual

Michele Lefebvre

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT
STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Reliev)** DECLARATION OF PLAINTIFF IN SUPPORT OF COMPLAINT FOR INJUNCTION

DECLARATION OF PLAINTIFF IN SUPPORT OF COMPLAINT FOR INJUNCTION

1. Plaintiff, Sara A. Steiner, hereby swears and affirms under penalty of perjury that I have personal knowledge of the subjects I am complaining about and the following is true to the best of my knowledge and ability:

2. I am a resident of Pahoa, County and State of Hawaii since 1985, moving here to help take care of ailing father in Leilani Estates.

3. Back then we smelled rotten eggs and saw the plume of white steam that flowed along the ground – but "scientists" from the University of Hawaii and the Director of the State of Hawaii Department of Health both said it wasn't harmful; even the school buses let the neighborhood children off at the bottom of the street corner of Pohoiki Road and Leilani Avenue and the kids had to walk through the stinky plume to get home.

4. It soon became apparent the gas was not safe, especially once Defendant PGV began drilling in earnest – the terrible blowout and leaks in 1991 led to our evacuation several times and we even were placed in a hotel in Hilo to get us away from the danger.

5. To try and protect myself and my family, Plaintiff has participated in numerous protests, public meetings, lawsuits, wrote letters to news media and elected and appointed Federal, State and County officials, gave testimony at County Council meetings and the EPA public hearing regarding numerous reasons why not to issue PGV any more Underground Injection Control permits.

6. Plaintiff has filed numerous public comments to Public Utility Commission "PUC" Docket No. 2019-0333 In Re HELCO relating to the environmental harm and lack of regulation of PGV and also has filed public comments in the PUC's "Energy Equity/ Environmental Justice" [Docket 2022-0250] relating to the safety of permitting seismically unmonitored geothermal plants on live volcanoes in exchange for paying royalties to certain government agencies, and how trading money for ruining the environment is not equitable to anyone but the polluter.

7. The PUC Ordered Defendant PGV to prepare an Environmental Impact Statement in 2021 – but then prematurely approved several Amended Purchase Power Agreements with HELCO – without even waiting to see if Defendant PGV would or could produce a lawful FEIS.

8. Plaintiff has tried since 2015 to be a participant in a State of Hawaii Department of Health Clean Air Branch contested case regarding PGV's Air Pollution Permit. The Hearing Officer twice dismissed our case, in 2019 and 2022.

9. Because we were twice denied the public hearing, residents were never able to subpoena witnesses, offer testimony and proof of harm from PGV at a public hearing mandated by law so we have never been able to bring our grievances to the forefront, instead, the State of Hawaii keeps issuing further permits to Defendant PGV to pollute the residents and environment.

10. In October, 2022 the Clean Air Branch Hearing Officer dismissed our contested case. A Notice of Appeal was filed in the Environmental Court of the Third Circuit in November 2022 and had no movement since January of 2023, when your Plaintiff filed a motion for a hearing date to certify the Record on Appeal which was never responded to by the Environmental Court [3CC191000091, joined with other Plaintiffs in 3CC191000086].

11. Plaintiff notes are many Puna residents who attended PGV FEIS meetings who also made written comments on Defendant PGV's EIS process who did not provide a Declaration for this Complaint, but who WILL testify as witnesses at trial that their valid concerns were not addressed in PGV's FEIS.

12. Plaintiff hereby declares that the attached Declarations of myself, Professor Falk Amelung, Larry Wood, Robert Petricci, Benjamin Cole, Christopher Biltoft and Jasmine Steiner, are made by real individuals who are impacted by Defendant PGV and demand compliance with Hawaii's Environmental laws and who read draft versions of PGV's EIS and submitted comments in the EIS process and the attached Declarations verify their concerns were not properly addressed by PGV's FEIS and they would testify so in court.

13. I hereby declare that I have tried to get an attorney to represent me, but I have no funds and no attorney is willing to enter their appearance pro bono because of the huge amount of time and resources they would need to dedicate to learning the issues.

14. I gave public and written comments on the numerous deficiencies of PGV's Scoping EIS.

15. I gave public and written comments on the numerous deficiencies of PGV's Draft EIS that were not addressed by my comments on the Scoping EIS.

16. The Final EIS was released on February 8, 2024, and it was not substantially different than the prior drafts, and the FEIS was intentionally made incredibly hard to both read and navigate and did not address my valid concerns, as summarized below.

17. The FEIS and Appendix use numbers that are not chronological, they are section numbers which you can't just put the page number in your pdf reader and hit go, you either have to go back to the table of contents and also one has to endlessly scroll up and down and back and forth to read the DEIS comments in the document, it is designed on purpose to not be user friendly.

18. Pages 112-120 of the FEIS lists names of those who submitted comments, how the comments were received, but not one (1) page number or section number was given to denote where the comments and responses are located in the 1,475 page Appendix.

19. I found out that Professor Falk Amelung's Public Comment Letter 10 in the Draft EIS were not reproduced in a legible format [FEIS Apx 519-522] and I brought that to the attention of PLANNING DEPARTMENT and KERN when PGV's FEIS was released in January, 2024.

20. The mistake was rectified by reproducing the letter in the Environmental Notice, but you will notice the explanation from KERN downplays and does not recognize that Falk Amelung is a Professor at the University of Miami, he just calls him "Mr." Amelung [Comp Exh 2 pg 2-3].

21. I found out commenter Robert Petricci's very substantive comments submitted by email for the Draft EIS on June 22, 2023, are not reproduced in the FEIS Appendix, despite Michele Lefebvre's email confirmation of July 7, 2023 that she was on vacation but she did receive his Draft EIS comments [*see* attached Declaration of Robet Petricci].

22. 8 months later, Ms. Lefebvre seemed to forget she already confirmed that she was on vacation at the end of June 2023, and when she returned on July 7, 2023 she told Mr. Petricci she got his June 22nd comments.

23. Regarding deadly toxic **Hydrogen Sulfide** which permeates the PGV plant and surrounding neighborhoods, there is no real discussion of the deadly toxicity of Hydrogen Sulfide in the entire FEIS or the 30-pg Ramboli Air Quality Technical Study attached as Appendix E [FEIS APX pgs 1264-1294]. The only mention I see relating to toxicology of Hydrogen Sulfide is in the bibliography or Reference Sections of the FEIS [pgs 121, 125, 126, 130] or what I or Declarant Robert Petricci brought up.

24. I brought up **Hydrogen Sulfide** and deadly nature of the gas, the lack of public monitors, lack of notification to residents in emergency situation, lack of Hawaii County Emergency Response plan, lack of protective equipment for residents, lack of adequate laws to protect the residents, and none of it was addressed with any substance in the FEIS.

25. I brought up **Induced Seismicity** in my comments to the EISPN and the Draft EIS and they were not discussed with substance they were swept under the rug.

26. PGV's FEIS fails to admit that removal and injection of millions of gallons a day under high temperatures and pressures **Induces Seismicity**.

27. PGV's FEIS discusses exactly what is necessary for **Induced Seismicity** to occur, and all 3 requirements are occurring every minute PGV operates as the Lower East Rift Zone [FEIS pg 36]:

> Fluid injection activities can lead to induced seismic response and is typically associated with subsurface pressure buildup. This pressure buildup can activate faults, resulting in seismic events. These seismic events are typically associated with three conditions: 1) the presence of a fault which is in near-failure state of stress, 2) pathways exist which allow injected fluid to reach the fault, and 3) the fluid provides enough pressure over a long enough period of time to allow movement to occur along the fault (US EPA 2015). The chances of triggering induced seismicity increases with increased fluid injection volume and increased injection rate. Induced seismicity is more common in rock formations with limited permeability or where large volumes of fluid are injected (US EPA 2021b).

28. All of the 3 criteria stated by the EPA relating to **Induced Seismicity** are met by PGV operations every single day and are not recognized in the FEIS as brought up by myself and other Declarants, Professor Amelung, Larry Wood, Ben Cole and other commenters such as Sen. Russell Ruderman (Hawaii, Retired).

29. I brought up **Seismic Monitoring** and the lack of seismic monitoring at the PGV site for microearthquakes *ad nauseum* yet there is no discussion or offer to share PGV's seismic data.

30. The FEIS admits PGV has had their own seismic array until 2018 which was damaged by the Kilauea eruption, and installed another array in January of 2022, but PGV will not share the data on their **Seismic Monitoring** with anyone, not even the USGS/HVO or any other party so we can analyze the cumulative effects of PGV's seismicity on the integrity of the volcano.

31. I demanded the DOH and DLNR enact rules to provide for **Seismic Monitoring** of PGV's induced seismicity, but they denied the request.

32. Regarding the **Hilina Slump**, I demanded the EIS discuss the proximity of the Hilina Slump and the fact that the entire **South Flank of Kilauea Volcano is sliding into the Pacific Ocean** naturally, without added help from Defendant PGV.

33. There is not one (1) mention of the **Hilina Slump** or the **South Flank of Kilauea** sliding into the ocean in the entire 130-pg FEIS. This was brought up in more detail by Declarant Cole.

34. I also brought up the fact there is possibly a **Hidden or "Suspected" Fault** that runs near the area where PGV is located with no substantive reply.

35. Actually, that Hidden Fault looks suspiciously like part of that new decollement that detached during the May 4, 2018 Kilauea eruption discussed by Declarant Cole.

36. Regarding **Subsidence**, I brought up the fact that PGV has paid the University of Hawaii Geology Department to study the subsidence at PGV for some decades now and their 2020 report shows the "Grand Canyon" of **Subsidence** at PGV's wellfield.

37. Declarant Professor Amelung notes the subsidence has increased since PGV re-entered the premises in late 2019 and now there is evidence the south side of the 2018 Fissure line is slumping more in relation to the north side, but PGV refuses to discuss that.

38. That subsidence is IN ADDITION to the natural subsidence of the South Flank of Kilauea which PGV's FEIS refuses to acknowledge as discussed more fully in Larry Wood's Declaration.

39. The UH subsidence report also show that decades of subsidence was also altered during the time PGV was injecting water into the erupting volcano, but PGV states it could be a number of things and will take no responsibility for anything:

> Thank you for submitting comments on the Draft EIS. Subsidence is discussed in Sections 3.1.1.3 and 3.1.16 of the Draft EIS. **Ground surface subsidence is the lowering of the ground surface over time and driven by changes in subsurface volume or stress conditions. It can be caused by groundwater or other fluid withdrawal, subsurface mining activities, volcanic eruption, magma movement, volcanic spreading, extensional tectonism, and other processes. Subsidence can be induced by natural or manmade causes. Likewise, inflation of the ground surface can also be caused by natural or manmade causes.** Inflation due to magma movement has been documented in the ERZ (Baker, Amelung & , 2015). Where rift zones form, subsidence is a well-documented result of tectonic processes. Kilauea's rift zones have been subsiding since at least 1975 (Delaney, Fiske, Miklius, Okamura, & Sako, 1990). As with all areas of the ERZ, the project site is subject to potential inflation and subsidence from magma movement, volcanic eruption, volcanic spreading, tectonic processes, and other causes. Geothermal operations at PGV recirculate the fluid extracted through injection wells, limiting overall fluid and volume loss within the reservoir area due to geothermal operations.

40. Declarant Larry Wood contention that the "Grand Canyon" is located at approximately the line along PGV's injection wells, were also brushed to the side by the drafters of the FEIS with an outright lie [Declaration Wood].

41. Regarding **Water**, the Department of Water Supply noted that PGV is using more water than their 2" meter can register [FEIS Apx pg 1225]. PGV is supposed to follow up and get back to them, but PGV's water use should be declared but there is never any way to confirm anything about PGV, it is all proprietary and they don't have to respond to UIPA or FOIA requests.

42. Regarding **Lack of Emergency Escape Routes:** For nearly 6 years the County of Hawaii has spent innumerable Kilauea Relief Funds on improving infrastructure not in the impacted area, buying out landowners covered in lava, including 2nd homes and vacant land and the County of Hawaii has routed an unknown amount of funds to local nonprofits for throwing giant block parties and/or community meetings with lots of money spent on glossy handouts and on Kilauea Recovery websites telling us what services are available to displaced residents from the 2018 lava flow, always congratulating us on how "resilient" we are.

43. The Road To Recovery Begins With The Roads! Not one time in 6 years have the remaining residents been offered help with gas stipends even though we have to drive hundreds of extra miles a week with no roads to get places that used to be within 10 miles. No help has been offered to the fishermen who have to drive and boat hundreds of miles just to get to Hilo to launch their boat and sail back to Puna to get to their ancestral fishing grounds.

44. Despite spending hundreds of millions of dollars on "recovery" the County has only opened two (2) roads during that time, and one of the roads, a temporary road on Highway 137 at Mackenzie State Park is what gives egress to the landlocked Pohoiki interior residents downhill and downwind from PGV.

45. The landlocked resident's other escape option could be by sea at Pohoiki except is still not possible after 6 years because the State has done nothing but spend recovery money studying the problem of what to do about our boat ramp…

46. We residents have been told at public Civil Defense meeting in late 2023 that if Highway 130 is blocked before Pahoa, our "Alternate Escape Route" is the Chain Of Crater's Road, but that road takes probably more than 100 miles - up to Volcano to get back to Pahoa then home to Lower Puna.

47. Chain of Craters Road is many times closed or impassible due to volcanic and earthquake activity and many people in Lower Puna do not have enough gas in their beater cars or even own transportation to self-evacuate.

48. All in all, there is so much more of importance that was not addressed by PGV's FEIS and Responses to Commenters, and I reserve my right to bring up any and all comments and responses to any and all commenters on PGV's EISPN as well as the FEIS.

49. Once Plaintiff has access to the filed Complaint on JEFS, I will provide courtesy electronic copies of the Complaint, Exhibits, Declarations and Summons to the State of Hawaii Department of Health, Clean Air Branch as well as to the Hawaii Public Utility Commission so they are aware of the lawsuit.

DATED: Pahoa, Hawaii, April 4, 2024.

Sara Steiner, Plaintiff

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT
STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Reliev)** DECLARATION OF PROFESSOR FALK AMELUNG

DECLARATION OF PROFESSOR FALK AMELUNG

1. I, Falk Amelung, am a Professor of Geophysics at the University of Miami, Division of Marine Geology and Geophysics, hereby declare the following is true:

2. My education is as follows: I obtained a PhD in geophysics from the University of Strasbourg, France, with a dissertation on the seismicity of Northern California, followed by a post-doctoral research stay at Stanford University, CA.

3. I am a former Hawaii resident and have authored numerous studies relating to Hawaii volcanoes.

4. This Declaration is based upon my personal knowledge, and I am competent to testify about the matters contained below. If a hearing or trial were scheduled or held in this case I would testify, in part at least, as follows:

5. I have been interested and following the Puna Geothermal Venture Environmental Impact Statement process and found several areas of concern in PGV's Draft EIS that should be addressed in the final EIS.

6. I submitted comments on PGV's DEIS on May, 30, 2023, a long with a list of my published articles on Hawaiian volcanoes [attached as Exhibit "1"].

7. My overall concern is that PGV's operations could pose volcanic and earthquake hazards which are not satisfactory addressed in the EIS.

8. In order to understand these hazards the seismic monitoring data acquired by PGV need to be made public.

9. PGV is located on the most active volcano in the world. A new eruption will inevitably occur in the PGV area, although we don't know when this will be. Publicly available monitoring data will lead to new knowledge on this section of the volcano and will inform the response to the next eruption.

10. In reviewing the responses to my comments in the Final EIS, I discovered my legitimate concerns were not addressed with any scientific particularity in the response section [pgx 1197-1198].

11. In response to my concerns on 1) lack of **publicly available seismic monitoring data**, the final EIS describes the PGV's own seismic monitoring system. Describing the monitoring system, however, is not enough. The data need to be made publicly available so that the scientific community, including myself, can investigate whether PGV operations cause new hazards.

12. Of particular interest for the scientific community are the seismic data of the 2018 eruption which recorded the interaction between the propagating dikes and geothermal production wells, if there was.

13. There was no proper response to my concerns in PGV's Final EIS on my issue number 3:

> **Impact of geothermal exploration on dike propagation.** The draft EIS lacks a discussion on how geothermal exploration affects the trajectory of

> dikes propagating through Kilauea's east rift zone. The draft EIS cites a USGS study which concludes that there is no evidence that humans have influenced the volcanic processes in the lower east rift zone (Kauahikaua & Truesdell, 2020). This study, however, only considers the origin of the dike (which at 25 km was too far to be affected by the PGV operations), but not the location of the eruption of the dike. Was it coincidence that the 2018 dike erupted in the PGV area? Given the length of Kilauea's lower east rift zone the random probability of a dike to erupt in the PGV area is about 10-20%. There is a mechanism of how geothermal exploration can affect dike propagation. The extraction of heat leads to the formation of cooling contraction cracks. These cracks make the rock mechanically weak, which can lead to the arrest of dikes. This effect should be estimated in the draft EIS. An alternative explanation for the eruption of the dike in the PGV area is the presence of the dacitic magma bodies which is the reason why the site was selected for geothermal exploitation in the first place.

The response given was about geothermal wells intersecting fluid magma, which misses the point.

14. If not addressed in the EIS, at the minimum all seismic monitoring data need to be publicly available so that the scientific community can start investigating this issue.

15. In response to my concerns of **subsidence from geothermal operations in the lower Puna area** I was told:

> The ground surface subsidence noted by the USGS (2020) is consistent with subsidence measured at other locations within the East Rift Zone. InSAR data can indicate subsidence or inflation at the surface; however, it does not indicate the cause of such. Although changes in surface elevation may coincide with human activities, that coincidence does not, in itself, indicate causation. Both inflation and deflation are common in active volcanic areas due to indicate the cause of such. Although changes in surface elevation may coincide with human activities, that coincidence does not, in itself, indicate causation. Both inflation and deflation are common in active volcanic areas due to changes in location and volume of magma, and additional data and research would be required to determine the cause of surface elevation changes associated with InSAR-based change detection. As stated in Section 3.1.1.3 of the Draft EIS, the USGS has confirmed that there have been no significant changes due to human activity in patterns or trends of deformation or seismicity in the LERZ in the last 35 to 50 years, including the period during which PGV has been operational (USGS 2020). This Draft EIS does not address or consider the findings of studies which have not been published in peer-reviewed scientific journals or from similar sources. Instead, the best available science is used.

This response misses the point. Subsidence started in late 2020, coinciding with the resumption of production at PGV. This data post-date the 2020 USGS study cited in the response.

16. Due to lack of substantive data in the responses to my comments in PGV's Final EIS, I drafted a Response letter with more particularity, including updated ground deformation data through December 2023. Given the new data, I am concerned that an earthquake could be generated along the 2018 Fissure line due to ongoing subsidence which I believe is tied to geothermal operations in the area as explained [attached as Exhibit "2"].

17. From this data it is obvious that human geothermal operations have a propensity to impact the underground. That is why we need all PGV's seismic and pumping data to be public so the hazards can be studied. The area was subject to two eruptions in the past 70 years and it is only a question of time when a new eruption will occur.

18. I am concerned for the safety of the residents surrounding the plant due to ongoing unmonitored geothermal operations that elsewhere in United States and other countries such as Iceland, would be continually seismically monitored and analyzed for impacts.

DATED: Miami, Florida, March 31, 2024.

Falk Amelung
Professor, Division of Marine Geology & Geophysics, University of Miami

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE

Division of Marine Geology and Geophysics

4600 Rickenbacker Causeway

Miami, Florida 33149-1031

Phone: 1 305 421-4949

May 30, 2023

To:
Scott Glenn, Acting Director
Office of Planning and Sustainable Development
Environmental Review Program
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813
HI_Climate@hawaii.gov

cc: Zendo Kern, Hawaii County planning department (planning@hawaiicounty.gov)

Comments on the Draft Environmental Impact Statement of the Puna Geothermal Venture Repower project.

Dear Mr. Glenn,

I am a professor of Geophysics at the University of Miami and a previous Hawai'i resident. I am writing to bring to your attention four items that are not sufficiently addressed in the Draft Environmental Impact Statement (draft EIS) which are explained in detail below. In essence, the PGV should be mandated to operate dedicated seismic monitoring with open data access to be able to investigate whether and how PGV operations impact the volcano.

I have a long-term interest in studying the Hawaiian volcanoes using geophysical methods (see publication listing below). My expertise regarding the PGV comes from a pending research proposal with the Department of Energy to study (i) how geothermal exploitation affected the propagation of the 2018 dike from Kilauea volcano that erupted in the vicinity of the PGV, and (ii) the subsidence in the PGV area (see item 4). The proposal was submitted to DOE in January 2023.

As a clean energy advocate I am concerned about Hawai'i reaching its climate goals. What will be the future of geothermal energy if another eruption occurs and PGV operations are found to be responsible for focusing the magma?

Please don't hesitate to contact me for additional information. Also please be so kind to confirm that you have received this letter.

Best regards

Falk Amelung

Falk Amelung, Professor of Geophysics
Phone: 1 305 421-4949 ● Fax: 1 305 421-4632 ● E-mail: famelung@earth.miami.edu

Item 1: Lack of seismic monitoring. The draft EIS lacks a plan to monitor the seismic activity in the PGV area. Although PGV does not inject water at pressures sufficient to fracture the rock (PGV is not an enhanced geothermal system), PGV's operations nevertheless can induce seismicity. This is because the east rift zone is likely under tectonic extension driven by seaward motion of Kilauea volcano's south flank. The injection of water is associated with local increases in pore fluid pressure which in the widely accepted Coulomb Failure model acts to reduce the stress threshold for faults to rupture. Pore fluid pressure increases therefore can lead to the spontaneous generation of seismicity (see section 3.1.1.4 in the draft EIS). Most of these induced earthquakes are small (magnitude -2 to 2) and not detectable by the island-wide seismic network operated by the U.S. Geological Survey's (USGS) Hawaii Volcano Observatory (HVO). However they could be detected by seismographs located inside boreholes in and near the PGV area. Precise local seismic data combined with sub daily production and injection data could demonstrate that PGV operations are safe and answer many questions regarding the induced seismicity such as the seismic swarms during the 2018 eruption (see next item).

I therefore recommend the operation of a bore-hole seismic network at PGV.

Geothermal projects in California and Nevada all have excellent seismic monitoring networks (e.g. 48 stations at The Geysers, 16 stations at Coso and 8 stations at the Salton Sea). Community acceptance of these projects is partly based on studies by independent scientists showing that induced seismicity is within expectations.

Although PGV does not use EGS methods, seismic monitoring should be mandated because of PGV's location within an active volcanic rift zone.

The draft EIS does not describe the current state of seismic monitoring in the PGV area. I was informed that PGV operates a borehole seismic network but these data are not shared because they are proprietary. If true, this should give us some pause. Why are these data not openly available and used to demonstrate that the induced seismicity is within expectations?

Item 2: Hazards from propagating dikes and 2018 co-eruption seismicity. The geological hazards section of the draft EIS addresses the hazards from subaerial lava flows but not the hazards from dikes propagating underground. The 2018 dike from Kilauea volcano propagated from the Pu'O'o area down the lower east rift zone and erupted in the PGV area. When the pressure in the production wells had risen to unusual high values (2000 psig or 13.8 MPa) heavy mud was injected in order to "kill" the well (Spielmann et al., 2020). The draft EIS does not discuss whether this was an appropriate response measure and what are the lessons, if any, for the next eruption.

The injection of heavy mud during an eruption can be debated. It led to high pressure at the bottom of the well and potentially to a hydraulic fracture. In fact, the day when the mud was injected a seismic swarm was detected and the eruption transitioned to erupt hotter, less viscous lava (Neal et al., 2018). This is consistent with the generation of a hydraulic fracture. Whether the pressure was enough to fracture the rock or not, it almost certainly was above the allowable limit for a non-enhanced geothermal system. Precise seismic data (which may exist, see item 1) would allow us to study how the injection of the heavy mud affected the course of the eruption.

The draft EIS should contain a discussion on how a propagating dike can affect the wells. It also should contain an eruption response plan considering whether the injection of heavy mud during an eruption can have unintended consequences. Alternatively the wells could be filled prior to the arrival of the dike.

Item 3: Impact of geothermal exploration on dike propagation. The draft EIS lacks a discussion on how geothermal exploration affects the trajectory of dikes propagating through Kilauea's east rift zone. The draft EIS cites a USGS study which concludes that there is no evidence that humans have influenced the volcanic processes in the lower east rift zone (Kauahikaua & Truesdell, 2020). This study, however, only considers *the origin of the dike* (which at 25 km was too far to be affected by the PGVoperations), but not *the location of the eruption of the dike.* Was it coincidence that the 2018 dike erupted in the PGV area? Given the length of Kilauea's lower east rift zone the random probability of a dike to erupt in the PGV area is about 10-20%.

There is a mechanism of how geothermal exploration can affect dike propagation. The extraction of heat leads to the formation of cooling contraction cracks. These cracks make the rock mechanically weak, which can lead to the arrest of dikes. This effect should be estimated in the draft EIS.

An alternative explanation for the eruption of the dike in the PGV area is the presence of the dacitic magma bodies which is the reason why the site was selected for geothermal exploitation in the first place.

Item 4: Subsidence from geothermal exploration in the lower Puna area. In the draft EIS it is stated that there have been no significant changes in patterns or trends of deformation due to human activity in the PGV area, based on the Kauahikaua & Truesdell (2020) study mentioned above (section 3.1.1.3). This statement is not correct.

I processed InSAR time series data based on >100 Sentinel-1 SAR images which show for the 2021-2022 period a linear 50-200 meter-wide ground displacements feature in the area of the eruptive fissure at a rate of 2-3 cm/yr (~1 inch/yr) in direction of the satellite (Fig. 1). A displacement time-series starting after the 2018 eruption shows that ground displacements started in fall 2020 when PGV resumed production. This suggests that displacements represent subsidence due to water extraction and/or cooling of the hot rock.

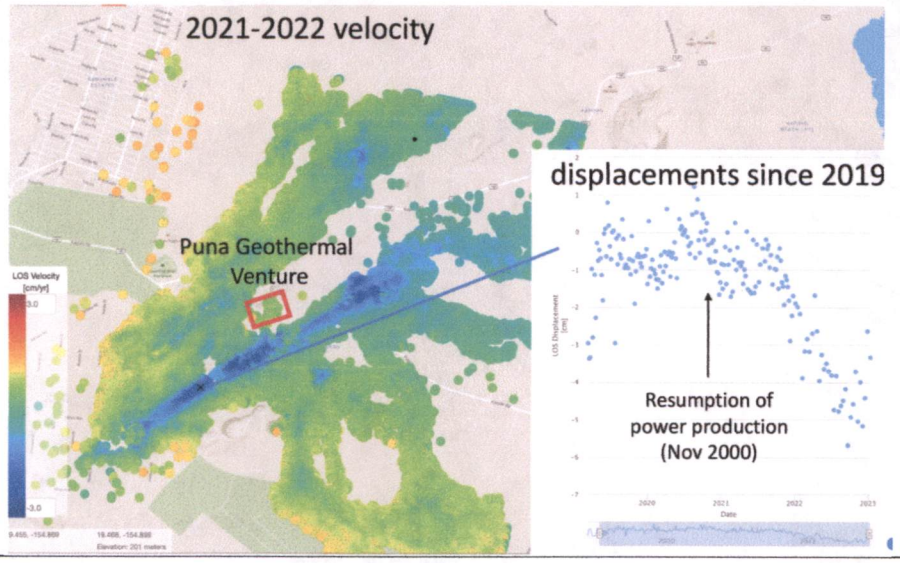


Fig. 1. *2021-2022 InSAR LOS velocity of the lower Puna area. Blue colors: subsidence. Inset: displacements since 2019. Subsidence aligns with the intruded dike, suggesting that fluid flow from geothermal production accelerates cooling contraction or the intruded dike*

The significance of the observed subsidence will not be known unless the proposed research project is conducted. Nevertheless, it is proof that PGV operations affect a larger area and highlight the need for high-quality seismic monitoring.

These data can be viewed at

https://insarmaps.miami.edu/start/19.4963/-154.8161/11.5323?flyToDatasetCenter=false&startDataset=S1_IW12_087_0527_0531_20190106_XXXXXXXX_N19428_N19512_W154924_W154847_noCorrPS&minScale=-3&maxScale=3&refPointLat=19.50517&refPointLon=-154.88401&pointLat=19.46892&pointLon=-154.89778&startDate=20200107&endDate=20230109

Attachment: Selected publications on the Hawaiian volcanoes by F. Amelung

Varugu, B., Amelung, F. Southward growth of Mauna Loa's dike-like magma body driven by topographic stress. Sci Rep 11, 9816 (2021). https://doi.org/10.1038/s41598-021-89203-6

Farquharson, J, F. Amelung; Extreme rainfall triggered the 2018 rift eruption at Kīlauea Volcano, Hawaii (2020), Nature, 580(7804), 491-495.

Shuangyu Ge, Guoqing Lin, Falk Amelung, Paul G. Okubo, Don Swanson (2019), The accommodation of the south flank's motion by the Koa'e fault system, Kīlauea, Hawai'i: insights from the June 2012 earthquake sequence, DOI:10.1029/2018JB016961

Baker, S., and F. Amelung (2015), Pressurized magma reservoir within the east rift zone of Kīlauea Volcano, Hawai'i: Evidence for relaxed stress changes from the 1975 Kalapana earthquake, Geophys. Res. Lett., 42, doi:10.1002/2015GL063161.

Lin, G., Shearer, P. M., Matoza, R. S., Okubo, P. G., & Amelung, F. (2014). Three-dimensional seismic velocity structure of Mauna Loa and Kilauea volcanoes in Hawaii from local seismic tomography. Journal of Geophysical Research: Solid Earth, 119(5), 4377-4392.

Lin, G., F. Amelung, P. M. Shearer, and P. G. Okubo (2015), Location and size of the shallow magma reservoir beneath Kīlauea caldera, constraints from near-source *Vp*/*Vs* ratios, Geophys. Res. Lett., 42, doi:10.1002/2015GL065802.

Lin, G., Amelung, F., Lavallée, Y., & Okubo, P. G. (2014). Seismic evidence for a crustal magma reservoir beneath the upper east rift zone of Kilauea volcano, Hawaii. *Geology*, G35001-1.

Amelung, F., S.H. Yun, T. Walter, Paul Segall and S.-W. Kim. Stress control of deep rift intrusion at Mauna Loa volcano, Hawaii. Science 316: 1026-1030 [DOI: 10.1126/science.1140035], 2007.

Plattner, C., Amelung, F., Baker, S., Govers, R., & Poland, M. (2013). The role of viscous magma mush spreading in volcanic flank motion at Kīlauea Volcano, Hawai 'i. Journal of Geophysical Research: Solid Earth, DOI: 10.1002/jgrb.50194

Baker, S. and F. Amelung (2012), Top-down inflation and deflation at the summit of Kīlauea Volcano, Hawaii observed with InSAR, J. Geophys. Res., doi:10.1029/2011JB009123

Walter T. R., F. Amelung, Volcano-earthquake interaction at Mauna Loa volcano, Hawaii, J. Geophys. Res., 111, B05204, doi:10.1029/2005JB003861, 2006.

UNIVERSITY OF MIAMI
ROSENSTIEL SCHOOL of MARINE, ATMOSPHERIC & EARTH SCIENCE

Division of Marine Geology and Geophysics

4600 Rickenbacker Causeway

Miami, Florida 33149-1031

Phone: 1 305 421-4949

March 14, 2024

To:
Michele Lefebvre
Stantec
Hilo, Hawaii 96721

cc: Zendo Kern, Hawaii County planning department (planning@hawaiicounty.gov)

Response to response to my comments on the Draft Environmental Impact Statement of the Puna Geothermal Venture Repower project.

Dear Ms. Lefebvre,

In my comments regarding the draft Environmental Impact Statement (draft EIS) of May 2023 I raised 4 items: (1) the lack of seismic monitoring in the PGV area, (2) the hazards from propagating dikes, (3) that geothermal exploitation may affect dike propagation, and (4) that the geothermal production activities cause subsidence. In this letter I am providing additional information regarding items 1 and 4. I am satisfied with the response regarding item 2. Item 3 was not properly understood and not answered in the response to my comments. The concern is that geothermal exploitation changes the mechanical properties of the rock which affect the trajectories of propagating dikes. The hypothesis is that the PGV attracts propagating dikes because the rock has been weakened by cracks due to cooling. This would explain why the 2018 dike erupted in the vicinity of the PGV.

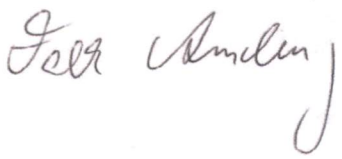
The final EIS describes a new seismic monitoring network consisting of 8 three-component stations operating since 2022 (section 3.1.1.3). A previous monitoring network was destroyed by the 2018 eruption. I am repeating my recommendation from the May 2023 letter:

The seismic monitoring data need to be made publicly available.

These data will allow scientists like myself to test claims made in the final EIS about the seismicity in PGV area. In fact, I am surprised that the 2018 data are still under wraps. As I pointed out in my previous letter, they would help to answer important questions about whether PGV operations pose any hazards, including whether and how during the 2018 Kilauea eruption the propagating dike interacted with the geothermal wells.

Please don't hesitate to contact me for additional information.

Best regards



Falk Amelung

Falk Amelung, Professor of Geophysics
Phone: 1 305 421-4949 ● Fax: 1 305 421-4632 ● E-mail: famelung@earth.miami.edu

Item 1: Seismic monitoring.

