STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

September 23, 2010
Honolulu, Hawaii

Application for Stream Diversion Works Permit (SDWP.2677.4) and
Petition to Amend Interim Instream Flow Standard for 2.5 GPM Solar Pump in Loiloa Spring
Kaunakakai, Molokai, TMK: (2) 5-7-007:028

APPLICANT:

Nathaniel Bacon
P.O. Box 730
Kaunakakai, HI 96748

LANDOWNERS:

Nathaniel and Anne C. Bacon
Same

SUMMARY OF REQUEST:

Application for Stream Diversion Works Permit (SDWP.2677.4) and Petition to Amend Interim Instream Flow Standard (PAIIFS) for 2.5 GPM Solar Pump in Loiloa Spring, Kaunakakai, Molokai at TMK: (2) 5-7-007:028.

LOCATION: See Exhibit 1.

BACKGROUND:

H.T. Stearns and G.A. Macdonald (*Geology and Ground-Water Resources of the Island of Molokai, Hawaii.* Hawaii Division of Hydrography, Bulletin 11. 1947) reported that the basal spring, known as Loiloa Spring, was one of two Springs that fed the Pukoo Fishpond. Loiloa Spring was the larger of the two springs and was reported by Mr. E. K. Duvauchelle to have discharged 0.75 million gallons per day (mgd). There was no reference as to who performed the measurement or how it was accomplished. Stearns and Macdonald (1947) described Loiloa Spring as issuing from alluvium (loose, unconsolidated, soil or sediments eroded, deposited and reshaped by water) at the base of a basalt (volcanic rock) spur (narrow ridge), about 150 feet mauka of the highway at an approximate elevation 5 ± feet, mean sea level (msl).

On August 5, 1993, Zelie K. Duvauchelle submitted an application for a Water Use Permit to the Commission for approximately 35,500 gallons per day for an existing well in Pukoo, East Molokai at TMK: (2) 5-7-007:028. The proposed uses were for orchard crops, watercress, taro and aquaculture on 2.17 acres.

Item C1

On November 12, 1993, Sterling J.L. Chow Engineering and Planning Services conducted a field investigation of the applicant's proposed use of spring water for the ground water use permit application. Well index number 0448-09, Pukoo-Duvauchelle, was to be assigned to the new well.

- During this investigation an apparent much older, second, unused well was also discovered 40 feet mauka of the new well, but it was not clear if these were two wells or a surface water diversion from a spring and an older unused well.
- Sterling Chow's Field Memorandum dated November 21, 1993, noted that the source for the proposed well was a spring that flowed into a pond approximately one-third acre in size.
- Water from this pond flowed through a 24-inch culvert under Kamehameha V Highway into a ditch on TMK (2) 5-7-007:021 and then into the ocean.

On November 17, 1993, the Commission deferred action on Zelie Duvauchelle's Water Use Permit Application pending further field investigation to clarify the field investigation findings.

On January 10, 1994, the Commission informed Zelie Duvauchelle:

- The Commission determined that the spring-fed water that the Ms. Duvauchelle was proposing for agricultural use was surface water in nature and was assigned a surface water diversion #0448-01.
- Since Ms. Duvauchelle's source was a surface water source and since the Southeast Sector of Molokai was a water management area for ground water only, it was unnecessary for her to obtain a water use permit from the Commission.
- If Ms. Duvauchelle planned to install a pump at the spring source or planned to divert any of the water, a stream diversion works permit and a petition to amend the interim instream flow standard for the surface water source would be required.

On August 11, 1999, staff conducted a field investigation on the flow and condition of the spring at Pukoo, Molokai because of concerns that a proposed well approximately 1,000 feet northeast of the spring and up gradient of the groundwater flow could affect spring flow and to collect baseline data prior to issuance of a well and water use permit.

- Staff observed that the spring orifice was visible but flow from the spring was restricted by California grass, and the water was channelized makai and under Kamehameha V Highway to a drainage ditch that ran along the perimeter of the property.
- Staff measured the flow in the drainage channel in two locations because it was impossible to measure Loiloa Spring above King Kamehameha V Highway. Based on the flow measurements of the two locations in the drainage channel, the calculated flow from Loiloa Spring was 0.310 mgd which was less than half of what was reported by Stearns and Macdonald in 1947 (0.75 mgd).
- Staff concluded that the proposed well would not have an effect on the Loiloa Spring discharge and recommended long-term monitoring of Loiloa Spring and other Spring.
- Staff was informed by a neighboring resident that the source of the spring was a "tunnel" into the mountain which conformed to staff's expectation that the spring was fed from a lava tube.

On November 19, 1997, Zelie K. Duvauchelle-McCary and Robert A. McCary conveyed a warranty deed to Nathaniel Bacon and Anne C. Bacon for TMK: (2) 5-7-007:028.

