

CHRONOLOGY

GEOHERMAL DEVELOPMENT AND ASSOCIATED DATES

WILL BE USED TO UPDATE DBEDT'S ANNUAL CHRONOLOGY

- 1778 Pre-contact Hawaiians used Kilauea's geothermal resources for a variety of cooking and heating purposes.
- 1827 Explorers identify numerous fumaroles and thermal features on Kilauea and Mauna Loa volcanos.
- 26 September, 1881 An article in the New York Sun relates a meeting between King David Kalakaua and Thomas Edison, at which the possibility of generating electrical power from Kilauea Volcano and transmitting it to the other islands via a submarine cable is discussed.
- 15 February, 1960 Leilani Estates subdivision approved.
- 1961 Four shallow exploratory wells drilled into the Kilauea East Rift Zone by Hawaii Thermal Power Company.
- 22 January, 1969 Unit IV of Nanawale Estates subdivision approved.
- 1972 State legislature allocated \$200,000 for geothermal research to identify and utilize geothermal resources in Hawaii.
- 1973 National Science Foundation sponsors drilling of a research well near Halemaumau crater to a depth of 4,140ft with a maximum temperature of 279pF.
- 30 May, 1973 Lanipuna Gardens subdivision approved.
- 10 December, 1975 Drilling begins at HGP-A.
- June-July, 1976 Well completion and testing at HGP-A.
- 14 July, 1977 SLUC approves SP 77-265 (LUC-364 GEDCO-Ashida).
- 19 May, 1978 DLNR's well drilling regulations become effective.

18 July, 1978 SLUC approves a one year extension to SP 77-265.

26 September, 1978 DLNR approves well drilling permit for four wells for Puuwaawaa Steam Co.

7 February, 1979 SLUC approves SP 78-307 (LUC-392) for DPED's Hawaii Geothermal Research Station.

30 May, 1979 SLUC approves SP 79-333 (LUC-411) for GEDCO/Puuwaawaa Steam Co for four wells.

5 September, 1979 SLUC approves a second one year extension to SP 77-265.

10 September, 1979 DLNR approves well modification permit for HGP-A.

10 January, 1980 DLNR approves well drilling permit for Opihikao No. 1 (Ashida).

June, 1980 Final designs completed for the HGP-A power plant.

21 August, 1980 PC approves LUC 460 for GEDCO for nine wells off Opihikao Road.

15 October, 1980 Planning Commission approves LUC- 468 (Thermal/Dillingham).

19 November, 1980 SLUC approves SP 80-347 (LUC-460) for a maximum of 9 wells for GEDCO.

16 December 1980 Planning Commission approves LUC-471 (Barnwell) for 6 wells.

20 January, 1981 DLNR approves drilling permit for Lanipuna 1.

2 March, 1981 DLNR approves drilling permit for GEDCO's Daiichi No. 1.

4 March, 1981 DLNR approves drilling permits for Lanipuna 2 and 3.

19 March, 1981 DLNR approves drilling permit for KS-1.

7 May, 1981 Planning Commission deletes Condition No. 11 of GEDCO's LUC-468 and allows 7 day drilling instead of only on weekdays.

June,	1981	Construction complete on the HGP-A power plant and visitor's center.
July,	1981	First electrical power generated from the HGP-A well.
2 July,	1981	Pohoiki Bay Estates subdivision, Unit I approved.
September,	1981	HGP-A power plant shutdown due to problems with turbine control valves and the balance of the turbine.
18 November,	1981	Planning Commission deletes Condition No. 10 of Barnwell's LUC-471 and allows 7 day drilling instead of only on weekdays.
December,	1981	HGP-A well and power plant restarted, but additional problems with generator balancing and the exhaust system system keep the plant from operating reliably until May, 1982.
8 January,	1982	DLNR approves drilling permit for KS-2.
19 January,	1982	SLUC approves time extension for SP 77-265 (LUC-364 GEDCO-Ashida) to July 14, 1984.
1 February,	1982	Puna Hui Ohana releases its "Assessment of Geothermal Development Impact on Aboriginal Hawaiians.
2 March,	1982	Campbell Estate applies to BLNR for drilling, development and exploration at Kahaualea.
8 March,	1982	COH Planning Commission recommends a one year extension for SP 80-347 for GEDCO-Daiichi.
21 April,	1982	SLUC approves extension of SP 80-347 to June 4, 1983.
20 May,	1982	Public hearing on the CDUA for Campbell Estate's Kahaualea project held and contested case hearing requested.
July,	1982	State Geothermal Development Program Plan prepared.
2 July,	1982	COH Planning Commission (PC) recommends nullification of SP 79-333 (LUC-411 GEDCO-Puuwaawaa) for four wells.
30 July,	1982	DLNR accepts the final revised EIS for the Kahaualea

Geothermal Project.

2 August, 1982 SLUC informs PC that 7/2/82 "action to nullify" of SP 79-333 (LUC-411 GEDCO-Puuwaawaa) is final.

23 September, 1982 Pohoiki Bay Estates subdivision, Unit II approved.

5 October, 1982 Contested case hearing starts on Kahaualea project.

13 January, 1983 Final date of contested case hearing on the Kahaualea project.

25 February, 1983 DLNR issues Decision and Order to allow limited exploration rights to Campbell Estate at Kahaualea.

14 June, 1983 ACT 296, SLH 1983 passed delegating BLNR to designate Geothermal Resource Subzones (GRSZ) throughout the State.

12 March, 1984 Supplemental CDUA hearing held on volcanic hazards with regard to the Campbell/True project.

8 May-30 July 1984 DLNR holds 7 public informational meetings on the geothermal subzone designation process.

25 May, 1984 Act 151, SLH 1984 passed which grandfathered existing geothermal mining leases into GRSZs.

10-12 Sept., 1984 DLNR holds a series of 4 hearings on the proposed designations of geothermal resource subzones.

12 September, 1984 Contested case hearing requested for the Kahaualea geothermal resource subzone (Kilauea Upper East Rift Subzone, KUERS) at the Hilo hearing.

16 November, 1984 BLNR designates the Kilauea Lower East Rift (Kapoho and Kamaili sections) and the Haleakala Southwest Rift as Geothermal Resource Subzones.

12-20 Dec., 1984 Contested case hearings held in Hilo on the Kahaualea subzone (KUERS).

28 December, 1984 BLNR issues Decision and Order designating 800 acres at Kahaualea as a GRS (Kilauea Upper East Rift Subzone).

18 February, 1985 A field survey was completed for the purpose of

relocating the air quality monitoring instruments as a part of the assessment of the KMERZ in and adjacent to the Natural Area Reserve.

