

US EPA ARCHIVE DOCUMENT

U.S. Environmental Protection Agency, Region 9
UNDERGROUND INJECTION CONTROL (UIC)

INDIVIDUAL PERMIT

Class V Geothermal Injection

Permit No. HI596002

Issued to:
Puna Geothermal Venture (owner and operator)
14-3860 Kapoho-Pahoa Road
Pahoa, Hawaii 96778

TABLE OF CONTENTS

PART I. JURISDICTION AND AUTHORIZATION TO OPERATE	4
PART II. SPECIFIC PERMIT CONDITIONS	6
A. LOCATION OF EXISTING AND PROPOSED INJECTION WELLS.....	6
1. Existing Injection Well Locations	6
2. Proposed Injection Well Locations	6
B. WELL CONSTRUCTION AND RELATED CONDITIONS	7
1. New Wells and Conversions	7
2. Casing and Cementing	8
3. Tubing	8
4. Injection Intervals	9
5. Monitoring Devices	9
6. Proposed Changes, Workovers, Redrills and Downhole Work.....	10
C. CORRECTIVE ACTION	11
1. Area of Review	11
2. Corrective Action.....	11
D. WELL OPERATION.....	11
1. Mechanical Integrity	11
2. Injection Pressure Limitation.....	12
3. Injection Rate Limitation	12
4. Injection Fluid Limitation	13
5. Upset Conditions.....	13
E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS.....	13
1. Hydrologic Monitoring Program	13
2. Program for Mechanical Integrity Testing and Monitoring of Injection Wells	14
3. Injection Fluid Monitoring Program.....	14
4. Monitoring Information	15
5. Calibration of Monitoring Equipment	16
6. Automatic Alarms and Shut-Off Devices	16
7. Recordkeeping	16
8. Accurate, Current, and Representative Information	17
9. Reporting.....	17
10. Modifications to Monitoring and Reporting.....	18
11. Additional Monitoring and Reporting	19
12. Twenty-Four Hour Reporting	19
13. Reporting of Noncompliance of Permit Limitations	20
F. PLUGGING AND ABANDONMENT	20
1. Notice of Plugging and Abandonment.....	20
2. Plugging and Abandonment Plan.....	20
3. Plugging and Abandonment Report.....	20
4. Well Closure	21
G. FINANCIAL RESPONSIBILITY	21
1. Demonstration of Financial Responsibility	21
2. Insolvency of Financial Institution	22
PART III. GENERAL CONDITIONS	23

A. EFFECT OF PERMIT	23
B. PERMIT ACTIONS.....	23
1. Modification, Revocation, Reissuance, and Termination	23
2. Transfer of Permits	24
C. SEVERABILITY	24
D. CONFIDENTIALITY	24
E. GENERAL DUTIES AND REQUIREMENTS	24
1. Duty to Comply.....	24
2. Penalties for Violations of Permit Conditions	25
3. Need to Halt or Reduce Activity not a Defense.....	25
4. Duty to Mitigate.....	25
5. Proper Operation and Maintenance	25
6. Duty to Provide Information.....	25
7. Inspection and Entry	25
8. Records of the Permit Application.....	26
9. Availability of Reports.....	26
10. Signatory Requirements.....	26
11. Reporting of Changes and Noncompliance	26
12. Continuation of Expiring Permits	27
13. Required Immediate and Followup Notifications of Non-permitted Releases.	27
APPENDIX A - INJECTION WELL SCHEMATICS	
APPENDIX B - EXISTING AND PROPOSED WELL PAD LOCATIONS	
APPENDIX C - APPROVED CHANGES AND WORKOVERS	
APPENDIX D - CASING MONITORING PROGRAM	
APPENDIX E - CHEMICAL AND PHYSICAL ANALYSIS PLAN FOR INJECTATE TESTING	
APPENDIX F - PLUGGING AND ABANDONMENT PLANS	
APPENDIX G - PUNA GEOTHERMAL VENTURE HYDROLOGIC MONITORING PROGRAM	
APPENDIX H - CHEMICAL ADDITIVES	
APPENDIX I - EPA FORMS	

PART I. JURISDICTION AND AUTHORIZATION TO OPERATE

The U.S. Environmental Protection Agency (EPA) issues UIC Permits pursuant to its authority under the Safe Drinking Water Act (SDWA), as amended, and implementing regulations at Title 40 of the Code of Federal Regulations, Parts 124, 144, 146, 147, and 148.