1 - 1 Open data access

As mentioned above, the PGV has seismic monitoring, but the data are stored on a company server. The community does not have access, nor does the Hawaii Volcano Observatory. The data need to be made publicly available, preferably through Earthscope (former IRIS), a seismic data archiving facility supported by the National Science Foundation. This will allow to study the seismicity at the PGV and facilitate comparative studies between the PGV and geothermal powerplants elsewhere in the world. In many seismic archiving software packages the transfer of data to Earthscope can be implemented with a switch in the software settings.

The EIS states that only event-detected time segments are stored. This is not optimal. Continuous recordings would allow to utilize a data analysis technique known as ambient noise interferometry to search for changes in the seismic velocities related to the geothermal production. I strongly recommend archiving the continuous recordings.

In addition, the injection, pumping and production information for the PGV needs to be made more openly available. Currently it is available only via Freedom of Information Act (FOIA) requests to the County.

1 - 2 Unverifiable statements

The final EIS states in section 3.1.1.3 "*While some have suggested that injection of geothermal fluids from PGV operations results in increased seismicity in nearby areas, data from the seismic network installed in 1993, ..., do not support this claim.*" The EIS does not present any data or references supporting this statement. It appears to be pulled out of thin air. Without the PGV seismic data this statement can't be verified. Fig. 1 suggests that this statement is false.

1 - 3 Quality of the Hawaii Volcano Observatory (HVO) earthquake catalogue.

The final EIS refers to the earthquake catalogue of the HVO. This catalogue, however, is incomplete for the PGV area. Fig. 2 shows the seismic events during 6 June to 19 July 2018 in the HVO catalogue and in the science catalogue of Wei et al., 2022, which was assembled using all publicly available seismic data (excluding the PGV data). The Wei et al. (2022) catalogue contains much more events than the HVO catalogue and shows elevated seismicity in the PGV area. Access to the PGV recordings would allow to assemble a complete seismic catalogue.

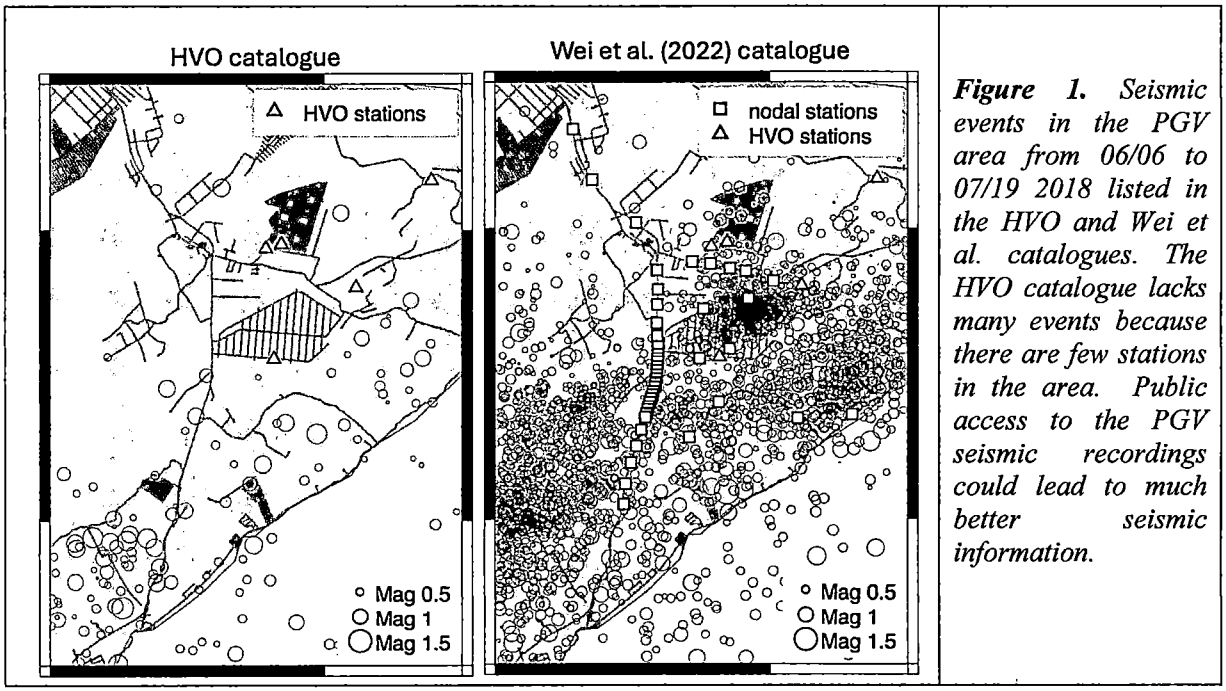


Figure 1. *Seismic events in the PGV area from 06/06 to 07/19 2018 listed in the HVO and Wei et al. catalogues. The HVO catalogue lacks many events because there are few stations in the area. Public access to the PGV seismic recordings could lead to much better seismic information.*

Item 4: Subsidence due to geothermal activities. Fig. 2 presents InSAR data for the September 2020 to December 2023 period from the Sentinel-1 satellite. The vertical and east-west velocities have been inferred by combining data from ascending (east-looking) and descending (west-looking) orbits. About 6 cm of subsidence and 4 cm east-west displacements occurred since late 2020 (Fig. 2a,b). The onset of displacements appear to coincide with the resumption of geothermal production, suggesting that subsidence is due to cooling contraction of the basalt, instigated by the injection and circulation of water. This is the most likely explanation. However, please note that the east-west displacement signal has similarities to a creeping fault. Without detailed investigation it can't be ruled out that stress is being accumulated that eventually will be released in a moderate earthquake (magnitude 4-5). The seismic data from the PGV could help to illuminate whether this hazard exists.

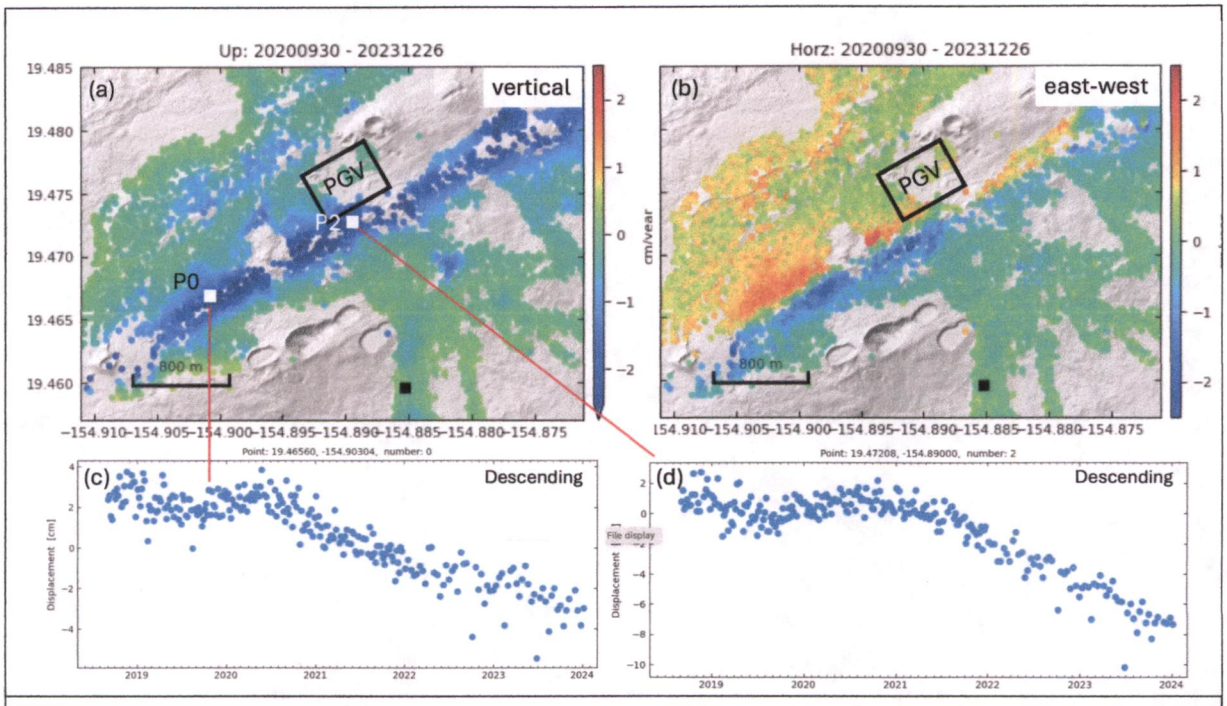


Figure 2. *(a) Vertical and (b) east-west displacements in the PGV area during the September 2020 to December 2023 period from Sentinel-1 InSAR data. (c,d) Descending displacement time series in satellite line-of-sight direction showing ~6 cm subsidence since late 2021. No similar signal is observed anywhere at Kilauea, which is why we interpret it as caused by the geothermal production.*

References

Wei, X., Shen, Y., Caplan-Auerbach, J., & Morgan, J. K. (2022). An improved earthquake catalog during the 2018 Kīlauea eruption from combined onshore and offshore seismic arrays. *Earth and Space Science*, *9*(6), e2021EA001979.

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT

STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Reliev)** DECLARATION OF ROBERT PETRICCI IN SUPPORT OF COMPLAINT FOR INJUNCTION

DECLARATION OF ROBERT PETRICCI IN SUPPORT OF COMPLAINT FOR INJUNCTION

1. I, Robert Petricci, hereby swear and affirm the following is true and I will testify at trial as a witness, not limited to the following:

2. I am a resident of the County of Hawaii, State of Hawaii.

3. I moved to Leilani Estates in the 1981 and have been impacted by Puna Geothermal Venture operations since 1991.

4. I have participated in multiple lawsuits, protests, meetings, mediations, contested case hearings, and have been arrested and prosecuted for trespassing, all regarding Puna Geothermal Venture and the lack of adequate environmental protections for the humans residing in the area since the 1989.

5. I served as President of the environmental non-profit group Puna Pono Alliance until it disbanded in 2023.

6. I attended Stantec's public meeting in Pahoa in June 2022 where they released the first draft of PGV's EIS. I made public comments at the Scoping Meeting in June of 2022 and also

submitted written comments to Michele.Lefebvre@stantec.com for the Scoping EISPN reproduced in PGV's FEIS Appendix, pgs 138-150 (Puna Pono Alliance), 178-183 (personal comments submitted by email on 8/21/2022).

7. Stantec notes receiving that testimony in the FEIS, page 115, the copies of my written testimony are found in a spreadsheet in the FEIS Appendix, pgs 386-393 (Robert Petricci, Puna Pono Alliance Letter 16) and pgs 405-409 (letter 20 Robert Petricci), and also a revised email was sent and printed in the FEIS Apx, pgs 412-413 (letter 26, Robert Petricci, revised).

8. I attended a public meeting on June 1, 2023 and then worked for weeks after the June 1 meeting on reviewing and commenting on the Draft EIS and emailed 15 pages of substantive comments to Michele.Lefebvre@stantec.com on June 22, 223 at 5:27 p.m. attached as Exhibit "1".

9. I emailed Ms. Lefebvre on June 23, 2023 at the same email to ask her to confirm she got my comments (Exhibit "2").

10. After receiving no response, I telephoned her a week later, around the beginning of July and left a message. On July 7, 2023, I got an email from Ms. Lefebvre who confirmed receiving my telephone call and apologized for not responding earlier as she was on vacation. Ms. Lefebvre's email stated in pertinent part "…**Your written comments on the Draft EIS were received. We are currently working on responding to comments on the Draft EIS and are preparing the Final EIS…" (emphasis added)** (Exhibit "3").

11. PGV's Final EIS was released on January 8, 2024, and notice of the acceptance as to form and content by the Hawaii County Planning Department's Director Zendo Kern was published on February 8, 2024.

12. It took me several weeks of reviewing the Final EIS and the thousand-plus-page Appendix before I realized that my Draft EIS comments were not reproduced or responded to in the FEIS Appendix.

13. I telephoned Ms. Lefebvre to enquire why my comments were not printed or addressed and left a message. She responded on March 4, 2024 to my email of June 23, 2023, saying

> Your email regarding the ARPPA (see attached) was sent and received on July 7, 2023. The comment period for the Draft EIS concluded on June 22, 2023. Since your email was received after the close of the 45-day comment period, it was considered but not included in the Final EIS (per HAR Section 11-200.1-25)....
>
> All comments received on the Draft EIS during the 45-day comment period are included in Appendix D (Volume 2) of the Final EIS including your oral comment (Letter 92) which appears on pages D-1146 and D-1147.

(Exhibit "4). I

14. I emailed back with copies of my emailed 15-page comments on June 22, 2023, and also , copies of my email on June 23, 2023, and an email of her July 7, 2023 confirmation she received my comments (Exh "4").

15. I then emailed on March 7, 2024, with a second request for clarification that I was not inquiring about a Public Utility Commission "ARPPA" I was inquiring about the PGV Draft EIS comments she already confirmed receipt nearly a year ago, on July 7, 2023 (Exhibit "5").

16. I found other commenters who sent their Draft EIS comments to the Planning Department on June 22, 2023, for example, Paul Kuykendall and Suzanne Wakelin. My email was sent to the Planning Department and PGV's Mike Kaleikini as well and should have been included by one of the Planning Department personnel who were assisting Stantec assemble comments.

17. Yes, I attended the second public meeting and my Oral Comments at the June 1, 2023 Draft EIS meeting are noted under the name Robert Petricci [FEIS pg 115] and I found them printed in the FEIS Appendix on pages 1260-1260 under the name Robert Petrucci.

18. None of the responses to my or Puna Pono's initial comments (see Paragraphs 6 and 7 above) or my Draft EIS comments (Paragraph 16) were responded to with any particularity in PGV's Final EIS.

19. This is another pattern of abuse of process by PGV and their Final EIS is not complete as it does not include my Draft EIS comments as provided for by law.

20. I firmly believe PGV is a danger to my community and their Final EIS does not disclose their true impacts on the environment, humans or Hawaiian Culture, nor the great lengths the community has gone through to try and gain protections as I detailed in Exhibit "1" and that is why my comments were not included.

21. I firmly believe PGV is a nuisance to the surrounding neighbors and is not properly monitored for Hydrogen Sulfide gas or induced seismicity on an active volcano.

DATED: March 26, 2024.

/s/Robert Petricci

Robert Petricci

Gmail Sara Steiner <pahoatoday@gmail.com>

[ppastrat] Comments of Robert Petricci submitted for 2023 PGV EIS
5 messages

Robert <nimo1767@gmail.com> Thu, Jun 22, 2023 at 5:27 PM
To: michele.lefebvre@stantec.com
Bcc: ppastrat@googlegroups.com

6/22/2023

The following comments, questions, documents, exhibits, and facts are hereby submitted to the 2023 Puna Geothermal Venture EIS process by

Robert Petricci
PO box 2011,
Pahoa, Hawaii, 96778

To

Ms. Michele Lefebvre
Stantec Consulting, Inc.
P.O. Box 191
Hilo, HI 96721-0191
Re: Puna Geothermal Venture Repower Project DEIS

Aloha Ms. Lefebvre:

Please accept and address these comments, questions, documents, articles, exhibits, and facts for the Puna Geothermal Ventures 2023 Environmental Impact Statement (EIS) you have been contracted to prepare.

1) INTRODUCTION:

I lived in Pohoiki near the current PGV power plant site from 1981 until 2001. I bought land in Leilani Estates in 1981 approximately a half mile from what later would become the PGV property line and approximately 3/4 of a mile from the Hawaii Geothermal Project - Abbot Well (HGP-A) experimental geothermal plant and built my home there. That was before the problem plagued toxic HGP-A experimental power plant began to operate in the summer of 1981. In 2001 I gave up on trying to get help from the county, state, US government or PGV and sold my home at a loss of $150,000.00 because of the adverse health impacts I had due to exposure to H2S and other toxins released by PGV. I bought another property, built a new home, and moved. It is a much safer location further away from PGV and out of the wind dispersion pattern of the constant toxic leaks and noise from PGV. The only reason I sold my home at a 66% loss was because of the serious adverse health impacts I was experiencing due to the toxic gas PGV was releasing.

I do not get paid or profit for commenting on this EIS unlike the developer, county, state and company doing this EIS. The opposite is true. It costs me money to do this and takes me away from my family, friends, work, and things I love to do. These comments took days to research and write, I hope but do not have much faith that you will take my effort and comments seriously and give them the research, weight, and consideration they deserve. The comments, facts, documents and articles I am submitting here took a lot of time and effort to prepare. I would like the EIS to consider why would I do that if PGV was not an ongoing threat to me and the community? I live off grid, grow organic food, support solar, energy conservation, energy efficiency, getting off fossil fuels, living sustainably, and micro grids. So why have I fought PGV and geothermal development for 42 years? Is it more likely that I am just rabidly anti geothermal as Dr. Bruce Anderson claims or that PGV has harmed me as I have detailed in my comments here? I would like the EIS to ask, is it more likely I was born anti geothermal or more likely it is a learned position due to personal negative experiences.

2) HISTORY: Establishing and documenting the harm, and pattern of lawlessness demonstrated and practiced by PGV, DLNR, DOH, and the County Of Hawaii, that is still happening now as the DEIS perpetuates;

The findings of this DEIS are disturbing, insulting to me and the intelligence and dignity of our community in their absurdness and blatant disregard of the facts as I will document in my comments below. This DEIS for all intents and purposes amounts to nothing more than the equivalent of a paid PR campaign for PGV. This kind of attempt to subvert the permitting process by PGV is nothing new and not surprising to me. In fact I expected something like this as just another act in the long term pattern of disinformation and lawlessness demonstrated by PGV. PGV has been subverting the permitting process since the first Geothermal Resource Permit (GRP) hearing in 1989. Held in Kona by the Hawaii County Planning Department (HCPD) head Duane Kanuha for a project to be built in Puna intentionally to try to limit area residents' participation. Residents packed that Kona hearing that went on well into the night. Public testimony was overwhelming against the PGV project. The permit was approved after heated discussions and changes to the permit that required mediation. Maurice Richard, representing PGV, lied to the community then and made promises in mediation that included 51 conditions that PGV had no intention of keeping, and the county had no intention of enforcing. It was the beginning of the pattern that this DEIS continues today 34 years later. The community had to drive to the other side of the island just to participate in the "public" hearing that was alway going to approve PGV's permit, the hearing was simply a formality. Much like this EIS is just a formality, the decision to approve it has already been made. Not based on the merits

EXHIBIT "1"

or facts but on the influence PGV has and the county and states agenda to promote geothermal at the expense of area residents. This DEIS was like Dejavue of that first disinformation campaign and subversion of the permitting process by PGV back in 1989, it shows a pattern of a willingness to operate outside the law and legitimate permitting process by PGV that still exist today. The determinations are not based on the merits orfacts, but on the power of PGV and the fact that we are a poor community with little or no political power. That same "pattern" has forced the community to litigate literally every permit PGV has ever gotten to enforce the law as detailed and documented below in my comments. The fact is PGV has deep pockets and an army of attorneys, PGV is a predator that preys on the fact that we are a poor community that was sacrificed long ago by the regulatory agencies because of the political drive for geothermal and the royalties PGV pays to the state, county, and OHA. The determinations in this DEIS are an indictment and classic example of that decades old pattern that will be exposed in my comments below for all to see.

Point in case:

5.4 Significance Criteria

Based on the preceding analysis in this document, the proposed protection measures, and mitigation measures identified, the Project is not anticipated to have significant environmental impacts. This determination is based upon the 13 significance criteria outlined in Chapter 343, HRS, as amended, and Title 11, Chapter 200.1-13, HAR, discussed below.

The facts and history I have assembled below shows conclusively that the PGV "project" as the DEIS refers to the power plant does in fact have significant environmental impacts, contrary to the finding and determinations of PGV's paid consultants. The level of incompetence and or misinformation in the DEIS is truly shocking to me, a person that has 42 years of experience living near the geothermal developments in Puna, and 34 years of personal experience dealing with PGV and their "project". How any reasonable mind can come to those determinations shows a level of willful ignorance that can only be bought. The history I will detail below will expose and explain how this DEIS is just the latest in a 42 year long pattern of actions by not only PGV but also the County of Hawaii, the state Department of Health (DOH) and thate Department of Land and Natural Resources.

3) how I got here:

I was denied relocation funds by the county for decades, Bobbi Jean Leithead Todd the relocation fund facilitator claimed I did not qualify and denied my application for relocation. Before selling my home at a substantial financial loss on my investment, I spent years trying to get relocation from the county and PGV. Finally I had no choice but to sell for whatever I could get. My health was getting worse with each exposure to the toxic emissions from PGV. I felt compelled to disclose the hazards of living near PGV to the potential buyers, which severely impacted what I was able to sell my home for. I have sued PGV, the county, and the state more than 10 times, winning damages from PGV twice in addition to payments from PGV during the KS-8 blow out and other accidents. The KS-8 blow out and other accidents and releases by PGV forced me to go to a hotel or live in my car more than a few times over the 20 years I lived next to and downwind from PGV because of the toxic emissions from the power plant and wellfield.

I was a plaintiff in Aluli vs Lewin, we sued the Hawaii Department of Health (DOH) for refusing to follow the law and promulgate an H2S standard for PGV, there was no DOH H2S standard. PGV instead was allowed to set the levels of H2S they released in order to operate in what was best for them with little regard to the exposure levels in our community. The DOH fought against our demand they follow the law and promulgate an H2S standard for many years. Finally ending when the Hawaii Supreme Court ordered the DOH to obey the law and propagate an H2S standard. This lawlessness by the state and DOH is part of the pattern of abuses and lawlessness that I have and am documenting here in my comments for this EIS. The culture of lawlessness by the county, state, and PGV will become obvious and is very clearly documented below.

The continuing disregard for their (DOH's) responsibility (job) to protect the health, well being, safety, and quality of life of area residents and their determination to facilitate geothermal development at any cost is obvious. DOH's actions and lack of in this regard have harmed our community. Clearly demonstrated when after losing at the supreme court in Aluili v Lewin DOH adopted an H2S standard that violates our rights under the state constitution to benefit PGV at the expense of the health, safety and well being of the area residents.

"HI. Const. art. XI, Sect.9.

ENVIRONMENTAL RIGHTS

Section 9. Each person has the right to a clean and healthful environment, as defined by laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources. Any person may enforce this right against any party, public or private, through appropriate legal proceedings, subject to reasonable limitations and regulation as provided by law.HI. Const. art. IX,
ALSO: ARTICLE IX
Public Health And Welfare
PUBLIC HEALTH

Section 1. The State shall provide for the protection and promotion of the public health."

The inadequate standard adopted is just one of many actions that expose a " pattern" and culture of abuse and disregard for our community by the DOH that is still prevalent to this day. The court ordered DOH to follow the law against their wishes. The DOH only then promulgated and adopted an H2S standard. They set a 25ppb H2S standard that uses an hourly average for a gas that can kill in a matter of a few breaths. That in itself is an indictment and evidence of the ongoing

blatant and callous disregard for the health and safety of our community. This has been exhibited time and again by the regulatory agency (DOH) charged with protecting the health and welfare of the community.

Nothing has changed after 42 years PGV is still allowed to poison the area resident without recourse outside of litigation as the current H2S standard clearly shows.

This pattern of intentional regulatory agency refusal to protect the rights, health, safety, and well being of our communities was shown again by the County of Hawaii when they refused to enforce the law enacted by the Hawaii County Council that made it illegal for PGV to drill 24hours a day. I was a plaintiff in a lawsuit against the county for failing to enforce the noise standard/laws on PGV. The night drilling ban as the law was known was passed by the council after an outcry from the community. The law explicitly prohibited PGV from drilling from 7pm to 7am. PGV chose to ignore that law and noise requirements in the GRP, the county has never enforced the drilling ban, permit condition, or noise laws against PGV.

The "pattern" of regulatory abuse is well documented when in the early 1990's PGV began drilling their first wells. The county GRP governing the "project" explicitly required PGV to use Best Available Control Technology (BACT). At the time BACT for well cleanouts was a cyclonic separator that partially abated the noise and toxic emissions. PGV flagrantly violated the BACT requirement and open vented the wells they were drilling unabated into the community to clean them out because it was cheaper. The county refused to enforce the BACT requirement in the GRP, which led to many people being poisoned and made sick. It also led to large protests that included acts of civil disobedience. Me and many others were arrested trying to stop PGV from open venting in violation of their permit and continuing to poison the whole community. That went on until 3rd circuit court judge Riki May Amono acquitted me of trespassing at PGV to stop them from open venting on a lesser of evils defense. I defended myself and proved the trespassing at PGV to stop the unabated open venting into our community was a lesser evil and in fact a necessity because regulators (county and state) were not protecting area residents from harm. The court found I met the burden of proof needed for a successful "necessity" defense. The judge found I proved beyond a reasonable doubt that by allowing PGV to open vent and poison the community the regulatory agencies had failed to protect the communities rights and health. That the communities protest and my actions were necessary to stop it. That was and is not an easy burden to meet, I had to prove that in court to a judge.

This is another example of the "pattern" of intentional actions by regulators and PGV that were deliberate, intended to help PGV at the communities expense. The only way to enforce the law and permit requirements was by the public through community action, not through the regulatory agencies that were in fact helping PGV instead of upholding our constitutional rights, permit conditions, and the law. A serious hardship for one of the poorest communities in the state of Hawall, I could not afford an attorney so I defended myself Pro Se. Only then did PGV follow the law and their permits BACT requirement, not because of regulatory enforcement but only because of community actions. I would like it noted in this EIS to show and establish what is now becoming an obvious "pattern" in these EIS comments and documentation of the lawlessness and disregard for permit requirements and the safety of our community by the state, county, and PGV that exist to this day.

That was the last time PGV open vented a well to clean it out, not because they wanted to comply with the law, or permit and not because regulatory enforcement of either, but because the judge had given the community the right to trespass at PGV to stop them and to protect themselves. That the community including me had to do that to get enforcement of the law and the permit shows PGV's true intentions and the lack of any regulatory enforcement of the laws that govern PGV and protect the health and safety not to mention the quality of life of the community. Reading this draft EIS it made me sad to see that nothing has changed in the culture of PGV or the regulators who continue to see the surrounding residents as a sacrificial community to further their geothermal agenda and allow PGV to operate as cheaply as possible. I believe we need an independant EIS, by paying for this EIS PGV appears to have had undue influence over its content as evidenced in the information/misinformation to reach a determination that is in error, and is not supported by the facts, history or area residents testimony.

It became clear PGV would never be able to operate within the county GRP conditions and the courts were ruling in favor of the disadvantaged economically challenged residents that were litigants pressing the regulatory issues. in 2012 the Hawaii state legislature passed act 97 to remove the county's authority to regulate geothermal development and rendered the county GRP and the regulatory conditions and promises made to the community during the permitting process mute and useless. Now we see the powerless county planning department being made the accepting agency for this EIS? Please explain for the EIS how that Hawaii County Planning Department (HCPD is the best, or proper authority to be the accepting agency for this PGV EIS with the legal basis for that decision please.

HB411 (hawaii.gov)

DOH and DLNR in litigation and during public hearings along with Mike Kaleikini representing PGV at public meetings in Pahoa have all said more than once that PGV is "self reporting". PGV's position when asked is "the public should trust us". Can this EIS explain why I or the community should trust PGV to be self reporting given the history, facts and evidence I have presented in these comments along with the rest of the community comments, facts, documents, articles, and information pertaining to PGV submitted to you for this EIS? In not obeying the laws or permit conditions such as using BACT, abiding by the night drilling ban, or noise conditions in the permit as examples, PGV has demonstrated they can not be trusted in general much less specifically to be self reporting. Given that and having dealt with PGV and their representatives personally from day one at the GRP hearing in Kona in 1989 starting with Steve Morris and progressing through every spokesperson or representative up to and including Mike Kalikini over the last 34 years. This includes Paul Thompson who worked for Sen Harry Ried of Nevada and was part of the green energy fraud linked below.I can say

unequivocally I have in-depth personal experience, knowledge, and understanding of how PGV and the regulatory agencies they report to operate. I have to say for the record and this EIS PGV has lied and intentionally misrepresented the facts and situations multiple times. Neither I nor the community trust PGV in any way, shape, or form, for good reason based on our personal experiences interacting with them. This EIS needs to explain in detail why a dangerous, toxic project like PGV with it's dismal record of failing to follow the laws, permit conditions, accidents, cutting corners, refusal to do real source monitoring and modeling of releases and exposure levels in the community, community mistrust, and long record of litigation brought by the community both for damages due to exposure and for enforcement of regulation should have ever been be trusted to self report, or should continue to be self reporting going forward.

Ormat Nevada

As we reported in the introduction, Kai Anderson, a lobbyist for NGP's partner corporation, Ormat Technologies, Inc., is a former Senate aide to Harry Reid. Ormat's CEO Paul Thomsen is another former Reid aide. Additionally, according to the Washington Times, "Mr. Fairbank denied knowing or lobbying Mr. Reid, but the House Oversight Committee said Ormat Inc., which was paid $80 million to build NGP's Blue Mountain plant, has 'strong ties' to the senator."
he thumbnail of Ormat in the introduction reads as follows:

Ormat Nevada is a wholly-owned subsidiary of Ormat Technologies, Inc., whose website touts "green energy you can rely on." They have an S&P rating of BB and received $350 million in partial loan guarantees. Ormat's lobbyist Kai Anderson and Director of Policy and Business Development Paul Thomsen were both former senate aides to Harry Reid and donors to his campaign.
Senator Harry Reid's Part in the Green-Energy Crony-Corruption Story (grantcountybeat.com)

The community in effect has had to become both the reporting and regulatory enforcement agency through litigation. This EIS needs to name any other power plant in Hawaii that has forced numerous evacuations of the surrounding communities because of toxic emissions, violated the laws and permit conditions for decades, or been sued successfully by residents for harm and regulatory abuses more than 10 times. There is no project in Hawaii's history I have found that has been more contested or protested by the community for decades than PGV. That the regulators task with protecting the constitutional rights, health, wellbeing, and quality of life of the area residents have allowed PGV to be self reporting after everything that has happened, should be investigated by the US justice department to see how that is even possible IMO. Have there been pay offs, and or political favors, why and how has/does PGV manage to get such extraordinary treatment for over three decades? Those are reasonable questions given the facts in the community comments for this EIS, please answer them in a clear and comprehensive manner. With no regulatory or judicial relief available to me, after HGP-A when the PGV project permitting was starting I turned to the Pele Defense Fund (PDF).

PDF had been fighting geothermal development long before I moved to Leilani Estates in 1981 and was impacted by HGP-A. Primarily for the rights of Native Hawaiian beliefs and practices but also for the health and safety of not only native Hawaiians but for all the residents and communities impacted by geothermal development and the environment posed by geothermal development. The regulatory failure to protect me and the surrounding community from the cumulative impacts of PGV operations by the state, county, and federal authorities led me to also become a founding member of Puna Pono Alliance (PPA). PPA was a community based non profit, as president of PPA I helped lead the community efforts to protect area residents from the many different harmful activities and illegal actions by PGV and the regulatory agencies as outlined and documented in these comments. For the past decade PPA has fought to challenge the illegal actions and harm that the county, state, and PGV were facilitating and causing in our community through education, public meetings, participation in hearings, the legislature, the PUC, protest, and litigation.

Following the conclusion and release of the Hawaii County Geothermal Public Health Assessment (GPHA) finding and recommendations detailed below in my comments. Funding was obtained from the Geothermal Asset Fund for a study on the psycho-social impact of geothermal development on Native Hawaiians and their beliefs by Dr. Michael Edelstein. Psycho-social impact studies should be mandatory as part of any EIS for any significant project affecting a surrounding community. The PGV EIS should include a psycho-social impact study of PGV for the entire Puna community. That would include documentation of the psychic and social trauma caused by PGV to the whole community.

I believe given the facts this EIS should find not only that PGV can not be trusted to be self reporting. Instead, given the record and history PGV requires even more stringent oversight than other dangerous toxic industries cited in pre-existing communities. Currently residents are at the mercy of a company that has shown it is more interested in and prioritises profits over the known and obvious impacts their operations have on the surrounding communities. PGV has shown repeatedly and conclusively they can not be trusted to self regulate or report their violations. Relying on PGV to self-report violations or operation upset conditions does not protect the communities constitutional rights, is not pono, or in the best interest of area residents and the community to get reliable reporting or meaningful oversight.

The impacts I mentioned are well documented and indisputable. The facts are independently verified in the Hawaii County Geothermal Public Health Assessment (GPHA) commissioned by then Hawaii County mayor Billy Kenoi. The GPHA is both linked here and attached below and should be included in this EIS as a reference guide to historical facts and evidence of what geothermal has done to the surrounding community. The PR and glorification of PGV in the DEIS is exposed and repudiated by the historical facts and record, this EIS should explain why the facts are being ignored and instead PGV PR is being used to facilitate the DEIS.