- 13-14 March, 1985 Public informational meetings were held in Keaau and Pahala to report on the most likely location of geothermal resources in KMERZ and the KSWRZ.
- 15-16 May, 1985 Public informational meetings were held at Pahoia and Pahala to identify the impact issues in these areas.
- 25 August, 1985 Campbell Estate files CDUA for exploration and development within the KMERZ GRS.
- 26 September, 1985 BLNR holds public hearings on designation of KMERZ and KSWRZ. Contested case hearing requested on KMERZ.
- 25 October, 1985 BLNR approves exchange of Campbell Estate's Kahaualea land for the State's Wao Kele O Puna forest reserve.
- 13 November, 1985 BLNR begins contested case hearing for the KMERZ GRS.
- 20 December, 1985 BLNR issues the decision and order designating 9014 acres of Wao Kele O Puna as a GRS.
- 18 February, 1986 Contested case hearing on the CDUA for Wao Kele O Puna begins.
- 11 April, 1986 Blnr issues decision and order for exploration up to 100MW and development to produce 25MW on Campbell Estate's land at Wao Kele O Puna.
- 10 December, 1986 Thermal Power submits its PGV project application for a Geothermal Resource Permit from the County of Hawaii.
- 1987 An environmental review of the 500MW transmission system predicts adverse effects during construction as well as unsightly overhead power lines, but notes that the alternative, new oil-fired plants, would be worse.
- 1987 The Hawaii Supreme court, considering a lawsuit by Ralph Palikapu Dedman challenging geothermal development, ruled unanimously that such development does not subvert worship of the ancient Hawaiian volcano goddess. Appealed to U. S. Supreme Court.

1987 Governor John waihee appoints former Republican Governor William F. Quinn to head an advisory board on the geothermal/cable project.

November, 1987 Thermal Power submits its EIS for the PGV project.

January, 1988 The Quinn panel reports that the concept of the 500MW project appears to be technically feasible, and compared to oil, economical.

January, 1988 The Public Media Center, a non-profit San Francisco advertising agency, launches an anti-geothermal ad campaign for the Pele Defense Fund, in Hawaii and major mainland newspapers.

April, 1988 The U. S. Supreme Court refuses to hear an appeal by the Pele Defense Fund, leaving intact the 1987 Hawaii Supreme Court decision.

April, 1988 Pele Defense Fund files suit in U. S. District Court over the Campbell Estate land exchange with the State.

May, 1988 Ormat Energy Systems Inc. of Nevada completes its purchase of Puna Geothermal Venture, including a 25% share held by Amfac.

30 December, 1988 PGV submits an amendment to the GRP application submitting modifications in power plant design and abatement technology.

February, 1989 DBED signs a one year contract with Cassidy and Associates, a Washington, D.C. lobbying firm to pursue Federal money for geothermal development. This contract was renewed in 1990 for an additional 12 months.

March, 1989 Puna Geothermal Venture submits its application. amendment to the plan of operations to DLNR for the PGV project.

28 March, 1989 DLNR approves amendment to the plan of operations for PGV.

March, 1989 Puna Geothermal Venture submits its application to the DOH for the ATC to construct the wellfield and the ATC to construct the power plant.

March 1989 A State sponsored environmental review of the 500MW geothermal development proposal says special attention should be paid to avoiding archaeologically and biologically sensitive areas and to noise abatement, air quality and potentially dangerous lava flows and earthquakes.

May, 1989 Hawaiian Electric Co. invites private sector proposals to finance, develop and operate the 500MW geothermal and undersea cable project with the first increment of electricity to come on line in 1995.

May, 1989 The DOH issues an air-quality authorization for True Mid-Pacific to drill up to 12 wells in KMERS. The permit is challenged in State court by the Pele Defense Fund.

23 May, 1989 Planning Commission appoints mediators for the SOH application for a geothermal resource permit from the COH.

June, 1989 DBED contracts with ERC Environmental and Energy Services Co. for preparation of a master development plan, environmental impact statement and analysis of overland transmission systems for the 500MW geothermal and undersea cable project.

June, 1989 The San Francisco based Rainforest Action Network, in cooperation with the Pele Defense Fund, takes up the issue of geothermal development in the Wao Kele O Puna forest.

6 June, 1989 PC holds first hearing on PGV's application for a geothermal resource permit for up to 30 geothermal wells and a 25MW power plant.

7 June, 1989 Mediation on the SOH application starts.

19 June, 1989 PC appoints mediator for the PGV project application.

7 July, 1989 Mediation on the SOH application finishes.

13 July, 1989 Final report on mediation for the SOH application for GRP 89-1 issued.

19 July, 1989 Mediation starts for PGV project application for a geothermal resource permit.

8 August, 1989 PC grants an extension to mediation for the PGV application until 17 August, 1989. PC schedules a second public hearing for 28 August, 1989.

August, 1989 True Geothermal is fined \$15,000 for clearing five more acres of forest than called for in its permit. True intended to clear 8 acres, but said that, due to a mistake in paperwork, the authorized area was only three acres.

15 August, 1989 SOH GRP 89-1 issued by the COH Planning Commission.

17 August, 1989 Mediation ends for PGV's project.

21 August, 1989 Mediators report on mediation for the PGV project application issued.

28 August, 1989 PC holds the second public hearing on PGV project.

September, 1989 DOH issues and air quality authorization to Ormat Energy Systems Inc., operating as PGV to drill 14 geothermal wells and install 10 Ormat generators with a net capacity of 25MW, one fifth of the Big Island's energy needs, in an abandoned papaya field in Pohoiki.

19 September, 1989 PC holds the third public hearing and approves the PGV project.

October, 1989 Demonstrators, numbering approximately 350, construct and altar to Pele on the True Mid-Pacific geothermal drilling site. The company takes it down.

3 October, 1989 PC issues PGV's GRP-2 for up to 14 wells and a power plant of 25MW net.

19 October, 1989 Ad Hoc Asset Fund Committee has first meeting to work on the Geothermal Asset Fund Rules (GAFR) resulting form Condition No. 51 of GRP-2.

November, 1989 True/Midpacific Geothermal begins drilling in Wao Kele O Puna.

- 16 November, 1989 Last meeting of the Ad Hoc Asset Fund Committee attended by government agencies.
- November-December, 1989 Five international consortia submit proposals to HECO to privately finance, develop and operate the 500MW geothermal and undersea cable project.
- December, 1989 HGP-A power plant permanently closed down.
- December, 1989 The University of Hawaii commenced drilling its first Scientific Observation Hole (SOH) on PGV's leased land near its entrance gate.
- December, 1989 Surrogate deep-water cable undergoes successful tests at sea. This was the final task in the cable research program.
- December, 1989 Police arrest 39 demonstrators at the True/Mid-Pacific drilling site.
- December, 1989 DBED announces plans to have the preliminary geothermal master development plan completed by March, 1990 and a final plan by August, 1990. Work on a programmatic environmental impact statement starts in May, 1990 with completion of the EIS scheduled for February 1991.
- January, 1990 Governor Waihee announces that he supports geothermal development projects for the Big Island with further development of an interisland cable project to be dependent on the experience and success of those projects.
- February, 1990 Hawaiian Electric and DBED announce that negotiations on proposals for the 500MW cable project have been narrowed to two partnerships. One, called Kilauea Energy Partners, comprises Mission Power Engineering Co., California Energy Co., and Sumitomo Corp., and the other comprising Pacific Gas and Electric Co., Bechtel Generating Co., Sumitomo Electric Industries and Mitsubishi Heavy Industries America Inc.
- 6 February, 1990 DOH issues the Authority to Construct (ATC) No. A-833-795 and No. 834-796 to PGV for the wellfield and the power plant.
- March, 1990 Police arrest 141 in the State's biggest antigothermal

demonstration which involved some 1200 supporters of the Pele Defense Fund and the Big Island Rainforest Action Group at the True/Mid-Pacific gate in Wao Kele O Puna.

