

PROJECT DESCRIPTION

A new onsite wastewater system, using enhanced treatment and pressure-dose dispersal technology, is proposed to serve new development of a veterinary hospital on an undeveloped lot, located in Felton off Highway 9 in Santa Cruz County, California. The property owner has operated an existing veterinary hospital located on an adjacent lot for many years. The existing veterinary facility has an average water consumption of about 300 gallons per day. The size of the new facility will be increased from 1,649 to 3,480 square feet (111% increase). A design flow of 900 gallons per day is proposed (200% increase). Two 1,500 gallon watertight processing tanks and an AdvanTex™ AX20 treatment system from Orenco Systems®, Inc. is proposed. Treated effluent is proposed for dispersal via pressurized laterals installed in 2 rock-filled trenches. The design presented complies with County of Santa Cruz septic system requirements in Chapter 7.38 of the County Code.

DESIGN CRITERIA

- The septic system is designed to serve a new veterinary hospital with average flows estimated at 700-800 gallons per day. The proposed wastewater system has been sized to handle an average of 900 and a peak of 1,800 gallons per day.
- Groundwater is estimated to be deeper than 13 feet below the surface based on the winter water test (see site evaluation).
- The soil percolates in the 1-5 minute per inch range and thus enhanced treatment of the wastewater is required by County Code.

DISPERSAL TRENCH SIZE CALCULATIONS

Design Flow: 900gpd
 Application Rate: 0.43gpd/sq. ft.
 *maximum application rate requirement for commercial establishments in areas with soils that percolate in the 1-5 MPI range: 0.43gpd/sq. ft. (from Section 7.38.160A of county code)

Square Feet of Trench Bottom and Sidewall Required: $900\text{gpd} \div 0.43\text{gpd/sq. ft.} = 2,093\text{sq. ft.}$
 Trench Design: 5' effective flow depth of 18" wide dispersal trench, therefore:
 11.5sq. ft. of trench bottom and sidewall area per linear foot

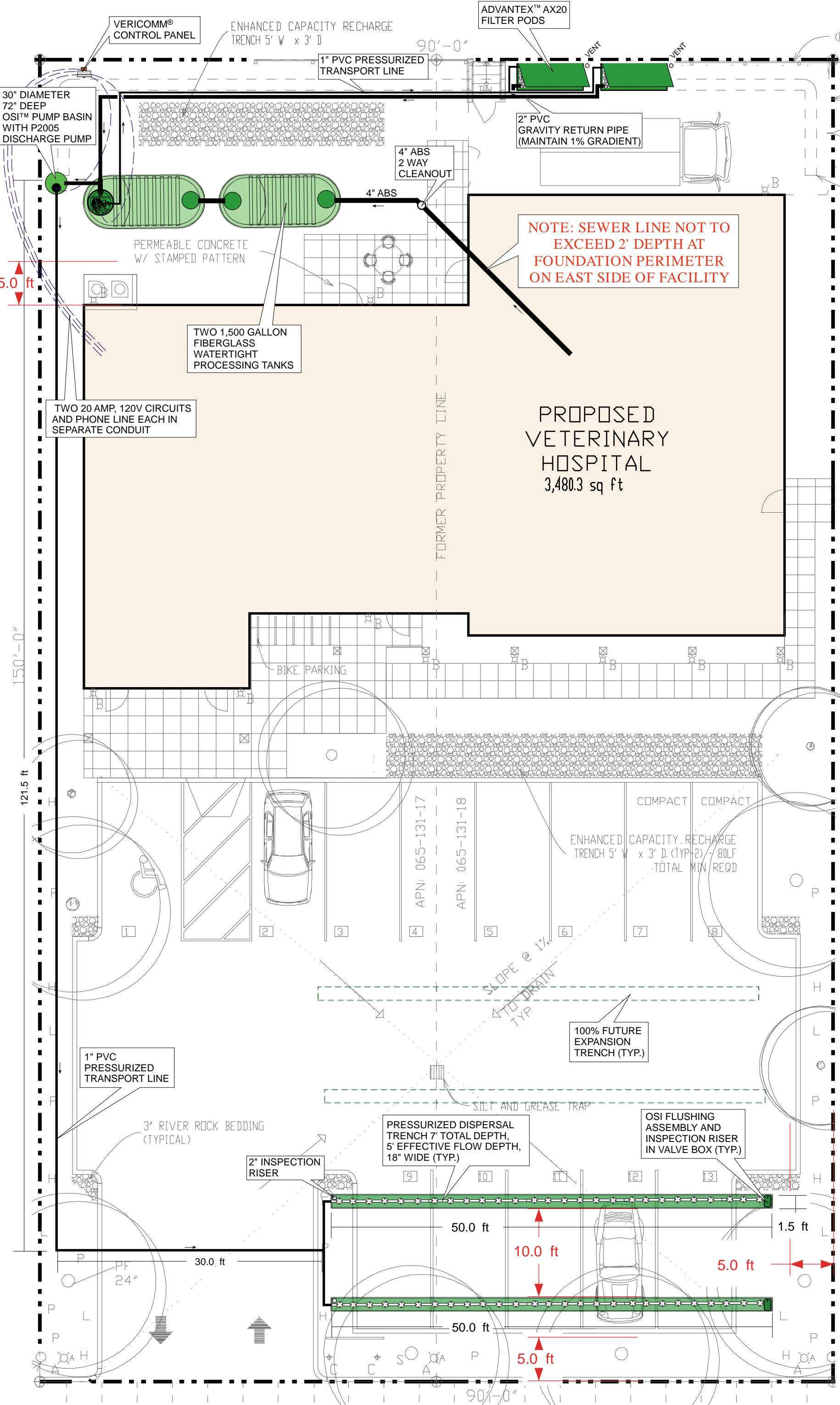
Lineal Feet of Trench Required: $2,093\text{sq. ft.} \div 11.5\text{sq. ft. per linear foot} = 182\text{ lineal feet}$
 Enhanced Treatment allows for 50% reduction of leachfield size, therefore:
 182 lin ft $\times 2 = 91\text{ lineal feet}$ (Equates to an application rate of 0.86gpd/sq. ft. based on 900gpd flow)
 Result: 2 trenches each 50' long \times 18" wide \times 7' deep with 5' effective flow depth.