I have seen and experienced all of the impacts, accidents, intentional toxic releases, lack of emergency responses, protest, meeting, hearings, promises, lies, and violations from both HGP-A and PGV that have occured since 1981. I was a community first responder to HGP-A and PGV leaks, accidents, and community complaints for most of that time. I helped successfully lobby the Hawaii County Council for funding for community handheld H2S Jerome samplers. I was trained at Hawaii County Civil Defense to use them properly to take readings around the PGV power plant. I responded countless times at all hours of the day or night to toxic releases and noise complaints at PGV and have seen for myself PGV try to cover them up and lie about it more than a few times. Area residents had my phone number and would call me for help because they could not get civil defense or Hawaii DOH to help them or respond. I did that voluntarily without compensation at my own expense not because I was anti geothermal as Dr Don Thomas, Dr. Bruce Anderson, or PGV would have you believe but because no regulatory authority would and I was being hurt without recourse. It was all I could do to create a record for just such a chance to be heard as this EIS now presents. That record is detailed here now for this EIS, are you going to use it or ignore it? After Pele shut down PGV in 2018 I returned the 2 Jerome samplers to Hawaii County Civil Defense administrator Talmadge Magno.

Link to HPHA
content (hawaii.edu)

Geothermal public health assessment : findings & recommendations (hawaii.edu)

42 years of history and experiences living next to both HGP-A and the PGV geothermal developments are detailed in my comments in the hope it will aid in a fair and well informed EIS process. The DEIS failed so completely to include an accurate history and relevant facts I felt compelled to respond with the historical facts, documents, and information here for inclusion in your final EIS document in the hope that we will finally be heard. The record shows I have participated, been vocal, and testified at all levels of permitting consistently for the last 42 years. As such I believe I should be qualified as a community historical expert on PGV and geothermal developments impacts on me and my community for the purposes of this EIS. I am including information, links to sources, and documents to support and substantiate what I am saying for the purposes of this EIS.

I lived through, participated in, and experienced all of the countless public hearings, meetings, community opposition and protest, intentional releases of toxic gasses and chemicals, drilling, noise, lights, too many to count accidents, leaks (fugitive emissions), and venting's both open and abated that have occurred over the last 42 years. I am very familiar with (all of) them and have been forced to evacuate my home numerous times and been harmed countless times by both HGP-A and PGV development and operations, and have documentation that proves it. This history is relevant to this EIS and needs to be adequately addressed in the final document and/or next draft.

Unabated H2S, geothermal gases and toxins were consistently released into the surrounding communities by HGP-A from most notably but not limited to the failed John Zink abatement system that never worked properly and was not manned or monitored at night over the 8 years the experimental power plant was operated as documented in the attached county Geothermal Public Health Assessment (GPHA). I was asked to be a member of the mayor's task force by Peter Adler and agreed, as such I was a member of the GPHA committee representing the community interest.

GPHA findings and recommendations

{"Hawai'i Island Mayor William Kenoi asked Peter S. Adler, PhD of ACCORD3.0 if he would organize an independent "joint fact finding" Study Group that would examine the type and extent of health impacts from Hawai'i Island geothermal operations. Hawai'i County Council members had shown interest in such an effort, and the Mayor expressed his own belief that public officials, regulators, and residents must consider the health risks that may be associated with geothermal energy production. The specific aims of the project were to: 1 List the public health questions pertinent to the production of geothermal energy in the Puna region; 2 Create a reliable inventory of existing studies that addresses those public health concerns and that could serve as references for decision-makers; and 3 Recommend the priorities and preferred methodologies for future scientific and monitoring studies that may be required or that can best assist the County and the Windward Planning Commission to make informed decisions that protect the long term health of the community."

Study Group members: Jay Bondesen, Alfred Dettweiler, Edward Fisher, James Haefner, LaRee Hiltner, Robert Petricci, René Siracusa, A. Jeff Sutton, Laura Travis, and Thomas Travis.}

This EIS must consider and follow the recommendations of the GPHA if it wants to have any chance of being considered credible or legitimate. The HGP-A was closed by emergency order from then governor of Hawaii John Waihee after the labor day holiday in 1989 when a particularly bad 3 day episode of toxic poisoning of me and our community caused a public outcry over the harm being done to area residents. This EIS should examine the total impacts HGP-A had on the community over it's 8 year life, and how that both traumatized and galvanized area residents' opposition to geothermal development in their community. Contrary to PGV's, Dr, Don Thomas's, and the Hawaii DOH specifically Dr. Bruce Anderson's assertion that our concerns are rooted in extremism and ignorance rather our opposition is rotted in what was done to our families and our community by PGV and HGP-A under the guidance of Dr. Thomas and DOH director Dr. Anderson. Dr. Anderson was Deputy Director of the DOH under Director Jack Lewin. He went on to become Director of DOH for 2 different periods of time.

The HGP-A was designed to operate for 2 years, but largely due to the efforts of Dr. Don Thomas's intentionally useless, inadequate and fraudulent monitoring data, and lies he told, supported by DOH's Dr. Jack Lewin and Dr. Anderson, it was allowed to operate for 6 more years doing untold harm and damage in our community to the children, kapuna, and the rest

of us, as detailed in the GPHA. HGP-A was so egregious and made so many people sick it was almost single handedly responsible for turning the surrounding community against geothermal development. Dr. Thomas and the Hawaii Department of Health used home made samplers taped to telephone poles to insist that the emissions from HGP-A were safe. These homemade samplers consisted of a piece of black 3" PVC pipe with a cap on top and a sticky tab hung inside to detect H2S levels in the community. They in no way were reliable or gave honest H2S exposure levels to the constant 24 hour a day release of H2S that poisoned our community for 8 years. If Dr. Thomas or DOH want to dispute that, this EIS needs to have independant air monitoring experts examine those sampling methods and comment on their reliability or lack thereof. I have already consulted experts about this and they were disturbed that those samplers were the basis Dr. Thomas and DOH used to claim the exposure levels were accurate and safe, that is simply not true and they knew it or should have, given their education, experience, and position even then.

By 1992 when PVG had already had accidents and blow outs at both the KS-7 (kick) and KS-8 wells, -- (see the Godd ard and Goddard state investigation here

Goddard and Goddard 1991 - Geothermal Action Pl...

for the facts}

--- the state and federal government had spent over $64 million dollars and heavy political capital by that time promoting geothermal and a 500 megawatt inter island cable project. While at the same time spending zero dollars on any attempt at a legitimate monitoring system, emergency response plan, or any effort to mitigate or address the constant community complaints of impacts that had plagued the project from the beginning. Instead the Hawaii DOH's Dr Bruce Anderson responded in the Hawaii Tribune Herald on the front page in response to the protesters and community complaints as coming from people who were "rabidly anti geothermal" with no evidence of, or real data without any actual source based monitoring program to actually assess if any negative health impacts were being caused by geothermal, as I have documented for this EIS. Dr. Anderson and Dr. Don Thomas lied and threw the community under the geothermal bus for their personal agenda to move the state's pet project (PGV) forward over overwhelming community opposition. It is important for this to be noted in this EIS as it seems not much has really changed judging by what was used in the DEIS determination of no significant impacts from the"project" that these comments are attempting to correct.

Open venting and operation of the HGP-A well caused many large protests in the community with civil disobedience and arrest a common occurrence for years. The constant complaints and pleas for monitoring and regulation started in 1981 and continue until today 42 years later, no one can say we did not make ourselves heard and present the problems publicly for PGV, all the regulators and politicians to see. The blatant disregard and dehumanizing of the community by PGV, the regulatory agencies and politicians shows where the governments and developers geothermal priorities lie and have been from the very beginning, the record is clear, there is no excuse, they can not claim they did not know, or they tried to do the right thing after all this time, countless accidents, lawsuits, and protests. The fact is our community was sacrificed, red lined, and seen as expendable acceptable collateral damage to the federal, state, and county's goal and desire to develop geothermal power at any cost regardless of the harm to our community. This was willful and intentional, the facts are clear to anyone who has a reasonable, unbiased, approach to the issue.

Geothermal drilling began in Puna in 1961 when Thermal Power drilled four shallow wells in the Kilauea Middle East Rift Zone in the Puna district of the Big Island. Considered one of the most active and unstable geological volcanic areas on the planet, situated on a hot spot where a geothermal reservoir has been trapped in an area of faults and lava intrusions. Puna is the home of Pele, and native Hawaiian practitioners represented by Pele Defense Fund believe mining for steam is a desecration of her body. Hawai'i geothermal plants deal with a hot spot as opposed to tectonic plates creating heat as is the case in the vast majority of geothermal development around the world. The fact is PGV is trying to control one of if not the hottest resource on the planet that also has the highest concentrations of hydrogen sulfide, (a highly lethal toxic gas that is released into air during geothermal production) of any geothermal plant or development in the world with virtually no reliable public source monitoring and modeling as is the standard resulting in no usable data of exposure level resident endure. This is not my argument but PGV's and DOH's in court when they are sued for damages.

In 1973 the U.S. Department of Energy and the National Science Foundation assisted the state with grants to fund the HGP-A experimental well, the first geothermal plant in Puna. When the HGP-A well was drilled in 1976, ---

"the project was presented as strictly experimental, a two year demonstration project and not a production well". In 1982, despite those commitments (lies) to the public, a three-megawatt power plant went on line. "No community meetings were held explaining the change".

I included this information because it shows for the purposes of this EIS the mindset and actions by the state of Hawaii have never been transparent or honest with our community or the public with regards to geothermal development in general, and specifically for the HGP-A project. This political drive for geothermal found its roots at the federal level in the office of Senator Daniel Inouye. The lack of transparency and political pressure on the the state to develop geothermal power plants in Hawaii can be traced directly to Senator Inouye and in 1985 led to an illegal land swap.

In December, 1985, the State of Hawaii illegally exchanged approximately 27,800 acres of public "ceded" (1) lands, including the Wao Kele 'O Puna Natural Area Reserve and other Puna lands on the Island of Hawaii, for approximately 25,800 acres of land owned by the Campbell Estate at Kahauale'a.

This illegal land swap of Hawaiian ceded lands (1) is included to support my position that their is a historical pattern of abuses by the state of Hawaii, for this EIS, and the lengths the state of Hawaii has gone to to facilitate geothermal development in Puna at any cost, with no regard to the laws, the Hawaiian people, or the community. These unlawful actions by the state of Hawaii were challenged in court by the Pele Defense Fund. The state fought the case all the way to

the Hawaii Supreme court and lost when in 1992 the court ruled the land swap was illegal and ordered the land returned to the native Hawaiians they stole it from.

Pele Defense Fund v. Paty :: 1992 :: Supreme Court of Hawaii Decisions :: Hawaii Case Law :: Hawaii Law :: US Law :: Justia

The HGP-A geothermal power plant continued for eight years and was shut down in 1989 by emergency proclamation issued by governor Ben Cayatano. HGP-A dumped their toxic geothermal brine into unlined ponds that fouled the air, land and water. Federal regulatory agencies finally deemed their effluent abatement systems unacceptable. For the life of the well and power plant they were operated without effective pollution abatement. Brine was disposed of in unlined ponds. Hydrogen sulfide and other pollutants were regularly and routinely released into the community during well cleanouts, operation, and plant maintenance. Yet Dr. Don Thomas and Dr. Bruce Anderson continued to defend those releases as safe and lie about the hazards they presented and instead brand the community as the problem when in fact the area residents were victims of the dangerous and very toxic HGP-A well and power plant being promoted by the state, Dr Anderson, and Dr. Thomas at area residents expense.

In 1989 the State began to drill four Scientific Observation Holes (SOH) to define the extent of the resource. The program ended in 1991 when a judge halted federal funding until an Environmental Impact Statement was prepared. Yet we see PGV drilling after the eruption "before" this EIS is done, demonstrating further, the pattern of disregard for the law that I am outlining and documenting in these comments for this EIS is ongoing to this day. Two holes were completed before the courts shut the program down because they had not done an EIS.

Being self reporting/regulating, PGV has been able to do what they want regardless of the impacts or laws. Because we are a poor community with little political power and the state, county, and federal government refuse to enforce their own laws unless we bring legal action as documented in my comments for this EIS we have been irreparably harmed. That harm is ongoing as evidenced in PGV's and the responsible regulatory agencies blatant disregard for Hawaii's HEPA laws

The reality on the ground here is: a wealthy corporation with a documented history of fraud and corruption with an army of attorneys has and continues to abuse, impact, and harm a poor community at will because we do not have the same political or economic power of wealthier communities where this would never have been allowed. That type of problem is not unique to PGV, it is a documented fact that toxic industries like PGV are disproportionately cited in poor communities. This EIS needs to address that history and ongoing regulatory failures to protect the public good instead of protecting PGV's bottom line and the royalty payments/bribes the state, county, and OHA get from geothermal for doing it. No other power producer pays the state and the county "royalties". Does that money influence regulatory oversight at PGV? Is it a contributing factor in PGV being allowed to be a self reporting/regulated power plant, even with the history of harm and abuse they have occurred? This EIS needs to answer that question.

Targeting minority, low-income neighborhoods for hazardous waste sites | University of Michigan News (umich.edu)

Paul Mohai of Michigan's School of Natural Resources and Environment and Robin Saha of the University of Montana wrote two related papers that were published online in the journal Environmental Research Letters in November and December.

Several decades of research in the field of environmental justice has established clear patterns of racial and socioeconomic disparities in the distribution of a large variety of environmental hazards. Hazardous waste sites, polluting industrial facilities and other locally unwanted land uses are disproportionately located in nonwhite and poor communities.

The court shutting down the SOH program for failing to do what the law requires (an EIS), The Goddard and Goddard state investigation, the Geothermal Public Health Assessment, Supreme Court findings in PDF V Paty, and Aluli v Lewin (see below) taken together with the rest of the facts and documents supporting my comments establish a clear pattern of regulatory failure, abuse, a clear political agenda that protects PGV and geothermal development. Demonstrated by a documented history that shows a willingness to skirt, ignore, or even break regulatory norms, requirements and the laws that govern them that go back at least 43 years.

When taken in totality it is easy to see a "pattern" emerge to protect geothermal exploration, and development at the expense of the constitutional rights, health, safety, well being, and quality of life of the area residents and pre existing communities where the geothermal projects including PGV were built. How much longer will this culture and these violations be allowed to go unchecked? What will it take before PGV is held accountable to the law and the community? After all the money spent by the state and developers and decades of exploration the only viable geothermal resource ever found was right in the middle of a large pre-existing residential community. PGV was built on that site and has been allowed to operate and emit toxic gases, noise in excess of reasonable limits, and light pollution that can be seen for many miles even from the coastal road by Pohoiki bay. Without any setbacks, monitoring of exposure levels in the community, or an emergency response and community evacuation plan. That fact and reality was laid bare for anyone to see when in 2014 area residents were trapped in their homes by tropical storm Issell and gassed by PGV with no way to escape. Over a hundred people were exposed to very high levels of H2S without any way to escape or even record their exposure levels. This proved conclusively again without any doubt no actual monitoring system exists to record exposure levels when PGV gasses our community. If anyone disputes that, ask them to produce the data that shows the exposure levels these families were subjected to during this event. They can not do anything except try to spin it because there is no data because there is no monitoring system. If PGV is really not hurting the area residents wouldn't they want the data to prove that? After 34 years and all the accidents and outcry, not to mention litigation, the fact that there is no data to show

exposure levels of the residents is not an accident, it is intentional. The lack of real monitoring and exposure levels data coupled with PGV's long history of accidents, upset conditions, intentional releases of toxins, and operating outside of permit conditions and the law all support the "pattern" of abuse inflicted on our community by PGV, the state and the county for decades. Is it really surprising then to anyone that the community is opposing PGV and their expansion plans now?

Puna Geothermal Venture got their county Geothermal Resource Permit (GRP) in 1989 and began drilling a well field and power plant construction for their original 25 megawatt project next to the state's HGP-A site. Although residential subdivisions and small farms surrounded the project, permits were issued by the State and County over overwhelming community opposition. Technological and managerial problems led to delays and accidents including well blowouts that affected neighbors over the years. Intervention by the EPA in groundwater protection permits and a compliance investigation in 1995 resulted in numerous recommendations--many have simply been ignored and never implemented to this day. Can this EIS explain how that is even possible and why the conditions and recommendations have not been enforced?

According to the Emergency Planning and Community Right-to-Know Act (EPCRA), local emergency planning committees are required to develop emergency response plans to prepare for and respond to potential chemical accidents. Can this EIS please produce the required Emergency Response Plan (ERP) for the surrounding community and any test that are planned or have been done as are needed to ensure it is workable. Please provide a map that shows the current escape routes and the number of residents that will need to use those escape routes during an emergency. The 1991 PGV well blow out of the KS-8 well vented more than 2,200 pounds of hydrogen sulfide over a 31 hour period, killing animals, sickening area residents, and forcing the evacuation of at least 75 Puna Residents as detailed in the attached Goddard and Goddard investigation and action plan. The impacted area according to the report was up to 10 miles away from the wild well. Based on a detailed review of emergency response capabilities at PGV in 1996, the EPA made numerous safety recommendations, including the development of a site specific evacuation plan. Per the established "pattern", 27 years later, these recommendations have not been implemented. We still do not have an evacuation plan for the local community, even though our records show 18 declared civil defense emergencies at PGV between 1991 and 1999. This EIS must explain how PGV is being allowed to continue to operate without compliance, exactly how that is even possible.

in Aluli v Lewin the Hawaii Supreme court ruled the DOH was required by law to promulgate an H2S standard for emissions at the PGV facility. The court ordered the DOH to follow the law. Up until that order the DOH had flatly refused to promulgate any standard for H2S exposure levels as per the pattern of lawlessness that permeates the entire life of the PGV project

Aluli v. Lewin, 73 Haw. 56 | Casetext Search + Citator

When Dominic Yagong chaired the Hawaii County Council, because of the demonstrated impacts drilling had on area residents the council passed a law banning drilling by PGV between the hours of 7pm and 7am. PGV refused to follow the new law as per their well established pattern of lawlessness, and the county as the responsible regulator and enforcement officer refused to enforce it. Do you see the "pattern" yet? This resulted in PPA and a number of area residents suing both PGV and the county. Refusing to follow the night drilling ban law is another in a long line of examples of the "pattern" PGV exhibits. PGV does not respect or follow our laws, instead they pick and choose which laws to respect or ignore. The regulatory agencies charged with enforcing the laws protected PGV instead (again) at the expense of the community and again facilitating these violations at the expense of the health, well being, and quality of life of the area residents.

November 2 2022
The lawsuits name the state health department and Puna Geothermal as defendants and claim that the plant's environmental impact statement is inadequate and outdated. The project was originally completed in 1987.

Two of the lawsuits were filed Oct. 21. The first case is on behalf of the nonprofit environmental group Puna Pono Alliance and residents living near the plant who claim the plant adversely affects health and property.

The second lawsuit claiming the state and Puna Geothermal violated environmental regulations was filed on behalf of an environmental activist and two residents.

The third lawsuit filed Oct. 23 accuses Puna Geothermal of hydraulic fracturing, or "fracking," and claims fluid injection into geothermal wells during the 2018 eruption caused explosions that ejected lava under the plant out through a fissure.
3 lawsuits filed by opponents of Big Island geothermal plant (hawaiinewsnow.com)

Geothermal on the Big Island: Hawaii County Approves Nighttime Drilling Ban (geobigisland.blogspot.com)

Lawsuit Filed To Stop Geothermal Night Drilling (bigislandvideonews.com)

VIDEO: Harry Kim Testifies On Geothermal Night Drilling (bigislandvideonews.com)

Hawaii County Council bills could affect expansion of Puna Geothermal Venture. – Hawaii News Digest

I have not been able to obtain historical geothermal incident and response records from Hawaii County Civil Defense. After Harry Kim was replaced as head of Hawaii County Civil Defense all the records he had relating to geothermal incidents and Hawaii County Civil Defense responses were destroyed, this EIS needs to explain exactly who ordered that and why. What happened to the Hawaii County official records? I know as the community first responder who documented

them there were many more than we have documentation for, how is that possible? Even when I had the hand held Jerome air samplers with data loggers the information on the Jeromes logger was ignored or dismissed. Many releases occurred that were simply ignored, when regulatory agencies failed to respond or document them. Where are the records if they ever existed? This EIS needs to explain in detail how that is possible and what is different now that will keep that from continuing to be the "pattern". This EIS needs to clarify who is responsible for oversight, documentation and enforcement of releases and accidents at PGV and custodian of those records?

PGV's parent company Ormat has gone to great lengths to insulate themselves from financial liability in the event of a catastrophic accident, this EIS needs to detail what the assets and liability insurance of PGV is, and are they adequate to cover the impacts of a catastrophic accident and decommissioning of the PGV power plant and well fields. Please detail in the event of a catastrophic accident or liability for toxic releases, exactly what assets PGV has, and why Ormat is allowed to profit from PGV income yet be insulated and protected from castitrofic harm claims by LLC's.

PGV calls their system "closed loop," but history proves the reality is they often release hydrogen sulfide, caustic soda, and other pollutants into the air when they have problems at the plant, and they lose 40 to 100 lbs of pentane a day. Numerous examples of this are well documented including the often talked about KS-8 blowout in 1991, and the August 14 release when PGV refused to shut down as tropical storm Issell bared down on Puna and was predictably knocked off line seriously gassing residents that were trapped in their homes and unable to flee the chemical assault. A less talked about but well documented release was on November 7, 2011 when PGV was hit by a lightning strike that tripped the plant offline and caused hydrogen sulfide gas to be vented. This EIS needs to explain clearly why if this is a "real" closed loop system there have been and will continue to be fugitive emissions and intentional or accidental release of toxic gasses and chemicals into the community on a regular basis. What are the total release numbers for H2S, caustic soda, pentane, and the other toxins or heavy metals released by PGV over the life of the plant?

This EIS needs to explain and reflect that without a source monitoring system that records the released emissions levels at the source and models those exposure levels in the community there is no way to document the exposure levels the people in the community experience on a regular basis. If that is inaccurate in any way please produce the records and data showing exposure levels in the community. There is no reason to have confidence anything has changed that would prevent further releases in the future particularly if PGV is allowed to expand production, continue drilling new wells, and be self reporting.

For the record in this EIS I want to make clear that data from a few sampling stations around PGV in no way provide exposure levels of residents that live nowhere near those samplers, they only show H2S levels of plumes that happen to hit them and what the concentration level is at the height of the sampler intake not near the ground. The vast distances between sampling stations means the H2S plumes can and do go unrecorded unless they hit the sampler directly and then only show the levels at the single location. Another fact that needs to be noted in this EIS is that concentration levels in the toxic H2S plumes can vary depending on if the edge of the plume where the gas is diluted hits the sampler as opposed to the center of the plume where concentration levels are highest and that H2S is heavier than air so it pools near the ground not at the height of the sampling intakes. For the reasons I have explained the sampler data has proved useless in litigation by residents against PGV for damages. The sampler data does not give any indication of exposure levels in the rest of the community as PGV and DOH have argued and relied on in the courts to protect PGV. PGV and the regulators have known that since 1989 at least yet not done anything to collect the actual exposure levels in our community. Please explain why that is and how after everything that has happened over the last 42 years PGV is allowed to continue to operate and release these toxic fumes without real time data to protect our community. This is inexcusable and must be viewed as deliberate, designed, and intentional to protect PGV at the communities expense after 33 years. It is unforgivable, and should be a crime, did they conspire to do this? How could they not know and have talked about it, does that raise to the level of a conspiracy? I think that is a reasonable question given the facts I and others have presented for this EIS, can you please explain how else after 42 years this is still happening. Reading the communications over the years from and between DLNR, DOH, the community, and PGV it is hard to find them not aware and actively working together to protect PGV at the area residents expense. Another question I would like to be answered by this EIS is have the communities civil rights been violated including but not limited to the right to be safe in their own homes and the right to a healthy environment?

It appears to me after decades of participating in this process that the lack of a real monitoring program that would give verifiable exposure levels in the community is intentional to help PGV avoid liability for the harm they have and are causing. Can this EIS explain why if PGV believes that they are not harming the community they do not put in a source monitoring system that models exposure levels in the community? If PGV is really not hurting people why don't they want the data collected that would prove that after 33 years?

Before the 2018 eruption PGV had 42,000 gallons of highly flammable, toxic pentane on site. PGV was losing an average of 40-100 gallons of Pentane a day into the environment, I request this EIS detail what the radius of the explosion would be if it detonates for any reason, what the emergency response plan for the community is, and how the community would be impacted if the pentane ignited in a catastrophic explosion.

At 38 megawatts PGV was pumping 3,000 gallons per minute of cooled geothermal fluids and additives into their injection wells. This EIS needs to show us how much PGV is reinjecting today, what the projected reinjection rates will be at plant and well field buildout and exactly where and at what depth that has, is, and will be occurring. Is there a seismic monitoring system in place to track the induced seismicity that reinjection causes? Will seismic data collection be collected and available to the public in real time?

In 2012 ACT 097 stripped the counties of land use control over geothermal development. Hawaii county, specifically

noted for the purposes of this EIS, the planning department, no longer has authority to issue or enforce Geothermal Resource Permits, the county GRP required an emergency response plan and had 51 conditions negotiated in mediation between the county, the developer, and the community. Can you please detail what authority the county currently has to address emergency response planning, noise levels enforcement and H2S emissions regulation or enforcement? Please explain in detail how the county of hawaii planning department is then able to be the "accepting agency" for this EIS. If the state legislature effectively neutered Hawaii counties authority to regulate geothermal development and any power they had to enforce emergency response requirements, noise, and H2S releases with act 97. What authority qualifies the Hawaii County Planning Department to be the accepting agency for the EIS you are preparing?

Amendment would limit county oversight of geothermal - Hawaii Tribune-Herald

This EIS should also make clear that Puna uses less than 10 percent of total power produced on the island, in part because many Puna residents are not served by HELCO and many more like me do not want to pay some of the highest electric rates in the United States for power to HELCO. As far as I can tell Puna is the largest off grid community in the United States and certainly in Hawaii. Thousands of residents here live off the grid including me and many of the other residents around the PGV power plant. We get no benefit from PGV yet endure all of the impacts and abuse, will this EIS make sure that is clear for everyone reading it to understand? We produce our own power now, not in 2030 or 2050 we are doing it today. We do not need HELCO or PGV to do it and should be an example and model of what Hawaii's energy future can be, instead of characterized as anti geothermal trouble makers. We have already achieved energy independence for our families and many of our communities, a goal the state has set for 2050. Today in many places around the PGV project, without any meaningful help from the county or state we are energy independent. If the financial and regulatory help PGV receives were instead given directly to communities for energy efficiency and off grid solar would not the results dwarf any benefit PGV might deliver with much less environmental and community harm?

This EIS should look at whether that is a better alternative to the dirty and expensive PGV project. Support given directly to residents would also generate support instead of opposition and protest in our communities. I am not opposed to geothermal for any reasons other than it is dangerous, harmful, noisy, pollutes our air, is not needed. and is not the best alternative to fossil fuel electricity production. Any additional power above the needs of the puna communities that are still on the "grid" PGV manages to produce. will not be used in Puna. It will be transported over expensive, vulnerable, environmentally destructive, and inefficient grid transmission lines. This EIS needs to explain why that is necessary, how much transmission cost rate payers including cost to buy the materials (poles, wire, substations, transformers ect), install the grid, maintenance cost, equipment cost like trucks ect, labor cost, and how that benefits or adversely impacts the environment, rates, and area residents

In 2011, PGV paid $1.8 million in geothermal royalties to the state of Hawaii. $568,000 went to the County of Hawaii, and $378,000 to the Office of Hawaiian Affairs. Does this money help buy support for geothermal power not because it is safe or reliable as history and most recently the 2018 eruption show, but because they are a source of revenue that the state and county do not get from other electrical power producers? The 1991 blow out, 2014 tropical storm Issell, and the 11/7/2011 lightning strike are just a few of a long list of "incidents" that show community safety and wellbeing come last when it comes to the state and county, the record on that is undeniable. The EIS needs to explore what role, if any, the millions in geothermal royalties play in that undeserved support that comes at the expense of the health and safety of area residents. Do those millions contribute to the regulator's reluctance, and flat out refusal to hold PGV accountable to their permit conditions and the prevailing laws?

In listening to the community testimonies about and against PGV you heard in Pahoa it must be noted for this EIS not one community member testified publicly in support of PGV not one, your EIS needs to say that. We took time out of our lives to come and give you the information you need because it is important to us. For every one that showed up you can be sure there are many more that could not come.

Following the 2018 eruption, PGV was allowed to build new roads, continue operations, drill new wells, and resume drilling, production, and reinjecting without a new permit or following the HEPA laws requiring a new or supplemental EIS to ensure the geologic changes both on the surface and in the ground at their drill sites are stable and safe. PGV was allowed to continue drilling along with adding new equipment and geothermal wells, without getting permits or doing a supplemental EIS as required by the HEPA laws. An EIS would have required PGV to actually listen to and address the concerns being voiced by the community and ensure that the current geology could safely support drilling into seismically active zones on the Lower East Rift Zone. Instead, PGV was allowed by regulatory agencies to violate the hawaii HEPA laws that required a new EIS because of the new conditions, topography, and elevations and only now is seeking to do an after the fact EIS. That is par for the course of PGV and the regulatory agencies "pattern" of recklessness and lawlessness that I have outlined above in my comments for this EIS.

I sent the following email to DLNR notifying them of the violation of HEPA laws on October 8, 2022 in response to their email response to Sara Stieners question about PGV drilling new wells.

to DLNR.Engr,

In reference to this DLNR reply to Ms Steiner's notice of violation copied below.....

Robert Petricci's email to DLNR

The EIS was required by the PUC based on the state of Hawaii HEPA laws, not its own accord, unlike DLNR. The PUC found the state of Hawaii HEPA laws require an EIS because state land use triggers HEPA considerations. Miss Stiener has

notified DLNR that they are in violation of the HEPA laws. DLNR's response is inadequate and in error. Ms Steiner, please check the Supreme Court rulings on such. The geothermal resource has been determined to be state land use. Any use of state land triggers HEPA requirements. DLNR is in error or worse, they already know this and are intentionally breaking the law to aid PGV to the detriment of the surrounding community.

Robert Petricci

From DLNR.....

Mahalo Ms Steiner for bringing this to our attention.

Aloha Ms. Steiner,

We have been asked by the Chair to provide a response to your query. Please see the responses below:

Where is the public notice and hearing for this new well?

- **A public notice and hearing is not required. KS-21's application is in accordance with the currently approved Plan of Operations and the Department's Rules and Regulations.**

You know PGV has been ordered to perform an EIS before they can expand their plant, so how are you allowing them to drill a new well without the EIS?

- **The referenced EIS is tied to PGV's application before the PUC and not to the KS-21 drill application under review.**

I am asking you to stop all approvals of new wells for PGV until AFTER THEY HAVE PERFORMED AN EIS.

- **We will continue to abide by the Plan of Operations and the Department's Rules and Regulations regarding issuance of drilling permits.**

Please let us know if you have any other questions.

Best Regards,

DLNR - ENGR

The PUC order for an EIS I that both DLNR and Sara Stiener referenced in the above emails was following the HEPA laws, DLNR's response to being notified by Sara Stiener was to continue the well established pattern of regulators that refuse to follow state law unless compelled to do so by the courts when area residents bring suit to force them to obey the laws. I have documented this for you and the courts at length in my comments for inclusion and consideration in this EIS. This email shows DLNR was aware of the PUC order and the law it was based on or should have been given due diligence and simply decided (again) they were not subject to follow the law but were in fact the law themselves.

Next I ask that this EIS seriously consider, answer, and explain the reasonable and sincere questions I ask below based on the facts submitted by all parties to this EIS and the information submitted in my comments here. Had PGV created the easiest path to the surface for the lava as it came down the east rift zone during the 2018 Kileuea eruption? Should that be investigated before PGV is allowed to further alter, fracture, and degrade the geology where the 2018 lava found the easiest path to the surface? If not, exactly why not? By my estimations and calculations based on the numbers given to me by Mike Kalikini, PGV has reinjected over 40 billion gallons of cooled fluids directly into super heated rock, voids, and fractures in the area where the lava found its easiest path to the surface in 2018. PGV is in fact recklessly doing the same

thing again now with the blessing of the County of Hawaii, DLNR and DOH as this EIS process is occurring. This is being done without any independent investigation into what effect their previous reinjection had on the geology where the 2018 eruption found its way to the surface right where PGV had been intentionally cracking the rock formations to create permeability. This again shows the regulatory agencies, and PGV's reckless lack of care for the consequences of PGV's actions and operations have already had and could have in the future on the community and the environment. The attitude of all of them shows the "pattern" established over the last 42 years, that the laws simply do not apply to them is still very much in play today.

Mike Kalikini told me numerous times that the rock explodes when the cooled fluids PGV reinjects come in contact with it because of the super heated nature of the rock. He also told me that PGV intentionally did that trying to create permeability that would allow the cooled fluids to travel through the super hot rock and be reheated as it traveled back to or became part of the resource in order to "recharge" the resource. According to Mr. Kalikini early on PGV had been reinjecting too close to the resource and had caused it to cool. PGV then started moving further away from the resource to both allow the fluids to be sufficiently reheated for recharge but prevent the resource being cooled by the reinjection. They needed to create "permeability" or fractures to facilitate that. That went on for decades. This EIS must independently investigate and explain what the impact of those actions had in the area that the lava in 2018 found its easiest way to the surface and buried our community. While the area has a history of eruptions prior to geothermal development the question is did PGV's operations and reinjection change the geology of the area both in withdrawing massive amounts of fluids and then reinjecting those fluids back into the ground and deliberately trying to create permeability?