16 March, 1990 DOH modifies ATCs Nos. 833-795 and 834-796.

April, 1990 True/Mid-Pacific announces that its first well hit a "geothermal resource". The developer completed 3 more sidetracks from the same well later in 1990.

May, 1990 The U. S. 9th Circuit Court rejects Pele Defense Fund's appeal in its suit regarding the Big Island land seap between the State and Campbell Estate.

May, 1990 Circuit Judge Shunichi Kimura rules in favor of True/Mid-Pacific in the suit by Pele defense Fund ove pollution issues.

19 June, 1990 Act 208, SLH 1990 signed allowing drilling of exploratory wells outside of GRS.

25 June, 1990 Governor John Waihee officially notes that the costs and benefits of the underwater cable need to be analyzed in better detail and that a key question of whether the resource exists needs to be answered

12 July, 1990 DOH accepts PGV's Hydrologic Monitoring Plan (HMP).

18 & 25 July, 1990 Last meetings of the Ad Hoc Asset Fund Committee (Not attended by government agencies).

21 February, 1991 PGV's well KS-7 experiences a kick (a small blowout) at 1678ft.

1 April, 1991 First meeting of a GAFR committee organized by Planning Director. Four meetings were held in April and May, 1991.

21 May, 1991 Draft of the Geothermal Asset Fund Rules developed by the Planning Director's committee was prepared and issued by Corporation Counsel.

28 May, 1991 DOH modifies ATC No. 833-795 for PGV's wellfield

12 June, 1991 PGV's well KS-8 unloaded at 2316hrs leading to an uncontrolled blowout for 31 hours.

13 June, 1991 Drilling crews and PGV personnel work on controlling the well.
HPD commences evacuation of Lanipuna Gardens at 0010hrs.
PGV reports two readings of 20 and 29 ppm H₂S just outside their boundaries at 0100hrs.

13 June, 1991 HCD requests HFD perform a house to house alert for Leilani Estates Subdivision.

14 June, 1991 PGV reports well KS-8 was shut in at 0630hrs.

14 June, 1991 COH planning Director suspends drilling activity at PGV.

17 June, 1991 PGV issues report on the blowout of well KS-8 to DOH.

18 June, 1991 Community meeting with the Mayor and COH administration in Pahoia on GRP-2 as a result of PGV's blowout of well KS-8.

24 June, 1991 Governor and Mayor announce both a State and an independent investigation of the blowout of PGV's well KS-8.

26 June, 1991 Act 315, SLH 1991 signed giving 30% of royalties collected by the State to the County.

28 June, 1991 Governor and Mayor announce an independent review of the State's air and noise monitoring programs at PGV.

24 July, 1991 Final reports of the three investigative groups on PGV's KS-8 blowout are available to COH and State agencies.

25 July, 1991 Community meeting with Mayor, COH administration and Directors of State agencies in Pahoia to present the investigative reports of the "Expert" Investigative Team on PGV's blowout of well KS-8.

26 July, 1991 COH planning Director suspends all activities at PGV except those taken to fully control well KS-8.

30 July, 1991 COH Mayor proclaims a State of Emergency at PGV's KS-8 wellsite as State and County investigators believe that the well is not under control.

18 September, 1991 COH Planning Director determines that PGV has violated conditions Nos. 23, 24, and 47 of GRP-2 and was remiss in not complying immediately with the Planning Director's order to cease all activities exclusive of efforts to bring well KS-8 under control. PGV is fined \$2,000.

1 October, 1991 Geothermal Management Plan (GMP) submitted to the Governor and Mayor by the Geothermal Task Force.

2 October, 1991 COH Planning Director removes suspension "of all further activities at the PGV site exclusive of efforts to fully control KS-8", but reminds PGV that drilling is still suspended.

9 December, 1991 DLNR approves PGV's amended plan of operations, allowing resumption of geothermal development activities, subject to other agencies' required actions.

31 December, 1991 Scientific Observation Hole (SOH) permit, GRP-1, expires.

13 January, 1992 DOH modifies ATCs Nos. A-834-795, and A-834-796 for PGV's wellfield and power plant.

23 January, 1992 DOH issues an extension to ATCs for PGV's wellfield and power plant.

13 February, 1992 DLNR approves conversion of well KS-1A from a production to an injection well.
DLNR approves permit to modify and complete injection well KS-8 as a production well.

14 February, 1991 Notice of Intent issued by the U.S. DOE for preparation of the EIS for the 500MW undersea cable geothermal project labeled the Hawaii Geothermal Project (HGP).

28 February, 1992 Mayor of Hawaii County, in her capacity as Deputy Director of Civil Defense for the Island of Hawaii, approves the Emergency Response Plan, Version 6.1, for the PGV project.

7-16 March, 1992 Federal personnel hold 10 scoping meetings on four islands for the Hawaii Geothermal Project (HGP) EIS.

15 May, 1992 Planning Department asks PGV to notify all people living within a radius of 6.7km of the plant of the possibility of evacuation.

8 June, 1992 Geothermal Compliance Coordinator meets with Lanipuna Gardens Community Association.

16 June, 1992 Community informational meeting on the May, 1992 draft of the GAFR held in Pahoa.

18 June, 1992 DOH issues new ambient air quality rules pertaining to H₂S.

30 June, 1992 Working draft of the Implementation Plan for the HGP EIS issued.

7 July, 1992 Hearing on the GAFR removed from the agenda of the Planning Commission.

7 July, 1992 COH agrees in writing with PGV's request that they not be required to pay for voluntary relocation or lost wages/income reimbursement during planned well testing since unabated or open venting was no longer permitted. PGV was reminded that the vented flow must be abated H₂S. PGV was also reminded of its promise pay residents as described in condition No. 39 if H₂S exceeded 1,000ppb or noise exceeded 85dBA at the property line.

9 July, 1992 DLNR approves PGV permit to drill wells KS-4, KS-9, and KS-11.

16 July, 1992 Hawaii Geothermal Project EIS Implementation Plan draft discussion with cooperating agencies in Honolulu.

17 July, 1992 DOH modifies and compiles past modifications, and reissues ATCs for PGV's wellfield and power plant.

20 July, 1992 DOH signs revised Authority to Construct for both well field and power plant.
Resource is again contacted unexpectedly in well KS-8 as a small amount of steam is released (plug was not

drilled out, but released spontaneously).

