UNIVERSITY
OF HAWAI'I
HILO

February 6, 2014

Mr. Herman Tuiolosega
Acting Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Mr. Tuiolosega:

With this letter, the University of Hawai'i at Hilo transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility situated at TMK: 3-2-002:056 on the island of Hawai'i for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two copies of the DEA-AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Mr. Harry Yada at (808) 933-3267.

Sincerely,

Marcia Sakai
Vice Chancellor for Administrative Affairs

Enclosures

c: Mr. Randy Honke, Oceanic Institute of Hawai'i Pacific University

APPLICANT ACTIONS

SECTION 343-5(C), HRS

PUBLICATION FORM (JANUARY 2013 REVISION)

Project Name:	Feeds Research and Pilot Production Facility
Island:	Hawai'i
District:	Hilo
TMK:	3-2-002-056:056
Permits:	Individual Wastewater System Permit Grading and Grubbing Permit Development Plan Review/Approval National Pollutant Discharge Elimination System Permit Air Pollution Control Permit Community Noise Control Permit
Approving Agency:	University of Hawai'i at Hilo 200 W. Kawili Street Hilo, Hawai'i 96720 Contact: Mr. Harry Yada Phone: (808) 933-3267
Applicant:	Oceanic Institute of Hawai'i Pacific University 41-202 Kalaniana'ole Highway Waimanalo, Hawai'i 96795 Contact: Mr. Randy Honke Phone: (808) 259-3189
Consultant:	Parsons Brinckerhoff 1001 Bishop St., American Savings Bank Tower, Suite 2400 Honolulu, Hawai'i 96813 Contact: Mr. James Hayes Phone: (808) 566-2239

Status (check one only):

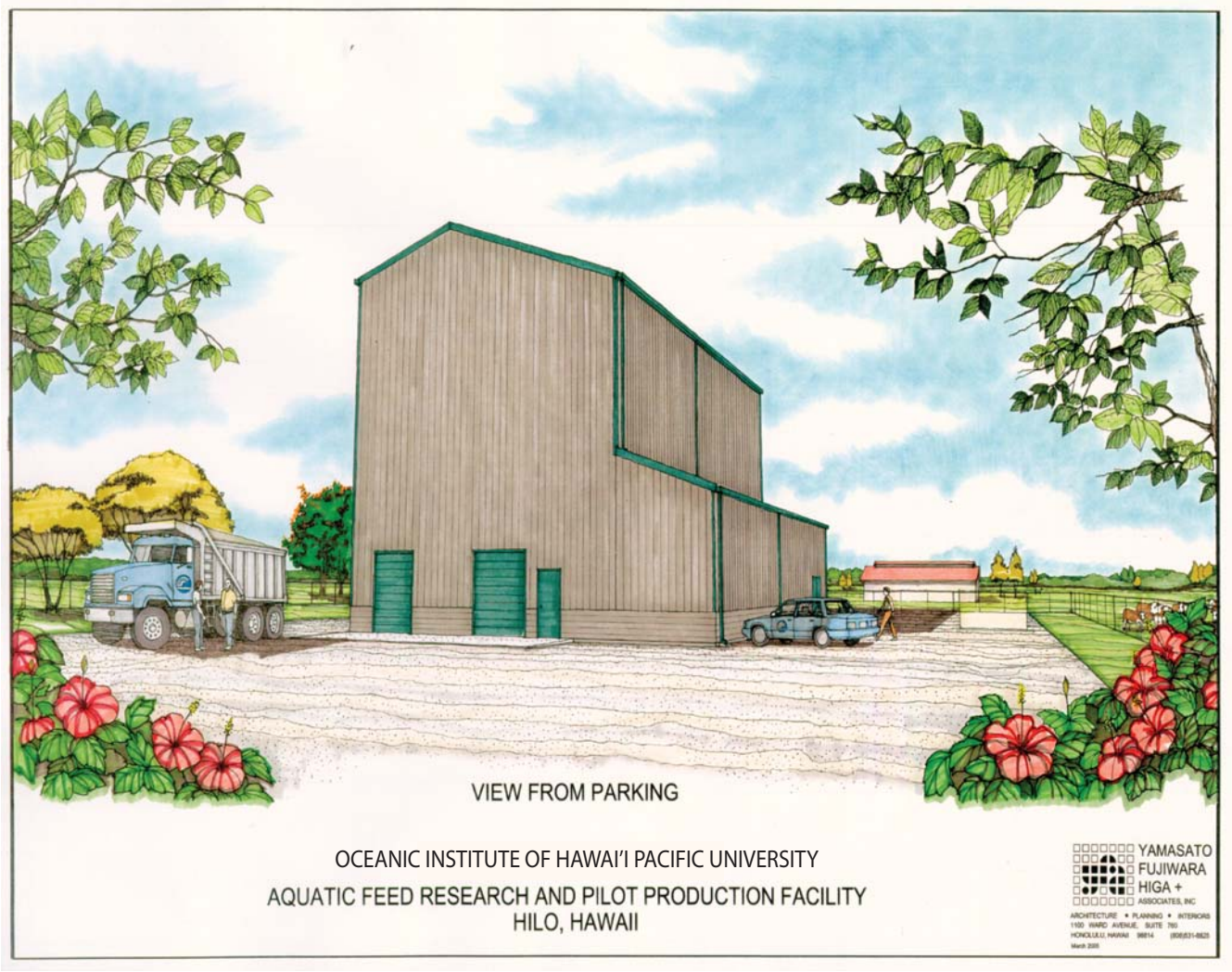
_X_DEA-AFNSI	Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov; a 30-day comment period ensues upon publication in the periodic bulletin.
__FEA-FONSI	Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov; no comment period ensues upon publication in the periodic bulletin.
__FEA-EISPN	Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to