MATERIAL SPECIFICATIONS

- Processing Tank**
 - Two 1,500 gallon, watertight, fiberglass tanks, from Orenco Systems®, Inc. (OSI), are specified for use in series as a processing tank with the proposed AdvanTex™ (Mode 1) treatment system. The first tank shall have a single chamber (no baffle) and have two 24" diameter, ribbed PVC access risers from OSI. The second tank shall have a 24" diameter, inlet access riser and a 30" diameter outlet access riser. Call Bonny Doon Environmental Consulting to order the tanks, AdvanTex™ treatment system and other OSI parts.
- AdvanTex™ Treatment System**
 - The proposed AdvanTex™ AX20 Mode 1 treatment system includes a Biotube® pump package for recirculation, a recirculating splitter valve (RSV), split-flow tee, two AX20 packed-bed filter pods and a telemetry-enabled VeriComm™ control panel.
- Discharge Pumping and Pressure-Dose Dispersal System**
 - A 30" diameter, 72" deep OSI pump basin shall be installed adjacent to processing tanks.
 - An OSI 1 horsepower, high-head effluent pump [P2005] is specified for pressurized dispersal from the pump basin.
 - The dispersal trenches lateral piping shall be 1/4" schedule 40 PVC with 1/8" orifices spaced 2' apart.
- Piping Schedule**
 - All piping shall conform to the current edition of the International Plumbing Code.
 - The building sewer pipe to the processing tanks shall be constructed of 4" ABS and shall include a 2-way clean-out fitting as needed to facilitate snaking.
 - The transport pipe to the filter pods shall be 1" schedule 40 PVC.
 - The filtrate return piping from the filters to the RSV and on to the pump basin shall be 2" schedule 40 PVC.
 - The discharge pump transport line shall be 1/2" schedule 40 PVC.
 - The dispersal trenches lateral piping shall be 1/4" schedule 40 PVC with 1/8" orifices spaced 2' apart.