- 23 July, 1992 First residents' meeting held at HGP-A with government agencies.
- 30 July, 1992 Geothermal Compliance Coordinator attends BIRAG meeting in Pahoia.
- 4 August, 1992 DOH issues the Permit to Operate (PTO) No. P-833-1399 o PGV to operate the wellfield.
- 5 August, 1992 Meeting held in Kalapana, to enable Hawaiian families of lower Puna to meet with personnel who will be preparing the federal EIS for the Hawaii Geothermal Project and to tell those personnel how they feel about geothermal development as Hawaiians.
- 11 August, 1992 PGV holds first of planned daily residents' meetings at HGP-A on the evening before the flow test of well KS-8.
- 12 August, 1992 Well KS-8 opened for planned 10 day flow test at 1134hrs. The well was closed in at 1200hrs for flange tightening and other minor repairs.
- 13 August, 1992 Well KS-8 was opened at 0831hrs to continue the planned flow test.
- 13 August, 1992 First steam to PGV's power plant at 1400hrs.
- 15 August, 1992 Caustic "rain" from overdosing of caustic at the Emergency Steam Release Facility (ESRF) fell on people gathered at corner of Pohoiki Road and Hinalo Street in Lanipuna Gardens at 1508hrs.
- 17 August, 1992 Bomb threat received at PGV.
- 18 August, 1992 Meeting held at Civil defense with government agencies and PGV regarding H₂S emissions in the surrounding community on the night of August 17th and lack of communications.
Emissions of H₂S reach levels of 69ppb in midafternoon in Lanipuna Gardens.
- 20 August, 1992 Flow test of well KS-8 terminates.
- 20 August, 1992 Meeting of regulatory and response agencies regarding

emissions and problems with communications during PGV's seven day flow test.

- 24 August, 1992 Local residents hold press conference at HGP-A. Drilling rig move started from well KS-8 to well KS-3. H₂S emissions recorded in the community around mid-day.
- 25 August, 1992 DLNR is reviewing the temperature anomaly in well KS-8. H₂S released during dismantling of the "kill" line on well KS-8. Concentrations reach 45ppb at PGV's boundary.
- 27 August, 1992 DBED issues press release critical of PGV's communications with both regulatory and response agencies and the surrounding residents.
- 31 August, 1992 Meeting of County regulatory and response agencies with DOH regarding recent problems/emissions at PGV, communication, geochemical analysis, and evaluation of the resource found in well KS-8.
- 1-3 September, 1992 PGV working on repairs to perforations in the casing at 2,500ft on well KS-3 and installation of hang down liner.
- 8 September, 1992 State and County agencies hold meeting with PGV to discuss recent concerns on emissions and communications and to finalize agreements reached with PGV.
- 9 September, 1992 Drilling rig move from KS-3 to site of well KS-4 starts.
- 14 September, 1992 Well KS-4 spudded in at 1700hrs.
- 21-23 Sept, 1992 Large number of noise complaints from surrounding residents due to air drilling of surface section of well KS-4
- 22 September, 1992 DOH issues modified PTO No. P-833-1399 for wells KS-1A, KS-3, and KS-8 (special condition No. 8 was modified).
- 11 October, 1992 Injection test (using water) of KS-3 was started this weekend.
Finished installing liner at KS-1A.
- 14 October, 1992 KS-8 released a small bit of H₂S carrying steam and or

- non-condensibles via an expansion spool that is leaking at an internal seal. A permanent station measured 2ppb.
- 15 October, 1992 PGV (Steve Morris) starts holding daily residents' meetings at the visitor's center at HGP-A for the period before and during plant startup.
- 20 October, 1992 DOH issues the Permit to Operate (PTO) No. P-834-1413 to PGV for their power plant.
- 20 October, 1992 PGV establishes an informational line updated twice daily to provide callers with daily status of operations (934-9072).
- 20 October, 1992 Draft of the Implementation Plan for the Federal HGP EIS issued.
- 21 October, 1992 Permits to Operate both the power plant and the injection wells were signed by DOH today. A residents meeting was held at the PGV main entrance. The group was very nasty with few constructive comments. Most of the comments were very derogatory, inflammatory, distorted and untrue.
- 22 October, 1992 Well KS-8 was started warming up at 0800hrs and by 1300hrs the flow was in the 50-70,000 lbs/hr range. At 1:45 pm the well (which had already "grown" 4 1/2 inches) suddenly "jumped" 8 more inches coupled with a breaking of concrete/cement in the cellar and the annular space between the surface casing and the 13 5/8 inch casing, and a release of steam from a 3 inch warm-up line flange that had its top bolts stretched due to the 8 inch upward movement. The well was not closed in at this time.
- 23 October, 1992 OEC units started producing power at the 1.5MW level.
- 24/25 October, 1992 Power production was in the range of 2-8MW over the weekend with the plant being very steady in the night shift at 5MW.
- 26 October, 1992 Community complaints of H₂S were the result of problems in the turbine drain collection system. Steam flow 130,000 lbs/hr.

27 October, 1992 There is still some concern about the mechanical integrity of well KS-8. Community complaints of H₂S were received. The source of which seems to be in the oil breathing system of the non-condensable gas compressors.

28 October, 1992 PGV installs liner in well KS-3. KS-8 is still boiling out steam (?) with an odd burnt rubber or burnt sugar smell from the annular space between casings.

28 October, 1992 Meeting of DLNR, DBED, and County administration to discuss GAFR and County-proposed government (dept. head), community, and developer panel to resolve all remaining issues starting with the GAFR.

29 October, 1992 H₂S emissions last night reached a high of 146ppb in Lanipuna Gardens. PGV had trouble finding the source of the leak. PGV generated 6.3MW for most of last night.

29 October, 1992 Ambulance called for PGV worker overcome with H₂S.

31 October, 1992 Power Plant producing 9-11MW today. Both wells KS-1A and KS-3 are being used for injection.

2 November, 1992 Lightning causes Helco to lose 69KV line limiting PGV to producing only station power (0.5MW) last night. PGV advises that it may shut in the well KS-8 and is considered possibly plugging and abandoning it.

2 November, 1992 DLNR requests that PGV prove the mechanical integrity of well KS-8 or shut it down permanently.

3 November, 1992 PGV decides to observe well KS-8 for 48hrs and then make a decision about plugging and abandoning the well. Subsequent data and observations regarding the well caused PGV to start killing the well. H₂S emissions in the community reached levels of 31ppb measured in Lanipuna gardens. According to civil defense, 4 families were evacuated (voluntary).

4 November, 1992 Nearly all the surface piping around the well KS-8 has been removed.

4 November, 1992 Meeting with DOH, DBED, DLNR and County to discuss emissions of the past few days, communication, and the plugging and abandoning of well KS-8.

9 November, 1992 GEOTHERMEX, DBED consultant, presented its first annual report on the East rift zone resource model they have developed. They report that reserves are there, but it remains to be seen if the production is there (considering 500MW production). KS-8 at >\$15MM construction cost is by far the most expensive well in the world.

24 November, 1992 Drilling complete in well KS-4.

24 November, 1992 DOH finds PGV in violation of Condition No. 8 of the wellfield PTO from Sept. 27 to Sept. 30, 1992 and in violation of special condition No. 18 of the power plant PTO on October 28, 1992 and fines PGV \$9,000.

25 November, 1992 PGV has installed a 7 inch slotted production liner in well KS-4 at the bottom with a 7 inch solid, hang down, liner above.