	oeqchawaii@doh.hawaii.gov; a 30-day consultation period ensues upon publication in the periodic bulletin.
__Act 172-12 EISPN	Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov. NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
__DEIS	The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
__FEIS	The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__ Section 11-200-23 Determination	The approving agency simultaneous transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.
__Statutory hammer Acceptance	The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.
__Section 11-200-27 Determination	The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.
__Withdrawal (explain)	

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

Oceanic Institute of Hawai'i Pacific University (OI) is proposing to construct a Feeds Research and Pilot Production Facility (Facility) at the Pana'ewa Agricultural Park in Hilo, Hawai'i. As the first of its kind within the U.S. Pacific Region, the proposed Facility would support the testing and evaluation of feed production for Hawai'i's aquatic and terrestrial agriculture industries on a commercial-scale. The Facility would include a research and pilot production building in which feed process-testing would occur; a separate office trailer; storage containers; and other improvements such as a short access road from the agricultural farm gate to the Facility; parking; off-loading and truck turnarounds; and security fencing.

The proposed Facility is consistent with agricultural policies and objectives within *The Hawai'i State Plan* (June 1991) because it would support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products (HRS§226-7). Research efforts would be an important step in reducing Hawai'i's reliance on imported feed for rearing local livestock and create new opportunities to re-direct bio-fuel and agricultural by-products from landfills to re-use.



Draft Environmental Assessment
Feeds Research and Pilot Production Facility

Prepared Pursuant to
Chapter 343, Hawaii Revised Statues and
TItle 11, Chapter 200, Hawaii Administrative Rules

Proposed by
Oceanic Institute of Hawai'i Pacific University
41-202 Kalanianaole Highway
Waimanalo, Hawaii 96795

Prepared by
Parsons Brinckerhoff
1001 Bishop Street
American Savings Bank Tower
Suite 2400
Honolulu, Hawaii 96813

Oceanic Institute
An Affiliate of Hawai'i Pacific University

DRAFT ENVIRONMENTAL ASSESSMENT
Oceanic Institute of Hawai‘i Pacific University’s Feeds Research and Pilot Production Facility
Hilo, Island of Hawai‘i, Hawai‘i