On April 18, 2001, Nathaniel and Anne Bacon informed the Commission that they had purchased TMK: (2) 5-7-007:028 from Robert A. and Zelie K. Duvauchelle/McCary and requested that the older existing well on the property (0448-09) be transferred from Duvauchelle to them.

On May 4, 2001, the Commission acknowledged the transfer of ownership of the "Zelie Duvauchelle Well" to the "Pukoo-Bacon Well," and transmitted copies of a Well Construction and Pump Installation Permit Application, a Water Use Permit Application, and a Petition to Amend the Interim Instream Flow Standard to the applicant.

On May 16, 2001, the staff informed the applicant that:

- Use of the term "well" for the applicant's Loiloa Spring source was incorrect although locally it was long referred to as the "Duvauchelle Well".
- The Commission's records indicated that the applicant's source is a surface water source (Loiloa Spring) rather than a well.
- The spring source should be referred to by its traditional name, Loiloa Spring.
- Future increased use of water from the existing diversion would require approval of a Petition to Amend the Interim Inseam Flow Standard (PAIIFS).

On June 17, 2002, Anne Bacon informed Commission staff that:

- The Duvauchelle "Well" was located approximately 40 feet mauka and slightly east of Loiloa Spring. The "well" was installed sometime around the turn of the century to pump water to the cistern/reservoir above the "well." This water was then gravity-fed to the old Duvauchelle home that was located to the east and makai of the well and cistern.
- The "well" was located where the windmill was located, and although the windmill was no longer standing, the actual pump/well head was still there. Use of the pump had been discontinued since the 1920s.
- The new shed structure located at the Loiloa Spring outlet was constructed in the late 1980s by Duvauchelle/McCary to be used as a future pump house if they were granted a permit to pump from the actual spring source, instead of re-using the old well.

On June 18, 2002, staff informed Ms. Bacon that:

- The Duvauchelle "Well" that was once operated by a windmill, 40 feet mauka of Loiloa spring, was not investigated when staff measured the flow from Loiloa Spring in November 1993.
- The shed that was intended to house a future wellhead and pump and was incorrectly designated diversion 0048-09.
- The older existing windmill-operated well site, 40 feet mauka of Liloa Spring, was assigned the well number 0048-09 which had been the Commission's original intent. See Exhibit 4.

DESCRIPTION:

Loiloa Spring is approximately five feet in diameter and four feet deep and is bordered by a marshy pond that is approximately 150 feet long and 40 feet wide. The depth of the pond tapers from 3.5 feet deep to one foot deep. An existing, semi-circular, concrete curb surrounds one-half of the spring, and the other half of the spring flows into a marshy pond.

The applicant has been living on the property since 1997 and has observed that the level in the spring basin has remained pretty much the same throughout the years except for a two-inch drop in the level during the peak in the drought years. In March and April of this year, the applicant built a temporary rock and dirt weir with a small opening across the area where the spring flows into the pond and measured the spring flow three times, one week apart. The applicant pumped water out of the spring basin into a five-gallon bucket, measured the time it took for the water to stop flowing through the opening in the weir into the pond and counted the number of five-gallon buckets that had been filled. The applicant believes that the flow rate of the spring was the rate at which he was pumping the water out of the spring into the five-gallon bucket and that this crude method indicated that the spring basin was producing about 6,545 gpd, or 0.0065 mgd.

The applicant proposes to place a 4x4-inch beam across the spring to support a 1.25-inch PVC pipe and a submersible pump that will be placed three feet down into the spring. The submersible pump, rated at 112 gallons per hour (gph), will be wired directly to solar panels and will run about six to eight hours per day. Depending on the sun and weather conditions, the maximum capacity of the pump is estimated to be 1,000 gpd, or 0.001 mgd, or 0.0015 cfs. See Exhibit 2.

Water pumped from the spring will be transported via the 1.25-inch PVC pipe up to the existing shed/pump house where a 1.5-inch inline flowmeter will be installed and then to a 3,000 gallon storage

tank. From the storage tank, two 0.75-inch PVC pipes, each with its own booster pump, will provide potable domestic water by reverse osmosis and ultra-violet filters and non-potable water to irrigate vegetables, fruit trees and ornamental plants on 0.7 acres of land. See Exhibits 3 and 4.

ANALYSIS:

Agency Review Comments:

The U.S. Army Corps of Engineers (COE) determined that Loiloa Spring is a water of the U.S. and as such will require Section 404 authorization for any activity involving the temporary or permanent placement or discharge of dredged and/or fill material below the ordinary high water mark (OHWM). The COE understood that the proposed diversion will not involve the placement or discharge of dredged and/or fill material into Loiloa Spring; and therefore, a Department of Army permit was not required.