27 November, 1992 EPA calls DOH regarding the rumored swelling around KS-8.

1 December, 1992 Drilling rig begins move to well KS-9 location.

4 December, 1992 Mayor elect of Hawaii County, tells DBED that he would like the County to own and utilize the HGP-A facility.

6 December, 1992 Well KS-9 was spudded at 0800hrs.

6-11 December, 1992 A large number of noise complaints from surrounding residents were received by the developer, DOH and Civil Defense. Highest readings were in the 47-53dBA range.

14 December, 1992 PGV in process of running a resistivity survey to better define their resource model.

3 January, 1993 PGV drilled into a high pressure pocket on well KS-9 at nearly 3300ft in depth and blew out the rupture disk on the blooie line at 1857hrs with the cause estimated to be an isolated pocket of high pressure steam.

12 January, 1993 Drilling engineering estimates that at 3600ft in depth

well KS-9 is already an HGP-A type well. Drilling is expected to continue toward the planned total depth of 4500-5000ft to encounter a KS-8 type resource.

- 14 January, 1993 PGV has hired a contractor to clean out their drilling sumps and dry out the drilling mud to 25% moisture. They plan to spread it on their leased land and have agreement from the owner.
- 15 January, 1993 DOH (Harold Matsuura) requests PGV to help during an emission incident until on-call DOH personnel arrive, since DOH will not be able to have 24hr coverage as promised to the surrounding community. Civil disobedience by anti-geothermal activists is planned for the well cleanout and flow testing of KS-9.
- 20 January, 1993 True Geothermal Energy Company advises that their project is 3 months away from receiving any of their permits.
- 20 January, 1993 DLNR approves plug and abandon procedure for well KS-8.
- 21 January, 1993 PGV discontinued drilling on well KS-9 when the resource was contacted at 4556ft at 2300hrs. A drilling worker got a mouthful of mud and gas (containing H₂S and CO₂) and was knocked down when a drilling connection was being unscrewed. An ambulance was called but then cancelled as the worker sustained no apparent injuries. Highs of 130ppb H₂S were measured on site.
- 22 January, 1993 DLNR issues permit to drill PGV's well KS-10.
- 27 January, 1993 PGV starts to move the drilling rig to well KS-10 location.
- 27 January, 1993 An extensive, three month, East Rift Zone, seismicity study as part of the \$1,500,000 Geothermal resources Assessment Program Phase II, started this month with headquarters at HGP-A.
- 1 February, 1993 Well KS-10 was spudded at noon.
- 1 February, 1993 DOH drops its request of PGV to drill only in the daytime during the first 1000ft.

- 1-4 February, 1993 As a result of the large number of noise complaints and not being able to meet their noise limits, PGV suspended drilling operations during the nighttime hours.
- 3 February, 1993 DOH regular and contract personnel are now covering 24hrs/day during the surface drilling portion of well KS-10.
- 8 February, 1993 Well KS-9 cleanout started at 0900hrs with a "cloud" H₂S being released in the cyclonic muffler due to degassing of the water cap in the well. This "cloud" was "puffed" out of the cyclonic muffler when steam from the well flowed into the muffler. Two workers were knocked down by H₂S fumes. One got up immediately, but the other required a few minutes and some oxygen before rising. No medical attention was sought. A concentration of 250ppm H₂S was measured about 250ft downwind of the well with the only offsite measurement coming from station "D" in Lanipuna gardens at 672ppb before 0915hrs. The latter measurement was exceeding the measurement limits as set on the instrument. Using these two data points a straight line relationship shows concentrations at the fenceline may have reached 40ppm.
Due to a communications "snafu", DOH personnel were not in position to monitor the emitted "cloud" until 0920hrs when they were able to take one reading which was discounted due instrument vagaries.
- 8 February, 1993 PGV drilling crew has been unable to retrieve a lost bit in well KS-10 and plans to skid the drilling rig to the West and start the well again.
- 9 February, 1993 State and County agencies meet with PGV. DOH says concentration of H₂S reached as high as 3.3ppm on the boundary at 0920hrs.
DOH chastises PGV for continuing to "learn" at the expense of government and the reputation of the geothermal industry, for lack of proper communication, and places the well cleanout of KS-9 on hold pending further consideration and investigation.
- 9 February, 1993 DOH declares that the KS-8 drilling sump material "does not exhibit the characteristics of a hazardous waste".

- 10 February, 1993 State and COH agencies meet with Mayor to discuss the incident of 2/8/93.
State and COH agencies meet at DOH-Hilo to discuss lifting of ban on continuation of well KS-9 flow test. DOH Clean Air Branch Chief lifts ban at noon just as the meeting ended. At 1730hrs a DOH Spokesperson says ban is still in effect.
- 11 February, 1993 PGV informs agencies that an overpressure condition developed during the start of the cleanout of well KS-9, in the top section of the 13 3/8 inch casing at the well head due to a plugging of a vent line. This will probably require a replacement of a section of the 13 3/8 inch casing.
- 16 February, 1993 Drilling rig has been skidded over and crew is getting ready to restart drilling on KS-10.
- 16 February, 1993 Civil Defense released information that 15 families were heavily impacted by the H₂S emissions on 2/8/93.
- 16 February, 1993 Six or more local residents testified in opposition to all geothermal bills (with the exception of bill #687) in the legislature particularly those relating to relocation.
- 16 February, 1993 DOH modifies the PTO for PGV's wellfield.
DOH modifies the ATC for PGV's wellfield.
- 17-22 Feb., 1993 DOH and PGV receive a large number of noise complaints due to air drilling of well KS-10 which causes PGV to suspend drilling operations several nights.
- 23 February, 1993 First draft of the MOA concerning communication and notification between DOH, DBEDT, PGV and the County is being reviewed by the County and DBEDT.
- 25 February, 1993 Police initiate investigation of events occurring on February 8, 1993 for a possible criminal negligence charge against PGV for the H₂S emissions that occurred.
- 28 February, 1993 H₂S emissions from a leak during logging operations in well KS-9 when a logging tool was dropped in the hole, reach levels of 59ppb in Pohoiki Bay Estates.
- 1 March, 1993 PGV submits the required Revegetation/Site Reclamation

plan pursuant to Condition No. 36 of GRP-2 that had never been completed.

3 March, 1993 DOH stops PGV from fishing for tool lost in KS-9 on 2/28/93 due to not enough information on the procedure.

4 March, 1993 Work on MOA between government agencies and PGV has been stopped.

4 March, 1993 DOH approves wireline fishing procedure for the lost tool in well KS-9.

8 March, 1993 Cement plugs placed in well KS-9 in preparation for replacing the top section of casing that was over pressured.

10 March, 1993 DLNR issues permit to drill PGV's well KS-5
DLNR approves plug and abandon procedure for well KS-7.

10 March, 1993 PGV is rigging up Cudd hydraulic snubbing unit on well KS-7 for plug and abandon procedures that will start this weekend.