CONSTRUCTION SPECIFICATIONS

- Installer Qualifications and Responsibilities**
 - The system installer shall be licensed by the State of California, Department of Consumer Affairs, to install septic systems. Installer certification is required by the local AdvanTex™. The installer is required to fully read and understand the AdvanTex™ installation manuals prior to the commencement of work.
 - The installer shall be responsible for locating any property lines, underground utilities or piping. Any damage to these facilities shall be the responsibility of the installer.
 - Pre-construction conference, construction inspections, watertight tank test, observation of AdvanTex™ installation, and final system operation shall be made by the designer or representative (423-8022) and the County of Santa Cruz Environmental Health Service (EHS) (454-2022). The installer shall give at least 24 hours notice to the designer and EHS for all inspections requested.
- Building Sewer Installation to the Processing Tank**
 - All new building sewers shall be installed to convey all raw sewage from the facility to the inlet of the processing tanks. Building sewer shall not be installed deeper than 2' below grade at the rear of the building perimeter. All wastewater including graywater shall be discharged to the processing tanks.
 - All sewer piping must maintain a minimum 2% gradient with 2-way cleanout fittings installed to facilitate snaking.
- Electrical Work**
 - The VeriComm™ control panel shall be installed on a 4X6 ACZA-treated post set in concrete near the processing tanks. Do not install this control panel on building frame.
 - Two 20 amp 120V electrical circuits shall be extended to the VeriComm™ panel in separate conduits. Underground circuits in conduit shall be installed from panel to the recirculation pump and discharge pump. A separate conduit containing phone line shall be installed to the VeriComm™ control panel.
 - All work shall conform to the National Electrical Code and the contractor shall obtain an electrical permit and inspection from the County of Santa Cruz Building Department (454-2260).
- Processing Tank, Access Risers, Watertight Tank Testing, AdvanTex™ System, and Pump Basin Installation**
 - The hole for the new tanks shall be excavated so that the tanks sit level. Install the access risers with a watertight joint using the adhesives supplied by manufacturer.
 - Install the inlet fitting with a watertight joint. Cap off or use a test plug on this fitting.
 - Fill the tanks with clean water 2" above the joint between the riser and the tank top. Repair any leaks so that the tanks will hold level.
 - Obtain a watertight tank inspection by the designer with 24 hours notice.
 - Install the recirculating splitter valve (RSV) and split flow tee in the outlet side of the second processing tank in series. A concrete block shall be placed under the split-flow tee to help prevent cracking due to settlement.
 - Complete backfill of the tank with native materials after all pipe joints are tested for leaks.
 - Install the AdvanTex™ system according to the installation instructions and in the location shown on the plan. Concrete shall be poured over the anti-floatation flanges as described in the manufacturer's installation manual. Install the transport and return piping taking care to have continuous fall on the return piping. Test the squirt height on the filter. The filter pods shall be installed slightly above grade.
 - Pump basin shall be installed according to the manufacturer's instructions. The basin shall be wet set in concrete to prevent floatation. The basin shall be filled with clean water immediately after installation. Install the pump and float tree according to the instructions provided by manufacturer.
- Site Clean up and Erosion Control Measures**
 - All excavated areas shall be smoothed.
 - All construction debris shall be removed from the site.
 - All disturbed soils shall be seeded and mulched. Other landscaping plans may be used for erosion control.

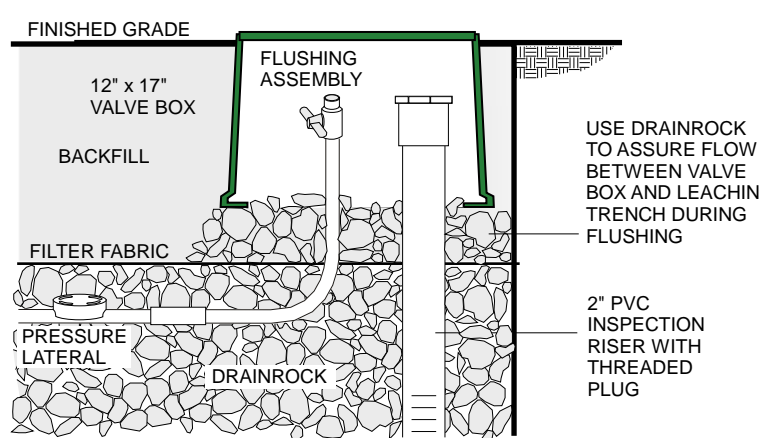


NOTE: THIS MAP IS SCHEMATIC AND IS NOT A SURVEY. THIS MAP WAS PREPARED SOLELY FOR THE PURPOSES OF THE SEPTIC SYSTEM DESIGN AND SHOULD NOT BE CONSTRUED AS SUFFICIENT FOR OTHER PURPOSES. LOCATIONS ARE APPROXIMATE. THE SYSTEM INSTALLER SHALL VERIFY ALL PROPERTY LINES AND UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND BE RESPONSIBLE FOR ANY DAMAGE CAUSED DURING CONSTRUCTION. BASE MAP (GRAY) PREPARED BY DANIEL SILVERNAIL, ARCHITECT, 2024