For the record and this EIS I was at my home near PGV when PGV began to implement their Emergency Response Plan. I personally experienced PGV's actions directly influencing the 2018 Kilauea eruption. There was a long whistling followed by an explosion about every 60 seconds that went on for approximately 3 days. Each explosion was so powerful it shook my house more than the earthquake that started the eruption. It was so loud and terrifying, the shaking so severe I could not sleep. On the second day I invited an attorney who has a degree in geology to come to my house to see what was happening. We sat there for hours together trying to understand what was causing the clearly hydrologically driven explosions. We did not know at that time that PGV was pumping massive amounts of cold water into the lava chamber. Then as suddenly as it had begun, after roughly 3 days of non stop explosions it stopped.

When Mike Kalikini was asked whether they were involved with influencing the eruption he denied any influence. Clearly he knew that was not true. No one could have been anywhere near those explosions and ground shaking while pumping huge amounts of water into the lava chamber without knowing those explosions were the direct result of those actions. PGV representative Mike Kaleikini responded when asked that the excess 1.2 million gallons of water that was pumped into the "natural geology" of the erupting volcano, only a few meters away, had "zero" effect on the subterranean geology. I believe he lied, how could I hear and feel those ground shaking explosions a mile away but he and the other people and officials including USGS not know? This EIS needs to investigate what I am saying, if they want sworn statements from me and the attorney who was here during those explosions for hours we will provide them. Mike Kaikini and whatever officials from USGS that said there was no influence are not telling the truth and they know it.

To date no environmental impact study that I am aware of has been conducted to conclude or support his response. Whoever was there from USGS needs to explain exactly what caused 3 days of whistling and ground shaking explosions at the same time PGV was pumping over a million gallons of water into the eruption. How could hundreds if not thousands of explosions powerful enough to shake my house more than a magnitude 7 earthquake not affect the geology of the active eruption they were pumping that water into. That is a fair and reasonable question particularly since PGV is pumping cooled fluids directly into the same area again as you are reading this.

PGV position that the geology is the same as when the geothermal plant first started commercial operations in 1993 is not supported by the facts. PGV needs to produce the data they are basing those outrageous claims on.

More than a few of us that attended the 6/1/2023 EIS public comment hearing including Luana Jones, Pali Kapu Deadman, Jon Olson and myself have testified and asked for cultural considerations, monitoring, emergency evacuation plans, and real regulation at every public hearing or meeting since the very first public county GRP permit hearing for PGV in 1989. Well over any hope of being able to count them, why would anyone do that at every opportunity for 44 years? I have lost track of how many meetings I have been to or even how many times I have been hurt by PGV and or sued them. Dr Bruce Anderson who was the director of Hawaii DOH at least twice over the life of the PGV plant was quoted in the Hawaii Tribune Herald as saying it is because we are all rabidly anti geothermal. When the truth is it is because PGV has hurt us and gotten away with it for decades.

That Dr Anderson would say such a thing publicly lumping all residents concerned about the very real impacts PGV has had on our community shows the embedded bias in the regulatory agencies task with regulating PGV against our community. PGV has paid me damages more than once yet nothing has changed to prevent them from doing it again, that is why there is no real monitoring program or regulation. If PGV was not harming the area residents wouldn't they want real data to prove that? Instead they rely on, with the help of the regulatory agencies the lack of monitoring and lack of exposure levels data to get away with what should be criminal acts at this point in my view.

3) Lack of a working Emergency Response Plan for area residents.....

There is not now nor has there ever been a workable plan, model, or test of an emergency response plan for a community response to a catastrophic accident at PGV such as the well blowout of KS-8 in 1991, or when PGV was knocked off line in 2014 by Tropical storm Issell. The whole community was trapped as PGV's uncontrolled leaks vented very dangerous levels of H2S and other toxins into the surrounding communities. PGV struggled to regain control of their power plant after

they lost HELCO power and their back up generator failed. They came very close to losing control of the power plant, and even their severely inadequate flawed sampling stations were knocked off line, there is no community data at all. if PGV wants to try and deny any of this I can provide evidence that will show it is true. Over 100 people were hurt and sued PGV because of this with a number of them having been knocked unconscious by the high concentration of H2S while trapped in their homes. PGV paid damages but there is no monitoring data to show exposure levels because there is no actual monitoring system for community exposure levels. If any regulator or PGV wants to argue there is a community response and evacuation plan please have it introduced into this EIS along with all the data and testing they have run in the affected communities.

3. Conclusion

The funding which was obtained from the Geothermal Asset Fund for Dr. Michale Edelstein's study of the impact geothermal development has on native Hawaiians, done and has been entered into this EIS by the Pele Defense Fund. It should be clear that that psycho-social impact studies should be mandatory as part of any EIS for any significant project affecting a surrounding community. The PGV EIS should include a psycho-social impact study of PGV for the entire Puna community. That would include documentation of the psychic and social trauma caused by PGV to the whole community.

4)Questions:

Please respond in detail, did PGV contribute to the loss of 700 homes in lower Puna by creating the easiest path to the surface for the 2018 eruption with their intentional cracking of the subsurface rock and dikes? I think it is certainly a possibility that needs detailed analysis and response by this EIS. According to Mike Kaleikini PGV was reinjecting approximately 2 billion gallons a year of cooled geothermal fluids at 38 megawatts into voids and already fractured very hot rock and crack, crack, cracking it for 32 years, by my best estimate due to fluctuations in the output and amount of well flow, over 40 billion gallons has been rejected this way over the life of the plant. Can you please get Mike Kaleikini's exact number of the total gallons PGV has reinjected into the area where lave found the easiest path to the surface during the 2018 eruption for this EIS? PGV freely admits they are trying to fracture the rock in order to facilitate the fluids being able to pass through to get back to or expand the resource. Certainly the possibility exists that PGV's reinjection methods of intentionally and/or unintentionally fracturing the hot rock may have contributed to making a weak spot even weaker and in doing so may have contributed to lava finding its easiest path to the surface there. This can not be swept under the rug and needs to be seriously looked at and addressed in the new EIS instead of ignored as is currently the case. Please have independent experts explain exactly how fracturing the rock as PGV did for decades in this area did or did not weaken it and or provide an easier path for Pele to visit the plant, and devastate the surrounding communities.

5)Alternatives to geothermal exist:

Independent off grid solar is here now, if there is any chance at all PGV contributed to the easiest path to the surface for the 2018 eruption they should be shut down immediately, instead they are not only doing it again right now, they are expanding to increase the amount of cracking they already have done. We already have the largest off grid community in the country here in Puna that I know of. That independant solar production not only eliminates the need for the expensive, hard to maintain, vulnerable to disruption, and environmentally degrading effects it produces, it is not hurting our friends, families, or neighbors like the toxic and dangerous PGV operations have for the last 30 years. When is enough, enough, why can't we shut PGV down now? Until such time as all of these issues have been honestly addressed. One of the reasons PGV refused to stop or do the EIS first is they are banking on the courts giving weight to the economic investment they have made when the harms and benefits are weighed. That should not be a factor given in this case, the deliberate violation of the HEPA laws were done with forethought and planning. PGV was told HEPA required them to do an EIS "first"and litigation was initiated, yet they ignored the law like they have for 34 years and proceeded anyway they should bear the cost of their reckless financial expenditures not the community.

We do not need dirty, expensive, dangerous PGV power nor is it the best option to reduce our dependence on fossil fuels.

Solar is now growing much faster than any other energy technology in history. How fast? Fast enough to completely displace fossil fuels from the entire global economy before 2050.

I would like to submit the article linked below for the EIS record.

The rise and rise of cheap solar is our best hope for rapidly mitigating climate change.

Despairing about climate change? These four charts on the unstoppable growth of solar may change your mind (techxplore.com)

I also join in and adopt the attached comments submitted by Christopher A. Biltoft and Michael R. Edelstein, Ph.D., Environmental Psychologist and attached as my own.

Robert Petricci
Close proximity neighbor to the PGV site since 1981

1) Hawaii's ceded lands are lands which were classified as government or crown lands prior to the overthrow of the Hawaiian monarchy in 1893. Upon annexation in 1898, the Republic of Hawaii ceded these lands to the United States. In

1959, when Hawaii was admitted into the Union, the ceded lands were transferred to the newly created state, subject to the trust provisions set forth in § 5(f) of the Admission Act. Hawaii Admission Act, Pub.L. No. 86-3, 73 Stat. 4, 6 (1959). Section 5(f) provides:
The lands granted to the State of Hawaii by subsection (b) of this section ... together with the proceeds from the sale or other disposition of any such lands and the income therefrom, shall be held by said State as a public trust [1] for the support of the public schools and other public educational institutions, [2] for the betterment of the conditions of native Hawaiians, as defined in the Hawaiian Homes Commission Act, 1920, as amended, [3] for the development of farm and home ownership on as widespread a basis as possible, [4] for the making of public improvements, and [5] for the provision of lands for public use. Such lands, proceeds, and income shall be managed and disposed of for one or more of the foregoing purposes in such manner as the constitution and laws of said State shall provide, and their use for any other object shall constitute a breach of trust for which suit may be brought by the United States.

Reference materials and documents in support of my comments:

Legendary long time civil defense director and 3 time Hawaii County Mayor Harry Kim:
I consider Act 97 a huge threat to Hawaii's people and its environment.*Harry Kim*
KIM: Bill to repeal Act 97 needs your help (bigislandvideonews.com)

Geothermal is a Red-Hot Topic

NOVEMBER 3, 2013

Geothermal is a Red-Hot Topic - Hawaii Business Magazine

PGV's parent company Ormat, the apple doesn't fall far from the tree

October 28 2016
The lawsuit alleged that the federal government had claims against the defendant arising from the submission of applications for and receipt of grants under the American Recovery and Reinvestment Tax Act of 2009, related to the 8MW Puna Geothermal Power Plant and Puna KS-14 Well, both on the island of Hawaii, and the North Brawley Geothermal Power Plant in Imperial County, Calif.

Several Reno companies that operate geothermal power plants in Nevada, California, Hawaii and elsewhere, have agreed to pay the United States $5.5 million to resolve civil fraud allegations that they unlawfully applied for and received millions in federal clean energy grants, announced U.S. Attorney Daniel G. Bogden for the District of Nevada.

Ormat Technologies, Inc., Ormat Nevada, Inc., Puna Geothermal Venture II, L.P., ORNI 18, LLC, and Puna Geothermal Venture, G.P. (hereinafter referred to as Ormat), and the United States entered into the agreement to avoid the delay and uncertainty and expense of protracted litigation.

District of Nevada | Reno Geothermal Power Plant Operator Enters Into $5.5 Million Settlement With DOJ Over Grant Fraud Allegations | United States Department of Justice

April 20 2015
Suit Alleging Massive Fraud Includes Hawaii Geothermal Plant - Honolulu Civil Beat

Part of this money fraud was connected directly to PGV

June 22 2013
Two former employees of Ormat Technologies filed a lawsuit two years ago claiming that the firm lied to the Treasury Department in order to obtain more than $130 million in federal grants.

The lawsuit also alleged that Ormat retaliated against one whistleblower by threatening to take away her health insurance when she was being treated for breast cancer.

"Not only did Ormat wrongfully obtain the 1603 funds, but Ormat continues to file false certifications pertaining to the success, viability and operation of the geothermal projects that received grant funds so as to prevent the funds' recapture. Ormat additionally continues to make false public statements claiming its use of funds obtained from the Government were appropriate," the lawsuit alleges.

Harry Reid Defends 'Green Energy' Firm Accused of Lying to Govt | Newsmax.com

March 1, 2021

Ormat's General Counsel & Chief Compliance Officer and a Director Are Under Pre-Indictment in Israel, a Formal Stage of Prosecution, Over Extensive Allegations of Bribery, Fraud, And Money Laundering

- **Today we reveal how ESG-darling Ormat, a developer and operator of geothermal power plants, has engaged in what**

we believe to be widespread and systematic acts of international corruption

Ormat: Dirty Dealings in 'Clean' Energy – Hindenburg Research

June 11, 2018,
As alleged in the June 11 complaint, the Company repeatedly made false and misleading statements in its SEC filings during the Class Period.
For example, on a form filed with the SEC on August 8, 2017, the Company stated that its "disclosure controls and procedures" were effective as of June 30, 2017. It also stated that "[t]here were no changes in our internal controls over financial reporting in the second quarter of 2017 that have materially affected or are reasonably likely to materially affect our internal controls over financial reporting."
On the same form, Ormat included signed certifications in which the senior officers named in the suit affirmed the "accuracy of financial reporting, the disclosure of any material changes to the Company's internal controls over financial reporting, and the disclosure of all fraud."
The Company reiterated these statements and included signed certifications attesting to the same matters on two additional forms filed with the SEC during the Class Period.

Ormat Technologies Class Action Lawsuit | Levi & Korsinsky, LLP | Securities Class Action Attorneys (zlk.com)

Ormat Nevada
But the story continues. As we reported in the introduction, Kai Anderson, a lobbyist for NGP's partner corporation, Ormat Technologies, Inc., is a former Senate aide to Harry Reid. Ormat's CEO Paul Thomsen is another former Reid aide. Additionally, according to the Washington Times, "Mr. Fairbank denied knowing or lobbying Mr. Reid, but the House Oversight Committee said Ormat Inc., which was paid $80 million to build NGP's Blue Mountain plant, has 'strong ties' to the senator."

Goddard and Goddard 1991 - Geothermal Action Pl...

5 attachments

- **Letter_HawaiiEnvironmentalReviews_PGV_EIS_Amelung.pdf** 2019K
- **2013 - Geothermal Public Health Assessment.pdf** 3102K
- **6-6-23-Shelley Article_000062.pdf** 1046K
- **PGVRepower0623 (1).pdf** 55K
- **Preliminary Executive Summary (1).docx** 29K

Sara Steiner <sarahsteiner@gmail.com> Thu, Jun 29, 2023 at 6:00 PM

Gmail

Sara Steiner <pahoatoday@gmail.com>

[ppastrat] Comments of Robert Petricci submitted for 2023 PGV EIS

Robert <nimo1767@gmail.com> Fri, Jun 23, 2023 at 10:39 PM
To: michele.lefebvre@stantec.com
Bcc: pahoatoday@gmail.com

Aloha Michele]

Can I please get confirmation that you received and logged my comments? The date and time are on the email I sent you yesterday at 5:27pm 6/22/2023

Mahalo
Robert Petricci
[Quoted text hidden]

EXHIBIT "2"

Gmail **Sara Steiner <pahoatoday@gmail.com>**

[ppastrat] Fwd: Response to voicemail

1 message

Robert <nimo1767@gmail.com> Fri, Jul 14, 2023 at 9:11 AM
Bcc: ppastrat@googlegroups.com

--------- Forwarded message ---------
From: **Michele Lefebvre** <Michele.Lefebvre@cardno-gs.com>
Date: Fri, Jul 14, 2023, 8:36 AM
Subject: Response to voicemail
To: nimo1767@gmail.com <nimo1767@gmail.com>
Cc: Planning Internet Mail <planning@hawaiicounty.gov>, Michael Kaleikini (Mkaleikini@ormat.com) <Mkaleikini@ormat.com>

Hi Robert Petricci,

This email is to confirm that I received your voicemail on Friday July 7. I apologize for the delay in getting back to you, but I was traveling off-island this week for work and had limited availability. Your written comments on the Draft EIS were received. We are currently working on responding to comments on the Draft EIS and preparing the Final EIS. We don't have any other updates to the schedule at this time.

Sincerely,

Michele Lefebvre

Sr. Project Manager

Office: 808 528-1445

Direct: 808 791-9872

michele.lefebvre@stantecgs.com

Stantec

PO Box 191

Hilo HI 96721

https://www.stantec.com

EXHIBIT "3"

--
For web access, visit https://groups.google.com/d/forum/ppastrat?hl=en
---

2 attachments

image001.jpg
7K

image001.jpg
7K

Gmail **Sara Steiner <pahoatoday@gmail.com>**

[ppastrat] Fwd: Response to voicemail

Robert <nimo1767@gmail.com> Mon, Mar 4, 2024 at 2:43 PM
To: Michele Lefebvre <Michele.Lefebvre@cardno-gs.com>
Cc: "Michael Kaleikini (Mkaleikini@ormat.com)" <Mkaleikini@ormat.com>, Planning Internet Mail <planning@hawaiicounty.gov>
Bcc: pahoatoday@gmail.com

Michele

My email records show you received my comments for the final EIS Thu, Jun 22, 2023 at 5:27 P. See attachments

Robert Thu, Jun 22, 2023 at 5:27 PM To: michele.lefebvre@stantec.com Bcc: ppastrat@googlegroups.com 6/22/2023 The following comments, questions, documents, exhibits, and facts are hereby submitted to the 2023 Puna Geothermal Venture EIS process by Robert Petricci PO box 2011, Pahoa, Hawaii, 96778 To Ms. Michele Lefebvre Stantec Consulting, Inc. P.O. Box 191 Hilo, HI 96721-0191 Re: Puna Geothermal Venture Repower Project DEIS Aloha Ms. Lefebvre: Please accept and address these comments, questions, documents, articles, exhibits, and facts for the Puna Geothermal Ventures 2023 Environmental Impact Statement (EIS) you have been contracted to prepare

Robert Fri, Jun 23, 2023 at 10:39 PM To: michele.lefebvre@stantec.com Bcc: pahoatoday@gmail.com Aloha Michele] Can I please get confirmation that you received and logged my comments? The date and time are on the email I sent you yesterday at 5:27pm 6/22/2023 Mahalo Robert Petricci [Quoted text hidden]

On Mon, Mar 4, 2024 at 2:22 PM Michele Lefebvre <Michele.Lefebvre@cardno-gs.com> wrote:

> Hello Robert,
>
> Your email regarding the ARPPA (see attached) was sent and received on July 7, 2023. The comment period for the Draft EIS concluded on June 22, 2023. Since your email was received after the close of the 45-day comment period, it was considered but not included in the Final EIS (per HAR Section 11-200.1-25).
>
> All comments received on the Draft EIS during the 45-day comment period are included in Appendix D (Volume 2) of the Final EIS including your oral comment (Letter 92) which appears on pages D-1146 and D-1147.
>
> [Quoted text hidden]

3 attachments

- **Gmail - [ppastrat] Comments of Robert Petricci submitted for 2023 PGV EIS (1) (2).pdf** 510K
- **Gmail - [ppastrat] Fwd Michele Lefebvre Response to Petricci voicemail (1).pdf** 179K
- **Gmail - [ppastrat] Confirmation email to Lefebvre by Petricci 6-23-2023 (1).pdf** 93K

EXHIBIT "4"

Gmail

Sara Steiner <pahoatoday@gmail.com>

Formal request for why my testimony on the PGV EIS were not included as required by law

Robert <nimo1767@gmail.com> Thu, Mar 7, 2024 at 10:09 AM
To: michele.lefebvre@stantec.com
Cc: "Michael L. Kaleikini" <Mkaleikini@ormat.com>, Planning Internet Mail <planning@hawaiicounty.gov>, ashley.kierkiewicz@hawaiicounty.gov, David Corrigan <davecorrigan2002@yahoo.com>, Joy San Buenaventura <joy4puna@outlook.com>, news@civilbeat.org
Bcc: pahoatoday@gmail.com

Aloha Michele

This is my second formal request to you for an explanation of why my testimony in the PGV EIS was not included and answered as required by law. My first request for an explanation to you by email on March 4 2024 was in error as the attached emails show. Your response to my request sent on March 4 claimed you did not get my emailed testimony until July 7th and said you got them but not by the deadline of 6/22/2024. You talked about a PUC proceeding instead of my PGV EIS comments. To be clear my email records along with the people they were BCC to show you not only received my testimony at 5:23 June 2 2024 but a follow up email asking you to confirm receipt of my comments on June 23 @ 10:39pm. As one of the most historically impacted area residents, being denied my participation follows the pattern of and abuses lawlessness I outlined in my oral and written comments. We talked several times on the phone and I testified and talked with you at the public hearing in Pahoa. I told you about my concerns, things like this being the norm during PGV permitting more than once or twice. You assured me not to worry my concerns would be addressed each time we spoke. The reality is the permit has now been approved with me being denied participation or my submitted written testimony, facts, documents, and other essential information to the process that I sent "before" the deadline considered or included. Please do not ignore me here again, I need an explanation in a timely manner. The public hearing limited me to 3 minutes, there was no way I could even scratch the surface, much less get the documents, facts, and information needed into the record. There was time left at the end of the public hearing so I asked to finish commenting and you refused to allow it. This is nothing new, it fits the pattern of PGV permitting and regulation that has allowed this dangerous development to operate above the law since the first permit hearing I attended and testified at in 1989. I attached the emails again here for you that show what I am telling you is correct and you are mistaken in claiming I missed the deadline by 2 weeks. Also attached is your email response on July 14 to my follow up phone call seeking confirmation my comments were received. You say in that email you got them and are working on the EIS. In reality it appears after all my efforts to get you the information and verify you got it, my comments and concerns were not considered or answered. Please respond with an explanation, time is of the essence.

Mahalo for your prompt attention and response
Sincerely
Robert Petricci

3 attachments

Gmail - [ppastrat] Comments of Robert Petricci submitted for 2023 PGV EIS (1) (2) (1).pdf
510K

Gmail - [ppastrat] Confirmation email to Lefebvre by Petricci 6-23-2023 (1).pdf
93K

Gmail - [ppastrat] Fwd Michele Lefebvre Response to Petricci voicemail (1).pdf
179K

EXHIBIT "5"

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT
STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Relief)** DECLARATION OF CHRISTOPHER BILTOFT IN SUPPORT OF COMPLAINT

DECLARATION OF CHRISTOPHER BILTOFT IN SUPPORT OF COMPLAINT

1. I, Christopher Biltoft, hereby declare the following is true to the best of my knowledge and belief and will testify at a hearing or trial, not limited to the following:

2. I was a resident of Lower Puna, near the Puna Geothermal Venture "PGV" for many years until the 2018 Kilauea eruption.

3. I have many years' expertise in modeling and monitoring gasses, including Hydrogen Sulfide, and am qualified to discuss the matter.

4. Since 2015, I was a party in the twice-failed attempt to have a contested case hearing with the State of Hawaii Department of Health over their issuance of a "noncovered source permit" "NSP" regulating the emissions of Hydrogen Sulfide.

5. Hydrogen Sulfide is a heavier-than-air gas which can kill a human in several seconds at a high concentration and I am concerned it is not properly regulated by the State of Hawaii.

6. I submitted various comments on the Draft Puna Geothermal Venture EIS which were not adequately addressed, as follows:

7. **COMMENT 1**: Draft EIS, Section 2.1.6 Existing Operations. Please note that the ESRF is used for upset conditions, but does not prevent a release of unabated H2S into the atmosphere. The ESRF is essentially a pile of rocks into which steam containing high levels of H2S and other toxins are dumped during emergency conditions. Sodium hydroxide is sprayed over the ESRF in an attempt to neutralize the H2S, but is only marginally successful. PGV failed to shut down power production in a timely fashion during Hurricane Iselle and had to use the ESRF to dump its toxic steam after power lines went down. The result was the wind-borne dispersion of both H2S and caustic soda through the nearby community. No H2S measurements were available for this incident because the monitoring system went down when the power was shut off. PGV received a slight slap on the wrist for this incident. STANTEC RESPONSE: *Sections 3.10 and 3.11 of the Draft EIS include a description of the facility's procedures for identifying, reporting, and responding to any exceedances and how to respond in the case of natural disasters as required in permit requirements for public health and safety.* REPLY: A description of the facility's procedures does not address the demonstrable fact that those procedures are faulty at best and dangerous to the public when implemented.

8. **COMMENT 2.** Draft EIS, Section 3.3 Air Quality and Climate Change. PGV continues to operate under an outdated non-covered source permit (NSP 0008-02-N) that expired in 2019, and the DOH has refused, for some unknown reason, to update this permit to include current wells (as shown in Table 2.1 of this notice) and other facilities. Compliance with existing laws and regulations pertaining to H2S is also missing in the draft DOH NSP. STANTEC RESPONSE: *This Notice correctly states in Table 4.1 that the current NSP requires amendment for the Project. Comment noted. PGV is currently working with the DOH to update the noncovered source permit. New permits will be applied for if and when necessary, as described*

in Sections 1.5.1, 3.10, and 3.11 of the EIS and Draft EIS. REPLY: No! NSP 0008-02-N was outdated, deficient, and replete with errors the moment it was recently re-issued. If DOH is working on a correction, they have yet to produce it.

9. **COMMENT 3.** Draft EIS, Section 3.3 Air Quality and Climate Change. Existing studies, for example the 1992 ERP as well as the April 2021 updated ERP, do NOT conclude that PGV plant operations are "unlikely to post a threat to the air quality in nearby residential areas." The early dispersion modeling done for the PGV Emergency Response Plan (ERP) using ISCST and the recent ERP modeling done using AERMOD are consistent in showing that H2S disperses into public space in concentrations well in excess of acute exposure guideline level 1 (AEGL1), posing a hazard to both nearby residents and to the public traveling along roads past PGV. It is worth noting that these models are Gaussian dispersion models which provide ensemble averages, not peak concentrations. Peak concentrations can be many times greater than the reported ensemble averages. STANTEC RESPONSE: *Evacuation warning levels for H2S can be exceeded during toxic gas dispersion scenarios at PGV. Potential impacts to air quality are analyzed in Sections 3.3 and 3.11 of the Draft EIS. Section 3.11 also includes a discussion of the ERP, which includes an updated air modeling analysis completed in 2021 and reporting thresholds. Additionally, the ERP identifies potential impacts to the facility as well as response actions for each hazard by incorporating warning systems, control options, steps for securing and shutting down the facility, personnel evacuation, and notification of appropriate state and county agencies.* REPLY: The modeling shows that there is ample reason for concern when upset conditions occur. While PGV may have "response actions" for the safety of their on-site personnel and "notification procedures" for "appropriate state and county agencies," procedures for ensuring public safety are totally inadequate. Dispersion modeling for PGV needs to take

into account toxic plume travel down corridors like Pohoiki Road. It is not clear that the AERMOD model has that kind of resolution and there are no monitoring stations down that road to verify model performance. An attempt to study dispersion down the Pohoiki Road corridor was canceled by Mayor Kim.

10. **COMMENT 4.** Draft EIS, Section 3.3 Air Quality and Climate Change. It is true that PGV publishes "real time data" for H2S and wind direction" (along with wind speed and other variables) with 5-minute updates from three sites near the PGV perimeter. However, publishing the data and publishing correct and meaningful data are different things. Studies such as Meder (2013) have shown that data quality, particularly the H2S data quality, is poor, with missing data and negative concentrations (which are impossible) rendering the data unusable. Data from the Hilo Airport, not PGV data, were used for the latest AERMOD modeling of the PGV site, presumably due to poor quality and missing data at PGV. The Adler Report (2013) also notes that "existing monitoring systems and protocols" were found to be inadequate. PGV uses various sensors near flanges, seals, valves and other points to alert staff when significant H2S emissions occur, yet this is not included in the NSP even though laws clearly state that emissions should be measured at the source. The refusal of PGV to provide real emissions information, compounded by the refusal of the DOH to require adequate H2S measurements in their NSP, constitutes a serious threat to public health and safety. I hope that the comments presented above help inform the development of the PGV EIS. Please keep me "in the loop" as the EIS is developed.

STANTEC RESPONSE: *Comment noted; an independent third party verifies the accuracy of the air data collected and reports the results to the DOH and County of Hawai'i in compliance with the requirements of PGV's air permit and GRP. The location and operation of the monitoring stations, as well as the methods for analysis and reporting with the data from the stations, are*

consistent with Department of Health permit requirements. Potential impacts to air quality are discussed in Sections 3.3 and 3.11 of the Draft EIS. REPLY: **Negative toxic gas concentrations are physically impossible.** Data of this sort cannot be "verified" by any "independent third party." The reporting of such data to the "DOH and County of Hwaii'i in compliance with the requirements of PGV's [out of date and erroneous] air permit" (NSP 0008-02-N) does not make the reporting of obviously erroneous data acceptable. Relying on bogus data from three perimeter sampling stations does not constitute an adequate monitoring program. Using faulty data to produce 1-hr and 24-hr averages is bogus. The Agency for Toxic Substances and Disease Registry (astdr.cdc.gov) states that H2S from natural sources is routinely found in concentrations below 1 ppb, but can be higher [in excess of 1 ppb] near industrial and volcanic sources. Emissions should be measured at the source. The technology exists to do this. PGV and DOH refuse to comply with this legal requirement. Toxic gas emissions are supposed to be measured at the source where they enter the atmosphere. HAR 11-60.111 addresses sampling, testing and reporting methods, to include a requirement for source sampling. HAR 11-60.1-12 states: "*all required estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR Part 51, Appendix W.*" Such modeling requires source information, which includes a requirement for source sampling.

11. **COMMENT 5.** Table 2-1. Past and Current Wells at PGV. Please note that the wells and facilities listed in this Table are at variance with the wells and facilities described in the PGV Noncovered Source Permit (NSP No. 0008-02-N) issued October 11 2022. It is worth taking note of these discrepancies to ensure that they are corrected. STANTEC RESPONSE: The source of the list was cited from the EPA's response to comments: *Puna Geothermal Venture. Puna Geothermal Venture Class V Geothermal Injection Well Permit No. R9-UICHI5-FY16-1R. The*

reference, EPA 2021a, is included with the other references at the end of the Draft EIS. REPLY: The errors in the current NSP are yet to be corrected.

12. **COMMENT 6.** Section 2.1.6. Pollution Abatement. The DEIS cites the (out of date and erroneous) PGV NSP No, 0008-02-N, which grossly overstates the functionality of hydrogen sulfide (H2S) abatement systems, as evidenced by numerous releases of this toxic gas into the surrounding community. There is also no analysis of how or if the proposed alternatives will alleviate current or future problems with the release of H2S into public space. STANTEC RESPONSE: *PGV currently implements an air quality monitoring program that is required under the conditions of its Noncovered Source Permit, regulated by the State of Hawaii Department of Health, that would continue through the life of the currently authorized PGV facility and under the Proposed Action and 46 MW Alternative. As stated in Sections 3.3.1 and 3.3.11 of the Draft EIS, three air monitoring stations operate on the southeast, southwest, and west fencelines –A1, B1, and C1, respectively – and capture real time air quality data to monitor emissions compared to the permitted thresholds that is available on the PGV website. As stated in Section 3.11.2 of the Draft EIS, there are also sensors with alarms located strategically on each turbine/generator unit and throughout the existing wellfield. The alarms immediately alert PGV personnel of fugitive H2S emissions so that corrective action can be taken. Also as noted in Section 3.11.1 of the Draft EIS, PGV publishes real-time data from the H2S monitoring sites on its website.* REPLY: Citing a noncovered source permit (NSP No. 0008-02-N) previously identified as outdated, deficient, and erroneous and "monitoring stations" shown to produce erroneous data constitutes a non-response to the comment. The EIS produces no analysis indicating that any of the considered alternatives would adequately protect the public from future releases of toxic gas, particularly hydrogen sulfide, into public space.

13. **COMMENT 7.** Section 3.2.1 Existing Environment, Surface Water Features, Springs, etc. The "historical Green Lake" and "perched aquifer at the Kapoho Crater"no longer exist. They were destroyed in the May-June 2018 Kilauea Volcano eruption through the Lower Eastern Rift Zone (LERZ). Further, reference to Evans (2015) is problematic due to the 2018 eruption which greatly impacted the LERZ environment. If there are no studies available describing the current condition of surface water, ground water, springs, etc. it should be so stated in the EIS. STANTEC RESPONSE: *As described in Section 3.2, the study by Evans et al. (2015) is a broad understanding of surface water and groundwater in the vicinity of PGV following 20 years of operations. Impacts to springs or groundwater was not identified in this study and the 2018 eruption has not changed PGV's operations in a way that would change the conclusions of Evans et al. (2015). Groundwater monitoring by PGV at their monitoring wells occurs biannually per PGV's Hydrologic Monitoring Program. Regional water supplies are tested by their operators and water quality is reported annually.* REPLY: The Evans et al (2015) report's "broad understanding of surface water and groundwater in the vicinity of PGV" cannot possibly be relevant after the major 2018 lava flow completely altered the geology of the affected area and destroyed the "historical Green Lake" and "perched aquifer at the Kapoho Crater."

14. **COMMENT 8.** Section 3.2.2 Environmental Impacts. In addition to the analyzed alternatives, please consider an alternative that evaluates the expansion of wind, biofuel, photovoltaic, and solar thermal sources. There are abundant opportunities to expand these alternatives on the Big Island of Hawai'i, which would provide the required energy without the cost, social, and environmental burden of continuing to use the PGV geothermal power plant. Also note that the flawed Act 296-83 that allowed geothermal development regardless of existing land use classification set up a continuing conflict between PGV and local residents, with PGV

operating an industrial geothermal facility in close proximity to public roads and peoples homes. Most other geothermal facilities are located at considerable distance from public roads and residences, thereby reducing the potential for such conflicts. STANTEC RESPONSE: *Evaluation of alternative energy sources is out of scope of this EIS. The Project proposes upgrades to the existing PGV facility for continued geothermal power production. Zoning laws in the Project Area allow the industrial operations of the geothermal powerplant at such location, and the PGV facility site operates in compliance with existing permits. Additionally, several operating geothermal power plants are located nearby to neighborhoods per their specific zoning laws and environmental permitting, including in the French Caribbean (Bouillante plant), Guatemala (Zunil plant), United States (Nevada – Steamboat Hills plant), Turkey (Kerem plant), and Indonesia (Sarulla plant). PGV operates within the applicable zoning laws and the GRP.* REPLY: Who decided that reasonable alternatives (wind, bio-fuel, photovoltaic, and solar thermal) were out of the scope of this EIS? Considering only the continuation of geothermal exploitation is not a reasonable evaluation of available alternatives.