The Department of Health (DOH) Clean Water Branch (CWB):

- Any project and its potential impacts to State waters must meet the State's anti-degradation policies, designated uses and water quality criteria.
- A National Pollutant Discharge Elimination System (NPDES) permit may be required for the discharge of wastewater, including stormwater runoff, into State surface waters.
- Loiloa spring and the pond that received overflow from Loiloa Spring are considered State waters.
- All discharges related to the project construction activities must comply with the State's Water Quality Standards (WQS).

The University of Hawaii Environmental Center submitted comments that are either addressed in this submittal such as flow measurement for Loiloa Spring, or are not applicable such as a water use permit (which is not required for the Molokai Groundwater Management Area) and Pukoo Fishpond (which no longer exists).

The U.S. Fish and Wildlife Service, Office of Hawaiian Affairs, Department of Hawaiian Home Lands, and County of Maui Planning Department did not submit comments as of the date of preparation of this submittal.

DLNR Review Comments:

- The Division of Aquatic Resources (DAR): previously commented in 1993 that it had no objections to a water use permit application for Zelie Duvauchelle and did not submit comments for this application.
- Historic Preservation: previously commented in 1993 that there were no known historic sites on this parcel which has been under residential and agricultural uses for many years and did not submit comments for this application.
- Land Division: Loiloa Spring is located on private property; accordingly, no permits are required from the Land Division.
- Engineering: the project site is located in Flood Zone X and XS according to the Flood Insurance Rate Map (FIRM). The National Flood Insurance Program (NFIP) does not have any regulations for developments within Flood Zone X and XS.
- State Parks: not subject to its authority or permit.

Forestry and Wildlife did not submit comments as of the date of preparation of this submittal.

Chapter 343 Environmental Assessment (EA) Compliance Review:

EA Triggers: In accordance with HRS §343-5 (a), the applicant's proposed action does not trigger the need for an EA because the proposed use is located on private property, nor are any other triggers met.

Cumulative Impacts HAR §11-200-8 (b): No significant cumulative impacts are anticipated as a result of this activity because the proposed project is not part of a larger project and will be withdrawing 0.001

mgd, which is 0.0032 per cent of the 0.310 mgd flow that staff measured in 1999 and will be less than five per cent of the spring flow (0.016 mgd) and is considered to be *de minimis*.

Staff Review

According to Stearns and MacDonald (1947), Loiloa Spring is a basal spring with a reported discharge of 0.75 mgd. In 1999, Commission staff was not able to measure the flow of Loiloa Spring because it was restricted by California grass but measured the flow exiting the spring in the drainage channel makai and under Kamehameha V Highway. Based on flow measurements in two drainage channel locations, the calculated flow from Loiloa Spring was 0.310 mgd which was less than half of what was reported by Stearns and Macdonald in 1947. In 2010, the applicant measured 0.0065 mgd using the five-gallon bucket method; however, the reliability and accuracy of the applicant's measurements cannot be substantiated. Using the Commission staff's measurement of 0.310 mgd for Loiloa Spring, the applicant's proposed daily withdrawal of 0.001 mgd is 0.003 per cent of the 0.310 mgd flow measured by staff in 1999 and below the five per cent amount of the spring flow (0.016 mgd) and is considered to be *de minimis*; and, therefore, a Petition to Amend the Interim Instream Flow Standard (PAIIFS) is not required.

RECOMMENDATION:

That the Commission:

1. Approve the applicant's Stream Diversion Works Permit (SDWP.2677.4) for a 2.5 GPM Solar Pump in Loiloa Spring, Kaunakakai, Molokai at TMK: (2) 5-7-007:028;
2. Allow the applicant to divert up to 1,000 gallons per day at a pumping rate of 0.0015 cfs for domestic and irrigation purposes; and
3. Find that the applicant's proposed daily withdrawal of 0.001 mgd is considered to be *de minimis*; and, therefore, a Petition to Amend the Interim Instream Flow Standard (PAIIFS) is not required.

Respectfully submitted,

LENORE N. OHYE
Acting Deputy Director

Exhibits:
1. Location Map
2. Site Plan
3. Construction Details
4. Photos
5. Standard Stream Diversion Works Permit Conditions

APPROVED FOR SUBMITTAL:

LAURA H. THIELEN
Chairperson

Department of Land and Natural Resources
Commission on Water Resource Management
Stream Protection and Management Branch

Description:
Loiloa Spring, Molokai

Legend

Streams

- Ephemeral
- Intermittent
- Perennial

☆ TMK: (2) 5-7-007:028

This map was produced by the Department of Land and Natural Resources (DLNR), Commission on Water Resource Management for planning purposes. It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from DLNR.