Pursuant to its permitting authority, the EPA hereby authorizes

Puna Geothermal Venture, (PGV) (owner and operator)
14-3860 Kapoho Paho Road
Pahoa, Hawaii 96778

to operate four existing Class V geothermal injection wells (the term "well" shall refer to an injection well unless otherwise stated), known as geothermal wells Kapoho State 1A (KS-1A), Kapoho State 3 (KS-3), Kapoho State 11 (KS-11) and Kapoho State (KS-13):

Injection Well No.	Operational Status	Located on Well Pad	Approximate Well Head Elevation Above Sea Level
KS-1A	Primary Injector	A	618 feet
KS-3	Primary Injector	E	617 feet
KS-13	Primary Injector	A	618 feet
KS-11	Primary Injector	A	618 feet

and having the specifications as listed in Figure No. 1, Figure No. 2, Figure No. 3, and Figure 4, respectively, of Appendix A--Injection Well Schematics; to inject geothermal fluids consisting of geothermal brine, geothermal steam condensate, and geothermal noncondensable gases that are produced during the operation of the well field and power plant; chemical additions for process system and well casing biofouling, corrosion, and scale control; and the intermittent injection of supplement water back into the geothermal reservoir at an interval between the approximate depths of 3,900 feet and 7,300 feet (in reference to the Kelly Bushing, or KB, which is 25 feet above the top of cellar), located at the facility's address of 14-3860 Kapoho Paho Road, Pahoa, Hawaii, 96778; at Tax Key Number, 3rd Div. 1-4-01:2 and 19; at the approximate well pad coordinates:

Well Pad A: Latitude 19 28' 49" N and
Longitude 154 53' 35" W;

Well Pad E: Latitude 19 28' 41" N and
Longitude 154 53' 40" W;

in accordance with monitoring requirements and other conditions set forth in Parts I, II, III and IV hereof.

Permit No. HI596002

The EPA authorizes the operation of the four (4) existing Class V geothermal injection wells, and the construction and operation of up to six (6) new Class V geothermal injection wells, contingent on the conditions of this permit being met. As specified in Part II.A.2 of this permit, the location of new injection wells will be included in Appendix B--Existing and Proposed Well Locations.

This permit further authorizes PGV to perform redrill operations on Well KS-11, to conduct the generic redrill operations on other injection wells, and to conduct scale control and removal operations (see Appendix C) as appropriate for the development of PGV's geothermal field and to efficiently generate electrical power. In addition, the term "conversion" as used in this permit refers to either converting an injection well to non-injection or converting a non-injection well to injection. Implementation of any of these activities, as authorized by this permit, will be handled as a minor permit modification and require pre-notification of EPA and adherence to all other terms and conditions of the permit.

All conditions set forth herein refer to Title 40 Parts 124, 144, 146, and 148 of the Code of Federal Regulations.

This permit consists of twenty-eight (28) pages in addition to appendices and includes all items listed in the Table of Contents. Further, this permit is based upon representations made by the permittee and on other information contained in the administrative record. It is the responsibility of the permittee to read and understand all provisions of this permit.

This permit is a modified version of that which was issued by the EPA and will remain effective for a period of ten (10) years from the original date of May 16, 2006, unless terminated under the conditions set forth in Part III, Section B of this permit.

This permit modification action is issued on 09/09/2009 and becomes effective on 10/15/2009.

Signed by Alexis Strauss

Alexis Strauss, Director
Water Division, U.S. EPA Region 9

PART II. SPECIFIC PERMIT CONDITIONS

A. LOCATION OF EXISTING AND PROPOSED INJECTION WELLS

1. Existing Injection Well Locations

The permittee currently operates four (4) Class V injection wells known as geothermal wells, Kapoho State 1A (KS-1A), Kapoho State 3 (KS-3), Kapoho State 13 (KS-13) and Kapoho State 11 (KS-11).

Injection Well No.	Operational Status	Located on Well Pad	Approximate Well Head Elevation Above Sea Level
KS-1A	Primary Injector	A	618 feet
KS-3	Primary Injector	E	617 feet
KS-13	Primary Injector	E	617 feet
KS-11	Primary Injector	A	618 feet

The wells are located at the facility's address of 14-3860 Kapoho Pahoa Road, Pahoa, Hawaii 96778; at Tax Key Number, 3rd Div. 1-4-01:2 and 19; at the approximate well pad coordinates:

Well Pad A: Latitude 19° 28' 49" N and
Longitude 154° 53' 35" W;

Well Pad E: Latitude 19° 28' 41" N and
Longitude 154° 53' 40" W;

2. Proposed Injection Well Locations

- (a) The permittee is authorized by the EPA to operate the four (4) existing geothermal injection wells, and construct and operate up to six (6) new geothermal injection wells, contingent on the conditions of this permit being met. The new wells will be located on the well pads within the property boundary delineated in Appendix B, and will be set back at least 600 feet from the property boundary.
- (b) At least sixty (60) days prior to spudding a new well, EPA shall receive from the permittee: 1) the latitude and longitude of the new well(s), and 2) a map similar to the one in Appendix B with the location of the existing and new wells.