15. **COMMENT 9.** Section 3.3.1.1. General Discussion of Air Quality Products. While there is a Federal standard for "criteria air pollutants" such as sulfur dioxide (SO2), no Federal standard exists for I-LS, which is basically SO2 below ground in its reduced (un-oxidized) state. This is for purely political not scientific reasons, due to intense lobbying by polluting industries. Of the two, H2S is the far more dangerous toxic gas, second only to carbon monoxide in terms of the injuries and deaths from industrial sources. STANTEC RESPONSE: *Comment noted. As described in Section 3.11.1 of the Draft EIS, PGV conducts H2S monitoring and reporting as required by its DOH NSP (a state air pollution control permit) for its current operations.* REPLY: The cited "DOH NSP" was previously identified as outdated, deficient, and erroneous.

The H2S monitoring data presented in 1-hr and 24-hr averages has been shown to be bogus. Toxic emissions should be measured at the source.

16. **COMMENT 10.** Section 3.3.1.2. Air Quality Setting. Ambient air monitoring data from the Leilani site, over a mile from the PGV source, cannot possibly be considered representative of PGV toxic gas emissions. Tbe PGV H2S monitoring program has been repeatedly identified as being totally inadequate (see, for example, Meder's 2013 thesis: 'Hydrogen Sulfide Emissions of Geothermal Development in Hawai'i [www.soest.hawaiLedu/oceanography/GES/thesis/Emile Meder.pdf], and the 2013 Adler Geothermal Public Health Assessment). Neither county or state officials have been willing to address this issue. STANTEC RESPONSE: *Monitoring Site C1 located on the west fence line of the facility was chosen due to the proximity of homes at the Leilani Estates Subdivision. As stated in section 3.11.1 of the Draft EIS, PGV publishes these real-time data (including H2S concentrations) on its website. These data are reviewed, validated, and submitted by PGV in monthly reports to the Hawai'i DOH and semiannual reports to the Planning Department consistent with permit requirements.* REPLY: PGV toxic gas emissions must be measured at the source. Bogus data from PGV's "monitoring sites" are useless regardless of being "reviewed, validated, and submitted by PGV in monthly reports" to a DOH agency.

17. **COMMENT 11.** Section 3.11.1 Health and Safety. Existing Environment. The effects of H2S exposure vary greatly from one individual to the next, making the establishment of precise health and safety standards difficult. Existing NIOSH etc. standards presumably apply to healthy adults in a work environment. Effects on children, the infirm, the elderly, or those with increased sensitivity to H2S are not adequately addressed in these standards, or in the Hawai'i State H2S standard. When assessing the potential human health risks associated with inhalation exposure to

H2S, the frequency, duration, and magnitude of the exceedances all play important roles. Infrequent exceedances of a short-term (one-hour) exposure limit may be less likely to result in respiratory events than exceedances that occur over prolonged periods of time (hours to days at a time). Moreover, the receptor location with the greatest number of exceedances is likely to better represent reasonable worst-case conditions than the receptor location where the maximum concentration is predicted to occur but where fewer exceedances are anticipated. STANTEC RESPONSE: *As described in Section 3.11.1 of the Draft EIS, monitoring data suggest that H2S concentrations within the fence line are well below 5 ppb the majority of the time. Thus, under normal operating conditions, residents in nearby communities are not expected to experience an H2S odor. Furthermore, the three National Academy of Science's Acute Exposure Guideline Levels (AEGLs), adopted by the EPA, represent threshold exposure limits for the general public and are applicable to emergency exposure periods from 10 minutes to eight hours (described further in Section 3.11.1 of the Draft EIS). Based on the air dispersion modeling conducted at the PGV facility in 2012, H2S concentrations decrease the further one moves from the fence line; however, contour plots show that as far as 1.5 miles beyond the fence line concentrations in residential areas may still exceed the acute MRL of 70 ppb and the 1hour AEGL-1 of 510 ppb. As such, residents in the surrounding communities may experience transient, non-disabling irritation and discomfort assuming the upset condition continues unabated for an hour. However, this scenario can be quickly controlled by closing valves to shut in the well, so it is unlikely that exposures to this scenario would last as long as an hour. The results of the air dispersion modeling analyses indicate that the AEGL-1 and acute MRL were exceeded for nine out of the twelve modeled upset conditions. The AEGL-2 and AEGL-3 thresholds were not exceeded in any upset scenario. PGV has an ERP in place to protect the health and safety of the public should an*

upset condition or an emergency scenario occur. REPLY: PGV has a history of upset conditions with durations extending for hours or days. The EIS provides no evidence that PGV's capacity for responding to or controlling releases during upset conditions has improved or will improve under the preferred scenario.

18. **COMMENT 12.** The problem with H2S exposure is further compounded by measurements reported at PGV sampling sites (Al, Bl, Cl). These sites routinely present negative H2S readings (negative concentrations are impossible) which, when averaged over 1, 8, or 24 hours would mask any real gas concentration data measurements. Refer to Meder (2013) for the only known comprehensive analysis of monitoring system performance at PGV. The whole monitoring setup is designed to fail in its supposed function, creating the illusion that PGV does not have an H2S emissions problem. Even in the unlikely event that the PGV perimeter samplers were actually correctly measuring H2S from a PGV toxic gas plume passing into public space, an array of three sampling sites is completely inadequate. Based on 25 years of personal experience, I can confidently state that at least six concurrent transecting measurements are needed to adequately characterize a plume dispersing in the atmosphere. STANTEC RESPONSE: *PGV currently implements an air quality monitoring program that is required under the conditions of its Noncovered Source Permit, regulated by the State of Hawaii Department of Health, that would continue through the life of the currently authorized PGV facility and under the Proposed Action and 46 MW Alternative. As stated in Sections 3.3.1 and 3.3.11 of the Draft EIS, three air monitoring stations operate on the southeast, southwest, and west fencelines –A1, B1, and C1, respectively – and capture real time air quality data to monitor emissions compared to the permitted thresholds that is available on the PGV website. As stated in Section 3.11.2 of the Draft EIS, there are also sensors with alarms located strategically on*

each turbine/generator unit and throughout the existing wellfield. The alarms immediately alert PGV personnel of fugitive H2S emissions so that corrective action can be taken. Negative measurements are a result of sensor calibrations. REPLY: Sampler stations (A1, B1, and C1) at the PGV perimeter, even if functioning properly, are totally incapable of monitoring PGV H2S emissions. The number of sampling stations is inadequate. Emissions must be monitored at the source. Negative concentration measurements may be a consequence of faulty sensor calibration or a sensor out of calibration.

19. **COMMENT 13.** The DEIS notes that, according to the previous EIS, total PGV emissions should not exceed 4 lbs/hr. How is this measured? Where are the data? The PGV ERP identifies scenarios where H2S can be emitted at an unabated rate up to 560 lbs/hr. This is why PGV employees are provided HAZMAT suits. If PGV can actually measure its H2S emissions, it should do so and make those data public. If PGV cannot measure (or at least estimate) its emissions, it should not be operating. Hydrogen sulfide emissions are subject to the Emergency Planning and Community Right-To-Know Act (EPCRA), Section 112(r) of the Clean Air Act (CAA), and the EPA lifted its stay on reporting H2S releases on 11 October 2011. Any release over 100 lbs now should be reported under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Hawai'i DOH chooses to ignore these requirements, and if PGV actually measures its emissions these data are concealed from the public. STANTEC RESPONSE: *The PGV facility operates in compliance with the ERP, which complies with GRP Condition 26 (k) for notifications to the public arising from emergency conditions at the site. The PGV facility has operated within the requirements of the existing DOH NSP to ensure potential air pollutants remain under the regulatory thresholds and would continue to operate in accordance with the permit and all federal, state, and local regulations*

under the Proposed Action. Furthermore, under normal plant operations with the new OECs proposed, emissions of H2S are not expected to be above the human health thresholds. If H2S emissions are below the DOH limits of 25 ppb for 1-hour exposure, unacceptable risks to human health are not anticipated. Existing H2S abatement systems will remain in place to abate fugitive H2S emissions, which could result from upset conditions. As described in Section 2.1.6, Sensors with alarms are located strategically on each turbine/generator unit and throughout the wellfield. The alarms immediately alert personnel of fugitive H2S emissions so that corrective action can be taken. Also as noted in Section 3.11.1 of the Draft EIS, PGV publishes real-time data from the H2S monitoring sites on its website. The Draft EIS includes a description of the facility's requirements for identifying, reporting, and responding to any exceedances from monitoring air quality, and hazardous materials as identified in permit requirements (Sections 3.3 and 3.11). These permits are reviewed by the agencies that hold them. Table 4-1 of the Draft EIS includes a list of the permits and the agencies that review and issue them for the existing PGV facility and the proposed Project. If any exceedances are detected, each permit requires specific action to remedy the issue. REPLY: The ERP is not a compliance document and public notification has been inadequate during past emergencies when toxic gas has been released into public space. The (out of date, deficient, and erroneous) NSP is a compliance document, but fails to mention any requirement to notify local (County) authorities or the public. The County of Hawai'i Geothermal Resource Plan (GRP 87-1, issued 3 October 1989) states (page 2) "Unabated geothermal emissions will be vented to the atmosphere during well cleanout and pipeline clearing [no time limit; this may go on for hours]." It also states (Page 11) "The permittee shall apply Best Available Control Technology (BACT) for air emissions to all aspects of the project to minimize air quality impacts," and then goes on to state "....project emissions

shall not exceed 5 ppb at or beyond the project boundary." The cited GRP lacks consistency, is obviously out of date, and is of questionable validity given that the Hawai'i State Legislature granted full control of geothermal environmental issues to the State of Hawai'i (Act 97 of 2012).

20. **COMMENT 14.** During normal operations, H2S emissions are mostly contained. That changes drastically during "upset conditions" as described in the current (2022) PGV ERP with H2S source emissions on the order of 1000 ppm. Atmospheric dispersion modeling (AERMOD) results show that H2S releases disperse into public space at concentrations exceeding 6 ppm, well in excess of AEGL 1 levels. Also, AERMOD, a Gaussian dispersion model, can produce only ensemble average results. Peak concentrations can be many times greater than the ensemble average. STANTEC RESPONSE: *Comment noted.* REPLY: The EIS cannot reasonably state that PGV operations pose no hazard to the public while also stating that toxic gas emissions, to include H2S, may exceed AEGL-1.

21. **COMMENT 15.** Beyond the scope of the EIS is the fact that the State of Hawai'i Department of Health has exhibited a complete lack of interest in monitoring toxic emissions from PGV, perhaps because PGV is an integral part of the big plan to go "green" by some future date. STANTEC RESPONSE: *Comment noted. Air quality monitoring data is submitted to the DOH on a quarterly basis based on real time air quality data measures at the fence line monitoring stations at the existing PGV facility. These data are available on PGV's website. As described in Section 3.11.1 of the Draft EIS, PGV conducts air monitoring and reporting as required by its DOH NSP for its current operations.* REPLY: The failure of the DOH to update its NSP and note the receipt of bogus H2S concentration data is indicative of its unwillingness to adequately monitor PGV operations.

22. **CONCLUSIONS:** While the Stantec PGV EIS conclusion "*No adverse effects on air quality, water quality, or noise would occur beyond existing conditions*" is probably true, given that the "No Action Alternative" is the continuation of existing conditions. There is little evidence that existing adverse impacts will be mitigated by the "Preferred Alternative." The problems lie not just with the geothermal facility, but also with the agencies that are supposed to represent and protect the public interest, i.e. the Hawai'i State Department of Health, and to some extent the County of Hawai'i. These agencies ignore Federal and State laws and regulations designed to protect the public and the environment. The EIS should not be accepted because it fails to consider relevant alternative sources (wind, solar, etc.) and considers only those alternatives that perpetuate the existing threat to public health and safety. Further, the PGV EIS cites outdated sources such as (Evans et. al., 2015) and erroneous, deficient, and out of date information provided in the NSP and GRP. It is possible that PGV could function responsibly, but that would require regulatory change to bring it into compliance with applicable laws and regulations.

DATED: 28 March
Christopher A. Biltoft

CHRISTOPHER A. BILTOFT

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT
STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Relief)** DECLARATION OF LARRY WOOD IN SUPPORT OF COMPLAINT FOR INJUNCTION

DECLARATION OF LARRY WOOD IN SUPPORT OF COMPLAINT FOR INJUNCTION

1. I, Larry Wood, hereby declare the following is true to the best of my knowledge and ability and I am competent and willing to testify at a hearing or trial, not limited to the following:

2. I am a resident of the Puna District, County and State of Hawaii.

3. I have a bachelor's degree in Geophysics from Michigan Institute of Technology "MIT".

4. I have been studying the Kilauea volcano and Puna Geothermal Venture and the 2018 Kilauea eruption since 2018.

5. Last June I submitted comments on the Draft Environmental Impact Statement (DEIS) for Puna Geothermal Project (PGV). The Final Environmental Impact Statement (FEIS) for this project was released on January 8, 2024. I submitted 25 pages of comments on the DEIS [FEIS Apx 559-570, 1081-1096].

6. Stantec, the company which created the EIS, identified 55 substantive comments in my submission. Their replies totaled 5 pages of text. I identified 5 substantive replies to my 55 substantive comments. Most of their replies referred me back to the same text to which my

comments referred as if the original DEIS statement was the final word on the matter. In other words, they did not address 90% of my substantive comments [FEIS Apx 1202-1204, 1247-1250].

7. Even their few substantive replies were ridiculous. It would take years of my time to enumerate all of the problems in all of their replies. Only one of my comments actually produced any change in the FEIS and this was for a matter of little importance. Even that correction was done incorrectly.

8. I am going to discuss details of that one change to show the low quality of work which has been done by Stantec throughout the preparation of the FEIS. The passage I am talking about can be found in Section 3.1.1.2 of the FEIS pg 35 and the response on pg 1247 in the FEIS Appendix:

> *"The LERZ is characterized by a series of northeast trending fractures, pit craters, and volcanic vent alignments extending over approximately ~~125~~50 km east of the Kīlauea calder*a."

I did mention in my comments that the distance between Kilauea Crater and Cape Kumukahi at the eastern tip of the Big Island is about 50 km so perhaps that is why Stantec included the 50 km figure in its "correction", neglecting that I also stated that the length of the LERZ was 20 km. An almost exact sentence as the one corrected appears in the paragraph above the "corrected" paragraph. It was not "corrected". Just to remind you, the distance between Kilauea Crater and Cape Kumukahi on the eastern tip of the Big Island is 50 km. While this entire distance could be thought of as Kilauea's East Rift Zone, the LERZ comprises only about a third of this distance. This is not a debatable point.

9. Another common tactic used by Stantec throughout the FEIS is to misinterpret the conclusions reached in the "peer reviewed" papers which they cite. The following quote (FEIS, Section 3.1.1.2 pg 35, FEIS Apx pg 1247) can be used to illustrate this point:

> *"The most recent eruption in the Project vicinity began in 2018 and continued until December 13, 2022."*

Although there is stiff competition as to what might be the most absurd statement in the FEIS, I believe this is my favorite. While an eruption on the Big Island did end around December 13, 2022, this was the most recent eruption on the northeast slope of Mauna Loa volcano, which is about 65 km from "the Project vicinity". According to this criterion all the eruptions at Halema'uma'u in 2021, 2022, and 2023 would also be included in the 2018 eruption.

10. In Stantec's reply to my comment about this statement, they referred me to a "peer reviewed" paper whose main author was Patricia Neal. When I examined this FEIS on pg 35, I quickly found this quote:

> *"In 2018, Kīlauea Volcano experienced its largest lower East Rift Zone (LERZ) eruption and caldera collapse in at least 200 years. After collapse of the Pu'u 'Ō'ō vent on 30 April, magma propagated downrift. Eruptive fissures opened in the LERZ on 3 May, eventually extending ~6.8 kilometers. ... Activity declined rapidly on 4 August."*

There it is in plain English, eruptive activity ended abruptly on 4 August, yet this paper is cited as the source for the absurd statement that the 2018 eruption ended in December, 2022. The statement was not altered in the FEIS, my comment was ignored [*Id.*].

11. There seems to be confusion at Stantec about when the 2018 eruption actually began. Ask anyone who lives on the Big Island, and they will answer the bottom of Pu'u O'o dropped out on April 30 and lava appeared on May 3, 2018.

12. Stantec somehow managed to mangle Neal *et* al's report and came up with their own description of the beginning of the eruption as well [FEIS 35]:

> *"Tiltmeter data from Pu'u Ō'ō began to indicate magmatically driven inflation of the ground surface beginning in mid-March 2018, and these data were essential to the Hawaiian Volcano Observatory's ability to issue a warning of the impending eruption, which began on April 17, 2018 (Neal et al. 2019). The initial eruption was followed by collapse of the Pu'u 'Ō'ō vent on April 30, 2018, and continued into August 2018, covering 35.5 square km in lava flow deposits and resulting in a total erupted volume of approximately 0.8 cubic km (Neal et al. 2019; Liu et al. 2018)."*

13. There was never any public warning from HVO on April 17, 2018 of an imminent eruption and no lava erupted on April 17, 2018.

14. To recap, according to Stantec, and based upon "peer reviewed" science, the 2018 eruption began on April 17, 2018 and ended on December 13, 2022. Such is the quality of a study which will enable a billion-dollar contract contingent on the approval of the Hawaii County Planning Department, who have no scientific expertise to evaluate the document.

Again, my comment on the above statement was ignored and rebutted with:

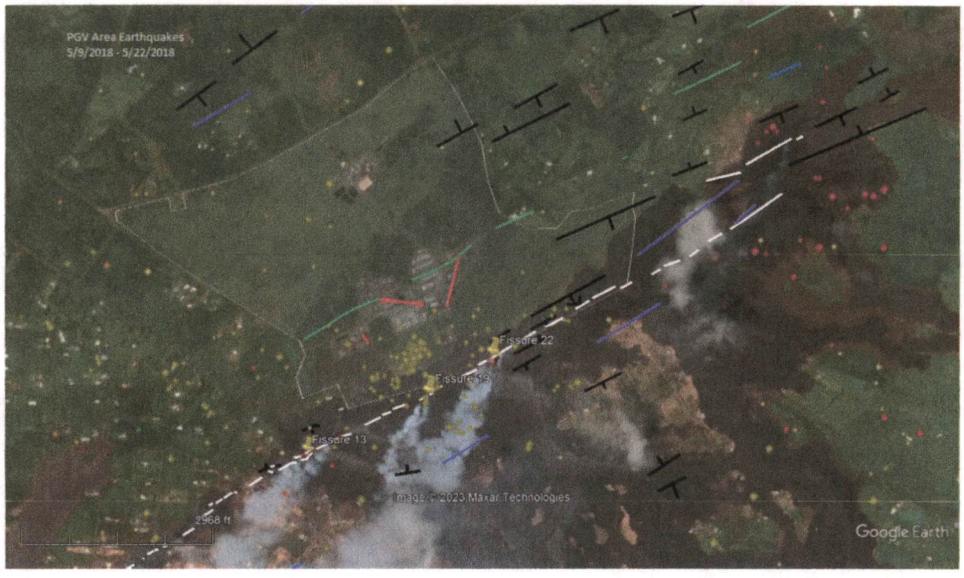
> *"This information is consistent with events included in a peer-reviewed USGS citation, Neal et al. 2019."*

15. These are just two of many similar inaccuracies found throughout the FEIS. I have chosen to write about them because they are gross misstatements of well-known and uncontroversial facts. I believe that the same sort of shoddy workmanship is also present in very important sections of the FEIS, but this is difficult to demonstrate since the evidence is more complicated and not obvious as it is in the two cases I have just cited.

16. The two examples which I have discussed above were not of great importance in terms of understanding the 2018 eruption, but I included them to show how the FEIS authors were not even capable of grasping the simplest details about the eruption.

17. I will next discuss what I believe is the most important error contained in the entire document. It concerns a major cluster of earthquakes which happened directly beneath the PGV facility during the period May 9-19 while PGV was injecting fluids into several of their production wells, illustrated by the map below.

18. My comment about this was: "PGV injected water into the four wells whose pathways are shown in red on the map for a period of over two weeks beginning May 9, 2018. Earthquakes began soon after in a somewhat dispersed fashion, but after about four hours coalesced into the yellow colored cluster near the center of the map. Eruptive activity, which had ceased four days before, resumed at Fissure 17, the most explosive fissure of the 2018 eruption, on the morning of May 13. On May 18 a significant increase in eruptive activity occurred, coincident with a renewed attempt to "quench" well KS-14. During this attempt wellhead pressures at KS-14 rose to 2000 psi, apparently triggering movement along the "reactivated fault zone #1 (RFZ#1)" which intersected KS-14 over a distance of about 2000 feet. A meter of uplift near KS-14 occurred around that time. Seismic activity ended hours later in the PGV area, as stress from the continuing injections was released through ejection of lava." [FEIS Apx 1248, Comment 67-13].



As is typical throughout the FEIS, this comment was largely ignored and dismissed with the following reply:

> *"As stated in Section 3.1.1 of the Draft EIS, USGS (the agency with the best available geologic data and publications) did not find evidence that the 2018 Lower Puna eruption of Kilauea Volcano was triggered or influenced by human activities. The eruption was caused by injection of magma down rift from Pu'u O'o and the summit of Kilauea, and the event fits a pattern of activity that has occurred many times previously on the LERZ (USGS 2020 EPA 2021a). These events are within the normal behavior for Kilauea Volcano. In summary, there is no evidence to support claims that human activity triggered or influenced the 2018 Lower Puna eruption (USGS 2020 EPA 2021a)."*

19. As usual, the reply contained no specific response to my comment, which referenced the most intense cluster of the 2018 eruption which "coincidentally" occurred directly beneath the plant while they were injecting water. Stantec replied with an irrelevant and generalized description of the eruption with the usual reference to the USGS 2020 paper. Of course, even this generic reply was full of errors and misstatements.

20. The event did NOT "fit a pattern of activity that has occurred many times". The Neal article quoted above clearly states that the 2018 was the largest eruption in Hawaii in over 200 years. Surging rivers of lava travelling 30 km/hour have never been observed before or since in Hawaii.

21. I correctly predicted Stantec's refusal to discuss my evidence with the comment: "Complete denial of this event is the only possible way to maintain the positions suggested in the DEIS." [*Id.*].

22. I notified Stantec of the following:

> PGV's Draft EIS, page 35, Section 3. l.1 .4 states in part: Fluid injection activities can lead to induced seismic response and is typically associated with subsurface pressure buildup. This pressure buildup can activate faults, resulting in seismic events. These seismic events are typically associated with three conditions: 1) the presence of a fault which is in a near-failure state of stress; 2) pathways exist which allow injected fluid to reach the fault; and 3) the fluid provides enough pressure over a long enough period of time to allow movement

to occur along the fault (USEPA 2015). The chances of triggering induced seismicity increases with increased fluid injection volume and increased injection rate. Induced seismicity is more common in rock formations with limited permeability or where large volumes of fluid are injected (USEPA 2021b). **Each of the three conditions listed by the USEPA exist in abundance at the PGV facility. The PGV facility was sited based on the ability to exploit the fault which produced the initial lava flows during the 1955 eruption. This fault is clearly in a state of stress both from the dilational movement of magma underneath and the gravitational stress induced by the slipping of the south flank of Kilauea volcano. The second condition is not even required in this case since fluid is injected directly into this fault. This fluid has had decades to allow movement to occur along the fault. Furthermore, injection pressures at the plant have doubled since the emption yet the volume of available geothermal fluids is cut in half. While fluid injection is projected to decrease with the new equipment, several million gallons of fluid will still be transiting a stressed fault every day at pressures double their former level. Each of the sentences in the paragraph above actually proves the danger that the plant poses to the community.** In my mind, this paragraph proves why no new permits should be issued to PGV. Further confirmed by the following extract of the DEIS Appendix, page 227 (from PGV application to the USEPA in 2019) "Fractures are aligned en-echelon and form a major left-step along the rift axis which results in a localized zone of enhanced dilation **(emphasis added.)**

23. Stantec's response to my comment above (FEIS Apx 1202, Letter 20, Comment 1) included the following absurd and false statement:

> *"Injection induced seismicity (IIS) has been studied at a number of geothermal project sites, and fluid injection into large faults and open fracture zones should be avoided. PGV does not inject fluids into large faults or open fracture zones, and does not inject fluids with the intent to create new fractures."*

24. Once again, we have a case of denial. In my comment I had listed detailed descriptions of PGV's exploitation of the fault which provided the pathway for the first fissure of the 1955 eruption. The plant was sited to be directly above this fault. Their wells intersect it as frequently as possible. So the statement bolded above is an obvious lie. At least they admitted that "fluid injections into large faults should be avoided."

25. In its 2019 application for renewal of its Underground Injection Control permit, PGV listed characteristics of its injection well resource:

> *"Associated with large aperture, steeply dipping fractures/fissures and the Puu Honuaula volcanic vents. The main permeable structure exploited is the 1955 Eruptive*

Fissure." Characteristics of the production resource were very similar: *"Associated with large aperture, steeply dipping fractures. The main fractures exploited are the KS6, KS5, KS14 & KS8."*

26. Thus, PGV's own US EPA permit application directly contradicts Stantec's bolded statement. PGV does in fact inject millions of gallons of fluid per day into "large faults and open fracture zones." Though it is not explicitly stated, PGV does inject fluids with the intent to create new fractures since its profits are directly tied to the existence of said fracture zones.

27. In my comments on PGV's Draft EIS about PGV injecting cold water into hot wells during the eruption, I included a quote from two scientists (Theiry and Mercury) who have extensively studied the explosive behavior of water when it encounters lava [FEIS Apx 1203,Letter 22, Comment 3] :

> "An explosion is always the violent response of a system to a physicochemical perturbation, which has left it in an energetic, metastable or unstable, state. For instance, fast thermodynamic processes (water heated at the contact of a magma, rapid depressurization of a liquid, high-speed flow of a fluid, ...) produce highly transient metastable states, which return towards equilibrium in a very rapid and explosive way. ...This paper describes, from a thermodynamic point of view, the physicochemical conditions, under which water behaves as an explosive. This phenomenon occurs frequently in hydrothermal and volcanic systems when water is brutally shifted from its initial equilibrium state. Water (either liquid or gas) becomes metastable or unstable and reequilibrates by violent demixing of a liquid-gas mixture ...

28. Stantec's reply repeated the same quote which I had used:

> **"An explosion is always the violent response of a system to a physicochemical perturbation, which has left it in an energetic, metastable or unstable, state. For instance, fast thermodynamic processes (water heated at the contact of a magma, rapid depressurization of a liquid, high-speed flow of a fluid, ...) produce highly transient metastable states, which return towards equilibrium in a very rapid and explosive way."**

Stantec then added:

> **"The geothermal wells and associated infrastructure at PGV are designed with pressure and flow rate monitoring, and both injection and production wells are operated under pressure conditions below those capable of leading to explosive behavior due to the thermodynamic properties water in the system."**

This reply had nothing to do with my own comment which referenced actions which PGV undertook in response to the approach of lava during the 2018 eruption, not as a normal operating procedure. This irrelevant reply is referenced twice more in replies to other comments I made.

29. Here is my comment about a current University of Hawaii report on PGV's subsidence FEIS Apx page 1203, Letter 21, Comment 4:

> Figure 5: Differential vertical displacement of the PGV Line relative to benchmark 147 YY. The 1992 survey acts as the baseline for elevation differences. Note that this graph compares motion from a different reference benchmark than that of figure 4 (Highway Line) and consequently, the vertical scale is slightly exaggerated relative to the graph of vertical motion along that line. Individual survey data are stacked to show cumulative relative motion. The maximum relative subsidence is located between benchmarks KS 92-6 and LC 11. Changes to the benchmark array account for the missing data for LC10 and LC11.

30. Stantec replies:

> *"Subsidence is discussed in Section 3.1.1 of the Draft EIS. In response to the comment, no survey benchmark 147 VY is defined in the work of Lundblad and Anderson (2020). The maximum relative subsidence recorded was between benchmarks KS 92-6 and LC 11, both outside of the PGV operating area (Lundblad & Anderson 2020)."*

IN REALITY: The Benchmark 147YY is clearly shown in the map accompanying my comment (reproduced in the FEIS Apx on page 564) while benchmarks 92-6 and LC11 are both within 200 meters of the main PGV facility and re included in PGV's leasehold area. This Stantec reply to my comment is a blatant lie.

31. When discussing PGV's contribution to the Big Island's energy needs, these comments are located in the FEIS Apx on page 1202:

> Over the 30-year period PGV has had 10 years of producing less than 20 MW, so I wouldn't even consider 25 MW to be firm. In summary, the DEIS report pretends that PGV's best year is typical instead of being 50% higher than average in the 30-year period. Their actual

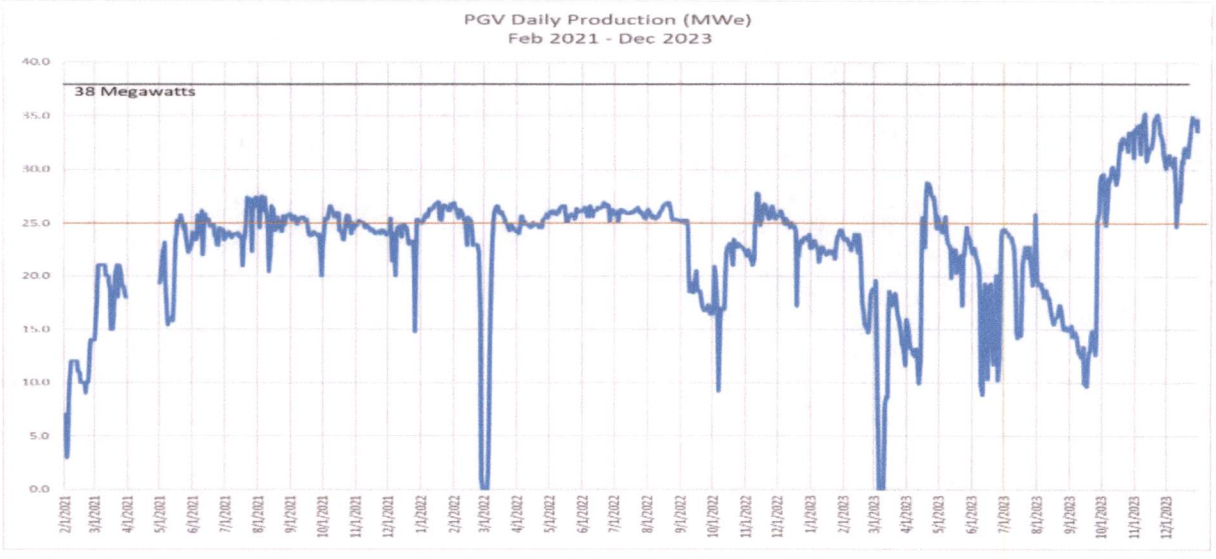
performance is artfully exaggerated with the phrase "prior to the eruption PGV produced 38 MW of electricity." The untruth of this statement is graphically shown below... While production resumed in late 2020, the total for the year was almost zero. l have not yet been able to find updated figures of PGV's production for 2022. So, again, to pretend that PGY's production is a "firm" 38 MW is fantasy. The whole DEIS reads like an advertisement for the PGV facility, instead of a serious assessment of PGV 's contributions and dangers.

32. Instead of discussing the actual performance of PGV over the decades Stantec uniformly insists that PGV's power is firm:

> "Additionally, as discussed in Section 1.3 of the Draft EIS, the electricity generated by the PGV facility is firm generation (i.e., continuous and reliable) as defined by Hawaiian Electric."

This reply was in response to one of my comments showing graphs of PGV's output over both yearly and daily periods. One would have to be delusional to describe PGV's output as "continuous" or "reliable".

33. I include a recent daily graph below which makes this abundantly clear. The recent two-and-a-half-year period from May 2018 to November 2020 when PGV generated no electricity shows that PGV cannot guarantee continuous power. Another eruption could happen at any time. There have been several periods lasting more than a year when PGV produced less than half of its listed capacity. During its 30-year history PGV has produced an average of 60% of its capacity.



34. For those familiar with statistics, the standard deviation of PGV's monthly output is 10.2 MW, or about 40% of its average output (23 MW), showing a very low degree of reliability in both the short term and the long term. This places the 95% confidence interval for PGV's output at 1 MW. Once again Stantec refused to examine actual data and make the FEIS a science-based document.

35. Instead, it doubled down on its fraudulent science based summarize, the FEIS is a thoroughly fraudulent and biased promotion of the PGV facility with little resemblance to an objective environmental review. It represents a complete betrayal of the public trust and should be rejected.

36. The most appropriate course of action with regard to the PGV facility was not even considered in the FEIS. That would be to shut down the facility immediately. It constitutes a clear and present danger to life as we know it on this beautiful island.

Thank you for your consideration.