15 March, 1993 DLNR approves plug and abandon procedure for well KS-2.

13 March, 1993 Plug and abandon procedures start on well KS-7.

22 March, 1993 Cudd hydraulic snubbing unit is being rigged up on well KS-9 to drill out the cement plugs.

30 March, 1993 Stone and Webster gives a walk through review of PGV's power plant for COH and State agencies.

31 March, 1993 Stone and Webster presents its review and inspection report on PGV's power plant and piping in Honolulu.

31 March, 1993 PGV decides to install a 7 inch liner in well KS-10 from 4693ft to 3800ft.

April, 1993 IP issued for HGP Federal EIS.

4 April, 1993 Hydraulic snubbing unit work is complete on well KS-9, work starts on hooking up the permanent production piping for the well.

5 April, 1993 PGV plans for power plant startup on 15 April, which is

Merrie Monarch weekend. Upon advisement, PGV decides to avoid this weekend and the potential excessive publicity any incident would receive.

- 6 April, 1993 DOH modifies the PTO for PGV's wellfield.
- 6 April, 1993 PGV finishes well KS-10 at 5083ft in what appears to be the same resource as KS-9 and KS-8.
- 7 April, 1993 PGV will return the hydraulic snubbing unit to the mainland and use the Parker drilling rig for the plug and abandon procedures on wells KS-8, KS-1, and KS-2.
- 12 April, 1993 DLIR's Division of Occupational Safety opened a safety and health inspection on 24 February, 1993 assisted by OSHA to evaluate compliance with chapter 103.
- 20 April, 1993 PGV's well KS-9 was successfully cleaned out with test flows reaching 180,000lbs/hr. Maximum DOH H₂S reading in the community was 8ppb before the well was closed in at 1520hrs.
- 21 April, 1993 PGV starts up its power plant at 1346hrs with flow to separators on pad A. OEC-25 was synchronized with the Helco grid at 1536hrs with 1.5MW.
- 24-25 April, 1993 PGV reaches a high of 14MW during weekend production. Emissions recorded during plant startup since the Tuesday well cleanout, reached a high of 2ppb in the community.
- 26 April, 1993 DOH personnel are no longer stationed at HGP-A, but are on an on-call status.
- 26 April, 1993 Geothermal Compliance Coordinator attends meeting of the Kapoho Community Association.
- 3 May, 1993 Plug and abandon procedures are complete on well KS-8. Parker drilling rig starts move from KS-8 to KS-1.
- 5 May, 1993 PGV's power production reaches 25MW net to Helco's grid with 9 OEC units running and using only well KS-9. Noise levels in the community near PGV have been borderline or slightly above their limit of 45dBA for nighttime.

wells when operating together are approximately 1600psi.

- 25 June, 1993 PGV completes their second 100hr electrical generation test for Helco.
- 25 June, 1993 Board of Land and Natural Resources (BLNR) considers methods of royalty calculations in meeting in Kona.
- 2 July, 1993 Power production at PGV has been at a level of 29-31MW net since Monday, 28 June, with steam flows of 500,000 to 550,000lbs/hr.
- 7 July, 1993 Failure of an inverter resulted in inadvertent closing of the control valves on both producing wells tripping all but one OEC unit.
- 23 July, 1993 A valve bonnet leak forces closure of well KS-10 for repairs. Emissions reach a high of 6ppb H₂S at the SW monitoring station during the repair work. The well was back in service by the afternoon.
- 23 July, 1993 Carpenters union is concerned about PGV's continued use on non-union labor for construction projects.
- 23 July, 1993 A COH position paper on royalties was prepared for the Mayor to present at the BLNR meeting on Kauai.
- 26 July, 1993 DOH renews the PTO for PGV's wellfield now numbered P-833-1524 which supersedes P-833-1399.
- 26 July, 1993 A evening, COH noise survey shows noise levels of 42-47 dBA in Lanipuna Gardens. At the same time it was noted that light spillage from PGV's area lighting seems excessive.
- 27 July, 1993 Federal Hawaii Geothermal Project, EIS, cooperating agency meeting in Honolulu to present status report.
- 3 August, 1993 DOH, unilaterally decides to stop monitoring, regulating and enforcing noise limits at the PGV plant during normal operations, saying that is the COH's job to do this.
- 12 August, 1993 DLNR staff briefs the BLNR on steam valuation procedures for royalty calculations.

13 August, 1993 Work starts on the installation of a pentane vapor recovery unit at the PGV power plant.

19 August, 1993 DOH meets with COH's GCC to formally reveal their intentions with regard to routine noise monitoring.

30 August, 1993 Minor flange leaks in the high pressure piping at the wellheads continue to plague PGV.

31 August, 1993 The August 17, 1993 draft of the GAFR was presented to the public at the Pahoa Neighborhood Center.

14 September, 1993 Three out of four flanges on the TEE at the top of each producing wellhead are now leaking. These are expected to be repaired during the plant shutdown in late September. H₂S levels 50ft away are 12ppb.

16 September, 1993 Main steam valve seal failure allows 5 minute unabated release of steam. No measured H₂S offsite.

17 September, 1993 An instrument communication failure near the wellheads resulted in a total PGV power plant trip.

19 September, 1993 PGV Vice President denies to the press that there any leaks that will be fixed during the planned plant shutdown.

20 September, 1993 Reported rumors of a termination of operations for True-Midpacific are denied by their resident manager.

20 September, 1993 Complaints of emissions of H₂S from PGV have been coming from the surrounding community who are evidently smelling the low level, high pressure, flange leaks on the TEES near the wellheads.

21 September, 1993 Mechanical integrity testing of PGV's injection wells KS-1A, KS-3, and KS-4 starts today .

21 September, 1993 PGV starts annual mechanical integrity testing of its three injection wells.

22 September, 1993 COH takes over responsibility for writing the daily "Geothermal Update" from DBEDT.

22 September, 1993 PGV neighbors hold meeting to see if agreement can be reached on dividing up and accepting the money from the

\$55,000 account that was set up to defray voluntary relocation due to noise from drilling. No agreement was reached.

- 23 September, 1993 DOH renews the PTO for PGV's power plant.
- 24 September, 1993 PGV starts planned shutdown to install redundant instrumentation, and repair the high pressure flange leaks.
- 25 September, 1993 Several workers were sprayed with caustic soda while cleaning pipelines during PGV's plant shutdown, and two of those were sent to the hospital for further treatment.
- 27 September, 1993 PGV's shutdown has been characterized by sporadic emissions of H₂S which reached levels in the community of 33ppb with hourly averages remaining below the permit value of 25ppb. At one point all 5 permanent monitoring stations were showing H₂S readings of 3-5ppb. There were 25 H₂S complaints between 9/25 and 9/27 at 0800hrs. Several nearby families reported sickness from the emissions. The shutdown has revealed that both master valves on each producing well are leaking slightly.
- 28 September, 1993 Well KS-10 was opened and the first OEC unit was connected to the grid at 1629hrs and 8 OECs were on line by 1955hrs generating 25MW net. H₂S emissions continue to plague the community with low level concentrations being recorded, with one high of 80ppb recorded on the permanent monitors. These emissions are coming from the leaking flanges on well KS-9.
- 29 September, 1993 A high of 27ppb H₂S was recorded by station "A" due to continued low level emissions. Work starts today on the high pressure flange leaks around the TEE near the wellhead of KS-9. Air complaints to the DOH hotline totalled 16 since Monday, 9/27.
- 30 September, 1993 Emissions continue with highs of 7ppb recorded due to a popped rupture disk.
- 1 October, 1993 DBEDT issues a "Review of State and County Regulatory

Responsibilities".