Submitted Pursuant to the

Hawai‘i Environmental Policy Act,
Chapter 343, Hawai‘i Revised Statutes, and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules

by

University of Hawai‘i at Hilo

The following persons may be contacted for additional information concerning this document:

Mr. Harry Yada, Real Property Director University of Hawai‘i at Hilo 200 W. Kawili St. Hilo, Hawai‘i 96720 (808) 933-3267	Mr. Randy Honke Project Manager Oceanic Institute of Hawai‘i Pacific University 41-202 Kalaniana‘ole Hwy. Waimanalo, Hawai‘i 96795 (808) 259-3189	Mr. James Hayes Sr. Supervising Planner Parsons Brinckerhoff 1001 Bishop St., #2400 Honolulu, Hawai‘i 96813 (808) 566-2239

This Draft Environmental Assessment documents a provisional finding that there would be no significant environmental impacts if the Oceanic Institute of Hawai‘i Pacific University were to construct and operate a feeds research facility within the University of Hawai‘i at Hilo’s Farm Laboratory at the Pana‘ewa Agricultural Park.

Comments on this Draft Environmental Assessment (EA) are due by March 25, 2014, and should be sent to the University of Hawai’i at Hilo at the address above with copies to the Office of Environmental Quality Control, 235 South Beretania Street, Suite 702, Honolulu, Hawai‘i 96813, and James Hayes of Parsons Brinckerhoff, Inc. at the address above.

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CHAPTER 1
DESCRIPTION OF THE PROPOSED ACTION

1.1 Introduction

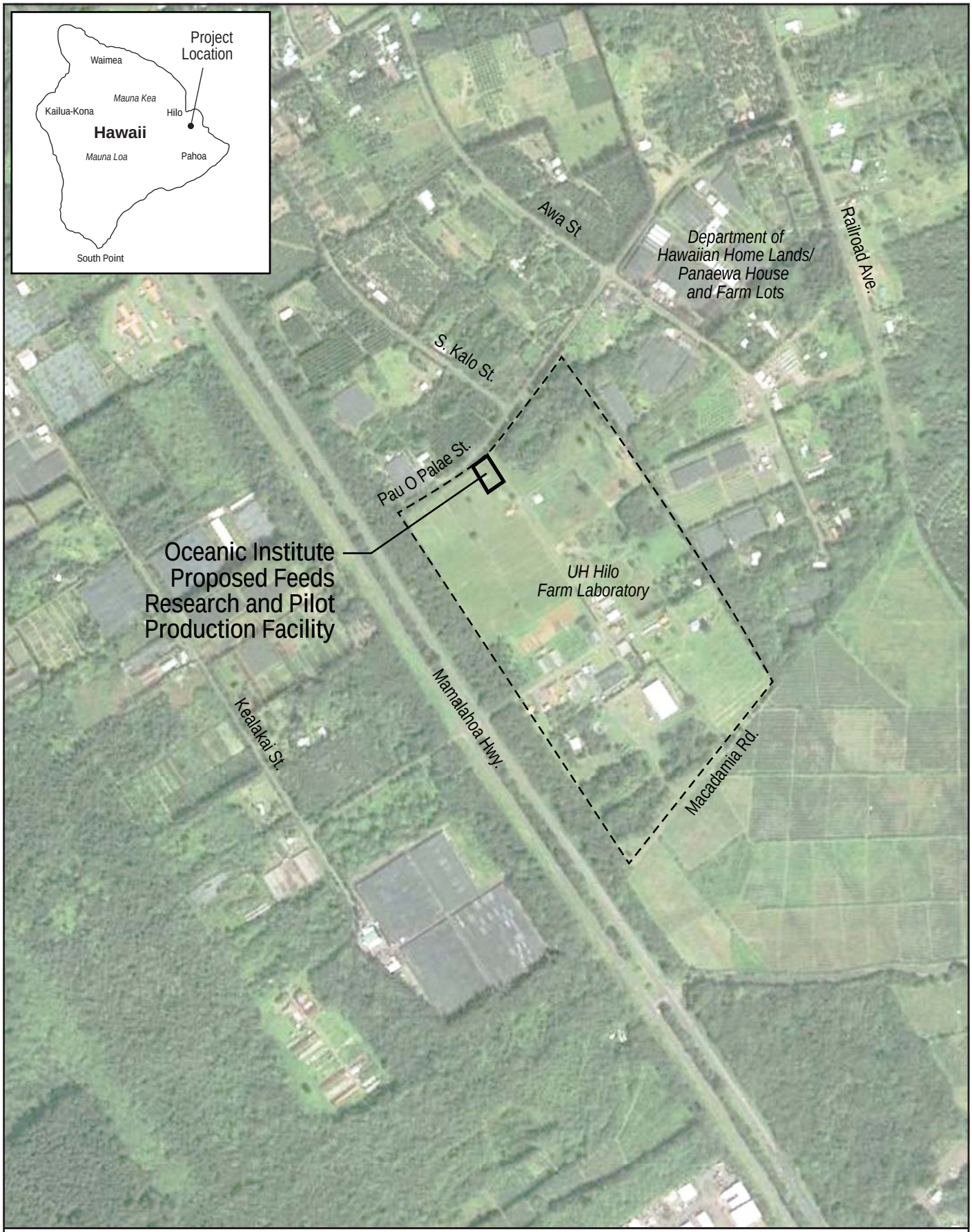
The Oceanic Institute of Hawai'i Pacific University (OI) has prepared this Draft Environmental Assessment (EA) pursuant to Chapter 343 of the Hawai'i Revised Statutes (HRS) for its proposal to construct a Feeds Research and Pilot Production Facility within the University of Hawai'i at Hilo's Agricultural Farm Laboratory (UH Hilo's Farm Laboratory) at the Pana'ewa Agricultural Park (see Figure 1-1).