DATED: Mountainview, Hawaii, April 2, 2024

/s/ Larry Wood
LeoRedWood222@gmail.com

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT
STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Relief)** DECLARATION OF BENJAMIN COLE IN SUPPORT OF COMPLAINT FOR INJUNCTION

DECLARATION OF BENJAMIN COLE IN SUPPORT OF COMPLAINT FOR INJUNCTION

1. I, Benjamin Cole, hereby declare the following is true to the best of my knowledge and ability and I am competent and willing to testify at a hearing or trial, not limited to the following:

2. I am currently a resident of the Puna District, County and State of Hawaii.

3. Before moving to Puna in 3rd quarter 2023, I was a geology student in Oahu and became concerned about Puna Geothermal Venture "PGV" operations affecting the volcano

4. After the 2018 Kilauea eruption I became concerned about the potential of a large earthquake affecting the Hilina Slump which could trigger a Pacific-wide tsunami and began researching induced seismicity and the Hilina Slump located in the same Puna District as PGV.

5. To air my concerns in public I began travelling to the Big Island to attend and video PGV quarterly public meetings and also attended a meeting with Puna Councilwoman Ashley Keickerwicz around September 2023.

6. Residents in the community were trying to get some meaningful monitoring for deadly Hydrogen Sulfide emanating from PGV and we believe the 2018Fissure line next to their property and also there was no vehicle for water testing and seismic monitoring.

7. I travelled from Oahu to attend a County of Hawaii Civil Defense public meeting in Pahoa in late October 2023 organized by Councilwoman Kerckiewicz, which was supposed to address the lack of notification and lack of emergency escape routes for the land-locked residents potentially affected by PGV, but the meeting did not address our concerns.

8. Over the last several years I became appalled at the way the community surrounding Puna Geothermal Venture has been ignored and dismissed by State, County and PGV employees after decades of fighting for the right to live without constant fear of gassing, noise, vibrations, lights and thousands of micro earthquakes being generated yearly under the plant that intentionally trespass way past PGV's property line by their "regular" operations and weaken the volcano.

9. I am very concerned about the State of Hawaii's lack of interest in establishing seismic monitoring data for PGV's operations on an active volcano and the well-known propensity for Puna geothermal operations to induce earthquakes in the proximity of the Hilina Slump.

10. I submitted written comments in June 2023 relating to the Draft EIS for comments which are found reproduced in PGV's FEIS Appendix at pages 659-673 [attached as Exhibit "1"].

11. PGV responses to my comments are found on in the FEIS Appendix, pages 1221-1224 and oral comments at page 1255 [attached as Exhibit "2"].

12. At no time were my concerns addressed with any meaningful discussion or scientific data, in fact, PGV's 130-page Final EIS does not even mention the Hilina Slump one time.

13. PGV's Final EIS claims to only use peer-reviewed articles and I provided plenty of peer-reviewed citations relating to the instability of the Hilina Slump and it's connections in my comments, yet they were not discussed in the FEIS or Appendix.

14. I am of the informed belief that other geothermal plants are seismically monitored and the data is available on national databases to the public, yet the County and State of Hawaii keeps its head in the sand and won't educate itself on current technology available to the rest of the world.

15. Professor Falk Amelung from the University of Miami has declared his concern that PGV may have impacted the dike propagation during the 2018 eruption due to their constant cooling of the hot rock under the plant.

16. Professor Amelung provided InSar satellite imaging showing additional subsidence (besides the normal slumping of the South Flank of Kilauea) in the 2018 Fissure line next to PGV's property line and would like to be able to access PGV's proprietary seismic data from 2009-2018 and then again from June 2022 to current to compare to PGV's production and injection records see if there is a correlation between the two.

17. I visited the Puna Geothermal Venture operation in late 2023. There was a distinct odor of rotten eggs and steam could be seen shooting from various pipes as we drove by but there were no Hydrogen Sulfide meters available to sample the air on our tour so I am unable to state the concentration of gas.

18. There were many comments made by surrounding residents on PGV's Draft EIS that complained of being gassed by PGV and it appears several of the events happened when PGV tests or brings new wells online [Declaration Larrry Wood].

19. I believe PGV failed to comply with environmental laws because there is no way to mitigate destabilizing the Kilauea volcano.

20. I firmly believe geothermal plants should not be located in the middle of faults on active volcanoes in the middle of the ocean, they are more appropriate (if at all) on a stable continent not prone to explosive water and lava activities.

21. For the County of Hawaii Department of Health and Zendo Kern to accept an Environmental Impact Statement that to refuses to discuss known impact to Kilauea volcano in the year 2024 is extremely dangerous for the residents, the stability of the volcano.

22. Because PGV's Final Environmental Impact Statement was not adequate, all future expansions at PGV should be null and void for failure to comply with environmental laws.

DATED: Mountainview, Hawaii, March 30, 2024.

Benjamin Cole

From: Benjamin Cole
To: planning@hawaiicounty.gov; Michele Lefebvre; mkaleikini@ormat.com
Subject: Cole EIS Comments
Date: Thursday, June 22, 2023 10:14:19 PM
Attachments: Cole_EIS_Comments .pdf

Please disregard my first email and see the attached EIS comments.

EXHIBIT "1"

June 21, 2023

To:
Scott Glenn, Acting Director
Office of Planning and Sustainable Development Environmental Review Program
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813 HI_Climate@hawaii.gov

Comments on the Draft Environmental Impact Statement of the Puna Geothermal Venture Repower project.

I'm writing this to address the concerns identified in the Environmental Impact Statement (EIS) regarding the proposed project at hand. The EIS serves as a comprehensive assessment of the potential environmental impacts and mitigation measures associated with the project, providing critical information to guide decision-making processes. While the EIS is an essential tool in evaluating the project's feasibility, it is crucial to acknowledge and address the concerns that have emerged from its analysis.

Upon careful review of the EIS, several key concerns have been identified, primarily centered around the existing environment, specifically the physical and natural aspects. The inaccuracies and potential implications highlighted within this section raise significant apprehensions that demand our attention. It is imperative to ensure the accuracy, thoroughness, and reliability of the environmental assessment process, as it forms the foundation for responsible and sustainable decision-making.

First and foremost, the inaccuracies within the existing environment section of the EIS raise doubts about the integrity of the data and studies used to compile the report. The reliance on outdated or incomplete information from past environmental studies, coupled with the omission of crucial data from new studies, undermines the credibility of the analysis. To make informed decisions, it is imperative that the EIS reflects the most current and comprehensive understanding of the project's potential impacts on the environment.

Furthermore, the EIS fails to adequately address the cumulative environmental impacts that may arise from the proposed project. The interconnectedness and cumulative effects of various activities and alternatives are crucial aspects to consider when evaluating the project's sustainability. A comprehensive analysis of the interrelationships and cumulative impacts is essential to ensure the long-term preservation of the environment and the well-being of the surrounding communities.

Additionally, the EIS seems to have limitations in properly evaluating the potential risks associated with the project. The assessment of seismic and volcanic hazards, particularly in the Project vicinity, requires rigorous and detailed examination. The information provided in the EIS lacks the necessary depth and precision to adequately assess the potential consequences and propose effective mitigation measures.

Lastly, the EIS appears to overlook the concerns raised by professional experts, other agencies, and public input. The inclusion of diverse perspectives and expert opinions is vital for a holistic and well-rounded assessment of the project's environmental impacts. The EIS should serve as a platform for meaningful public engagement, incorporating valuable insights and addressing the legitimate concerns of stakeholders.

In conclusion, the concerns identified within the EIS necessitate our careful attention and action. As responsible stewards of the environment, we must ensure that the evaluation process remains transparent, accurate, and inclusive. By addressing these concerns head-on, we can strive towards a more sustainable and harmonious relationship between human activities and the natural world.

With Aloha,
Benjamin Cole

This comment to the draft EIS is effectively putting Puna Geothermal Venture on notice for being provided with current information included in this document listed under the 'work sited' section, and knowledge regarding the potential harm to human life. By ignoring or continuing operations without conducting further due diligence to assess the current research, the Environmental Impact Statement (EIS) company and Puna Geothermal Venture are knowingly proceeding without adequate concern for potential loss of human life. It is imperative that immediate action is taken to prioritize human safety and thoroughly evaluate the potential risks associated with their operations.

The current draft of the Environmental Impact Statement being prepared by Puna Geothermal Venture aims to assess the potential environmental impact caused by the company, but the absence of current research within the statement raises concerns regarding the validity and comprehensiveness of the assessment. After reviewing the Environmental Impact Statement (EIS), I am deeply concerned by its blatant disregard and omission of current research, which provides credible information regarding geological changes, as well as the potential for accelerated destabilization and complete collapse of the Kilauea volcano. By neglecting this vital information, the EIS knowingly ignores the potential for devastating harm to human lives. I urge that the EIS thoroughly incorporates this research to ensure a comprehensive assessment of the potential environmental impact caused by Puna Geothermal Venture.

Given the location of Puna Geothermal Venture, on the actively moving Lower East Rift Zone and the proximity to large residential areas in Puna recently impacted by active lava flows from the 2018 Kilauea eruption, I believe this for-profit company should receive more oversight as to whether there was any intentional or unintentional influence that they contributed to the 2018 volcanic eruption. In order to make the best decision about how to handle geothermal energy in Hawaii, I believe Hawaii's people should be better informed to the increased earthquakes linked to geothermal drilling, potential catastrophes from close proximity to the Hilina Slump, and any influence the Puna Geothermal Venture had on the 2018 eruption.
From the very beginning, Puna Geothermal Venture has been bitterly contested and protested against by the local community. They believe corporate profit is being prioritized over the energy needs of the people.

The geothermal facility is built right on top of an active volcanic rift zone with known major faults all around, while also being surrounded by residential homes. This has raised legitimate concerns that have spanned over decades about detrimental environmental impacts caused by the drilling. These concerns by the local community have only been met with a lack of responses and zero transparency from PGV or the government concerning any environmental impact. This has led to some very interesting theories within the local community and furthered the reasons for concern. For instance, according to PGV Plant Manager Mike Kaleikini, PGV is a "self reporting" company and when asked he remarked "the public should trust them because they are good stewards at their job." With that being said, the people are faced with a for-profit energy company that self regulates and reports their violations on their own free will. Relying on an energy company to self-report violations or operation errors does not seem like the most logistic approach to allow for honest reporting or oversight. Another reason to be concerned is the fact that PGV's position after the 2018 eruption concluded that "no changes in the geology had occurred since they began commercial operations in 1993." What is curious about their response is that the eruption left their facility surrounded by lava on three sides and that there was no mention as to how this geological phenomenon could have occurred. After referencing the current research and subjective testimonies from residence affected by Puna Geothermal Venture operations there I believe that man-induced influence that intercepted the lava flow from passing over the entire Puna Geothermal facility?

When looking into the history of PGV's operations it seems as though it has operated with impunity from any laws or regulations with zero enforcement or accountability on known violations. I have personally witnessed public outcry and testimony at recent community meetings held by PGV about the lack of regard for following operation regulations; one community member stated, "PGV paid people not to say anything; these people were paid $10,000 dollars not to talk." Following the 2018 eruption and destruction that followed, PGV was allowed to build new roads, continue operations and drill new wells and fully resume all commercial operations without requesting a single new permit or performing an Environmental Impact Study (EIS) to ensure the geology of their drill sites is safe. This for profit energy company was allowed to continue drilling along with adding new equipment and geothermal

wells without ever completing an Environmental Impact Study process which would have required PGV to actually address the concerns being voiced by the people and ensure that the current geology could safely support drilling into seismically active zones the of the Lower East Rift Zone.

There are many concerns, by the people of Hawaii, that to this very day have never been addressed or acknowledged. One area of concern for instance would be the induced seismicity or man made earthquakes associated with geothermal drilling and what that could mean for the surrounding geology. This concern should be addressed immediately because the injection and extraction of fluid during geothermal operations affects the pore pressure (water pressure within the deep subterranean rock or soil), stresses within the underground geology and is known to cause man-made earthquakes. A recent example being a magnitude 5.5 quake in Pohang, South Korea that the South Korean Government confirmed to be linked with geothermal drilling operations in the area (Zbinden et al. 1). Ignoring concerns related to the drilling practices of geothermal in pursuit of renewable energy goals seems shortsighted and irresponsible especially when emerging research continues to confirm a direct link between the injection of fluids during geothermal operations and earthquakes. For instance, a team of geoscience engineers funded by the Swiss Seismological Service performed a detailed analysis of the earthquakes caused by the St. Gallen geothermal project in 2013. The team was able to utilize a hydrothermal model in order to reproduce seismic activity on a known and monitored fault over 900 meters away from where the drilling is located. This was performed because in 2013, the geothermal plant was responsible for creating hundreds of earthquakes with some reaching faults hundreds of meters and even kilometers away from where the drilling occurred (Zbinden et al. 1). Technology advancements along with emerging research has led to a better understanding of the impacts that geothermal drilling can have on the environment with Zbinden et al. stating "At some sites, seismicity has been induced at great distances from the injection wells (hundreds of meters to several kilometers)" (Zbinden et al. 2). In some documented scenarios the increased stress changes to the faults and fractures hundreds of meters and even kilometers away was significant and directly caused by the injection of fluids into the geothermal well with the induced seismic activity starting within an hour of the injection (Zbinden et al. 8). These experiments were

performed with only two injection wells and resulted in documented earthquakes on faults that were kilometers away from the drilling.

It's important to know that PGV started operations with five geothermal wells in 1993 and now operates with 46 wells. There are currently plans for the addition of more wells with discussion about Haleakala, Mauna Kea and Waianae Volcano all being future drill sites for geothermal production operations. Following the 2018 Kilauea eruption, PGV was forced to postpone operations until 2019 when PGV was able to resume operations. Interestingly, from the end of the volcanic eruption in 2018 until the start of PGVs operations in 2019 there was a significant reduction in seismic activity according to all publicly documented historical records to include USGS. According to PGV representatives, In the first quarter of 2019 PGV was able to start- up operations again and start drilling and inspecting new well systems. Concurrently, as drilling operations began USGS observed and recorded an increase in earthquake activity described as deep earthquake swarms underneath Pahala, a town located above the main magma chamber that sources Kilauea. Also, it's worth noting that USGS has stated in a recent Pahala town hall that the cause of the sudden increase in deep Pahala earthquakes is "peculiar" and "unknown at this time." I personally find it peculiar that there has yet to be any investigation or theories created to explain the reduction of seismic activity to Kilauea's Southern Flank during the shut-down of PGV following the 2018 eruption and the recent increase in seismic activity following PGV's start-up of operations again in 2019 to this area.

Talk of disaster and catastrophe is usually met with resistance and skepticism. Rightfully so but topics such as this should be addressed and have clear and comprehensive conclusions. Could drilling and injection of vast amounts of corrosive fluids deep into wells at depths of up to 11,000 ft into an active volcanic system create changes or alterations in the subterrain geology? Could these changes lead to a faster destabilization and collapse of the Southern Flank of the Kilauea Volcano? According to PGV, in order to create their energy production it is required that ~3,000 gallons of fluid be extracted from the subterranean geology system and at the same time be reinjected back into the same system. This is the idea behind the "closed loop system" where the wells are drilled into different locations within the deep subterranean fluid reservoir which contains the super heated fluid needed to create steam for geothermal production. In this closed

loop system one well site is equipped to pull the reservoir fluid up while another pumps and circulates the fluids back into the same deep subterranean fluid reservoir. A concerning effect of this process is its ability to accelerate any naturally occurring deterioration or create hydrothermal alterations which cause mineralogic composition changes within the rocks of the deep subterranean reservoir system. Scientists have found that there are correlations between hydrothermal alterations and catastrophic events.

A group of earth scientists from the University of Geneva recently published cutting edge knowledge from decades of information about the contributing factors that are known to a volcano to have a lateral collapse or a catastrophic and incredibly destructive debris avalanche. Roverato et al. believes that deposits left behind after major volcanic collapse events help identify the unique pre-collapse conditions of the geology structure but also identify the factors which contributed to the collapse (92-93). One of the pre-collapse conditions identified to affect volcanoes was the circulating of superheated fluid, hydrothermal changes to the geological system and deterioration and weakening of the rocks which leads to instability within the entire volcanic system and catastrophic structural collapse (Roverato et al. 111). Another pre- collapse condition identified is volcano flank movement which can be classified as: (i) persistent flank motion, typically deep-seated, steady- state movement of large sectors of a volcano edifice due to gravity; (ii) transient flank motion (i.e. flank "unrest"), considered the precursor to catastrophic collapses, associated with intrusive processes" (Roverato et al. 92). According to Roverato et al., "Volcanic lateral collapses can be caused by a wide variety of destabilizing factors such as over-steepened slopes, increasing fluid pore pressures (consequence of several combined factors), magma intrusions, hydrothermal alteration, climate fluctuations, deformation of the basement, cataclysmic eruptions, among other" (93). Roverato et al. state, "prolonged hydrothermal alteration can deeply weaken the edifice, but the collapse itself could be triggered by an eruption or an earthquake" (93). Reviewing this information poses the questions: is PGV's three decades of manipulating deep subterranean fluids considered an extended period of time? Is this enough time to weaken the entire surrounding geology to the point that shaking from a natural or induced earthquake could then cause the failure of the entire southern flank of Kilauea Volcano?

Although this is a complicated topic, there are some basics about the drilling operations and overall geothermal process that I have learned from attending community meetings hosted by PGV in Pahoa, Hawaii. The process PGV uses to inject and extract superheated geothermal fluid, or what is termed the "resource," from depths as great as 3.5 km or ~11,000 feet in order to create steam for electricity requires drilling of multiple wells. One well for the extraction and another to reinject the same "resource" back into the same geological system it originated from. This drilling process involves a metal drill bit and pressurized water, along with a mixture of chemicals designed to dissolve rock and stop equipment corrosion, all while actively targeting natural fractures and cracks of the rock formation on the lower east rift zone of Kilauea Volcano.

In my opinion, an operation such as this should be included in discussions and research with the hopes of identifying any man-made influence on the underlying geology. Information that I've been able to find on any possible hydrothermal alteration within the Kilauea Lower East Rift Zone due to geothermal drilling was in a study funded by Ormat, the parent company of PGV. In this 2009 study, a group of geologists documented the specific elemental makeup of magma that was encountered by PGV in 2005 during the drilling of an injection well named "KS-13" (Teplow el al. 989). It's important to know that in 2005, PGV drilled directly into a magma chamber while drilling a new injection well that led to the magma flowing into and up the well (Teplow et al. 989). They then repeated this drilling process in order to further analyze the glass like materials called cuttings that flowed to the surface (Teplow et al. 989). The group of geologists that analyzed these samples found that all 28 samples showed some level of hydrothermal alteration from undisclosed causes. Further analysis showed that those originating from below 7550 feet were "strongly altered" (Teplow et al. 991). There was no mention in the article whether or not PGV's operations were further accelerating the hydrothermal alterations found. Currently there are no known follow-up articles on the topic of PGV operations influencing hydrothermal alterations.

It is my belief that anyone residing or visiting the Hawaiian Islands would benefit greatly if more research and information were available about the potential risks associated with PGV's active drilling into the structural geology of the Kilauea Lower East Rift Zone. According to the University of Geneva study, "Another volcano showing strong flank instability is Kilauea, on the

Big Island of Hawaii" (Roverato et al. 107). Also according to Chen et al., "The last transient flank motion occurred in early May 2018 that coincided with the lateral propagation of a dike along the East Rift Zone [of Kilauea]. The flank slip triggered a moment magnitude (Mw) 7.2 earthquake, producing *5 m of fault slip" (2019). With this knowledge I believe there needs to be more awareness and discussion on what the process of producing geothermal energy entails. Additionally, further discussion and investigation is needed when analyzing the location of the PGV drilling sites in Hawai`i. It should also be mentioned that Teplow et al. stated, "The geologic conditions at PGV combine tensional tectonics with magmatic temperatures at readily drillable depths (<2500 m)"(989). In other words, there is an enormous amount of stress, like the kind of stress found at the tectonic plate boundaries along with immense heat that is all within easy drilling depth at the PGV site (Teplow et al. 989).

For anyone who believes that the 2018 eruption of the Kilauea Volcano was a completely natural event that occurred without man made influence, I would challenge them to look at PGVs Emergency Response Plan. In the event that lava approached the geothermal plant it was approved that the emergency response would entail quenching of the wells with water. The recently acquired "Quench Logs" from PGV showed that there was over 1.3 million gallons of water pumped into four different geothermal wells over a two week span in the effort to save their facility from approaching lava. These wells had a combined total capacity of ~140,000 gallons which meant almost 1.2 million gallons of excess seawater was artificially introduced into the super heated subterranean geology of the Kilauea Volcano. Although The PGV records show the pumping of water into their wells started on the 15th of May 2018, and was finished on the 28th of May 2018, there are many local testimonies stating the quenching actually began on the 13th of May with research now emerging in support of the local community (Wiesier et al. 18). It's important to note that according to PGV's own records there was a total of 32, 237 barrels or 1,342,194 gallons of water that was pumped into the wells. Recently, earth scientists Wieser et al. with the University of Cambridge performed an investigation on the 2018 Kilauea eruption by analyzing the molecular makeup of the minerals found in the different lava melts that surfaced during this eruption. This analysis also included a comparison of the molecular makeup of the minerals found in the 2018 eruption to all previous eruptions from Kilauea. In doing so,

the group of earth scientists were looking to better understand the reason for the destructive and explosive nature of the 2018 eruption which was more destructive than any prior Kilauea eruptions. Multiple types of lava were observed coming to the surface from the over 24 fissures that erupted during the initial two weeks of the 2018 eruption. One particular fissure, number 17 (F17) , showed an explosive nature and a lava melt never observed before during Lower East Rift Zone eruptions (Weiser et al. 1). The amount of H2O or water found to be present in the melt of the exceptionally explosive eruption of F17 was unlike anything recorded during previous eruptions at Kilauea (Wieser et al. 7).

PGV's decision to carry out their Emergency Response Plan to save the wells from being covered by advancing lava was made without any consideration of the surrounding environment or population. Wieser et al. addresses this by stating, "Extensive crystallization of a section of this larger magma body (perhaps on the periphery or in a region with enhanced hydrothermal cooling) produced a dacitic melt composition highly enriched in incompatible elements such as Cl, F, Zr, and H2O. Combined with an increase in magma viscosity with increasing SiO2 content and dropping temperatures, this H2O-enrichment accounts for the explosive strombolian behavior exhibited by the eruptive fissure tapping this melt (F17) without requiring external sources of volatiles such as groundwater."(21) To put it quite simply, the excess water found in the lava melt of F17 is the reason this eruption turned into the violently explosive, dangerous and unbelievably destructive eruption that it turned out to be. The group of earth scientists stated, "F17 also exhibited gas venting and the generation of shock waves, audible in the town of Mountain View >20 km to the NW" (Wieser et al. 2).

What does all this truly mean for those who lost everything in this eruption or for the complete and absolute destruction of the environment to include the irreplaceable Kapoho Bay? These findings by Wieser et al. would go along with what native Hawaiians and local residents have passionately spoken out about for years: PGV's Emergency Response Plan directly influenced the outcome of the 2018 Kilauea eruption. When PGV was prompted with the question of whether they were involved with influencing the intensity and worsening of the eruption they denied any influence. PGV representative Mike Kaleikini responded that the excess 1.2 million gallons of water that was pumped into the "natural geology" of the erupting volcano,

only a few meters away, had "zero" effect on the subterranean geology. However, to date no environmental impact study has been conducted to conclude or support his response. It should also be noted that PGV takes the position that the geology is the same as when the geothermal plant first started commercial operations in 1993. This claim seems to be more than unreasonable based on the findings of hydrothermal alteration along with the location and nature of the 2018 eruption.

A pair of Geoscientists, Guoquing Lin and Paul Okobu, used advancements in technology and 3d mapping software to analyze and relocate with more accuracy almost 50,000 earthquakes that occurred during the 2018 Kilauea eruption to better understand the resulting impacts to the surrounding geology and changes to the entire Lower East Rift Zone on the Big Island of Hawaii. Through the use of this high- precision mapping technology and seismic monitoring, Lin and Okobu were able to suggest that the 2018 eruption at Kilauea produced a new, never seen before seismic band at a depth of around 11,000 feet or 3.5 km representing a new active detachment within the Hilina slump fault system which also shows a larger potential impact that the Hilina slump has on the stability of the Kilauea Volcano than was previously believed by earlier observations. Lin and Okubo state, "results show that the seismicity distribution and focal mechanisms in Kīlauea have significantly changed since the 2018 activity" (9) According to Lin and Okubo, "A shallower layer at 3.5 km depth is a new feature of the recent activity, which we propose represents the boundary between Mauna Loa and Kīlauea volcanoes or the onland extension of a large submarine landslide. We suggest that large earthquakes are strong enough to trigger displacements at both surfaces" (Lin and Okubo 1).

With the truly historic nature of the 2018 eruption, I believe that it's important to understand any and all contributing factors to the nature of the eruption in order to understand if there was any outside influence from the actions of the geothermal energy plant and if quenching their wells during the eruption led to further destabilization of the volcanic structure. A full investigation looking into the actions of those who were involved in the approval of PGV's Emergency Response Plan to quench the wells is needed. In addition, investigation looking into the decision making that led to the quenching of the wells is needed to determine what actually

happened. Currently, the Emergency Response Plan for PGV still includes the "quenching of geothermal wells" putting the community at risk if there is ever another eruption.

It is my belief after extensive research that includes first hand testimony from community meetings, with PGV representatives, that the actions of PGV had a major impact on the 2018 eruption and that their drilling operations are also accelerating the hydrothermal alterations leading towards a natural catastrophic collapse of the Kilauea Volcano. The potential for failure is only one major earthquake away. Nothing I have encountered while investigating this topic has led to a decrease in concern; my concerns only grow the more I investigate the topic. I am more concerned now than I've ever been. Knowing that USGS had representatives on site during the quenching of the wells without a single public acknowledgement of what happened makes me question whether we're being completely informed about the risks posed by PGV continuing their operation. It seems if there was ever a time to bring truth and transparency to a situation it would be now.

Continuing to drill for this geothermal resource without responding to the concerns of the people and without the completion of an EIS seems irresponsible, unreasonable and done in bad faith. In my opinion this topic should be fully debated to see what the steps should be taken regarding geothermal operations in Hawaii because all geologist do agree on a relating topic which is that the collapse of the Hilina Slump and subsequent Southern Flank of Kilauea is not an "if" but a "when". In 2018 during the eruption, it was documented that the Hilina Slump moved ~16.4 feet towards an ocean floor that's roughly 20,000 feet deep. A mega-tsunami wave produced by this kind of collapse would be unimaginable and the magnitude of destruction would be something never before witnessed in modern history. Wave heights could reach hundreds of feet to possibly over a thousand feet tall. The time to stop provoking Pele is now!

Works Cited

1. Chen, Kejie, et al. "Triggering of the Mw 7.2 Hawaii earthquake of 4 May 2018 by a dike intrusion." Geophysical Research Letters 46.5 (2019): 2503-2510.
2. Lin, Guoqing, and Paul G. Okubo. "Seismic evidence for a shallow detachment beneath Kīlauea's south flank during the 2018 activity." Geophysical research letters 47.15 (2020): e2020GL088003. Roverato, Matteo, et al. "Factors contributing to volcano lateral collapse." Volcanic Debris Avalanches: From Collapse to Hazard (2021): 91-119.
3. Okubo, Chris H. "Rock mass strength and slope stability of the Hilina slump, Kīlauea volcano, Hawai'i." Journal of Volcanology and Geothermal Research 138.1-2 (2004): 43-76.
4. Teplow, William, et al. "Dacite melt at the Puna geothermal venture wellfield, Big Island of Hawaii." Geothermal resources council transactions 33 (2009): 989-994.
5. Wieser, Penny E., et al. "Explosive Activity on Kīlauea's Lower East Rift Zone Fueled by a Volatile-Rich, Dacitic Melt." Geochemistry, Geophysics, Geosystems 23.2 (2022): e2021GC010046.
6. Zbinden, Dominik, et al. "Hydromechanical modeling of fault reactivation in the St. Gallen deep geothermal project (Switzerland): poroelasticity or hydraulic connection?." Geophysical Research Letters 47.3 (2020): e2019GL085201.

By reading this document, you acknowledge that you have read and reviewed the information presented herein. Therefore, if the aforementioned research is not included in the Environmental Impact Statement (EIS), it is understood and stated that the EIS company and Puna Geothermal Venture consider said research to be negligible and of no consequence.

Original Diagram:

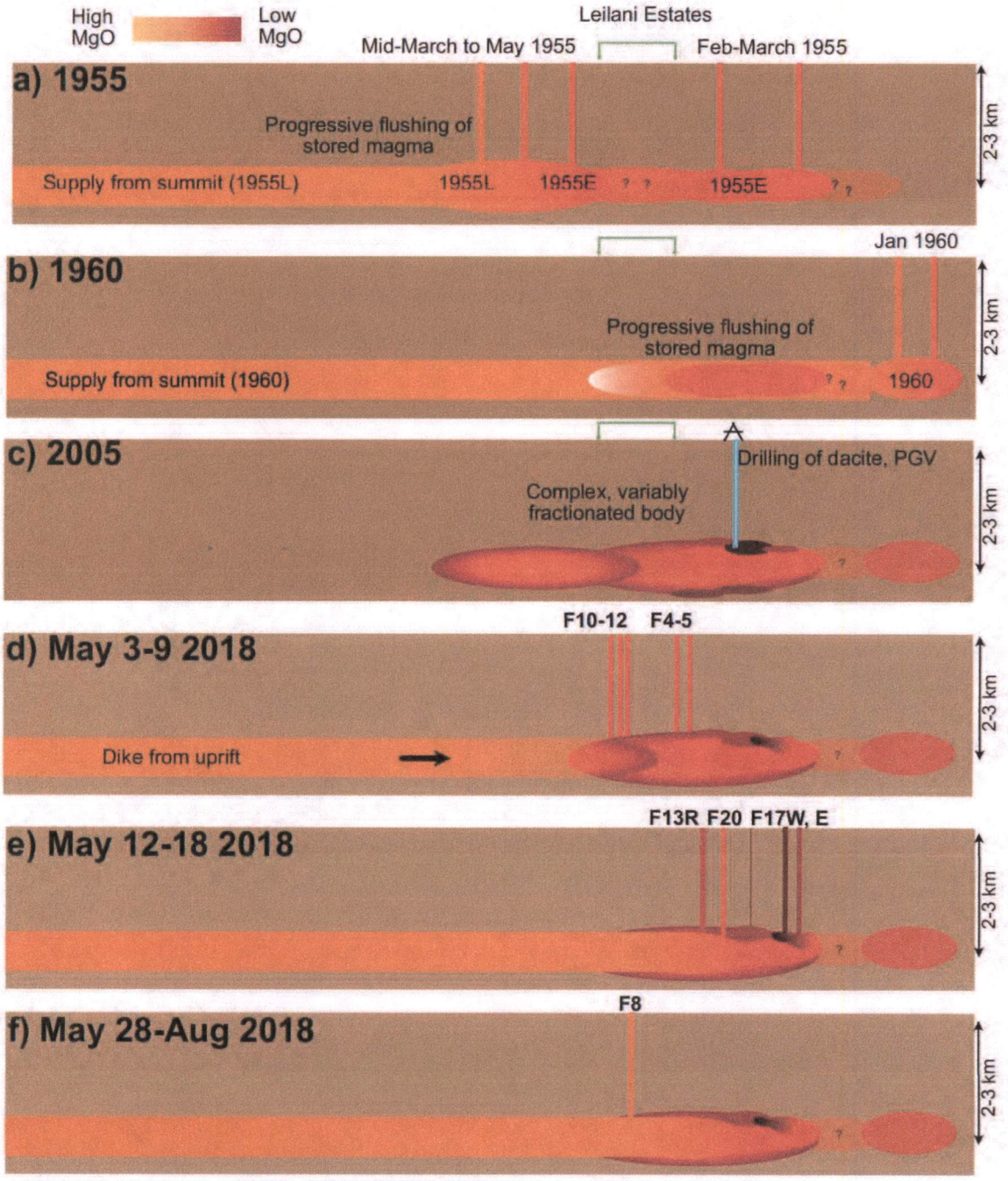


Figure 9. Schematic diagram showing evolution of the Lower East Rift Zone in the vicinity of the 2018 eruption site. (a) More MgO-poor stored melts (1955E) erupt between February and March 1955 very close to the 2018 eruption sites (Figure 1c). More MgO-rich melts (1955L) erupt slightly uprift in mid-March to May. (b) Activity farther down the rift zone in 1960 initiates with the eruption of more MgO-poor (1955-like) melts, followed by flushing by more MgO-rich summit magma. (c) Hydrothermal drilling in 2005 taps a dacitic body, likely located on the periphery of a complex, variably fractionated magma body. (d) Hydraulic pressure from a dike propagating downrift from Pu‘u‘ō‘ō forces stored melts to the surface. (e) Progressively, this dike-supplied material begins to mix with stored melts. By 28 May, this new component dominates.