B. WELL CONSTRUCTION AND RELATED CONDITIONS

1. New Wells and Conversions

- (a) The permittee shall give advance notice of at least sixty (60) days to the EPA prior to spudding a new injection well or non-injection well (e.g. developmental, production, exploration) well. The permittee shall give advance notice of at least sixty (60) days to the EPA of the conversion of a non-injection well to an injection well or the conversion of an injection well to a non-injection well. Such notice shall include a detailed list of operations and procedures planned to be executed in the proposed action.
- (b) Authorization of a conversion of an injection well to a non-injection well will not be granted nor will a new well or a non-injection well converted to an injection well commence operation until:
 - (i) construction is complete and the permittee has submitted a notice of completion of construction to the EPA through certified mail; and
 - (ii) the EPA has received and reviewed the well information in II.B.1.c and finds it is in compliance with the conditions of the permit. Any conversion of wells as described previously is prohibited until the permittee shows to the satisfaction of the EPA under §146.8 that the well has mechanical integrity. If the EPA elects to inspect the well, the EPA will notify the permittee of this within 13 days of the date of the notice in II.B.6. and will include a reasonable time period in which it will inspect the well. Review of the well will be based on the information in II.B.6.
- (c) The permittee shall provide EPA with the following information for new and converted wells:
 - (i) The latitude and longitude and well pad of the well and a map similar to the one in Appendix B with the location of the existing and new wells [for new wells, this information shall be received at least sixty (60) days prior to spudding the well];

- (ii) A schematic diagram showing the total depth of the well, and the depths of casing, tubing, and slotted liners for Appendix A;
 - (iii) The lithologic log (**for all wells**) and injectivity test results (for injection wells);
 - (iv) All mechanical integrity test results, including the results of a static temperature test and pressure test confirmed with fluid level shots from sonic device equipment; and
 - (v) A plugging and abandonment plan on Form 7520-14 to be included in Appendix F.
- (d) It is recommended that the permittee notify the emergency responders (County Civil Defense, Fire Department and Police Department) at least fourteen (14) days prior to drilling any new injection or non-injection well. It is also recommended that PGV keep an updated emergency response plan.

2. Casing and Cementing

The specifications in Figures No. 1, No. 2, No. 3 and No. 4 in Appendix A, apply to injection wells KS-1A, KS-3, KS-13, and KS-11, respectively. New injection wells will be drilled according to the construction plans in Attachment L of the original application and submitted to EPA for review and approval per II.B.1. Changes to the construction plans during construction are considered minor modifications provided that the permittee notifies and receives approval from EPA, and that the changes comply with the requirements of 40 CFR §§144 and 146 (40 CFR §144.41(f)). Within sixty (60) days of completing the construction of a well, the well schematic will be provided to the EPA to be included in Appendix A. All existing and new wells shall be cased and cemented to prevent the movement of fluids behind the casing and the casing shall be maintained until the plugging and abandonment of the well.

3. Tubing

Injection tubing (hangdown liner) will be utilized within the longstring casing and will extend to the depths indicated on the well schematics. For existing wells, injection tubing extends to below 3,700 feet KB (from the elevation of the kelly bushing when the well was drilled). The casing/tubing annulus of all existing and proposed injection wells will be filled with nitrogen gas down to a depth of at least 1,975 (below ground surface or BGS).

4. Injection Intervals

For each well, injection into the intended zones will be through the open borehole, with or without a slotted (perforated) liner, below the cemented solid casing. Alteration of the injection perforations and other rework operations must be properly reported using EPA Form 7520-12. Injection between the outermost casing and the well bore is prohibited. The injection interval of the proposed well will be at a depth so as not to cause the migration of injected fluids into Underground Sources of Drinking Water (USDW).

5. Monitoring Devices

Pursuant to 40 CFR §§144.51(h) and 144.52(a)(9) in order to prevent the migration of injected fluids into a USDW and adequately characterize the injectate, the operator shall maintain, in accurate and good operating condition, the following:

- (a) A sampling port on the injection line between the injection common header and an active injection well for the purpose of obtaining representative samples of the injected fluids;
- (b) Injection Pressure indicator
 - (i) An injection pressure indicator and a continuously-recording injection pressure recorder on the injectate line immediately upstream of each well;
 - (ii) a local indicator and a remote pressure transmitter on the combined flow injection line that provides information directly to the control room at the plant; and
 - (iii) an injection pressure switch that triggers a computer printout in the control room;
- (c) A continuously recording pressure recorder at each well to measure annular nitrogen pressure;
- (d) Flow metering
 - (i) A flow metering orifice on the injection line immediately upstream of each well;
 - (ii) a flow transmitter at each well that provides information directly to the control room of the plant;

- (iii) a flow totalizer on the injection line immediately upstream of each well; and
 - (iv) a flow transmitter on the combined flow injection line that provides information directly to the control room of the plant;
- (e) Temperature indicator
 - (i) A temperature indicator located on the injection line immediately upstream of each well; and
 - (ii) a local indicator and a remote temperature transmitter on the combined flow injection line that provides information directly to the control room at the plant; and
- (f) A device on the line between the Emergency Steam Release Facility (ESRF) and the combined flow injection line for measuring the quantity of supplemental water going to the wells.
- (g) A sonic device shall be used to measure the fluid level in the annulus of the injection wells.