The Feeds Research and Pilot Production Facility (Feeds Facility) would be used to research and develop aquatic and terrestrial livestock feeds for Hawai'i's aquaculture and animal agriculture industries. The proposed Feeds Facility would explore the use of local ingredients and bi-products such as kukui nut, algae, coconut, as well as slaughterhouse and seafood processing wastes and other items to generate aquatic and terrestrial animal nutrition on a commercial-scale.

Beyond exploring local ingredient formulas, the proposed Feeds Facility would test production methods for commercial quantities using U.S. manufactured processing equipment. Such technology and products would also be used in demonstrations and exhibitions at the Facility.

While the Feeds Facility would experiment and test the production of feeds at a "commercial-scale," it would not be a commercial facility. It would be a research facility operated by OI.

Funding for construction would primarily come from federal and state grants provided by the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA), the Hawai'i State Department of Land and Natural Resources (DLNR), and the Hawai'i State Department of Agriculture (HDA). Due to the involvement of federal funds, this project must comply with the National Environmental Policy Act (NEPA). Due to the use of State funding and State land, this project must also comply with HRS Chapter 343, the Hawai'i Environmental Policy Act (HEPA).



Project Location Map

Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility Draft Environmental Assessment

Figure 1-1

This Draft EA has been prepared to comply with the applicable requirements of HEPA. The comments and responses generated by this Draft EA will be considered part of the public and agency coordination required by NEPA; however, this document in itself will not be considered an EA satisfying NEPA requirements. It is intended that the Final EA, a subsequent document, which incorporates and addresses comments received on this Draft EA, would serve as (a) the Final EA required by HEPA, and (b) the NEPA EA, satisfying the requirements of NEPA.