Revised Diagram including the water used to "quench" the wells:

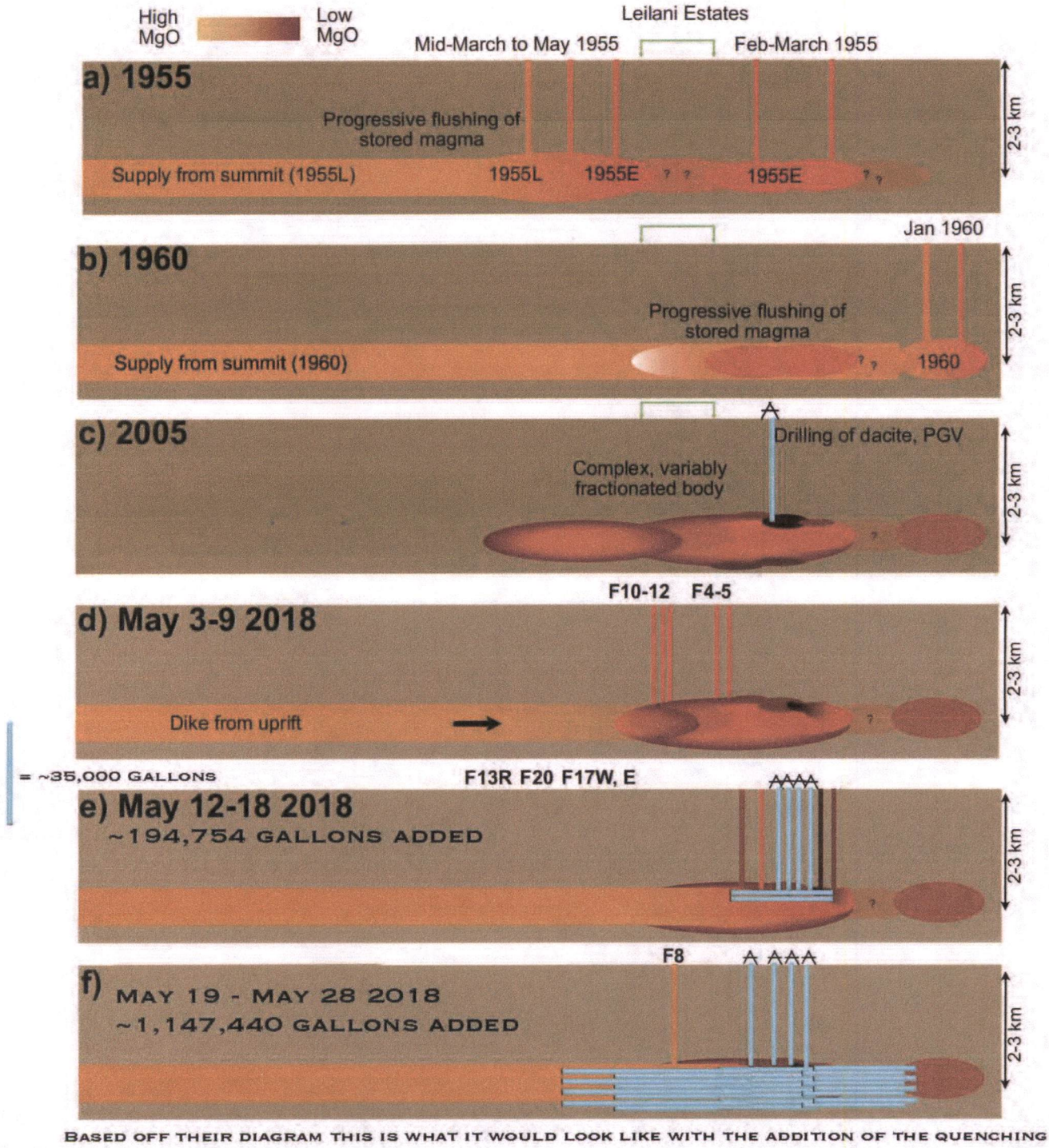


Figure 9. Schematic diagram showing evolution of the Lower East Rift Zone in the vicinity of the 2018 eruption site. (a) More MgO-poor stored melts (1955E) erupt between February and March 1955 very close to the 2018 eruption sites (Figure 1c). More MgO-rich melts (1955L) erupt slightly uprift in mid-March to May. (b) Activity farther down the rift zone in 1960 initiates with the eruption of more MgO-poor (1955-like) melts, followed by flushing by more MgO-rich summit magma. (c) Hydrothermal drilling in 2005 taps a dacitic body, likely located on the periphery of a complex, variably fractionated magma body. (d) Hydraulic pressure from a dike propagating downrift from Pu‘u‘ō‘ō forces stored melts to the surface. (e) Progressively, this dike-supplied material begins to mix with stored melts. By 28 May, this new component dominates.

Letter ID	Comment No	Commenter Name	Comment Text	Response	Comment Source
0048	0001	Emma Stierhoff	My name is Emma Stierhoff, I am a graduate student in Tropical Conservation Biology at UH Hilo. I am writing to bring forward some aspects of the Puna Geothermal Venture Repower Project (PGV) Environmental Impact Statement (EIS) that I believe are causes for concern. Primarily, I believe that the EIS does not present sufficient evidence that the noise pollution, light pollution, and deforestation generated by the facility will not cause harm to both people and endangered species. My sources are listed at the bottom of this email if you would like to refer to any of them.	Thank you for submitting comments on the Draft EIS. Please see the responses to your specific comments below.	Email
0048	0002	Emma Stierhoff	The PGV EIS sets a maximum noise level of 70 dBA, with a daily average of 57 dBA. However, consistent noise pollution above 30 dB is known to interrupt sleep and increase blood pressure and heart rate, potentially causing long-term harm (Jariwala et al. 2017). Even the "ideal long-term goal" of less than 45-50 dBA, for which there is not an actionable plan to achieve (page 3-25), qualifies as a disruptive noise level. They also have not accounted for booming populations of coqui frogs and insects in the area which compound evening noise pollution, so the overall noise level would be even greater than cited in the EIS. Thus, even with the noise limits laid out in the EIS, PGV still poses a health risk to surrounding communities.	PGV is operating with a noise permit issued by the State DOH Noise and Radiation Branch. PGV is classified as a Class C facility, which allows the facility to operate at a maximum level of 70 dBA, measured 24 hours a day at the property boundary. Under the GRP, the average noise for any day shall not exceed 57 dBA, average for any month shall not exceed 54 dBA, the average for any hour shall not exceed 62 dBA and the average for any five-minute period shall not exceed 68 dBA.	Email
0048	0003	Emma Stierhoff	Many studies have shown the threat that light pollution has on petrel and shearwater fledglings, causing them to get disoriented and fall or crash into anthropogenic structures and making them extremely vulnerable to other threats like predation and vehicle collisions. 10% of Newell's Shearwater ('A'o) fledglings on Oahu died as a result of light pollution (Ainley et al. 2001). Significant fledgling mortality as a result of light pollution has also been recorded in Dark-rumped Petrels and Band-rumped Storm-Petrels ('ake'ake) on Kauai (Reed et al 1985). A study by Troy et al. (2011) shows that even faint light can threaten seabird fledglings. The new PGV facility may prove fatal for 'Ua'u, 'ake'ake, and 'A'o, birds they acknowledge travel through the area (page 3-30). Although there may not be seabirds nesting in the study site, many 'Ua'u and other species nest on Mauna Loa and may fly through the site to forage at sea each night. Additional surveys of the area need to be conducted in the evening and early morning to determine the seabirds that do travel through the area.	Section 3.5.2 of the Draft EIS acknowledges that light pollution can impact nocturnally flying seabirds. Biological surveys in support of EISs are only a snapshot in time. The intent is not just to identify species detected but also potential habitat for those species not detected. Because site-specific surveys could inadvertently miss detecting native birds in the project area, the Draft EIS conservatively assumes (as stated in Section 3.5.1) seabirds could travel over the Project Area to breeding grounds. Since the Draft EIS assumes these species could be present, it includes the protection measures to avoid project-related impacts to these species in Section 3.5.2.1. In correspondence, DOFAW concurred with the measures included in the Draft EIS intended to avoid construction and operational impacts to native birds from the proposed Project.	Email
0048	0004	Emma Stierhoff	The EIS acknowledges the threat light pollution poses to endangered seabirds, and I am glad to see they plan to use shielding on outdoor lights. However, whether these shields work in cases where birds are coming from sea level and moving up in elevation remains to be seen. PGV therefore continues to pose a threat to threatened and endangered seabirds.	Comment noted. In correspondence, DOFAW concurred with the measures included in the Draft EIS intended to avoid construction and operational impacts to endangered seabirds from the proposed Project.	Email
0048	0005	Emma Stierhoff	The surveying that was done on 'Ope'ape'a (Hawaiian Hoary Bat) does NOT sufficiently demonstrate that the PVG expansion will not destroy nesting habitat and threaten 'Ope'ape'a. The surveys were done in "full daylight and did not involve the use of acoustical detection equipment" (page 3-31). 'Ope'ape'a are known to be crepuscular, most active at dawn and dusk. Thus, sampling during full daylight, when they are inactive, will not give an accurate estimate of the population present. I assert that PGV's surveying for endangered species is generally insufficient. More extensive and less skewed surveys need to be conducted before they can say whether or not the new facility will impact the endangered fauna of the area.	Similar to assuming that seabirds are present, the Draft EIS conservatively assumes (as stated in Section 3.5.1) Hawaiian hoary bats may utilize the Project Area for foraging and/or roosting. As described in Section 3.5 and Appendix G of the Draft EIS, the general biological survey was conducted during the day and did not include the technical acoustical equipment required to conduct a bat-specific survey. Instead the text in the Draft EIS note that no bats were observed. Since the Draft EIS assumes these species could be present, it includes the protection measures to avoid project-related impacts to these species in Section 3.5.2.1. In correspondence, DOFAW concurred with the measures included in the Draft EIS intended to avoid construction and operational impacts to Hawaiian hoary bats from the proposed Project.	Email
0048	0006	Emma Stierhoff	The PVG EIS seems to suggest that because the land was impacted by the 2018 lava flow and therefore does not have as much plant life, "the Project is not expected to result in impacts to any uniquely valuable plant habitat" (page 3-31). This is completely ignorant to the cyclical processes of lava flow and slow succession and spread of critical native plants such as 'Ohia, na'ena'e, and kupukupu that have made up Hawai'i since time immemorial. To say lava flow is not valuable habitat is not only disrespectful to Pele and Hi'iaka, who shape these cycles, but also inhibits those beautiful natural processes of lava flow and succession on which Hawai'i Island is shaped.	Section 3.5.1 of the Draft EIS describes the regional vegetation types and influences and vegetation history on the property. This section also describes the biological resources found within the area surveyed for the Project which includes the 9-acre kipuka. This section discusses the development of soils following eruptions which is followed by the recruitment of plant species that specialize on young lava flows. Reference to Hiiaka's role has been added to Section 3.8 of the Final EIS. The text in Section 3.5.2.1 states that the majority of project disturbance would occur on areas that were impacted by the 2018 lava flow and would not result in impacts to any uniquely valuable plant habitat or federally listed plant species or their habitat. That is, this portion of the lava flow is not unique for native plants (there is many more acres of habitat for native plants in the vicinity). The statement does not mean that the habitat is not valuable.	Email
0048	0007	Emma Stierhoff	Mahalo nui for reading my comments. With these points, I urge you not to pass PVG's EIS unless these shortcomings are resolved. Sources: Ainley DG, Podolsky R, Deforest L, Spencer G, Nur N. (2001). The Status and Population Trends of the Newell' Shearwater on Kaua'i: Insights from modeling. Jariwala H, Syed H, Pandya M, Gajera Y. 2017. Noise Pollution & Human Health: A Review. Reed JR, Sincock JL, Hailman JP. 1985. Light Attraction in Endangered Procellariform Birds: Reduction by Shielding Upward Radiation. The Auk 102:377–383. Troy JR, Holmes ND, Green MC. 2011. Modeling artificial light viewed by fledgling seabirds. Ecosphere 2:art109.	Thank you for submitting your comments on the Draft EIS.	Email
0049	0001	Benjamin Cole	At the commenters request, comment letter 50 supersedes letter 49. Both letters are included in their entirety following this table.	See responses to comment letter 50 below.	Email
0050	0001	Benjamin Cole	I'm writing this to address the concerns identified in the Environmental Impact Statement (EIS) regarding the proposed project at hand. The EIS serves as a comprehensive assessment of the potential environmental impacts and mitigation measures associated with the project, providing critical information to guide decision-making processes. While the EIS is an essential tool in evaluating the project's feasibility, it is crucial to acknowledge and address the concerns that have emerged from its analysis.	Thank you for submitting your comments on the Draft EIS. Please see the responses to your comments below.	Email
0050	0002	Benjamin Cole	Upon careful review of the EIS, several key concerns have been identified, primarily centered around the existing environment, specifically the physical and natural aspects. The inaccuracies and potential implications highlighted within this section raise significant apprehensions that demand our attention. It is imperative to ensure the accuracy, thoroughness, and reliability of the environmental assessment process, as it forms the foundation for responsible and sustainable decision-making.	Comment noted; please see the responses to your specific comments below.	Email
0050	0003	Benjamin Cole	First and foremost, the inaccuracies within the existing environment section of the EIS raise doubts about the integrity of the data and studies used to compile the report. The reliance on outdated or incomplete information from past environmental studies, coupled with the omission of crucial data from new studies, undermines the credibility of the analysis. To make informed decisions, it is imperative that the EIS reflects the most current and comprehensive understanding of the project's potential impacts on the environment.	Comment noted; the Draft EIS includes the best available data.	Email
0050	0004	Benjamin Cole	Furthermore, the EIS fails to adequately address the cumulative environmental impacts that may arise from the proposed project. The interconnectedness and cumulative effects of various activities and alternatives are crucial aspects to consider when evaluating the project's sustainability. A comprehensive analysis of the interrelationships and cumulative impacts is essential to ensure the long-term preservation of the environment and the well-being of the surrounding communities.	A cumulative analysis was included in the Draft EIS as Section 3.13 in accordance with the EIS rules for analysis of cumulative impacts (Section 200.1-2, HAR).	Email
0050	0005	Benjamin Cole	Additionally, the EIS seems to have limitations in properly evaluating the potential risks associated with the project. The assessment of seismic and volcanic hazards, particularly in the Project vicinity, requires rigorous and detailed examination. The information provided in the EIS lacks the necessary depth and precision to adequately assess the potential consequences and propose effective mitigation measures	As stated in Section 3.1.1 of the Draft EIS, USGS (the agency with the best available geologic data and publications) did not find evidence that the 2018 Lower Puna eruption of Kilauea Volcano was triggered or influenced by human activities. The eruption was caused by injection of magma down rift from Pu'u 'O'o and the summit of Kilauea, and the event fits a pattern of activity that has occured many times previously on the LERZ (USGS 2020; EPA 2021a). These events are within the normal behavior for Kilauea Volcano. In summary, there is no evidence to support claims that human activity triggered or influenced the 2018 Lower Puna eruption (USGS 2020; EPA 2021a). The proposed Project which consists of the upgrade of equipment and associated infrastructure are consistent with current operations, in compliance with existing permits, and according to local peer-reviewed scientific data, would not trigger a volcanic eruption.	Email
0050	0006	Benjamin Cole	Lastly, the EIS appears to overlook the concerns raised by professional experts, other agencies, and public input. The inclusion of diverse perspectives and expert opinions is vital for a holistic and well-rounded assessment of the project's environmental impacts. The EIS should serve as a platform for meaningful public engagement, incorporating valuable insights and addressing the legitimate concerns of stakeholders.	Comment noted; the Draft EIS includes the best available data and all public scoping comments submitted were considered in the development of the analysis of the Proposed Action and action alternatives. The approach to requesting and responding to public comments on the proposed action (which proposes to upgrade equipment and associated infrastructure) is consistent with public engagement requirements for the EIS process which are described in Chapter 343, HRS.	Email
0050	0007	Benjamin Cole	In conclusion, the concerns identified within the EIS necessitate our careful attention and action. As responsible stewards of the environment, we must ensure that the evaluation process remains transparent, accurate, and inclusive. By addressing these concerns head-on, we can strive towards a more sustainable and harmonious relationship between human activities and the natural world.	Comment noted; please see the responses to your specific comments below.	Email
0050	0008	Benjamin Cole	This comment to the draft EIS is effectively putting Puna Geothermal Venture on notice for being provided with current information included in this document listed under the 'work sited' section, and knowledge regarding the potential harm to human life. By ignoring or continuing operations without conducting further due diligence to assess the current research, the Environmental Impact Statement (EIS) company and Puna Geothermal Venture are knowingly proceeding without adequate concern for potential loss of human life. It is imperative that immediate action is taken to prioritize human safety and thoroughly evaluate the potential risks associated with their operations.	Comment noted. The Draft EIS includes the best available scientific data and peer-reviewed research. Additionally, the EIS has been prepared consistent with applicable laws and regulations including Chapter 343, HRS, and Chapter 11-200.1, HAR.	Email
0050	0009	Benjamin Cole	The current draft of the Environmental Impact Statement being prepared by Puna Geothermal Venture aims to assess the potential environmental impact caused by the company, but the absence of current research within the statement raises concerns regarding the validity and comprehensiveness of the assessment. After reviewing the Environmental Impact Statement (EIS), I am deeply concerned by its blatant disregard and omission of current research, which provides credible information regarding geological changes, as well as the potential for accelerated destabilization and complete collapse of the Kilauea volcano. By neglecting this vital information, the EIS knowingly ignores the potential for devastating harm to human lives. I urge that the EIS thoroughly incorporates this research to ensure a comprehensive assessment of the potential environmental impact caused by Puna Geothermal Venture.	See response to comment 8.	Email

Letter ID	Comment No	Commenter Name	Comment Text	Response	Comment Source
0050	0010	Benjamin Cole	Given the location of Puna Geothermal Venture, on the actively moving Lower East Rift Zone and the proximity to large residential areas in Puna recently impacted by active lava flows from the 2018 Kilauea eruption, I believe this for-profit company should receive more oversight as to whether there was any intentional or unintentional influence that they contributed to the 2018 volcanic eruption.	As stated in Section 3.1.1 of the Draft EIS, USGS (the agency with the best available geologic data and publications) did not find evidence that the 2018 Lower Puna eruption of Kilauea Volcano was triggered or influenced by human activities. The eruption was caused by injection of magma down rift from Pu'u ʻŌʻō and the summit of Kilauea, and the event fits a pattern of activity that has occurred many times previously on the LERZ (USGS 2020; EPA 2021a). These events are within the normal behavior for Kilauea Volcano. In summary, there is no evidence to support claims that human activity triggered or influenced the 2018 Lower Puna eruption (USGS 2020; EPA 2021a). Operation of the current facility is regulated by existing permits which are listed in Table 2-2 in Section 2.1.10 of the Draft EIS. Activities approved under the existing permits do not change with the proposed project, and no seismic monitoring is required by those permits. The scope of the Proposed Action analyzed in Section 3.4.2 of the EIS is the proposed change of equipment and the permits needed for its construction and operation. Drilling at the site is conducted in accordance with approved state and federal permits and would continue to occur under the Proposed Action as permitted.	Email
0050	0011	Benjamin Cole	In order to make the best decision about how to handle geothermal energy in Hawaii, I believe Hawaii's people should be better informed to the increased earthquakes linked to geothermal drilling, potential catastrophes from close proximity to the Hilina Slump, and any influence the Puna Geothermal Venture had on the 2018 eruption.	See response to comment 10 above regarding influence on the eruption. Geologic hazards are discussed in Section 3.1 of the Draft EIS. The Hilina Slump, a name broadly associated with submarine landslides along the southern flank of Kilauea, has been explained by slip along an underlying low angle fault and from dilation within the Kilauea rift system (Owen et al., 1995). In peer reviewed scientific journals, material movement in this area is associated with volcanic and seismic activity. News articles lacking scientific rigor have attributed material movement to PGV and fracking but these claims are unsubstantiated. Furthermore, the risk of mega tsunamis associated with flank failure at stratovolcanoes (assuming this is the "very catastrophic" event mentioned in the comment) have been previously overestimated and such events are "extremely rare" (Pararas-Carayannis, 2002). Owen, S., P. Segal, J. Freymueller, A. Miklius; R. Denlinger, T. Árnadóttir, M. Sako, R. Bürgmann, 1995. Rapid Deformation of the South Flank of Kilauea Volcano, Hawaii, Science, American Association for the Advancement of Science, 267 (5202): 1328–1332. Pararas-Carayannis, G. 2002. Evaluation of the threat of mega tsunami generation from postulated massive slope failures of island stratovolcanoes on La Palma, Canary Islands, and on the island of Hawaii. Science of Tsunami Hazards, 20. Smith, J.R., A. Malahoff, A.N. Shor. 1999. Submarine geology of the Hilina slump and morpho-structural evolution of Kilauea volcano, Hawaii. Journal of Volcanology and Geothermal Research, 94, 59–88.	Email
0050	0012	Benjamin Cole	From the very beginning, Puna Geothermal Venture has been bitterly contested and protested against by the local community. They believe corporate profit is being prioritized over the energy needs of the people.	Comment noted.	Email
0050	0013	Benjamin Cole	The geothermal facility is built right on top of an active volcanic rift zone with known major faults all around, while also being surrounded by residential homes. This has raised legitimate concerns that have spanned over decades about detrimental environmental impacts caused by the drilling. These concerns by the local community have only been met with a lack of responses and zero transparency from PGV or the government concerning any environmental impact. This has led to some very interesting theories within the local community and furthered the reasons for concern. For instance, according to PGV Plant Manager Mike Kalelkiki, PGV is a "self reporting" company and when asked he remarked "the public should trust them because they are good stewards at their job." With that being said, the people are faced with a for-profit energy company that self regulates and reports their violations on their own free will. Relying on an energy company to self-report violations or operation errors does not seem like the most logistic approach to allow for honest reporting or oversight.	The Draft EIS includes a description of the facility's requirements for identifying, reporting, and responding to any exceedances as identified in permit requirements for public health and safety (Sections 3.2, 3.3, 3.10, and 3.11). These permits are reviewed by the agencies that hold them. Table 4-1 of the Draft EIS includes a list of the permits and the agencies that review and issue them for the Project.	Email
0050	0014	Benjamin Cole	Another reason to be concerned is the fact that PGV's position after the 2018 eruption concluded that "no changes in the geology had occurred since they began commercial operations in 1993." What is curious about their response is that the eruption left their facility surrounded by lava on three sides and that there was no mention as to how this geological phenomenon could have occurred. After referencing the current research and subjective testimonies from residence affected by Puna Geothermal Venture operations there I believe that man-induced influence that intercepted the lava flow from passing over the entire Puna Geothermal facility?	See response to comment 10 above.	Email
0050	0015	Benjamin Cole	When looking into the history of PGV's operations it seems as though it has operated with impunity from any laws or regulations with zero enforcement or accountability on known violations. I have personally witnessed public outcry and testimony at recent community meetings held by PGV about the lack of regard for following operation regulations; one community member stated, "PGV paid people not to say anything; these people were paid $10,000 dollars not to talk."	Comment noted. As described in Section 2.0 of the Draft EIS, the existing PGV facility operates consistent with the federal, state, and county permits listed in Table 2-2 of the Draft EIS. The facility operates in compliance with these permits including the DLNR Plan of Operation, GRP, DOH NSP, and UIC permit, and EPA UIC permit. The Project, as analyzed within the Draft EIS which proposes upgrades to the existing equipment and associated infrastructure, would comply with all existing permits as well as all federal, state, and local regulations. It is outside the scope of this EIS to comment on allegations of bribery.	Email
0050	0016	Benjamin Cole	Following the 2018 eruption and destruction that followed, PGV was allowed to build new roads, continue operations and drill new wells and fully resume all commercial operations without requesting a single new permit or performing an Environmental Impact Study (EIS) to ensure the geology of their drill sites is safe. This for profit energy company was allowed to continue drilling along with adding new equipment and geothermal wells without ever completing an Environmental Impact Study process which would have required PGV to actually address the concerns being voiced by the people and ensure that the current geology could safely support drilling into seismically active zones the of the Lower East Rift Zone.	No EIS was prepared following the 2018 eruption as there was no statutory trigger for environmental review as defined by Section 343-5(a), HRS.	Email
0050	0017	Benjamin Cole	There are many concerns, by the people of Hawaii, that to this very day have never been addressed or acknowledged. One area of concern for instance would be the induced seismicity or man made earthquakes associated with geothermal drilling and what that could mean for the surrounding geology. This concern should be addressed immediately because the injection and extraction of fluid during geothermal operations effects the pore pressure (water pressure within the deep subterranean rock or soil), stresses within the underground geology and is known to cause man-made earthquakes. A recent example being a magnitude 5.5 quake in Pohang, South Korea that the South Korean Government confirmed to be linked with geothermal drilling operations in the area (Zbinden et al. 1). Ignoring concerns related to the drilling practices of geothermal in pursuit of renewable energy goals seems shortsighted and irresponsible especially when emerging research continues to confirm a direct link between the injection of fluids during geothermal operations and earthquakes.	Section 3.1 of the Draft EIS addresses induced seismicity. Prior to the preparation of this EIS, these concerns about induced seismicity associated with the facility were most recently addressed by the EPA in response to public comments on the UIC permit (https://www.epa.gov/system/files/documents/2021-09/r9uic-hi5-fy16-1r-puna-geothermal-venture-pgv-combined-rtc.pdf). As stated in Section 3.1.1.3, "the USGS confirmed that there have been no significant changes due to human activity in patterns or trends of deformation or seismicity in the LERZ in the last 35 to 50 years." As described in Sections 3.1.1.4 and 3.1.1.5, fluid production and injection during geothermal plant operations is carried out under controlled and monitored conditions, and under pressure and flow rates unlikely to cause seismic events that can be felt by humans at the ground surface, result in surface shaking, lead to infrastructure damage, cause major movement along faults, or endanger underground sources of drinking water. Every geothermal power site is subject to unique lithological, structural, hydrological, and geophysical conditions, including the site at Pohang, South Korea. Please see Section 3.1.1.6 of the Draft EIS for a discussion of seismic activity in the vicinity of the PGV facility.	Email
0050	0018	Benjamin Cole	For instance, a team of geoscience engineers funded by the Swiss Seismological Service performed a detailed analysis of the earthquakes caused by the St. Gallen geothermal project in 2013. The team was able to utilize a hydrothermal model in order to reproduce seismic activity on a known and monitored fault over 900 meters away from where the drilling is located. This was performed because in 2013, the geothermal plant was responsible for creating hundreds of earthquakes with some reaching faults hundreds of meters and even kilometers away from where the drilling occurred (Zbinden et al. 1). Technology advancements along with emerging research has led to a better understanding of the impacts that geothermal drilling can have on the environment with Zbinden et al. stating "At some sites, seismicity has been induced at great distances from the injection wells (hundreds of meters to several kilometers)" (Zbinden et al. 2). In some documented scenarios the increased stress changes to the faults and fractures hundreds of meters and even kilometers away was significant and directly caused by the injection of fluids into the geothermal well with the induced seismic activity starting within an hour of the injection (Zbinden et al. 8). These experiments were performed with only two injection wells and resulted in documented earthquakes on faults that were kilometers away from the drilling.	Every geothermal power site is subject to unique lithological, structural, hydrological, and geophysical conditions, including the site in St. Gallen, Switzerland. Please see Section 3.1.1.6 of the Draft EIS for a discussion of seismic activity in the vicinity of the PGV facility.	Email
0050	0019	Benjamin Cole	It's important to know that PGV started operations with five geothermal wells in 1993 and now operates with 46 wells. There are currently plans for the addition of more wells with discussion about Haleakala, Mauna Kea and Waianae Volcano all being future drill sites for geothermal production operations.	As described in Sections 2.1.1 and 2.2.2 of the Draft EIS, all PGV wells are permitted under the EPA's UIC permit and HDOH's UIC permit for the project. No additional permits to construct wells are needed for the proposed project. Therefore, drilling would continue as permitted. The Project as analyzed in the Draft EIS for proposed facility upgrades does not propose additional wells beyond those already authorized. Any actions planned for Haleakala, Mauna Kea, or Waianae are outside the scope of this EIS.	Email
0050	0020	Benjamin Cole	Following the 2018 Kilauea eruption, PGV was forced to postpone operations until 2019 when PGV was able to resume operations. Interestingly, from the end of the volcanic eruption in 2018 until the start of PGVs operations in 2019 there was a significant reduction in seismic activity according to all publicly documented historical records to include USGS.	Comment noted. Section 1.1 of the Draft EIS discusses the interruption of production at the facility.	Email
0050	0021	Benjamin Cole	According to PGV representatives, in the first quarter of 2019 PGV was able to start- up operations again and start drilling and inspecting new well systems. Concurrently, as drilling operations began USGS observed and recorded an increase in earthquake activity described as deep earthquake swarms underneath Pahala, a town located above the main magma chamber that sources Kilauea.	Comment noted.	Email
0050	0022	Benjamin Cole	Also, it's worth noting that USGS has stated in a recent Pahala town hall that the cause of the sudden increase in deep Pahala earthquakes is "peculiar" and "unknown at this time." I personally find it peculiar that there has yet to be any investigation or theories created to explain the reduction of seismic activity to Kilauea's Southern Flank during the shut-down of PGV following the 2018 eruption and the recent increase in seismic activity following PGV's start-up of operations again in 2019 to this area.	See response to comment 5.	Email