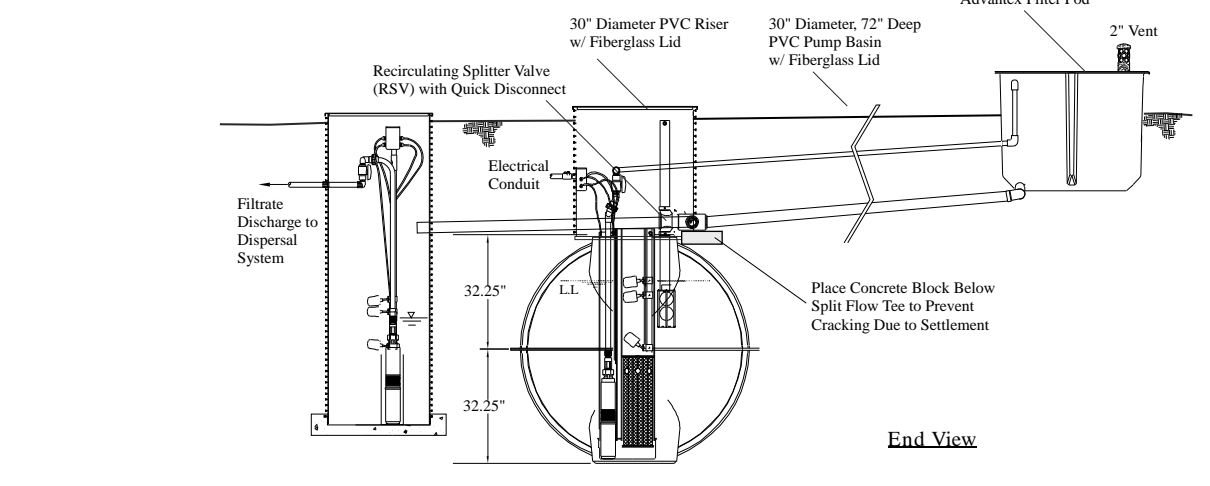
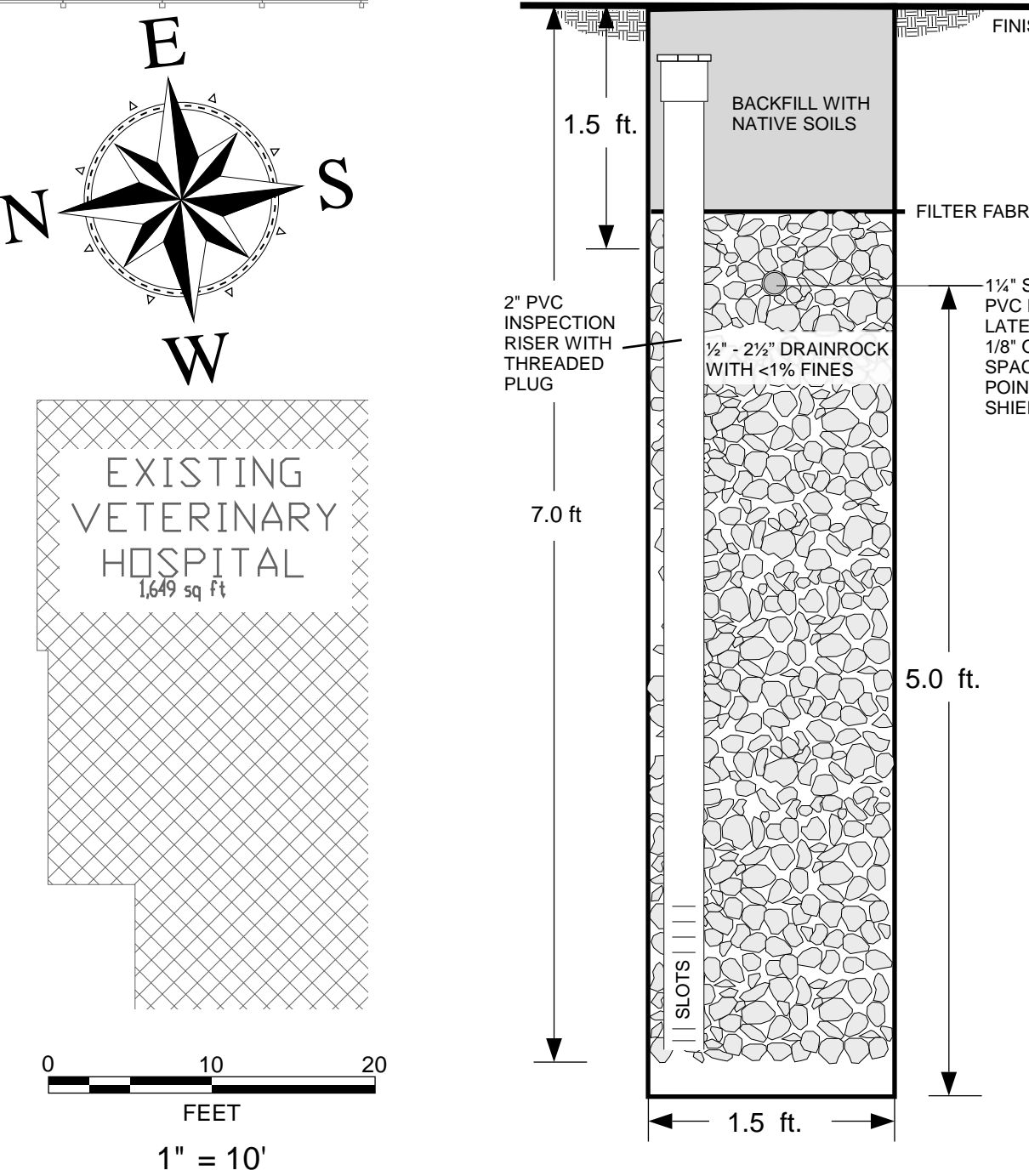
OPERATION AND MAINTENANCE