1.2 Background

The proposed Feeds Facility represents one of many steps towards improving Hawai'i's food self-sufficiency and food security. With an estimated 80-90% reliance on imported foods, Hawai'i's food-supply chain is vulnerable to any number of external forces with the potential to disrupt food from reaching Hawai'i's shores. Recognizing the need to address this vulnerability, the Hawai'i Department of Business, Economic Development & Tourism (DBEDT) with the HDA has prepared the Increased Food Security and Food Self-Sufficiency Strategy (2010), outlining policies, objectives, and actions to increase local food production to meet local needs. The plan recognizes that fortifying Hawai'i's vulnerable food-supply chain also means supporting the agricultural infrastructure and inputs to production. One such input is feed. According to the US Department of Agriculture's Economic Research Service (USDA ERS), which collects national agricultural expense and income data, feed is the single largest expense for any livestock or animal farming operation[1]. In 2012, Hawai'i's farmers spent $31.7 million dollars on feed, all of which was imported[2]. While the proposed Feeds Facility would not produce feed for the commercial market, it would be a proof of concept to attract commercial mills. As Hawai'i seeks to improve food security and food self-sufficiency by lessening reliance on imported goods, the proposed Feeds Facility is an important step towards developing local feeds with local ingredients.

[1] USDA ERS, U.S. Farm Income and Wealth Statistics, Farm Production Expenses 2009-2013(forecasted)
[2] USDA ERS, Historical U.S. and State-level Farm Income and Wealth Statistics, Annual production expenses by category, 2010-2012 nominal (current dollars), Hawaii

1.3 Environmental Review Process

1.3.1 Applicant

Oceanic Institute of Hawai'i Pacific University (OI) is a research institute (division) within Hawai'i Pacific University (HPU) dedicated to the sustainability of our oceans and islands through the development of responsible technologies to increase aquatic food production and protect our coastal resources. OI's research activities generally include: a) research to help restore depleted fisheries; b) technological advancements and aquacultural research for farming shrimp; c) finfish research to develop environmentally sensitive technologies for cultivating marine species for consumption and the aquarium market; and d) aquatic feeds and nutrition development, which researches and tests innovative food technologies for both aquatic and terrestrial species.

As part of its aquatic nutrition and feeds development program, OI has focused on creating better feed formulas and improving production methods. OI's approach to research and development is comprehensive, with significant contributions to the field of aquaculture in feed evaluation and processing technology that has earned OI a permanent seat on the American Feed Industry Association's Aquaculture Committee, and led to international recognition of OI as a center for aquaculture feed technologies. The proposed Feeds Research and Pilot Production Facility would give OI the resources to achieve its long-term goal of becoming a world leader in feeds production research, product development, equipment evaluation, and industry training, in turn raising the level of feed manufacturing expertise for both the scientific-research and the commercial industry.

1.3.2 Environmental Review Triggers and Accepting Agencies for HEPA and NEPA

Since this project is an Applicant Action, the Accepting Authority for the HEPA Draft EA rests with the agency receiving and agreeing to process the request for project approval. The project has multiple processes that trigger the need for an environmental review, pursuant to HEPA. These triggers include:

1) *The project action involves use of State and County Lands*. The proposed project would be constructed on lands leased from the University of Hawai'i at Hilo (UH Hilo), which is State property.

2) *The project action involves use of State funds.* The proposed project would be constructed with grants from DLNR, and the HDA.

From the agencies with jurisdiction, UH Hilo was deemed to be the most appropriate Accepting Agency for the HEPA Draft EA and HEPA Final EA because it: 1) is the agency with the greatest responsibility for approving the action as a whole; 2) can most adequately fulfill the requirements of HEPA; and 3) would have more participation in the proposed action than other state agencies involved.

Since federal grants administered by NIFA would help to construct the project, the project must also comply with NEPA.

1.3.3 HEPA and NEPA Document

It is anticipated that the UH Hilo will determine that the project would not have a significant impact based on the "significance criteria" specified in Title 11, Chapter 200 of the Hawai'i Administrative Rules (see Chapter 4, Anticipated Finding of No Significant Impact). For this reason an EA process instead of an EIS process was selected as appropriate for the environmental review.