6. Proposed Changes, Workovers, Redrills and Downhole Work

The permittee shall give advance notice of at least sixty (60) days to the EPA of any significant physical alterations to the wells. Any changes in the well construction will require prior approval of the EPA and either a major or minor permit modification under the requirements of 40 CFR §§144.39 and 144.41. In addition, the permittee shall provide a workover report containing all records of well workovers, or other subsequent test data to the EPA within sixty (60) days of completion of the activity. Implementation of the procedures outlined in Appendix C (for Well KS-11 or any other injection well) will be handled as a minor permit modification and require pre-notification of EPA and adherence to all other terms and conditions of the permit. Mechanical integrity testing shall be performed within thirty (30) days of the completion of any workovers or alterations. Mechanical integrity shall be demonstrated to EPA prior to resuming or commencing injection activities, following in accordance with Part II.D.1 of this permit.

C. CORRECTIVE ACTION

1. Area of Review

- (a) The area of review (AOR) shall consist of the aggregate of one-fourth (1/4) mile radii that extend beyond the edge of each well pad as identified in Appendix B.
- (b) Unless corrective action has been taken, the construction of a new injection well or conversion of a well to injection is prohibited within the area of review until all abandoned, improperly sealed, or improperly completed wells that are located within the AOR and penetrate the injection zone are properly plugged and abandoned by the appropriate party.

2. Corrective Action

- (a) The drilling of a new injection well or conversion of a well to injection is prohibited within a one-fourth (1/4) mile of Scientific Observation Hole #1 (SOH-1) until the internal and external mechanical integrity of SOH-1 has been demonstrated to the EPA by some party.

D. WELL OPERATION

1. Mechanical Integrity

- (a) All injection wells, including active, temporarily abandoned, and injection wells no longer serving their original function (e.g. injection wells used for monitoring purposes and other conversions) must have and maintain mechanical integrity consistent with 40 CFR §146.8. The permittee must show that there are no significant leaks in the casing and tubing and that there is no significant fluid movement into a USDW through channels adjacent to the injection wellbore.
- (b) In addition, an annulus pressure increase or decrease of more than ten (10) percent in five (5) hours constitutes a significant leak, unless it occurs during the normal shut-in of a well for repairs, wellhead changeout, annual maintenance, outage, or other normal operation and maintenance situations. When an annulus pressure increase or decrease of more than ten (10) percent in five (5) hours occurs or at any time the gas/fluid interface cannot be maintained at a depth of at least 2,000 feet KB (1,975 feet BGS), as measured by a sonic device such as an Echo Meter, then the permittee is

Permit No. HI596002

required to inspect the wellhead for leaks, repair any wellhead leaks found, and resume monitoring. If either one of the aforementioned conditions persists, then the permittee is required to shut in and secure the well, submit an action plan for locating and repairing the leak, repair the leak, and satisfactorily demonstrate to EPA mechanical integrity before returning to operations. The tests and monitoring data that show that the well has had its mechanical integrity restored shall be sent to the EPA.

- (c) If a lack of mechanical integrity and/or significant leaks are detected and confirmed in two or more injection wells, flow into these two or more wells will be stopped, and if necessary, the control operator will reduce the incoming flow from the production well(s). If all injection wells incur mechanical integrity failures and/or significant leaks at the same time, all injection wells shall be shut in.

2. Injection Pressure Limitation

- (a) Injection pressure shall not exceed the fracture pressure of the receiving formation, nor the injection pressures for the individual wells as listed below.

Well	Maximum Injection Wellhead Pressure (psig)
KS-1A	500
KS-3	500
KS-13	1,252
KS-11	1,040

The permittee shall propose for EPA review and approval the maximum injection wellhead pressure limitation for a new well to the EPA.

- (b) All piping, valves and facilities associated with injection operations shall meet or exceed API standards for the injection pressure and shall be maintained in a safe and leak-free condition.

3. Injection Rate Limitation

The injection rate shall not cause an exceedance of the injection pressure limitation in Part II.D.2.a.