- 5 October, 1993 PGV plans to "park" well KS-9 for a period of time.
- 14 October, 1993 Corporation Counsel determines that the language in and GRP-2 and the supporting documentation means that PGV can produce no more than 25MW (net) on a daily average.
- 21 October, 1993 Emissions of H₂S recently have been from the packing on the bottom master valve on well KS-9 with highs in the community from 4-14ppb.
- 22 October, 1993 There have been continued, sporadic, low level emissions of H₂S during the month of October due to the high pressure piping at the wellhead of KS-9 as it has remained closed in since the plant shutdown.
- 23 October, 1993 DOH renews the PTO for PGV's power plant now numbered P-834-1582 which supersedes P-834-1413.
- 25 October, 1993 PGV discontinues weekly project status reports since construction is complete.
- 27 October, 1993 DOH meets with COH GCC to discuss transfer of noise monitoring functions.
- 28 October, 1993 Troublesome expansion spool leaks on well KS-9 continue to plague PGV and community with sporadic H₂S emissions.
- 5 November, 1993 COH and DOH officials meet with Mayor and Planning Director (DOH) to discuss the noise monitoring responsibility that DOH wants to transfer to the COH.
- 5 November, 1993 Venting of a line at well KS-9 resulted in H₂S levels in Lanipuna Gardens of up to 9ppb.
- 8 November, 1993 During the warming up of well KS-9, various leaks of steam resulted in H₂S levels in the community of up to 10ppb starting at midnight.
- 9 November, 1993 PGV's steam system experiences an overpressure condition causing all the OEC units to trip resulting in a plant shutdown from 1300hrs to 1500hrs. H₂S emissions from the turbine seals reached levels of 250 and 370ppb at the fenceline parallel to Hinalo

street in Lanipuna Gardens. DOH gives a preliminary estimate of 18ppb for the hourly average measured at the permanent monitoring stations.

- 11 November, 1993 Well KS-9 placed in service today.
- 14 November, 1993 From 1630hrs to 2100hrs PGV produced a high of 29.0MW net to the grid with an average of 28.0MW.
- 18 November, 1993 Hearing on the GAFR before the Planning Commission in Keaau. Hearing was "continued". Most of the testimony was on the requested reopening of GRP-2 and not on the GAFR.
- 23 November, 1993 Bechtel Environmental finishes its Preliminary Assessment of PGV as a possible Superfund site for EPA. Future work on this site is not planned for years due to the low priority assigned .
- 24 November, 1993 PGV's measures an increased brine/condensate content in the resource being produced from well KS-10.
- 24 November, 1993 Planning Commission requests a PGV site inspection which would include the general public.
- 27 November, 1993 A pinhole leak in the condensate reinjection line that started 11/25 exacerbated, requiring a plant shutdown at 0730hrs. Emissions levels of 5ppb were recorded on the permanent monitors. The plant was restarted, producing full power by 2130hrs.
- 1 December, 1993 Noise levels measured at night near PGV continue to be near or above the 45dBA limit.
- 1 December, 1993 Corporation counsel advises the Planning Commission that the general public does not have to be included in a site visit.
- 1 December, 1993 PGV's well KS-10 being held to approximately 1/3 total resource output due to heavier condensate/brine of the well.
- 3 December, 1993 COH and DOH meet to discuss the terms of the noise MOA which gives responsibility to the COH for routine noise monitoring.

7 December, 1993 A high brine level condition resulted in a automatic shutdown of PGV's plant. Full power was restored three hours from the start of the problem.

8-10 December, 1993 GCC attends DOH noise workshop in Honolulu.

13 December, 1993 A piping failure in the sulfa-treat unit causes an alarm at the monitoring station near HGP-A of 6ppb H₂S.

14 December, 1993 Excessive brine in the steam caused several OECs to trip starting at 2100hrs.

22 December, 1993 Nearly 90% of the steam is coming from well KS-9 as low steam to brine ratios continue to plague well KS-10.

23 December, 1993 PGV tries several procedures to attempt to handle the excess brine from well KS-10 all of which were unsuccessful and showed that additional brine piping is needed.

7 January, 1994 PGV will do more tests today to attempt to remove more brine from well KS-10.

9 January, 1994 More leaks in the condensate reinjection line (in the same place as those that shut the plant down on 11/27) caused PGV to shut the plant down at 2126hrs. Although this shutdown was planned with Helco on Friday, COH and DLNR were not notified, nor were residents notified. Complaints of H₂S smell started at 0600hrs 1/9 with highs in the community of 10ppb at midnight 1/9

10 January, 1994 Emissions of H₂S from the opening of piping to repair a mixing element in the condensate reinjection line reached levels of 5ppb.

11 January, 1994 Plant startup of the PGV facility resulted in the first OEC being synchronized to the grid at 1615hrs with all 9 OEC on line by 2305hrs. Complaints of H₂S smells continued until shortly after noon today.

18 January, 1994 GEOTHERMEX Inc. presents its review of the East Rift Zone's geothermal resources using its reservoir model that is updated with the current PGV data.

26 January, 1994 Planning Department asks PGV for an explanation of

their lack of communication of their January 9, 1994 planned shutdown to government agencies and the public.

- 27 January, 1994 PGV advises DLNR of a five day plant shutdown starting March 9, 1994.
- 27 January, 1994 A leak on the stainless steel, 8 inch, schedule 10, reinjection line, found as a result of a neighbor's complaint, resulted in a plant shutdown where the wells were shut in by 2015hrs. The smell of H₂S reached the community in the afternoon and due to atmospheric conditions, remained in the area until morning.
- 28 January, 1994 Offsite H₂S concentrations reached a high of 12ppb last night.
- 7 February, 1994 True expects to start a plug and abandon procedure on their well KA1-1 to be completed by mid-March.
- 8 February, 1994 The MOA with DOH on noise monitoring at the PGV plant was revised per Mayor's instructions.
- 13 February, 1994 Well KS-10 was logged (pressure, temperature, and spinner) in an effort to determine what is causing the excessive brine problems with KS-10. There were no H₂S emissions.
- 15 February, 1994 Well KS-10 was logged again. Preliminary indications, reported by PGV show no problem with the well itself.
- 16 February, 1994 Well KS-10 was logged again.
- 25 February, 1994 Investigation still continuing by Puna police on criminal negligence charge against PGV for the February 8, 1993 emissions of H₂S.
- 28 February, 1994 H₂S readings of 3ppb in on Hinalo St. in Lanipuna Gardens.
- 2 March, 1994 Pinhole leaks developed in the reinjection line leading from the reinjection header to well KS-4. At least 5 other leaks were discovered recently in this system and appear to occur in the heat affected zone near the welds. H₂S concentrations of 6ppb were recorded offsite. Load was decreased to repair the leaks.