This Draft EA will be available for a 30-day public review period, which begins with the announcement in the Office of Environmental Quality Control's publication of The Environmental Notice. In light of public and agency comments on this document, the Anticipated FONSI determination will be further evaluated. A Final EA would then be prepared, addressing comments received on the Draft EA.

NIFA would, if appropriate, approve the Final EA prior to its issuance; the Final EA will serve as the basis for which NIFA is expected to issue its NEPA FONSI determination.

Assuming that UH Hilo and NIFA conclude that a FONSI determination is still appropriate, acceptance of the Final EA by UH Hilo and issuance of a FONSI will mark the completion of the State environmental review process. NIFA's issuance of a FONSI will mark completion of the NEPA process.

1.3.4 Organization of this Document

This Draft EA is organized as follows:

- Chapter 1 discusses the Purpose and Need for the proposed project and introduces the alternatives that were considered, as well as the project's anticipated schedule, costs, permits, and approvals that may be required.
- Chapter 2 describes the existing environmental and social conditions in and around the project site, discloses the potential impacts that may result from the project, and proposed mitigation measures for those impacts considered adverse.
- Chapter 3 documents the agency and public coordination conducted to date.
- Chapter 4 provides the rationale for the project's Anticipated FONSI, pursuant to HRS Chapter 343.
- Chapter 5 consists of a list of references used in the preparation of this EA.
- The Appendices contain records of comments and coordination conducted for the Proposed Project, as well as prepared documents in support of the EA.

1.4 Project Purpose

The Feeds Facility is needed to meet the spatial requirements for OI's aquatic feed and nutrition program to process and manufacture feed amidst evolving research and industry needs. OI currently conducts research on feeds and production at its Makapu'u property on O'ahu. At the existing facility, feeds production and research is spread across a series of 9 buildings and laboratories with a total space of 2,570 square feet dedicated to feed production laboratories and feed testing laboratories. In order to effectively consolidate these operations, and allow the program to continue to mature without potential compromise to existing research, a larger facility is needed. A larger facility would meet the following needs:

- *Increase capacity and ability to develop feeds and feed products to meet nutrition requirements for OI's finfish, marine shrimp, and stock enhancement research programs, as well as other aquaculture research being conducted at other institutions*. Table 1 provides estimates of how a larger facility of about 8,500 square feet would increase processing capabilities over the existing. The current processing facilities provide just enough feed for the indoor and outdoor microcosm laboratories. OI has already exceeded capacity of existing feed production, since at this time, commercial feeds are

used to maintain the broodstock, which has potential to affect research validity due to the inconsistency of the ingredients.

- *Accommodate commercial-scale feed milling technology and equipment.* A larger facility is needed for OI to house the U.S. manufactured processing equipment that would be tested and demonstrated in local feed production. The commercial-scale is important in order to demonstrate commercial viability and simulate process scalability, which would make this research facility unique.

  Exhibitions and trainings on the feed milling process and equipment would be conducted, allowing for the transfer of U.S feed technologies to the commercial sector, as well as to other countries of the Pacific Basin.

- *Expand OI's ability to offer training programs, and short courses related to aquaculture, livestock, and poultry feed processing technologies in cooperation with universities, private research organizations, and commercial companies.* A larger facility would allow for equipment demonstrations, exhibitions, and training programs which are an important part of OI's long-term objectives and the continued success of the Aquatic Feed and Nutrition Program. The intent is to model the facility after Kansas State University's extremely successful feed mill for terrestrial animals where the research feed mill works with educators and researchers to significantly enrich academic curriculum, provide hands-on training, serve as a vehicle for conducting short, intensive extension courses, and facilitate direct interactions with ingredient suppliers, feed producers, and equipment manufacturers.