4. Injection Fluid Limitation

- (a) Injectate in this permit is limited to geothermal fluids, supplemental water, and chemical additions for process system and well casing biofouling, corrosion, and scale control.
- (b) Geothermal fluids consist of geothermal brine, geothermal steam condensate, and geothermal noncondensable gases.
- (c) Supplemental water may consist of steam turbine seal water, rinsate from the water softener system, sulfatreat heat exchanger cooling water, raw/quench water, production well bleed system, abatement fluids, sulfatreat system vacuum pump seal water, condensate from the sulfatreat system, periodic produced drilling fluids, and fluids from the plant water storage tank and the emergency steam release facility (ESRF). Some of these fluids may contain the additives listed in Appendix H--Chemical Additives.
- (d) Chemical additives for process system and well casing biofouling, corrosion, scale control and tracers must be in accordance with the Chemical Additives list in Appendix H. The permittee shall notify the EPA of any new chemical additive prior to its use and shall provide the EPA with a copy of its Material Safety Data Sheet (MSDS).
- (e) To inject fluids other than those described in paragraphs a-c above, the permittee must receive written approval from the EPA.

5. Upset Conditions

In the event of an upset of facility operations where the injection wells cannot be used, injectate shall not be discharged on the ground. Additionally, there shall be no overflow of fluids from the Emergency Steam Release Facility (ESRF) to the ground. If there is an upset of facility operations, the permittee shall contact the EPA and other appropriate federal, state, and local agencies as specified in this permit (Parts III.E.11 and 13).

E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

1. Hydrologic Monitoring Program

The permittee shall implement the Hydrologic Monitoring Program dated December 2005, in Appendix G, or as modified with the written approval of the EPA.

2. Program for Mechanical Integrity Testing and Monitoring of Injection Wells
 - (a) The permittee shall implement the Program for Mechanical Integrity Testing and Monitoring of Injection Wells, dated July 29, 1996, in Appendix D or as modified with the written approval of the EPA. This program shall be implemented for all injection wells, including active, temporarily abandoned (idle), and injection wells converted to monitoring wells.
 - (b) The permittee shall notify the EPA at least sixty (60) days prior to performing the annual mechanical integrity tests. For mechanical integrity tests resulting from well repair, the permittee will notify the EPA as soon as possible to give the EPA the option of witnessing the mechanical integrity tests.
 - (c) Annual mechanical integrity tests for all wells shall be conducted sequentially within the same test period to enable EPA to witness them.
 - (d) In addition, a continuous recording of the injection wellhead pressure, injection rate, and annulus pressure shall be maintained. Injection wellhead pressure, injection rate and annulus pressure shall be visually checked daily. Pressure recordings shall be documented on a graphical chart, such as a strip chart or circular chart that shows the relationship between pressure and elapsed time. The pressure recordings shall be maintained whether or not the injection well is in use. The pressure recordings shall distinguish between the time periods of use and nonuse, if any. A summary report that contains the daily maximum injection pressure shall be submitted to the EPA quarterly. Any increase or decrease in the annulus pressure of ten (10) percent or greater over a continuous five (5) hour period or any rise in the gas/brine interface above 2,000 feet KB (1,975 feet BGS) in the tubing/casing annulus shall be reported within twenty-four (24) hours to the EPA, and in the monthly report with an explanation.
3. Injection Fluid Monitoring Program
 - (a) The permittee shall comply with the analytical and reporting conditions of the facility's Chemical and Physical Analysis Plan For Injectate Testing in Appendix E, or as amended with written approval from the EPA.

- (b) The permittee shall utilize the applicable analytical methods described in Tables IA-IE of 40 CFR §136.3, or in Appendix III of 40 CFR §261, or in certain circumstances, other methods that have been approved by the EPA.
- (c) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Injectate fluid samples shall be taken at the injection line sampling port between the injection common header and injection well KS-1A or any active injection well. Injectate gas samples shall be taken from the noncondensable gas line prior to mixing with the injectate fluid flow.
- (d) The following shall be monitored daily: quantity of total injectate, quantity of geofluids, quantity of supplemental water, chemical additions, and injectate temperature.
- (e) Under applicable conditions, the EPA shall have the right to order and direct the permittee to collect, analyze and report on special or unscheduled samples of the injectate. Applicable conditions consist of, but are not limited to, accidental discharges, malicious discharges, and undefined discharges into the injection well. The permittee is required to maintain records of the sample collection and analysis in conformance with Part II.E.4 of this permit.

4. Monitoring Information

Records of any monitoring activity required under this permit shall include:

- (a) The date, exact place, and time of sampling or field measurements;
- (b) The name of the individual(s) who performed the sampling or measurements;
- (c) The exact sampling method(s) used to take samples;
- (d) The date(s) laboratory analyses were performed;
- (e) The name of the individual(s) who performed the analyses;
- (f) The analytical techniques or methods used by laboratory personnel;

- (g) The results of such analyses, including reporting units; and
- (h) Chain of custody records.

5. Calibration of Monitoring Equipment

All monitoring and recording equipment shall be calibrated on a regular basis. The permittee shall submit to the EPA a one-time report describing the calibration procedures and the frequency at which the equipment will be calibrated.