Datum: North American Datum 1983

Tax Map Key (TMK) layer is comprised of tax assessor parcels derived from paper plat maps with attributes from public tax assessor records and is updated by each respective county.

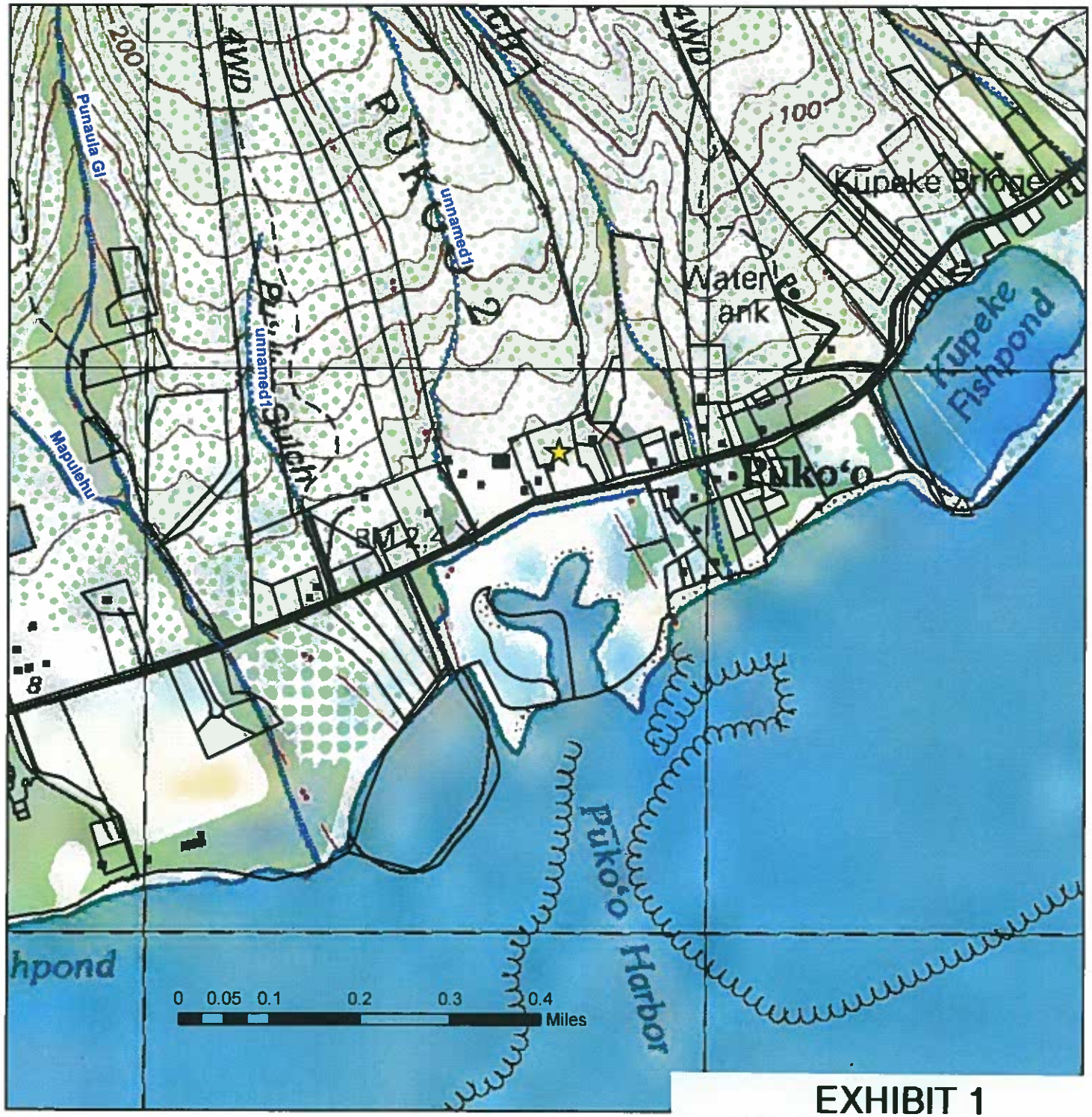
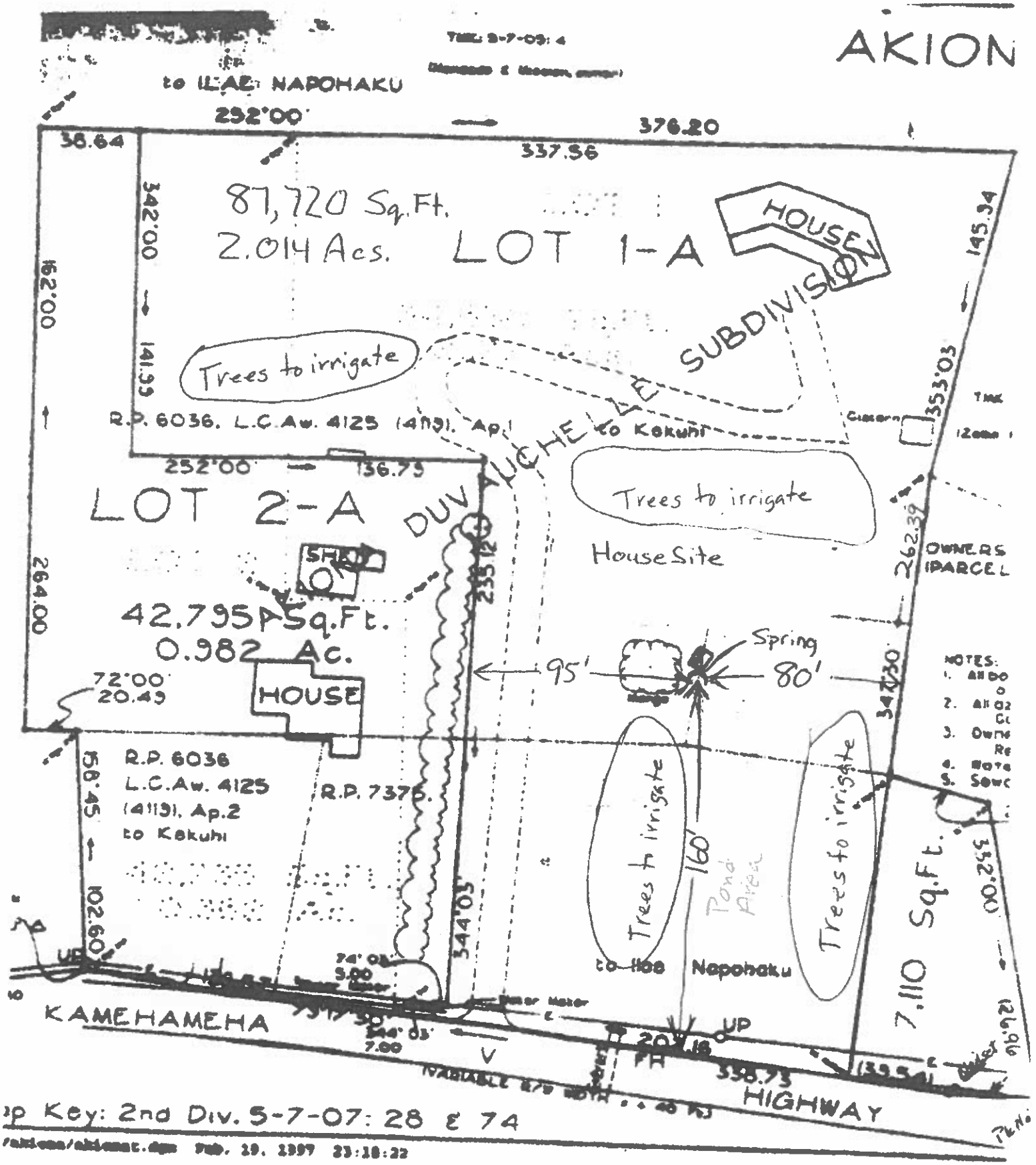
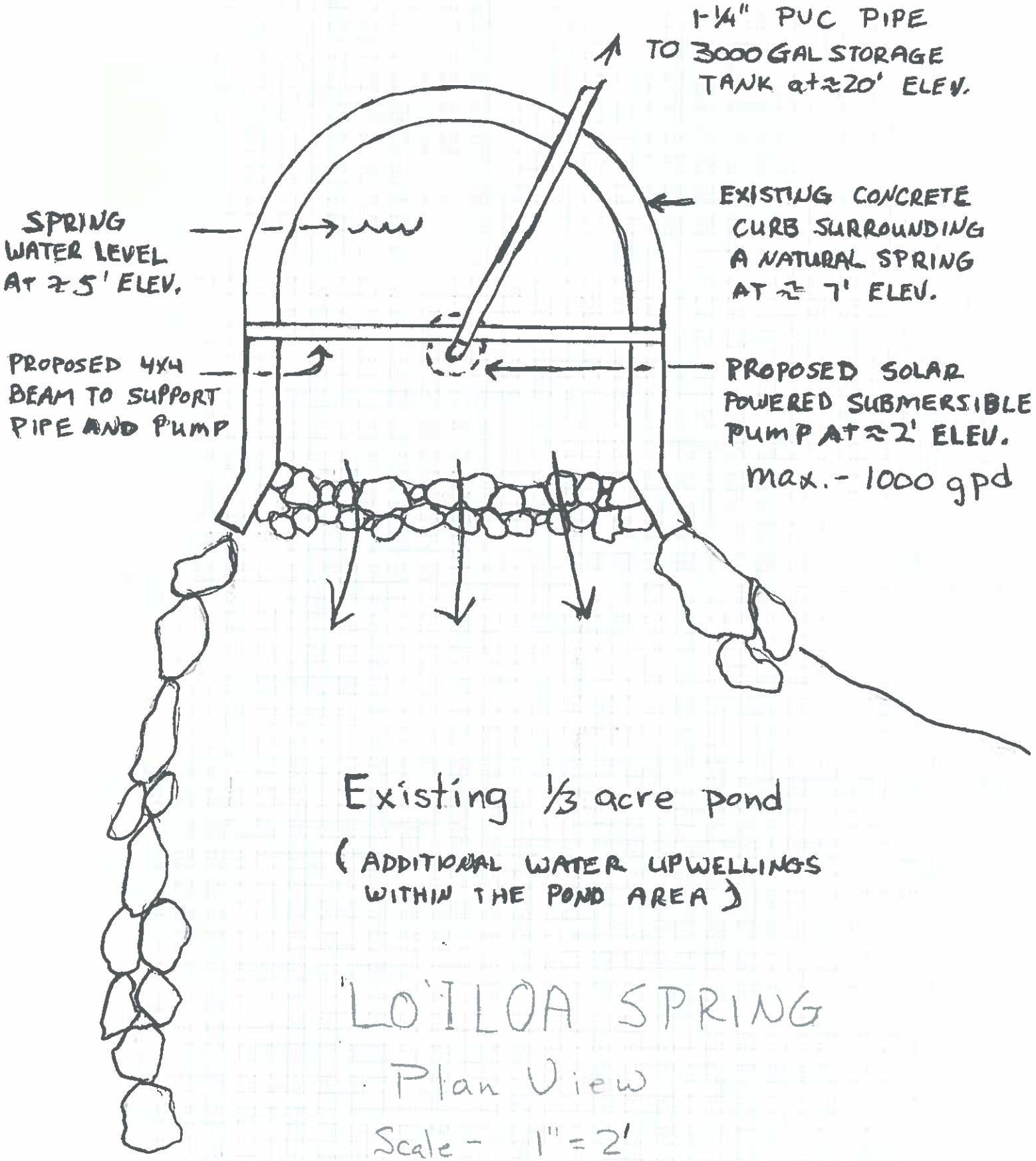