Table 1-1: Feed Mill Production Capabilities by Process

Processing Capability	*Current (O'ahu Feed Mill – 2,570 square-foot facility)*	*Future (8,500 square-foot facility)*
Hammer Mill	75 kg/hr	3,000 kg/hr @ 420 microns
Mixer	300 kg/hr @ 20 min mixing time	4,000 kg/hr @ 3 min mixing time
Pellet Mill	5-10 kg/hr	1,500 – 4,000 kg/hr
Dry Extruder	200 kg/hr	650-1,250 kg/hr
Wet Extruder	100-500 kg/hr	100-500 kg/hr

Processing Capability	*Current (O'ahu Feed Mill – 2,570 square-foot facility)*	*Future (8,500 square-foot facility)*
Dryer	1,500-4,000 kg/hr	1.500-4,000 kg/hr
Fat Coater	Not Applicable	2,000 kg/hr @ 6 min coating time

Source: Oceanic Institute's Feeds Research and Pilot Production Facility Business Plan 2012, Oceanic Institute of Hawai'i Pacific University, May 2012.

1.5 Proposed Action

The proposed Feeds Facility would include constructing the following:

- A Research and Pilot Production building in which process-testing would occur. The steel-framed structure would consist of a feeds processing area; electric utility room, feeds/ingredient storage rooms, and support areas. Building design and size would be based on accommodating the heavy equipment and processes. Machinery such as a pellet mill, hammermill, extruder, mixer, compressor, steam generator, industrial coolers, and fat coater would be housed within this enclosed building.
- A separate office trailer for office space and restrooms.
- Temporary containers for process ingredient storage.

Exterior utilities such as a short access road from the Highway/Agricultural farm gate to the facility, parking with off-loading and truck turn-arounds, fresh water supply lines, electric and telephone lines, sanitary waste treatment and disposal system, wastewater (non-sanitary) disposal system, security fencing, access gate and perimeter lighting would also be installed.