- The owner should read and operate the AdvanTex system according to the Orenco Systems, Inc. operation and maintenance literature.
- Orenco requires annual maintenance servicing of the AdvanTex system by a qualified technician. Service reports should be sent to EHS.
- Animal waste should not be disposed of into the septic system. Droppings should be collected and disposed of in solid waste receptacles.
- Grease and oils should not be put into the drains.
- The treatment tank is alive with microorganisms performing oxidation and reduction of the contents. Do not add any materials (paint thinner, paint, motor oil, unused medicine, etc.) that may disrupt this process. The septic tank should be pumped when the total of the scum and sludge thickness is greater than 1/3 of the total liquid level depth.
- Repair all plumbing leaks (especially toilet leaks) promptly.

FLUSHING VALVE DETAIL



DISPERSAL TRENCH CONSTRUCTION DETAIL



SITE EVALUATION FOR WASTEWATER SYSTEM

APN 065-131-17 & 18, Adjacent to 5980 Hwy 9, Felton, CA
 Patrick Gill, REHS

Introduction
 The parcels were analyzed for the purposes of designing a onsite wastewater system to serve a new veterinary hospital. A soil profile excavation (T-1) was made on March 22, 2001 during the winter water test season. Field soil morphology analysis is reported below. Percolation test holes were installed and presoaked with the tests conducted the following day. The general site characteristics are presented along with analysis of soil percolation rate and groundwater activity. Conclusions are drawn regarding wastewater treatment and dispersal design. The existing veterinary facility, located on an adjacent parcel, has a long history of average water consumption of about 300 gallons per day. The new facility is proposed to be more than twice as large. A design flow of 900 gallons per day is proposed.

General Site Characteristics
 The site is situated at about 280 feet in elevation on an alluvial terrace adjacent to the San Lorenzo River in the south Felton area. The slopes in the vicinity of the existing leach field and expansion area are nearly level. The site is mapped as county soil survey soil type 171, Soquel loam, 2-9% slopes. The site geology is mapped as Qal, Alluvial deposits, undifferentiated (Holocene). County of Santa Cruz Enhanced Treatment Regulations apply to this parcel based on the soil and geology. The existing vet hospital is served by a leach field located beneath the existing asphalt parking lot.