EXHIBIT 1


AKION
to ILAE NAPOHAKU
252'00
376.20
38.64
337.56
342'00
87,720 Sq.Ft.
2.014 Acs.
LOT 1-A
HOUSE
SUBDIVISION
145.34
162'00
141.99
Trees to irrigate
R.P. 6036, L.C.Aw. 4125 (4119), Ap.1
to Kekuhi
353'03
252'00
136.75
LOT 2-A
DUVAUCHELLE
Trees to irrigate
SHED
House Site
235.12
262.39
OWNERS PARCEL
264.00
42,795 Sq.Ft.
0.982 Ac.
Spring
95'
80'
72'00
20.49
HOUSE
347.30
NOTES:
R.P. 6036
L.C.Aw. 4125
(4119), Ap.2
to Kekuhi
R.P. 7376
158'45
102.60
Trees to irrigate
160'
Pond Area
Trees to irrigate
344'03
to Hoe
Napohaku
7,110 Sq.Ft.
352'00
KAMEHAMEHA
74' 03
5.00
344' 03
7.00
UP
20.18
358.75
HIGHWAY
Map Key: 2nd Div. 5-7-07: 28 & 74
/akions/akionst.dgn Feb. 19, 1997 23:18:22

for #3



LO'ILOA SPRING

Plan View

Scale - 1" = 2'