Letter ID	Comment No	Commenter Name	Comment Text	Response	Comment Source
0050	0023	Benjamin Cole	Talk of disaster and catastrophe is usually met with resistance and skepticism. Rightfully so but topics such as this should be addressed and have clear and comprehensive conclusions. Could drilling and injection of vast amounts of corrosive fluids deep into wells at depths of up to 11,000 ft into an active volcanic system create changes or alterations in the subterrain geology?	Section 3.2.1.6.3 of the Draft EIS includes a discussion of drilling mud and drilling fluids used at the facility. Corrosion and scale inhibitors added to geothermal fluids and injected into geothermal wells help protect steel well casing from corrosion and mineral scaling due to the geochemistry of produced or injected fluids. Corrosion inhibitors and anti-scaling agents react with naturally occurring minerals dissolved in the geothermal fluid and present in the reservoir rock and circulating fluids. These additives break down with increased time and temperature in the geothermal reservoir and would not result in changes to the geologic features.	Email
0050	0024	Benjamin Cole	Could these changes lead to a faster destabilization and collapse of the Southern Flank of the Kilauea Volcano?	See response to comment 11.	Email
0050	0025	Benjamin Cole	According to PGV, in order to create their energy production it is required that ~3,000 gallons of fluid be extracted from the subterranean geology system and at the same time be reinjected back into the same system. This is the idea behind the "closed loop system" where the wells are drilled into different locations within the deep subterranean fluid reservoir which contains the super heated fluid needed to create steam for geothermal production. In this closed loop system one well site is equipped to pull the reservoir fluid up while another pumps and circulates the fluids back into the same deep subterranean fluid reservoir. A concerning effect of this process is its ability to accelerate any naturally occurring deterioration or create hydrothermal alterations which cause mineralogic composition changes within the rocks of the deep subterranean reservoir system. Scientists have found that there are correlations between hydrothermal alterations and catastrophic events.	Section 3.1.1 of the draft EIS states that because the reservoir rock at PGV has naturally high permeability, PGV does not seek to increase subsurface permeability or open new fractures in the rock. Thus, fluid flow rates and system pressures are designed and operated to minimize the likelihood of new fracture formation and the induced seismicity typically associated with EGS or hydraulic fracturing.	Email
0050	0026	Benjamin Cole	A group of earth scientists from the University of Geneva recently published cutting edge knowledge from decades of information about the contributing factors that are known to a volcano to have a lateral collapse or a catastrophic and incredibly destructive debris avalanche. Roverato et al. believes that deposits left behind after major volcanic collapse events help identify the unique pre-collapse conditions of the geology structure but also identify the factors which contributed to the collapse (92-93). One of the pre-collapse conditions identified to affect volcanoes was the circulating of superheated fluid, hydrothermal changes to the geological system and deterioration and weakening of the rocks which leads to instability within the entire volcanic system and catastrophic structural collapse (Roverato et al. 111). Another pre-collapse condition identified is volcano flank movement which can be classified as: (i) persistent flank motion, typically deep-seated, steady-state movement of large sectors of a volcano edifice due to gravity; (ii) transient flank motion (i.e. flank "unrest"), considered the precursor to catastrophic collapses, associated with intrusive processes" (Roverato et al. 92). According to Roverato et al., "Volcanic lateral collapses can be caused by a wide variety of destabilizing factors such as over- steepened slopes, increasing fluid pore pressures (consequence of several combined factors), magma intrusions, hydrothermal alteration, climate fluctuations, deformation of the basement, cataclysmic eruptions, among other" (93). Roverato et al. state, "prolonged hydrothermal alteration can deeply weaken the edifice, but the collapse itself could be triggered by an eruption or an earthquake" (93).	Comment noted.	Email
0050	0027	Benjamin Cole	Reviewing this information poses the questions: Is PGV's three decades of manipulating deep subterranean fluids considered an extended period of time?	See response to comment 5.	Email
0050	0028	Benjamin Cole	Is this enough time to weaken the entire surrounding geology to the point that shaking from a natural or induced earthquake could then cause the failure of the entire southern flank of Kilauea Volcano?	See responses to comments 5 and 11 regarding induced seismicity. Regarding seismic activity, the East Rift Zone existed and was known long before development of PGV began. As stated in Section 3.1.1.4 of the Draft EIS, the amount of pressure needed to physically inject, fracture, and transport solid rock in the subsurface is extremely unlikely to be achieved given the permitted injection pressures at PGV's wells and also very unlikely to occur in a short time period (such as those experienced between injection on May 9 and the opening of Fissure 17 on May 12).	Email
0050	0029	Benjamin Cole	Although this is a complicated topic, there are some basics about the drilling operations and overall geothermal process that I have learned from attending community meetings hosted by PGV in Pahoa, Hawaii. The process PGV uses to inject and extract superheated geothermal fluid, or what is termed the "resource," from depths as great as 3.5 km or ~11,000 feet in order to create steam for electricity requires drilling of multiple wells. One well for the extraction and another to reinject the same "resource" back into the same geological system it originated from. This drilling process involves a metal drill bit and pressurized water, along with a mixture of chemicals designed to dissolve rock and stop equipment corrosion, all while actively targeting natural fractures and cracks of the rock formation on the lower east rift zone of Kilauea Volcano.	Comment noted.	Email
0050	0030	Benjamin Cole	In my opinion, an operation such as this should be included in discussions and research with the hopes of identifying any man-made influence on the underlying geology. Information that I've been able to find on any possible hydrothermal alteration within the Kilauea Lower East Rift Zone due to geothermal drilling was in a study funded by Ormat, the parent company of PGV. In this 2009 study, a group of geologists documented the specific elemental makeup of magma that was encountered by PGV in 2005 during the drilling of an injection well named "KS-13" (Teplow et al. 889).	Comment noted.	Email
0050	0031	Benjamin Cole	It's important to know that in 2005, PGV drilled directly into a magma chamber while drilling a new injection well that led to the magma flowing into and up the well (Teplow et al. 889). They then repeated this drilling process in order to further analyze the glass like materials called cuttings that flowed to the surface (Teplow et al. 883). The group of geologists that analyzed these samples found that all 28 samples showed some level of hydrothermal alteration from undisclosed causes. Further analysis showed that these originating from below 7550 feet were "strongly altered" (Teplow et al. 891). There was no mention in the article whether or not PGV's operations were further accelerating the hydrothermal alterations found. Currently there are no known follow-up articles on the topic of PGV operations influencing hydrothermal alterations.	PGV did not intentionally drill into magma. As stated in Section 3.2.2.1.3, "Permit conditions and facility procedures also ensure that if magma is encountered, similar to what occurred in 2005 during the drilling of well KS-13, appropriate steps would be taken to ensure that impacts are minimized. In 2005, no magma was flowing, and no fissure resulted from the inadvertent encounter with magma." PGV produces and injects geothermal fluids into the same reservoir. This cycling of geothermal fluids is unlikely to influence hydrothermal alteration processes that otherwise naturally occur as geothermal fluids react with rock within the geothermal reservoir.	Email
0050	0032	Benjamin Cole	It is my belief that anyone residing or visiting the Hawaiian Islands would benefit greatly if more research and information were available about the potential risks associated with PGV's active drilling into the structural geology of the Kilauea Lower East Rift Zone. According to the University of Geneva study, "Another volcano showing strong flank instability is Kilauea, on the Big Island of Hawaii" (Roverato et al. 107). Also according to Chen et al., "The last transient flank motion occurred in early May 2018 that coincided with the lateral propagation of a dike along the East Rift Zone [of Kilauea). The flank slip triggered a moment magnitude (Mw) 7.2 earthquake, producing "5 m of fault slip" (2018). With this knowledge I believe there needs to be more awareness and discussion on what the process of producing geothermal energy entails.	The existing PGV facility operates consistent with the federal, state, and county permits listed in Table 2-2 of the Draft EIS. The facility operates in compliance with these permits including the DLNR Plan of Operation, GRP, DOH NSP, and UIC permit, and EPA UIC permit. The Project, as analyzed within the Draft EIS which proposes upgrades to the existing equipment and associated infrastructure, would comply with all existing permits as well as all federal, state, and local regulations. Additional research on geologic conditions in the LERZ is out of scope and not proposed under this EIS.	Email
0050	0033	Benjamin Cole	Additionally, further discussion and investigation is needed when analyzing the location of the PGV drilling sites in Hawai'i. It should also be mentioned that Teplow et al. stated, "The geologic conditions at PGV combine tensional tectonics with magmatic temperatures at readily drillable depths (<2500 m)"(889). In other words, there is an enormous amount of stress, like the kind of stress found at the tectonic plate boundaries along with immense heat that is all within easy drilling depth at the PGV site (Teplow et al. 888).	There are no new wells proposed under the Proposed Action or action alternatives analyzed in the EIS. As described in Sections 2.1.1 and 2.2.2 of the Draft EIS, all PGV wells are permitted under the EPA's UIC permit and HDOH's UIC permit for the existing PGV facility. No additional permits to construct wells are needed for the Proposed Action since these actions would continue as permitted. The Project as analyzed in the Draft EIS for proposed facility upgrades does not propose additional wells beyond those already authorized.	Email
0050	0034	Benjamin Cole	For anyone who believes that the 2018 eruption of the Kilauea Volcano was a completely natural event that occurred without man made influence, I would challenge them to look at PGVs Emergency Response Plan. In the event that lava approached the geothermal plant it was approved that the emergency response would entail quenching of the wells with water.	The conditions at the currently operating PGV facility are described under the existing operations sections of the Draft EIS Section 2.1.8 for the emergency response plan. Operation of the current facility is regulated by existing permits which are listed in Table 2-2 in Section 2.1.10 of the Draft EIS.	Email
0050	0035	Benjamin Cole	The recently acquired "Quench Logs" from PGV showed that there was over 1.3 million gallons of water pumped into four different geothermal wells over a two week span in the effort to save their facility from approaching lava. These wells had a combined total capacity of ~140,000 gallons which meant almost 1.2 million gallons of excess seawater was artificially introduced into the super heated subterranean geology of the Kilauea Volcano. Although The PGV records show the pumping of water into their wells started on the 15th of May 2018, and was finished on the 28th of May 2018, there are many local testimonies stating the quenching actually began on the 13th of May with research now emerging in support of the local community (Wieser et al. 18). It's important to note that according to PGV's own records there was a total of 32, 237 barrels or 1,342,194 gallons of water that was pumped into the wells.	Section 3.1.1.4 of the Draft EIS describes concerns about quenching triggering explosive eruptions; however, a link in these events has not been verified in the scientific literature.	Email
0050	0036	Benjamin Cole	Recently, earth scientists Wieser et al. with the University of Cambridge performed an investigation on the 2018 Kilauea eruption by analyzing the molecular makeup of the minerals found in the different lava melts that surfaced during this eruption. This analysis also included a comparison of the molecular makeup of the minerals found in the 2018 eruption to all previous eruptions from Kilauea. In doing so, the group of earth scientists were looking to better understand the reason for the destructive and explosive nature of the 2018 eruption which was more destructive than any prior Kilauea eruptions. Multiple types of lava were observed coming to the surface from the over 24 fissures that erupted during the initial two weeks of the 2018 eruption. One particular fissure, number 17 (F17) , showed an explosive nature and a lava melt never observed before during Lower East Rift Zone eruptions (Weiser et al. 1). The amount of H2O or water found to be present in the melt of the exceptionally explosive eruption of F17 was unlike anything recorded during previous eruptions at Kilauea (Wieser et al. 7).	Comment noted.	Email

Letter ID	Comment No	Commenter Name	Comment Text	Response	Comment Source
0050	0037	Benjamin Cole	PGV's decision to carry out their Emergency Response Plan to save the wells from being covered by advancing lava was made without any consideration of the surrounding environment or population. Wieser et al. addresses this by stating, "Extensive crystallization of a section of this larger magma body (perhaps on the periphery or in a region with enhanced hydrothermal cooling) produced a dacitic melt composition highly enriched in incompatible elements such as Cl, F, Zr, and H2O. Combined with an increase in magma viscosity with increasing SiO2 content and dropping temperatures, this H2O-enrichment accounts for the explosive strombolian behavior exhibited by the eruptive fissure tapping this melt (F17) without requiring external sources of volatiles such as groundwater."(21) To put it quite simply, the excess water found in the lava melt of F17 is the reason this eruption turned into the violently explosive, dangerous and unbelievably destructive eruption that it turned out to be. The group of earth scientists stated, "F17 also exhibited gas venting and the generation of shock waves, audible in the town of Mountain View >20 km to the NW" (Wieser et al. 2).	The ERP is in compliance with Condition #28 of GRP 87-2 and in conformance with discussions with the County of Hawai'i CDA, the Hawai'i DOH, and the staff of the Hawai'i SERC. The ERP was most recently updated in 2022. Wieser et al. (2022) indicate that enhanced hydrothermal cooling could have influenced crystallization of a magma body feeding the Fissure 17 eruption, but do not conclude that this was an absolute cause of incompatible element enrichment, crystallization, or the explosive eruptive activity at Fissure 17.	Email
0050	0038	Benjamin Cole	What does all this truly mean for those who lost everything in this eruption or for the complete and absolute destruction of the environment to include the irreplaceable Kapoho Bay? These findings by Wieser et al. would go along with what native Hawaiians and local residents have passionately spoken out about for years: PGV's Emergency Response Plan directly influenced the outcome of the 2018 Kilauea eruption. When PGV was prompted with the question of whether they were involved with influencing the intensity and worsening of the eruption they denied any influence. PGV representative Mike Kaleikini responded that the excess 1.2 million gallons of water that was pumped into the "natural geology" of the erupting volcano, only a few meters away, had "zero" effect on the subterranean geology. However, to date no environmental impact study has been conducted to conclude or support his response. It should also be noted that PGV takes the position that the geology is the same as when the geothermal plant first started commercial operations in 1993. This claim seems to be more than unreasonable based on the findings of hydrothermal alteration along with the location and nature of the 2018 eruption.	No EIS was prepared following the 2018 eruption as there was no statutory trigger for environmental review as defined by Section 343-5(a), HRS. Furthermore, the ERP is in compliance with Condition #28 of GRP 87-2 and in conformance with discussions with the County of Hawai'i CDA, the Hawai'i DOH, and the staff of the Hawai'i SERC.	Email
0050	0039	Benjamin Cole	A pair of Geoscientists, Guoquing Lin and Paul Okubu, used advancements in technology and 3d mapping software to analyze and relocate with more accuracy almost 50,000 earthquakes that occurred during the 2018 Kilauea eruption to better understand the resulting impacts to the surrounding geology and changes to the entire Lower East Rift Zone on the Big Island of Hawaii. Through the use of this high- precision mapping technology and seismic monitoring, Lin and Okubu were able to suggest that the 2018 eruption at Kilauea produced a new, never seen before seismic band at a depth of around 11,000 feet or 3.5 km representing a new active detachment within the Hilina slump fault system which also shows a larger potential impact that the Hilina slump has on the stability of the Kilauea Volcano than was previously believed by earlier observations. Lin and Okubo state, "results show that the seismicity distribution and focal mechanisms in Kilauea have significantly changed since the 2018 activity" (9) According to Lin and Okubo, "A shallower layer at 3.5 km depth is a new feature of the recent activity, which we propose represents the boundary between Mauna Loa and Kilauea volcanoes or the onland extension of a large submarine landslide. We suggest that large earthquakes are strong enough to trigger displacements at both surfaces" (Lin and Okubo 1).	Comment noted	Email
0050	0040	Benjamin Cole	With the truly historic nature of the 2018 eruption, I believe that it's important to understand any and all contributing factors to the nature of the eruption in order to understand if there was any outside influence from the actions of the geothermal energy plant and if quenching their wells during the eruption led to further destabilization of the volcanic structure. A full investigation looking into the actions of those who were involved in the approval of PGV's Emergency Response Plan to quench the wells is needed. In addition, investigation looking into the decision making that led to the quenching of the wells is needed to determine what actually happened. Currently, the Emergency Response Plan for PGV still includes the "quenching of geothermal wells" putting the community at risk if there is ever another eruption.	The ERP is in compliance with Condition #28 of GRP 87-2 and in conformance with discussions with the County of Hawai'i CDA, the Hawai'i DOH, and the staff of the Hawai'i SERC.	Email
0050	0041	Benjamin Cole	It is my belief after extensive research that includes first hand testimony from community meetings, with PGV representatives, that the actions of PGV had a major impact on the 2018 eruption and that their drilling operations are also accelerating the hydrothermal alterations leading towards a natural catastrophic collapse of the Kilauea Volcano. The potential for failure is only one major earthquake away. Nothing I have encountered while investigating this topic has led to a decrease in concern; my concerns only grow the more I investigate the topic. I am more concerned now than I've ever been. Knowing that USGS had representatives on site during the quenching of the wells without a single public acknowledgement of what happened makes me question whether we're being completely informed about the risks posed by PGV continuing their operation. It seems if there was ever a time to bring truth and transparency to a situation it would be now.	Drilling at the site is conducted in accordance with approved state and federal permits at the existing PG facility and would continue under the Proposed Action or 48 MW Alternative as permitted.	Email
0050	0042	Benjamin Cole	Continuing to drill for this geothermal resource without responding to the concerns of the people and without the completion of an EIS seems irresponsible, unreasonable and done in bad faith. In my opinion this topic should be fully debated to see what the steps should be taken regarding geothermal operations in Hawaii because all geologist do agree on a relating topic which is that the collapse of the Hilina Slump and subsequent Southern Flank of Kilauea is not an "if" but a "when". In 2018 during the eruption, it was documented that the Hilina Slump moved ~16.4 feet towards an ocean floor that's roughly 20,000 feet deep. A mega-tsunami wave produced by this kind of collapse would be unimaginable and the magnitude of destruction would be something never before witnessed in modern history. Wave heights could reach hundreds of feet to possibly over a thousand feet tall. The time to stop provoking Pele is now!	See response to comment 41.	Email
0050	0043	Benjamin Cole	By reading this document, you acknowledge that you have read and reviewed the information presented herein. Therefore, if the aforementioned research is not included in the Environmental Impact Statement (EIS), it is understood and stated that the EIS company and Puna Geothermal Venture consider said research to be negligible and of no consequence.	Comment noted; all comments received on the Draft EIS including any research or references cited are reproduced in the Final EIS consistent with HAR 11.200.1-27(b)(1).	Email
0051	0001	Christopher Bilfoft	Thank you for the opportunity to comment on the PGV Repower Project DEIS. Comments related to specific DEIS paragraphs are presented below.	Thank you for submitting comments on the Draft EIS. Please see the responses to your specific comments below.	Mail
0051	0002	Christopher Bilfoft	Table 2-1. Past and Current Wells at PGV. Please note that the wells and facilities listed in this Table are at variance with the wells and facilities described in the PGV Noncovered Source Permit (NSP No. 0008-02-N) issued October 11 2022. It is worth taking note of these discrepancies to ensure that they are corrected.	The source of the list was cited from the EPA's Response to Comments: Puna Geothermal Venture. Puna Geothermal Venture Class V Geothermal Injection Well Permit No. R9-UICH5-FY16-1R. The reference, EPA 2021a, is included with the other references at the end of the Draft EIS.	Mail
0051	0003	Christopher Bilfoft	2.1.6. Pollution Abatement. The DEIS cites the (out of date and erroneous) PGV NSP No. 0008-02-N, which grossly overstates the functionality of hydrogen sulfide (H2S) abatement systems, as evidenced by numerous releases of this toxic gas into the surrounding community. There is also no analysis of how or if the proposed alternatives will alleviate current or future problems with the release of H2S into public space.	PGV currently implements an air quality monitoring program that is required under the conditions of its Noncovered Source Permit, regulated by the State of Hawaii Department of Health, that would continue through the life of the currently authorized PGV facility and under the Proposed Action and 48 MW Alternative. As stated in Sections 3.3.1 and 3.3.11 of the Draft EIS, three air monitoring stations operate on the southeast, southwest, and west fencelines – A1, B1, and C1, respectively – and capture real time air quality data to monitor emissions compared to the permitted thresholds that is available on the PGV website. As stated in Section 3.11.2 of the Draft EIS, there are also sensors with alarms located strategically on each turbine/generator unit and throughout the existing wellfield. The alarms immediately alert PGV personnel of fugitive H2S emissions so that corrective action can be taken. Also as noted in Section 3.11.1 of the Draft EIS, PGV publishes real-time data from the H2S monitoring sites on its website.	Mail
0051	0004	Christopher Bilfoft	3.2.1 Existing Environment, Surface Water Features, Springs, etc. The "historical Green Lake" and "perched aquifer at the Kapoho Crater" no longer exist. They were destroyed in the May-June 2018 Kilauea Volcano eruption through the Lower Eastern Rift Zone (LERZ). Further, reference to Evans (2015) is problematic due to the 2018 eruption which greatly impacted the LERZ environment. If there are no studies available describing the current condition of surface water, ground water, springs, etc. it should be so stated in the EIS.	As described in Section 3.2, the study by Evans et al. (2015) is a broad understanding of surface water and groundwater in the vicinity of PGV following 20 years of operations. Impacts to springs or groundwater was not identified in this study and the 2018 eruption has not changed PGV's operations in a way that would change the conclusions of Evans et al. (2015). Groundwater monitoring by PGV at their monitoring wells occurs biannually per PGV's Hydrologic Monitoring Program. Regional water supplies are tested by their operators and water quality is reported annually.	Mail
0051	0005	Christopher Bilfoft	3.2.1.6.6 Water Quality. Groundwater tends to flow down slope towards the nearest coast. Unconfirmed reports from independent sampling of wells down slope from PGV note the presence of hydrocarbon analytes (to include pentane) that can only come from PGV. These wells should be tested again to confirm these results.	Evans et al. (2015) noted pentane in wells Keonepoko Nui #2 and MW-2. Furthermore, they noted that ratios of pentane to butane at these wells were not indicative of geothermal injectate and that low levels of hydrocarbons in groundwater, such as those observed in these two wells, may be attributed to contamination during sampling or natural occurrences due to the breakdown of organic matter. "Unconfirmed reports from independent sampling" were not made available for this EIS and therefore were not considered.	Mail
0051	0006	Christopher Bilfoft	3.2.1.6.4 Geothermal Fluids. Evans (2015) is out of date, and the KS-5 production well at Pad A is "out of service" as stated in Table 2.1. This is due to the fact that much of Pad A was covered by lava during the 2018 flow.	See response to comment 4. Comment noted regarding the KS-5 production well.	Mail
0051	0007	Christopher Bilfoft	3.2.2 Environmental Impacts. In addition to the analyzed alternatives, please consider an alternative that evaluates the expansion of wind, bio-fuel, photovoltaic, and solar thermal sources. There are abundant opportunities to expand these alternatives on the Big Island of Hawai'i, which would provide the required energy without the cost, social, and environmental burden of continuing to use the PGV geothermal power plant. Also note that the flawed Act 296-83 that allowed geothermal development regardless of existing land use classification set up a continuing conflict between PGV and local residents, with PGV operating an industrial geothermal facility in close proximity to public roads and peoples homes. Most other geothermal facilities are located at considerable distance from public roads and residences, thereby reducing the potential for such conflicts.	Evaluation of alternative energy sources is out of scope of this EIS. The Project proposes upgrades to the existing PGV facility for continued geothermal power production. Zoning laws in the Project Area allow the industrial operations of the geothermal powerplant at such location, and the PGV facility site operates in compliance with existing permits. Additionally, several operating geothermal power plants are located nearby to neighborhoods per their specific zoning laws and environmental permitting, including in the French Caribbean (Bouillante plant), Guatemala (Zunil plant), United States (Nevada – Steamboat Hills plant), Turkey (Kerem plant), and Indonesia (Sarulla plant). PGV operates within the applicable zoning laws and the GRP.	Mail
0051	0008	Christopher Bilfoft	3.2.2.2 48 MW Alternative. There is no reason to assume that Hawaiian Electric's only recourse to meeting increasing power demands is to burn fossil fuels. There is a reasonable expectation that alternative renewable energy production could meet the demand. Hence, the need for evaluation of these alternatives.	Comment noted, please refer to the response to comment 7. Additionally, text in Section 1.5.2 of the Draft EIS acknowledges that under the No Action Alternative that in addition to burning of fossil fuels, HELCO could also partner with other renewable energy providers to provide power.	Mail
0051	0009	Christopher Bilfoft	3.3.1.1. General Discussion of Air Quality Products. While there is a Federal standard for "criteria air pollutants" such as sulfur dioxide (SO2), no Federal standard exists for H-S, which is basically SO2 below ground in its reduced (un- oxidized) state. This is for purely political not scientific reasons, due to intense lobbying by polluting industries. Of the two, H2S is the far more dangerous toxic gas, second only to carbon monoxide in terms of the injuries and deaths from industrial sources.	Comment noted. As described in Section 3.11.1 of the Draft EIS, PGV conducts H2S monitoring and reporting as required by its DOH NSP (a state air pollution control permit) for its current operations.	Mail

IN THE CIRCUIT COURT OF THE THIRD CIRCUIT
STATE OF HAWAII

SARA STEINER, Plaintiff, v. COUNTY OF HAWAII PLANNING DEPARTMENT; ZENDO KERN *official capacity,* ANY OTHER DOES 1-10; Defendants.	**CIVIL NO. _____** **(Environmental Court Action)** **(Injunctive Relief)** DECLARATION OF JASMINE STEINER IN SUPPORT OF COMPLAINT FOR INJUNCTION

DECLARATION OF JASMINE STEINER IN SUPPORT OF COMPLAINT FOR INJUNCTION

1. I, Jasmine Steiner, hereby swear and affirm the following is true to the best of my knowledge and ability, and I am competent and prepared to testify at a hearing or trial, not limited to the following:

2. I was born at Hilo Hospital in 1988 and have been a resident of the County of Hawaii, State of Hawaii, living near the Puna Geothermal Venture my entire life, on a sunken in acre on Mohala street in Leilani Estates, within a half mile radius of Puna Geothermal Venture.

3. During that time I was exposed to many years of toxic Hydrogen Sulfide and other heavy metals from PGV, who used to open vent and cover the community with sludge, with my own family trying to escape the really bad blowout in 1991, where the toxic plume travelled 10 miles to Seaview.

4. I lived on Mohala Street in Leilani Estates from 1988 until after the 2014 Hurricane Iselle where my father passed out for nearly 12 hours due to failure of Puna Geothermal Venture to

contain their toxic Hydrogen Sulfide. Luckily, I was not home at the time of Hurricane Iselle, so I was not gassed that day.

5. During this incident, my father was woken up by a sound, opened his bedroom window next to his bed and within a millisecond was knocked unconscious on the floor between his bed and window, only to wake up 12 hours later completely confused and trapped in by a massive Albizia forest in Leilani area.

6. After Hurricane Iselle, The County of Hawaii purchased our home with Geothermal Relocation Fund money and resold the property to an employee of Puna Geothermal Venture.

7. I have had asthma most of my life and have been seeing a doctor about Hydrogen Sulfide and other heavy metal poisoning due to living near PGV for 35 years and am currently undergoing extensive health research and bloodwork for heavy metals with my MD .

8. I have a Constitutional Right to clean air and a healthy environment, and Puna Geothermal Venture has been operating without perimeter air monitoring or sampling since 2018.

9. I have complained at PGV quarterly meetings for years about the gassing and I have called Mike Kaleikini many times when I smell gas but despite him saying he would personally come out to my house to check it out, he has never once come to my property, the worst was in January 2023, when my family and I were actually witnessing the brown air and the extreme physical symptoms of these gasses and took my daughter to the pediatrician for h2s poisoning symptoms and I then started calling and emailing all who could help us: Civil Defense, Hawaii EMA, Mike Kalekini personal, and PGV, to no avail for a entire week begging anyone to come check our air as my daughter could not breathe. That week we were in urgent care 3 times with her for the breathing machines for hour and had to take home a new nebulizer. After a week (7 days) Hawaii EMA was the one contact who responded with well wishes for my daughter and

hoped she felt better, yet only directed me to "forward my concerns, of threat to our atual life, to PGV, even though I had explained in emails for a week to them that PGV covers us up and has never once showed they actually cared to anyone in my beautiful community.

10. I attended the Stantec public hearings for PGV's Environmental Impact Statement in Pahoa in June of 2023 and submitted written comments by email.

11. My comments were reproduced on pages 529-531, and I want to clarify that the payouts and cover-ups I have "witnessed" happen every year; PGV pays royalties to the State and County of Hawaii for the privilege of drilling into the Kilauea and gassing the residents and the cover-ups happen when government agencies like the State of Hawaii Department of Health Clean Air Branch drag out a contested case hearing relating to PGV gassing us for 7 years, from September, 2015 to October, 2022, then dismiss it like there are no issues.

12. I also found my comments reproduced in PGV's Final Impact Statement Appendix on page 528 (Public Comment Letter 14) which was notification of a Petition Demanding Decomissioning of PGV due to health hazards and human right violations at Change.Org/pgvpetitionaole.

13. I have a right, under the Geneva convention, Article 8, which provides me the right to an effective remedy by the competent national tribunals for acts violating the fundamental rights granted to me by the constitution.

14. As a Hawaii born human woman, I am protected by all the articles in this Universal Declaration of Human rights, with the ones I would like to highlight being (see exhibit 1) Article 1, 3, 6, 7, 8, 18, 20, 22, and last but certainly not least , Article 25.

15. I believe the State of Hawaii Air Pollution laws are not strict enough and several residents from the community had been trying to participate in a contested case with the Department of

Health but after 7 years, 2 dismissals, and 2 appeals the residents have never gotten their public hearing.

16. After the 2018 Kilauea eruption forced me from my home on Pohoiki Road, my family and I lived at my father's house in Paradise Park for several years.

17. I moved back home and have been living full-time on Pohoiki Road for the last several years and I and my daughter and her father have been getting gassed by Puna Geothermal Venture operations, almost daily, usually always late at night or early in the morning, to which I bring up in the community meetings and it just gets mocked, I get laughed at by the PGV employees, all of which I have on video recordings, even me asking Mike Kalekini why they actually refuse to come check the air when he lies and tells the media or public that "all we have to do is call him and he will personally come right away to check the air himself". It is very confusing to me the contradictions and the actual gaslighting we endure as a community.

18. I noticed the 2018 Fissure line near PGV is very active and I believe the gasses coming out of there are toxic as the geothermal plant injection wellfield is very near the fissure line and that is poisoning my community.

19. Another cover-up I just witnessed is participating in a 2-day protest at the Hawaii County Planning Department on February 5 & 6, 2024 begging the Director Zendo Kern to reject PGV's Final EIS as inadequate. Others and I were there for nearly 10 hours in front of the County Building and **not one person from the Planning Department, including Zendo Kern, would come and speak with us!**

20. It turns out Mr. Kern had already sent the letter approving PGV's Final EIS as having no significant environmental effects nearly 2 weeks earlier, on January 22 – but nobody at the Planning Department had the guts to walk out the door and tell us to go home already.

21. There is evidence of long-term negative health effects from long-term exposure to Hydrogen Sulfide which is not discussed in PGV's Final EIS.

22. There is a vast amount of sacred Puna culture being desecrated in one of the most sacred places in all of Hawaiian tradition (Eastgate Kumukahi, "where all life springs forth") as well as extremely sacred areas of the lower Puna coastal areas that are in extreme danger with PGV being allowed to continue unregulated and unmonitored, and seemingly above all law on earth, and PGV has effectively erased it and or swept all of this Puna Culture under the rug as if it doesn't exist.

23. Look how many lawsuits have been filed in Hawaii Courts by residents harmed by actions of PGV and government officials because the government is not protecting us.

24. I believe Puna Geothermal Venture is harming myself and my family and community and there is not one government agency or representative who will even help us.

25. There were many other important issues brought up by other commenters such as Sara Steiner, Robert Petricci, Larry Wood, Professor Amelung and Ben Cole, none of whom received the serious discussion a truthful Environmental Impact Statement is supposed to do.

26. Puna is a sacred place in Hawaiian legends, and it is downplayed in PGV's Final EIS.

DATED: Pohoiki, Hawaii, April 4, 2024.

/s/ Jasmine Steiner

Jasmine Steiner
wearepuna@gmail.com

THE UNIVERSAL DECLARATION OF HUMAN RIGHTS was approved by the United Nations General Assembly in Paris December 10, 1948, by a vote of 48 to 0. Eight countries abstained—the U. S. S. R., the Ukraine, Byelorussia, Poland, Czechoslovakia, Yugoslavia, Saudi Arabia, and the Union of South Africa.

The Declaration is a statement of principles approved as a common standard of achievement for all peoples and all nations. It is not a treaty and therefore imposes no legal obligations. It is, however, a challenge to all mankind to promote world-wide respect for human rights and fundamental freedoms.

An International Covenant on Human Rights is now being developed in the United Nations. This will be a treaty and will deal with certain of the basic civil and political rights embodied in the Declaration. The United Nations Commission on Human Rights expects to complete the drafting of this Covenant at its next session early in 1949. It will then be considered by the Economic and Social Council of the United Nations and later by the General Assembly. After it has been approved by the General Assembly, the Covenant will be submitted to individual countries for ratification and will become legally binding on the countries which ratify it.

The United States actively supported the approval of the Declaration of Human Rights in the General Assembly in Paris. Secretary of State Marshall called for its approval at the opening of the session. He began his address by urging the nations to approve "a new declaration of human rights for free men in a free world", and continued:

"Systematic and deliberate denials of basic human rights lie at the root of most of our troubles and threaten the work of the United Nations. It is not only fundamentally wrong that millions of men and women live in daily terror of secret police, subject to seizure, imprisonment, or forced labor without just cause and without fair trial, but these wrongs have repercussions in the community of nations. Governments which systematically disregard the rights of their own people are not likely to respect the rights of other nations and other people and are likely to seek their objectives by coercion and force in the international field."

Department of State publication 3381
International Organization and Conference Series III, 20
Released January 1949

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 5 cents

UNIVERSAL DECLARATION OF HUMAN RIGHTS

APPROVED BY THE GENERAL ASSEMBLY AT ITS PLENARY MEETING ON 10 DECEMBER 1948

Preamble

WHEREAS recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

WHEREAS disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

WHEREAS it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

WHEREAS it is essential to promote the development of friendly relations between nations,

WHEREAS the peoples of the United Nations have in the Charter reaffirmed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom,

WHEREAS Member States have pledged themselves to achieve, in co-operation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms,

WHEREAS a common understanding of these rights and freedoms is of the greatest importance for the full realization of this pledge,

Now therefore

The General Assembly,

Proclaims this Universal Declaration of Human Rights as a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and educa-

818525°—49

tion to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.

Article 1

All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

Article 2

Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status.

Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, whether it be independent, trust, non-self-governing or under any other limitation of sovereignty.

Article 3

Everyone has the right to life, liberty and the security of person.

Article 4

No one shall be held in slavery or servitude; slavery and the slave trade shall be prohibited in all their forms.

Article 5

No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

Article 6

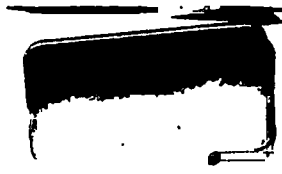
Everyone has the right to recognition everywhere as a person before the law.

Article 7

All are equal before the law and are entitled without any discrimination to equal protection of the law. All are entitled to equal protection against any discrimination in violation of this Declaration and against any incitement to such discrimination.

Article 8

Everyone has the right to an effective remedy by the competent



national tribunals for acts violating the fundamental rights granted him by the constitution or by law.

Article 9

No one shall be subjected to arbitrary arrest, detention or exile.

Article 10

Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal, in the determination of his rights and obligations and of any criminal charge against him.

Article 11

1. Everyone charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defence.
2. No one shall be held guilty of any penal offence on account of any act or omission which did not constitute a penal offence, under national or international law, at the time when it was committed. Nor shall a heavier penalty be imposed than the one that was applicable at the time the penal offence was committed.

Article 12

No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.

Article 13

1. Everyone has the right to freedom of movement and residence within the borders of each state.
2. Everyone has the right to leave any country, including his own, and to return to his country.

Article 14

1. Everyone has the right to seek and to enjoy in other countries asylum from persecution.
2. This right may not be invoked in the case of prosecutions genuinely arising from non-political crimes or from acts contrary to the purposes and principles of the United Nations.

Article 15

1. Everyone has the right to a nationality.
2. No one shall be arbitrarily deprived of his nationality nor denied the right to change his nationality.

Article 16

1. Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family. They are entitled to equal rights as to marriage, during marriage and at its dissolution.
2. Marriage shall be entered into only with the free and full consent of the intending spouses.
3. The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.

Article 17

1. Everyone has the right to own property alone as well as in association with others.
2. No one shall be arbitrarily deprived of his property.

Article 18

Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance.

Article 19

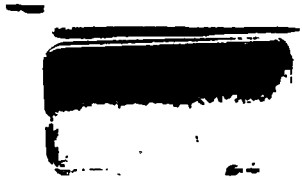
Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.

Article 20

1. Everyone has the right to freedom of peaceful assembly and association.
2. No one may be compelled to belong to an association.

Article 21

1. Everyone has the right to take part in the Government of his country, directly or through freely chosen representatives.
2. Everyone has the right of equal access to public service in his country.



3. The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.

Article 22

Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.

Article 23

1. Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment.
2. Everyone, without any discrimination, has the right to equal pay for equal work.
3. Everyone who works has the right to just and favourable remuneration insuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection.
4. Everyone has the right to form and to join trade unions for the protection of his interests.

Article 24

Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.

Article 25

1. Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.
2. Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.

Article 26

1. Everyone has the right to education. Education shall be free,

at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

2. Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.

3. Parents have a prior right to choose the kind of education that shall be given to their children.

Article 27

1. Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.

2. Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

Article 28

Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized.

Article 29

1. Everyone has duties to the community in which alone the free and full development of his personality is possible.

2. In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and the general welfare in a democratic society.

3. These rights and freedoms may in no case be exercised contrary to the purposes and principles of the United Nations.

Article 30

Nothing in this Declaration may be interpreted as implying for any State, group or person any right to engage in any activity or to perform any act aimed at the destruction of any of the rights and freedoms set forth herein.

U. S. GOVERNMENT PRINTING OFFICE: 1949