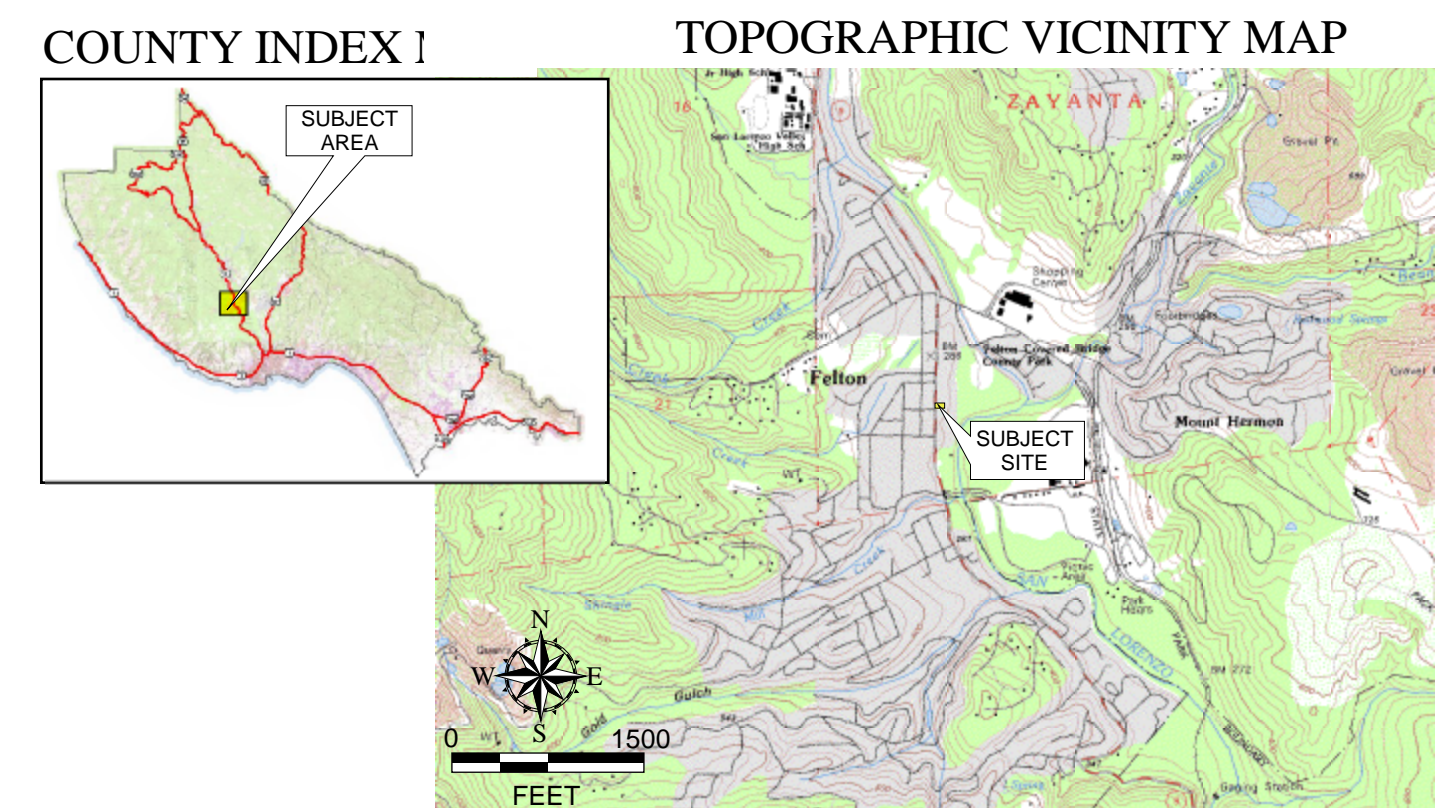
Discussion of Site Evaluation and Septic System Design
 The pedon examined fits the soil survey description for Soquel series soils. The shallow and deep soils are excessively drained sandy loam to loamy sand exhibiting very high hydraulic conductivity and rapid percolation rates (1.7 average MPI). No evidence of elevated groundwater was encountered in the soil profile to 13' below grade. Groundwater is estimated to occur at 13' below grade or lower for 90% of the year for design purposes, although periods of soil column saturation may occur during significant rain events. An application rate of 0.86gpd of treated effluent per square foot of trench bottom and sidewall area is proposed (see Design Criteria). Two AdvanTex AX20 packed-bed filter pods sized to handle an average of 900gpd and a peak of 1,800gpd are specified to treat the effluent. The proposed dispersal trench design incorporates 1,150 square feet of trench bottom and sidewall soil absorption area for dispersal to two, 18" wide, 50' long, pressurized dispersal trench filled with 5' of drainrock. Based on the application rate of 0.86 the proposed dispersal trench design will be capable of dispersing 989gpd.