EXHIBIT 2

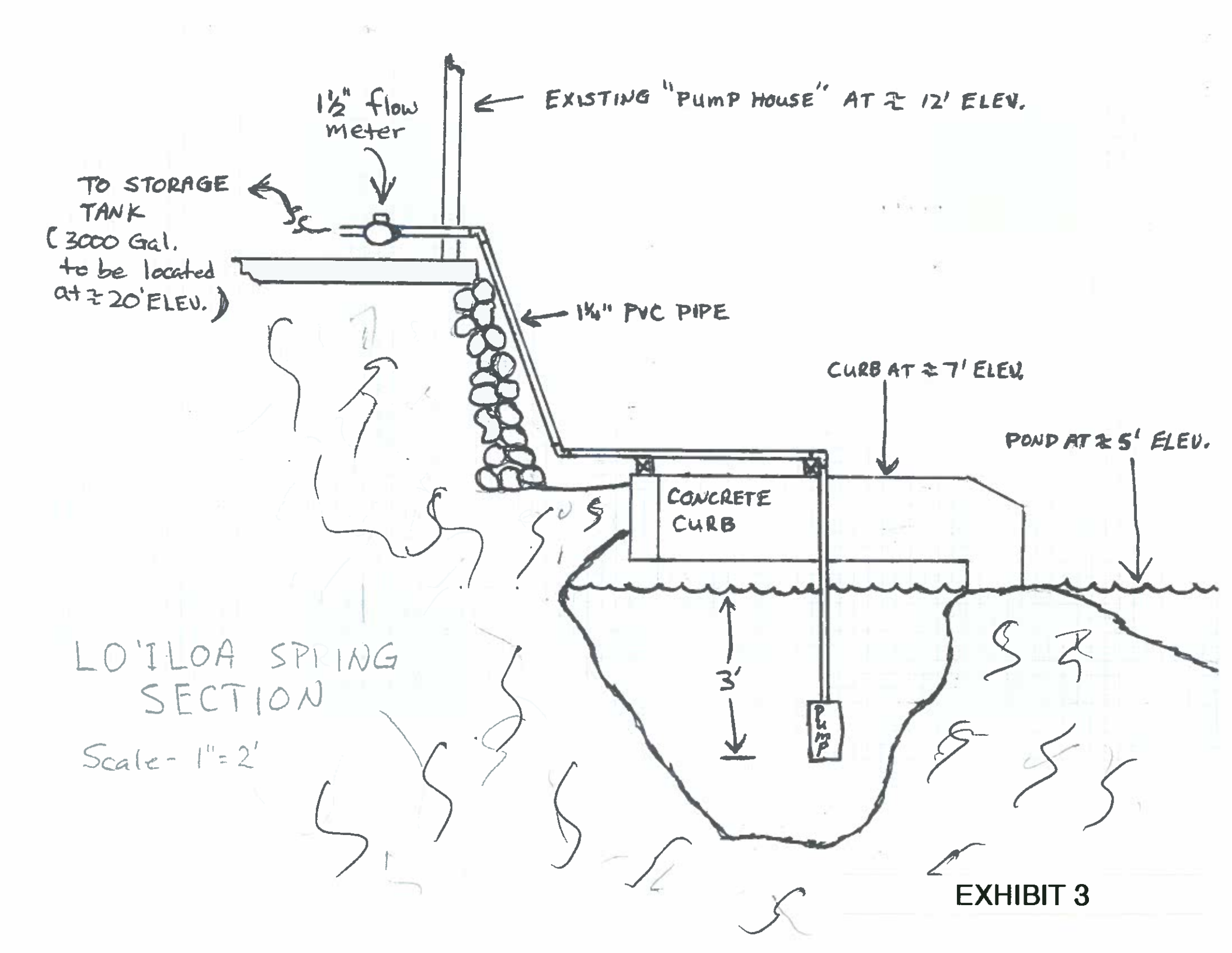
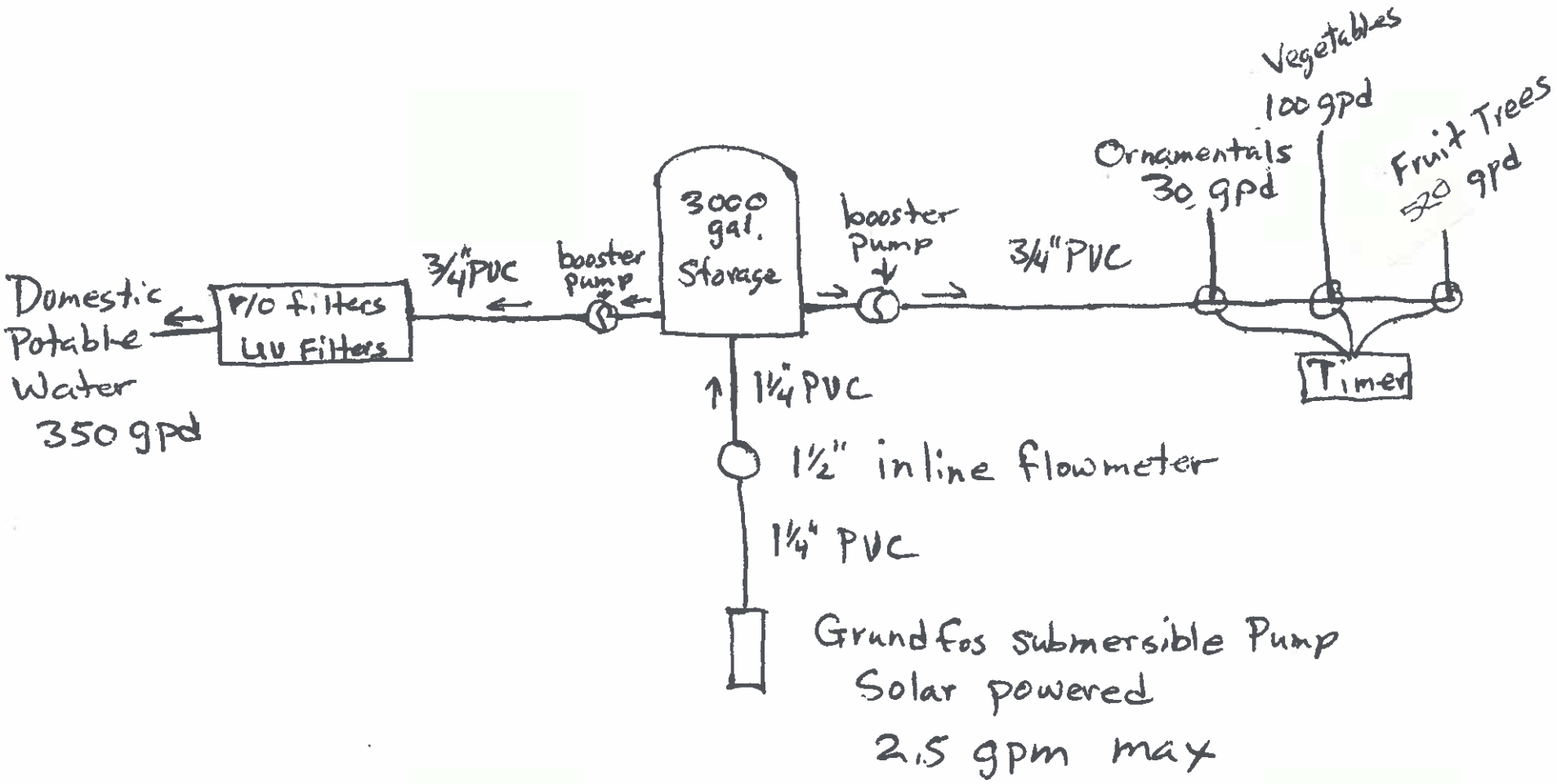