3 March, 1994 A leaking section of the Sch 10 stainless steel reinjection line was sent for metallurgical analysis.

4 March, 1994 True Geothermal Energy Co. announces its termination of geothermal development operations in Hawaii.

11 March, 1994 Insulation was removed from all welds in PGV's reinjection system to identify the scope of the problem.

March, 1994 BLNR approves transfer of SOH wells to DLNR for use in research and monitoring

4 April, 1994 Fiberglass patches are being installed on each weld as a preventative measure.

4 April, 1994 PGV feels that local antigothermal residents are using a scanner to monitor PGV radio messages to maintenance and operating personnel. This results in incomplete or false information being used and circulated in the community and the press.

6 April, 1994 Federal EIS personnel have advised that they are terminating work on the HGP-EIS and will issue a report instead.

11 April, 1994 PGV's plant shutdown to install additional brine handling equipment was accomplished with no offsite H₂S readings.

14 April, 1994 During logging operations in well KS-9 the tool was dropped in the well. Subsequent fishing operations failed to retrieve it. A "deformity" was discovered in the 9 5/8 inch liner at the 400 to 500ft level that may have been there for some time according to information received from PGV.

15 April, 1994 True Geothermal is waiting on the land owner, Campbell to decide on what actions it requires of True regarding the portion of the leased land that was cleared for operations.

16 April, 1994 PGV's plant restarted with first power to the grid early this morning using only well KS-10. The total plant five day shutdown and subsequent startup was accomplished without noticeable offsite H₂S emissions.

18 April, 1994 Station "B" (near HGP-A) alarmed at 5ppb H₂S at 2100hrs. The source was the "frac" tank into which well KS-9 has been bleeding since plant shutdown on 4/10/94.

18 April, 1994 PGV's well KS-10 reaches a maximum of 5-7MW gross over the weekend. Well KS-9 will be slowly opened today.

20 April, 1994 PGV generation reached 18.2MW gross and 16.5MW net with well KS-10 producing ~7MW and production in KS-9 being held to 9-11MW due to the lost tool and the recently discovered "deformity".

22 April, 1994 PGV expects to bring in a hydraulic snubbing unit to effect the repair of the obstruction in the 9 and 5/8 inch cemented liner at the 400 to 500 ft level of well KS-9 and remove the lost tool.

27 April, 1994 PGV is generating 17.5MW gross and 16.0MW net using a resource flow of 180,000lbs/hr from well KS-9 and approximately 100,000lbs/hr of resource from well KS-10. PGV is limiting the flow in well KS-9 because of the "deformity" discovered in the 9 5/8 inch liner at the 400-500ft level and is limited on the flow from well KS-10 by the amount of brine.

2 May, 1994 PGV announced a July repair of well KS-9 with drilling of the next two wells to follow.

12 May, 1994 A geothermal workshop was held for the members of the Planning Commission coupled with a PGV plant site visit and a tour of the surrounding community.

17 May, 1994 The State Board of Land and Natural Resources approved the DLNR staff recommendation to refuse to grant PGV a contested case hearing on the Board's decision on the method of calculation of royalties PGV must pay.

19 May, 1994 The Planning Commission sent the proposed draft of the Geothermal Asset Fund Rules back to the Planning Department with directions to work with the surrounding residents to produce a draft version of the GAFR on which both can agree which will be presented at their Hilo meeting on July 28, 1994.

22 May, 1994 All H₂S monitoring stations required recalibration due

to a HELCO power failure.

27 May, 1994 The Planning Director and the Geothermal Compliance Coordinator met with the Kapoho Community Association to discuss future PGV drilling plans.

30 May, 1994 Leaks from the brine reinjection line to PGV's wells KS-1A and KS-4 caused noticeable H₂S smell in the community.

2 June, 1994 Initial meeting held in Pahoa between the Planning Department, Corporation Counsel, and the people community interested in participating in redrafting the GAFR. Agreed to 7 community members plus 3 alternates to be chosen at a community meeting on June 9, 1994.

3 June, 1994 Fiberglass patching of PGV's reinjection line continues in areas that were identified in the past week.

10 June, 1994 A leaking patch in PGV's reinjection header resulted in a 28ppb H₂S reading on Hinalo Street in Lanipuna Gardens, followed by alarms at monitoring station "D".

11 June, 1994 PGV shut down its plant to replace the problem section of reinjection header at 0100hrs. Plant restart was at 1700hrs.

13 June, 1994 First working meeting of the Geothermal Asset Fund Committee held in Pahoa.

17 June, 1994 PGV started construction of a new reinjection header, additional brine handling equipment and extensive piping modifications in the separator area of Pad A.

17 June, 1994 The second meeting of the Geothermal Asset Fund Rules committee (GAFRC) was held in Pahoa.

20 June, 1994 The third meeting of the GAFRC was held in Pahoa.

17 June, 1994 The fourth meeting of the GAFRC was held in Pahoa.

1 July, 1994 Letters of agreement between the County and DOH, DLNR, and DBEDT were signed funding the Geothermal Compliance Coordination position until December 31, 1994.

5 July, 1994 The fifth meeting of the GAFRC was held in Pahoa. Upon

investigation of the matter, PGV agrees with the community members of the GAFRC that the \$10,000 promised to the community during mediation (p. 40 of the Final Report on Mediation, "other Agreements and Recommendations" section, item No. 2) was paid together with the first \$50,000 payment to the Geothermal Asset Fund. This \$10,000, "...for the sole purpose of enabling the community's involvement in the formation and implementation of this asset fund.", was never officially separated in writing from the first payment to the fund. The community members of the GAFRC requested that the Mayor release the money.

- 18 July, 1994 Installation of the down-hole seismometer in the HGP-A well started this morning.
- 21 July, 1994 The down-hole seismometer installation was completed this morning.
- 23 July, 1994 PGV shut down its power plant with no off-site alarms (over 5ppb H₂S).
- 24 July, 1994 Halliburton pumped a cement plug down well KS-9 in preparation for the repair.
- 24 July, 1994 Installation of the mechanical components of the brine handling facilities started.
- 25 July, 1994 Parker rig started mobilizing over well KS-9.
- 2 August, 1994 PGV now plans to drill KS-11 production well from pad A with well KS-5 to be drilled from pad E as an injector. Wells KS-12 and KS-13 will not be drilled at this time.
- 3 August, 1994 DOH noise monitoring personnel started monitoring the PGV area from 9 p.m. to 5 a.m. seven days per week.
- 3 August, 1994 A video camera survey of well KS-9 discovered an obstruction at 392ft consisting of the lost tool and some rocks.
- 5 August, 1994 Milling of the obstruction area in well KS-9 revealed that a 9 5/8 inch casing collapse had occurred.
- 7 August, 1994 PGV restarted its power plant.

- 8 August, 1994 A resident of Lanipuna Gardens complained of being gassed early this morning. There have been no H₂S alarms from the permanent monitoring stations.
- 8 August, 1994 PGV shut down its power plant to fix the instrumentation and mechanical problems that have prevented the plant from reaching full load.
- 8 August, 1994 PGV's Southwest monitoring station alarmed twice with readings between 5-7ppb H₂S during the 2100-2300hrs time frame.