Soil Profile

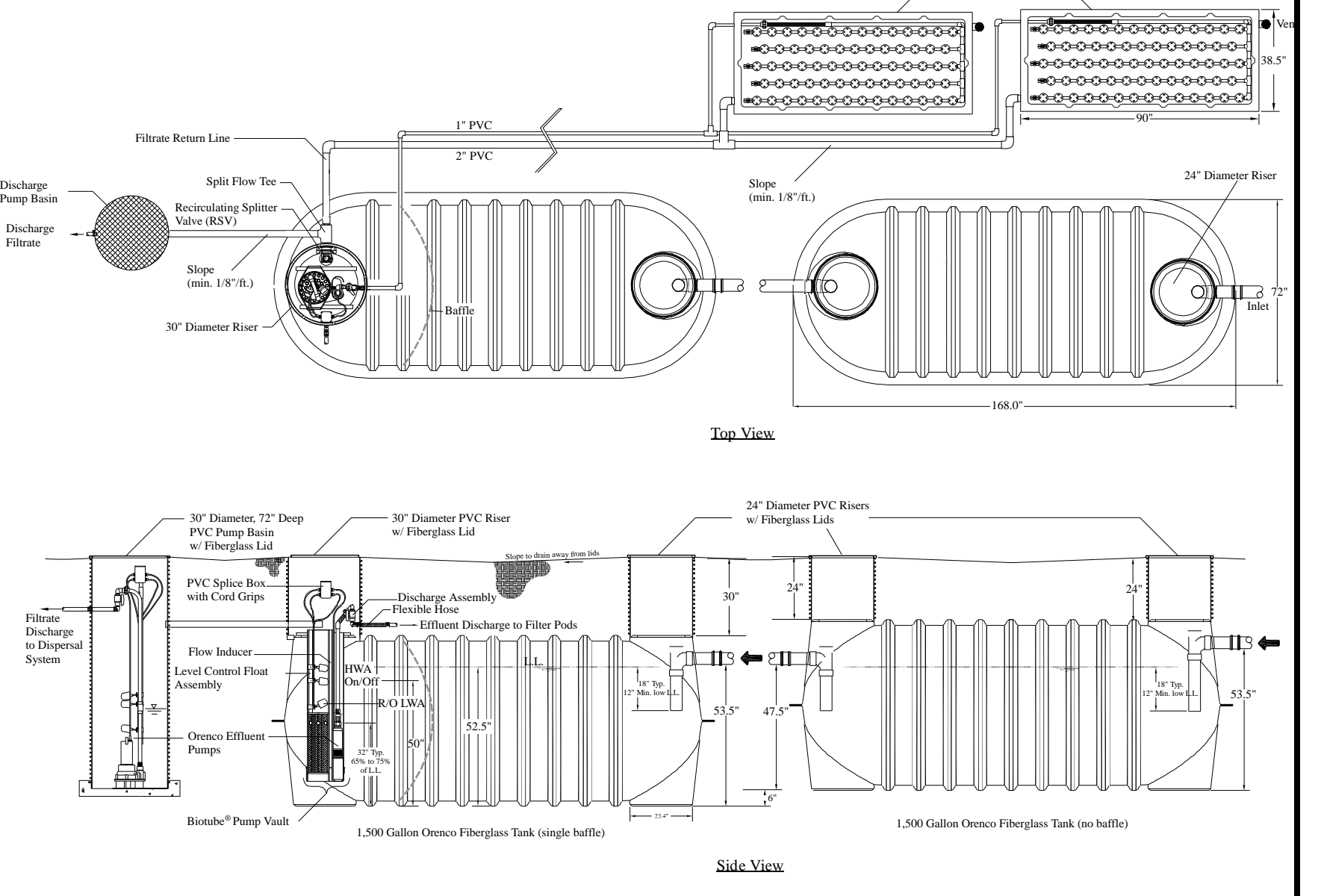
0-22"	Fill, massive, minor roots at surface.
22-44"	Old B horizon.
44"-13"	Qal, many cobbles to 6 cm, color change at 44", large boulder to 24", loose, caves in with depth, unable to dig past 13" without very large excavation.