1½" flow meter
EXISTING "PUMP HOUSE" AT ± 12' ELEV.
TO STORAGE TANK (3000 Gal. to be located at ± 20' ELEV.)
1¼" PVC PIPE
CURB AT ± 7' ELEV.
POND AT ± 5' ELEV.
CONCRETE CURB
3'
PUMP
LO'ILOA SPRING SECTION
Scale - 1" = 2'

EXHIBIT 3



Estimated Maximum Daily Usage

Spring Basin

Residence and Planting Area
Mauka of Spring

Planting Area Mauka
and West of Spring

Pond and Planting Area
Makai of Spring

EXHIBIT 4

Pump for old windmill driven well located approximately 40 feet mauka of Loiloa Spring.

STANDARD STREAM DIVERSION WORKS PERMIT CONDITIONS
(Revised 9/19/07)

1. The permit application and staff submittal approved by the Commission at its meeting on September 23, 2010, shall be incorporated herein by reference.

2. The applicant shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State and county governments.

3. The applicant, his successors, assigns, officers, employees, contractors, agents, and representatives, shall indemnify, defend, and hold the State of Hawaii harmless from and against any claim or demand for loss, liability, or damage including claims for property damage, personal injury, or death arising out of any act or omission of the applicant or his successors, assigns, officers, employees, contractors, and agents under this permit or related to the granting of this permit.

4 The applicant shall notify the Commission, by letter, of the actual dates of project initiation and completion. The applicant shall submit a set of as-built plans and photos of the completed work to the Commission upon completion of this project. This permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The proposed work under this stream channel alteration permit shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Commission upon showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

5. Before proceeding with any work authorized by the Commission, the applicant shall submit one set of construction plans and specifications to determine consistency with the conditions of the permit and the declarations set forth in the permit application.

6. The applicant shall develop site-specific, construction best management practices (BMPs) that are designed, implemented, operated, and maintained by the applicant and its contractor to properly isolate and confine construction activities and to contain and prevent any potential pollutant(s) discharges from adversely impacting state waters. BMPs shall control erosion and dust during construction and schedule construction activities during periods of low stream flow.

7. The applicant shall protect and preserve the natural character of the stream bank and stream bed to the greatest extent possible. The applicant shall plant or cover lands denuded of vegetation as quickly as possible to prevent erosion and use native plant species common to riparian environments to improve the habitat quality of the stream environment.

8. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the applicant shall stop work in the area of the find and contact the Department's Historic Preservation Division immediately. Work may commence only after written concurrence by the State Historic Preservation Division.

EXHIBIT 5