6. Automatic Alarms and Shut-Off Devices

- (a) Injection pressure shall be monitored in the control room and an automatic computer printout system shall be maintained so as to notify operators when the injection pressure switch in the combined flow injection line has been activated.
- (b) The pressure switch on the combined flow injection line and the relief valves on the individual injection wells shall be maintained in good working order and shall be set so as to not cause an exceedance of the maximum injection wellhead pressure limitations for the individual wells in Part II.D.2(a), or the fracture pressure of the formation, which ever is less.
- (c) The two manual block valves on each injection and production well shall be maintained in good working order.

7. Recordkeeping

- (a) The permittee shall retain records concerning:
 - (i) The origin, physical properties, and chemical composition of all injected fluids until three (3) years after the well has been plugged and abandoned in accordance with the Plugging and Abandonment Plans shown in Appendix F; and
 - (ii) All monitoring information, including all calibration and maintenance records and recordings used for continuous monitoring and copies of all reports required by this permit, shall be maintained by the permittee for a period of at least five (5) years from the date of the sample, measurement, or report until the well has been plugged and abandoned.

- (b) The permittee shall continue to retain such records after the retention periods specified in paragraph (a) unless it delivers the records to the EPA or obtains written approval from the EPA to discard the records.
- (c) The permittee shall maintain copies (or originals) of all pertinent observation records available for inspection at the facility, unless the permittee has sent the records to the EPA or has obtained permission from the EPA to discard the records.

8. Accurate, Current, and Representative Information

The submission of records, analytical results, recorded inspections, status reports, and any other reporting as specified and required by this permit shall be accurate, current, and representative of the activity being monitored within the specified time frame for monitoring. The submission of inaccurate, out-dated, and/or unrepresentative records, results, inspections, reports, and any other required information, or the nonsubmission of the required materials, is a violation of this permit.

9. Reporting

The permittee shall submit the following information to the EPA:

- (a) Semiannual groundwater monitoring data as required by the Hydrologic Monitoring Program, to be submitted in February and August;
- (b) Annual mechanical integrity test results and monitoring data as required by the Program for Mechanical Integrity Testing and Monitoring, part II.E.2 of this permit. Mechanical integrity test results shall be provided to EPA within sixty (60) days of the tests.
- (c) All records of mechanical integrity test results, monitoring data, workovers, well conversions, logging or other subsequent test data generated by the workover, alteration, or repair of a well as required by Parts II.B.1, II.B.6 and II.D.1.
- (d) The one-time calibration report describing the calibration procedures and frequency for monitoring equipment as required by Part II.E.5, in addition to calibrations required for the other reports in II.E.9;
- (e) Quarterly injection well performance status reports (herein referred to as quarterly reports) shall document the performance of the injection wells and shall follow the same format that has been used

Permit No. HI596002

for the DOH's UIC permit. The reports shall be made by a professional consultant, engineer, or geologist proficient in injection well performance. These reports shall include:

- (i) Daily maximum and average injection pressures;
 - (ii) The average daily minimum annulus pressure and calculated minimum annulus pressure required to depress the nitrogen/brine interface below 2,000 feet;
 - (iii) Daily average injection rate;
 - (iv) Total daily quantity, including the break down of geofluids and supplemental water quantities;
 - (v) Daily temperature;
 - (vi) Any increase in pressure that has triggered the pressure switch on the combined flow injection line; and
 - (vii) Narrative descriptions and explanations of any incidence of noncompliance that has occurred.
- (f) Quarterly reports shall be submitted for the reporting periods by the respective due dates as listed below:

Reporting Period	Report Due
Jan, Feb, Mar	May 1
Apr, May, June	Aug 1
July, Aug, Sept	Nov 1
Oct, Nov, Dec	Feb 1

Copies of the quarterly reports, all other reports, monitoring and test results required by this permit shall be submitted to the attention of the Project Officer for the permit at the following address:

U.S. Environmental Protection Agency
Ground Water Office (WTR-9)
75 Hawthorne St.
San Francisco, CA 94105

10. Modifications to Monitoring and Reporting

This permit herein acknowledges that environmental and facility operating conditions affecting the monitoring and reporting conditions of this

Permit No. HI596002

permit, including the Hydrologic Monitoring Program and Casing Monitoring Program, could change. This could warrant the EPA's reevaluation of those conditions in order to address changing concerns and to establish relevant analyses. Modifications to the monitoring and reporting conditions, resulting from reevaluations, shall be approved by the EPA.

11. Additional Monitoring and Reporting

If the operation of the injection wells is additionally regulated by other pollution control programs, e.g. Clean Air Act, the adherence to the monitoring and reporting conditions of such other pollution control programs shall not be circumvented by the terms and conditions of this permit.

12. Twenty-Four Hour Reporting

The permittee shall report any noncompliance which may endanger health or the environment, including:

- (a) Any monitoring, or other information which indicates that any contaminant may cause an endangerment to a USDW;
- (b) Any noncompliance with a permit condition, or malfunction of the injection well system which may cause fluid migration into a USDW or between USDWs;
- (c) Any wellhead leaks or overflows from the ESRF pond.

Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written report shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated length of time that it is expected to continue; and steps taken or planned to reduce, eliminate and prevent the reoccurrence of the noncompliance.

Oral reports to EPA Ground Water Office shall be made to (415) 972-3532 or (415) 972-3971. Messages can be left at these numbers for oral reporting that occurs during evenings, weekends, and holidays.

13. Reporting of Noncompliance of Permit Limitations

The permittee shall notify the EPA of any exceedances of or noncompliance with limitations or requirements contained in this permit. Permit limitations in this permit refer to, and are not limited to, injectate pressure, annulus pressure, physical parameters, chemical additives, and scheduled events such as analyses, evaluations, and reports. The notification shall consist of a report that shall include: a description of the noncompliance and its causes; the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, then the anticipated time it is expected to continue and the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance. The report shall be submitted to the EPA at the time of the next quarterly monitoring report.

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

The permittee shall notify the EPA no later than sixty (60) days before further conversion, workover, or abandonment of a well. The EPA may require that the plugging and abandonment be witnessed by an EPA representative.

2. Plugging and Abandonment Plan

The permittee shall abandon the well according to the Plugging and Abandonment Plan in Appendix F, and must also comply with the abandonment conditions required by the State of Hawaii and the County of Hawaii. The permittee shall submit any proposed revision to the method of plugging reflected in the plan no later than sixty (60) days prior to well plugging and abandonment. The EPA reserves the right to change the manner in which a well will be plugged if the well is modified during its permitted life or if the well is not consistent with EPA requirements for construction or mechanical integrity. The EPA may ask the permittee to estimate and to update the estimated plugging cost periodically. Such estimates shall be based upon costs which a third party would incur to plug the well according to the plan.

3. Plugging and Abandonment Report

Within sixty (60) days after plugging the well, the permittee shall submit a report on Form 7520-14 in Appendix I to the EPA. The report shall be certified as accurate by the person who performed the plugging operation, and the report shall consist of either: (1) a statement that the well was plugged in accordance with the plan, or (2) a statement specifying the

different procedures followed where actual plugging differed from the plan.

4. Well Closure

The permittee shall properly plug and abandon, in accordance with the conditions in Part II.F.1-3, any well that is determined to be a threat to a USDW, either voluntarily or thereupon notification by the EPA. Any injection well that is used for monitoring shall be properly plugged and abandoned once the monitoring is completed.

G. FINANCIAL RESPONSIBILITY

1. Demonstration of Financial Responsibility

The permittee is required to maintain financial responsibility and resources to close, plug, and abandon all injection wells, including active, temporarily abandoned (idle), and injection wells no longer serving their original function (e.g. injections wells used for monitoring purposes), as provided in the Plugging and Abandonment Plan.

- (a) The permittee shall replace or supplement the existing financial assurance (irrevocable standby letter of credit, No. 00652520001454, dated July 29, 2004, and standby trust agreement) to establish the estimated cost of plugging the four existing injection wells in the amount of \$1,761,000 before any injection well construction can begin.
- (b) Demonstration of financial responsibility must be provided to the EPA when the permit is issued and every year by June 1.
- (c) The EPA can periodically require the permittee to update the Plugging and Abandonment Plan and/or the cost associated with it. If the updated estimate indicates that the cost of the plugging and abandonment is more than ten (10) percent greater or less than the most recent estimate, the financial assurance mechanism shall be increased or decreased accordingly.
- (d) Prior to the construction of or conversion to a new injection well, the financial assurance mechanism shall be modified to reflect the cost of plugging the additional well. Should the cost of plugging the well, once it is constructed, vary by more or less than ten (10) percent of the original estimate, then the financial assurance mechanism shall be modified accordingly.

2. Insolvency of Financial Institution

The permittee must notify EPA as soon as possible and submit an instrument of financial responsibility acceptable to the EPA within sixty (60) days after any of the following events occurs:

- (a) The institution issuing the irrevocable standby letter of credit or financial instrument files for bankruptcy; or
- (b) The authority of the trustee institution to act as trustee, or the authority of the institution issuing the financial instrument is suspended or revoked; or
- (c) The institution issuing the financial instrument lets it lapse or decides not to extend it.

PART III. GENERAL CONDITIONS

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection well operation in accordance with the conditions of this permit. The permittee shall not construct, operate, modify, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Parts 141 and 142 or may otherwise adversely affect the health of persons. Furthermore, any underground injection activity not specifically authorized in this permit is prohibited. Compliance with this permit during its term constitutes compliance for purposes of enforcement with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other common or statutory law other than Part C of the SDWA. Issuance of this permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable regulations.