Soil Morphology Descriptions

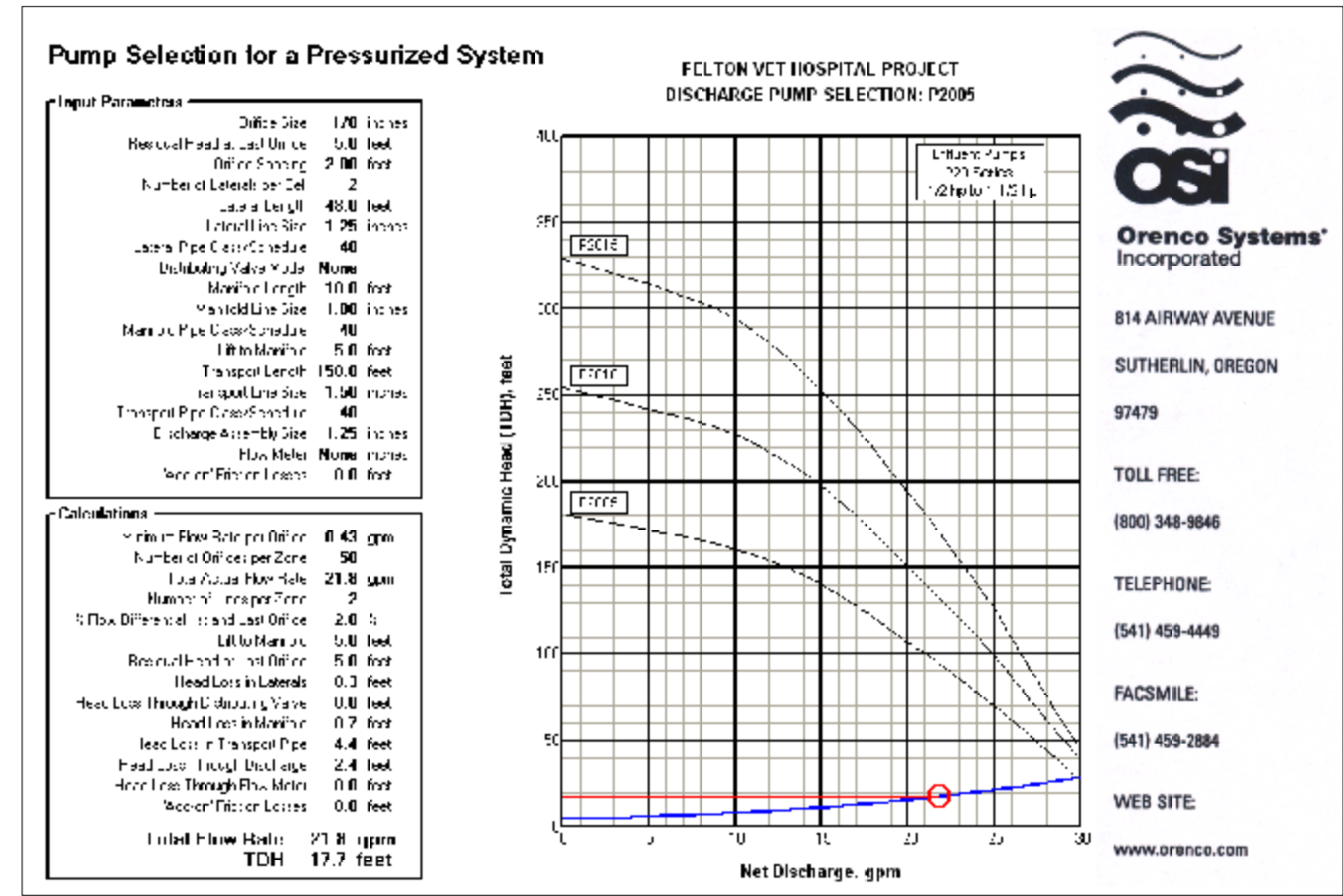
Soil Sample Depth:	18"	38"	7'
Moist Munsell Color:	7.5 YR 3/1 very dark gray	7.5 YR 3/1 very dark gray	10 YR 3/3 dark brown
Texture:	sandy loam	sandy loam	loamy sand
Structure Type:	massive	granular to loose	single grained to loose
Grade:	none	moderate	none
Dry Consistence:	slightly hard	very slightly hard	loose
Moist Consistence:	firm	very friable	loose
Wet Consistence:	nonsticky	nonsticky	nonsticky
Plasticity:	nonplastic	nonplastic	nonplastic
Pores:	few	very numerous	very numerous
Roots:	few	many to 1 mm	none
Mottles:	none	none	none
Notes:	fill	old B horizon	barely forms ribbon



ADVANTEX TREATMENT SYSTEM DETAIL



DISCHARGE PUMP SELECTION CHART



BONNY DOON ENVIRONMENTAL CONSULTING
 REGISTERED ENVIRONMENTAL HEALTH SPECIALISTS
 Design By: Patrick Gill, REHS
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 thegills@cruzio.com

ONSITE WASTEWATER SYSTEM DESIGN FOR DEVELOPMENT OF VETERINARY HOSPITAL PROPOSED ALTERNATIVE SYSTEM USING ENHANCED TREATMENT AND PRESSURIZED DISPERSAL TO ROCK-FILLED TRENCHES

Project Location:	Next to 5980 Hwy 9, Felton, California [Santa Cruz County]
Property Owner:	Robert Atton, D.V.M.
Mailing Address:	5980 Hwy 9, Felton, CA 95018
Owner Phone #:	335-3466
Directions to Site:	Hwy 9 south from Graham Hill Road, downtown Felton (Felton Vet)
Date:	8/13/04
By:	PG/ALB/alb
APN:	065-131-17 & 18 (to be combined)