If at any time the EPA learns that an injection well may cause a violation of primary drinking water regulations, the EPA shall order the permittee to take such actions as may be necessary to prevent the violation, including, where required, cessation of operation of the injection well. The EPA will issue an order to immediately cease and desist injection upon receipt of factual information that the injection has caused or is likely to cause imminent and substantial danger to the health of a person or persons due to contamination of a public water supply or underground source of drinking water.

B. PERMIT ACTIONS

1. Modification, Revocation, Reissuance, and Termination

The EPA may, for cause or upon request from the permittee or any interested person or upon the EPA's initiative, modify, revoke and reissue, or terminate this permit in accordance with applicable jurisdictions under 40 CFR §§ 124.5, 144.12, 144.39, and 144.40. Also, the permit is subject to minor modifications for cause as specified in 40 CFR § 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition. The EPA may also modify, revoke and reissue, or terminate this permit in accordance with any

amendments to the SDWA if the amendments have applicability to this permit.

2. Transfer of Permits

This permit is not transferable to any person except after one of the following actions has occurred at the discretion of the EPA: automatic transfer under 40 CFR §144.38(b); modification under 40 CFR §124.5 and §144.39, including "minor modification" 40 CFR §144.41; or revocation and reissuance of the permit §124.5 and §144.39. To initiate the process, the permittee shall supply written notice to the EPA sixty (60) days in advance of the proposed transfer date and in compliance with the requirements of 40 CFR §144.38. EPA will notify the permittee if a "major modification" or revocation and reissuance of the permit is necessary to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR §124, §144, and §146.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR §§2 and 144.5, any information submitted to the EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, the EPA may make the information available to the public without further notice.

E. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply

The permittee shall comply with all applicable UIC Program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued in accordance with 40 CFR § 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

Any person who violates a permit condition is subject to civil penalties, fines, and other enforcement action under the SDWA. Any person who willfully violates permit conditions may be subject to criminal prosecution.

3. Need to Halt or Reduce Activity not a Defense

It shall not be a defense, for the permittee in an enforcement action, that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize and correct any adverse impact on the environment resulting from noncompliance with this permit.

5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

6. Duty to Provide Information

The permittee shall furnish to the EPA, within the time specified herein, any information which the EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the EPA, upon request, copies of records required to be kept by this permit.

7. Inspection and Entry

The permittee shall allow the EPA or authorized representatives, upon the presentation of credentials and other documents as may be required by law, to:

- (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
- (b) Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
- (c) Inspect at reasonable times and photograph any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- (d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any location.

8. Records of the Permit Application

The permittee shall maintain records of all data required to complete the permit application and any supplemental information submitted with the permit application for a period of five (5) years for EPA from the effective date of this permit.

9. Availability of Reports

All reports prepared in accordance with the conditions of this permit shall be available for public inspection at appropriate offices of the EPA. Permit applications, permits, and well operation data shall not be considered confidential.

10. Signatory Requirements

All reports or other information requested by the DOH and/or EPA shall be signed and certified by a responsible corporate officer or duly authorized representative according to 40 CFR § 144.32.

11. Reporting of Changes and Noncompliance

(a) Anticipated Changes and Noncompliance

The permittee shall give advance notice, of at least seven (7) days, to the EPA of any planned changes in the permitted facility or activity which may significantly change any injection well operating characteristics or injection well specifications; or which may result in noncompliance with permit requirements. Changes, modifications or revisions in the operation characteristics or

specifications of the injection wells shall not be implemented unless otherwise approved by the EPA.

(b) Other Noncompliance

The permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Part II. E. of this permit.

(c) Other Information

Where the permittee becomes aware that it failed to submit all relevant facts in permit application, or submitted incorrect information in a permit application or in any report to the EPA, the permittee shall submit such facts or information within two (2) weeks of the time such information becomes known.

12. Continuation of Expiring Permits

(a) Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit a complete application for a new permit to the EPA at least one hundred eighty (180) days before this permit expires.

(b) Permit Extensions

The conditions of an expired permit may continue in force in accordance with 5 United States Code (U.S.C.) 558(c) until the effective date of a new permit, if:

- (i) The permittee has submitted a timely application which is a complete application for a new permit; and
- (ii) The EPA, through no fault of the permittee, does not issue a new permit with an effective date on or before the expiration date of the previous permit.

13. Required Immediate and Followup Notifications of Non-permitted Releases

- (a) Pursuant to the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Section 103 and/or the Emergency Planning and Community Right To Know Act

Permit No. HI596002

(EPCRA) Section 304, the permittee will immediately notify the National Response Center (NRC) at (800) 424-8802, the Hawaii State Emergency Response Commission (SERC) and the Hawaii County Local Emergency Planning Committee (LEPC) as soon as it has knowledge that there has been a release into the environment of a reportable quantity of a hazardous or extremely hazardous substance.

- (b) As soon as practicable following a reportable release under EPCRA Section 304, the permittee will submit a written followup report to the SERC and LEPC which conforms to the requirements of that section.