1.5.1 Project Location

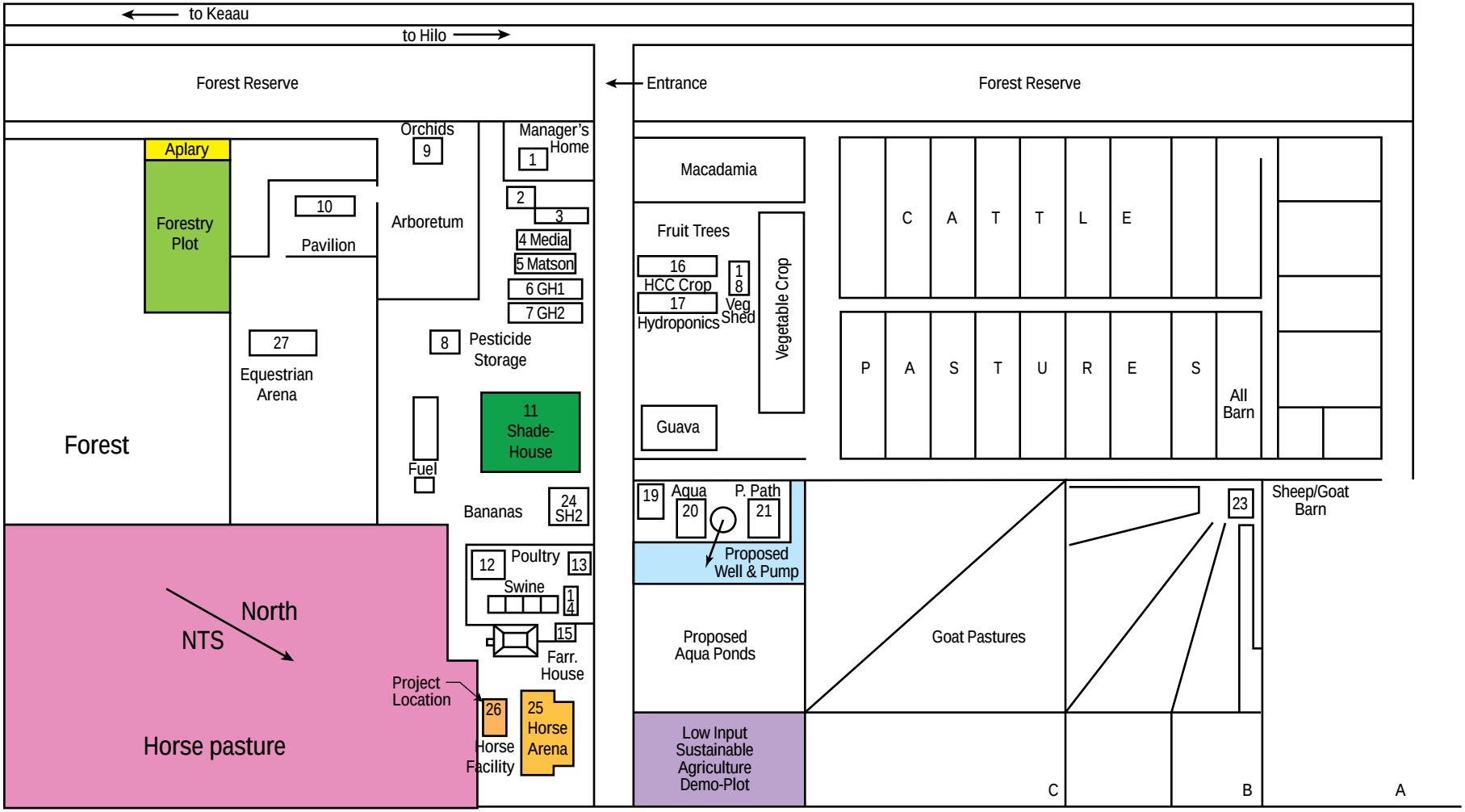
The proposed Feeds Facility would be constructed on a 1-acre parcel within UH Hilo's Farm Laboratory at the Pana'ewa Agricultural Park. UH Hilo's Farm Laboratory is a 110-acre research farm that is located a few miles outside of Hilo, and is part of the enriched hands-on curriculum offered by UH Hilo's College of Agriculture, Forestry and Natural Resource Management (CAFNRM). Training in livestock production, equine science, anthuriums, ornamental foliage, hydroponics, floriculture, plants, orchids, forestry, vegetables, beekeeping, tropical fruit, and aquaculture is provided at the Farm Laboratory. A map of the agricultural park is provided in Figure 1-2.

1.5.2 Operations

Research, training, and feed production for research institutions and government contracts would be the primary focus of the proposed Feed Facility's operations. Potential secondary uses of the facility are detailed in Section 6 of OI's 2012 Business Plan (See Appendix B). In addition to OI's research, the principal users of research feeds would include:

- University of Hawai'i at Manoa, and UH Hilo's Aquaculture and Animal Science Programs
    - Aquatic feeds for fresh and marine water species (shrimp, fish, mollusks, urchin, etc.);
    - Terrestrial animal feeds: beef, dairy, swine, poultry, sheep, goats, horses, dogs, cats, birds, zoo feeds, etc.
- USDA Pacific Basin Agricultural Research Center (PBARC)
    - Research feeds for aquaculture (fresh and marine species of fish and shrimp);
    - Research feeds for terrestrial animals (beef, dairy, swine, poultry, goats, sheep).
- USDA NIFA, Center for Tropical & Subtropical Aquaculture – Research feeds for aquaculture (fresh and marine species of fish and shrimp).
- Other research institutions such as Texas A&M University, Kansas State University, University of Guam, Hawai'i Institute of Marine Biology, American Samoa Community College, and Kagoshima University.

OI's Aquatic Feed and Nutrition Department would manage and operate the Feeds Facility in Hilo, which would be organized into two separate milling operations. The laboratory scale mill would produce small scale experimental aquatic feeds for small growth trials and for evaluating feed formulas and ingredients. Feed from this laboratory mill would be produced in relatively small quantities to support the research being conducted at OI's Makapu'u site. Feeds and processes that demonstrate superior animal performance would then be scaled-up in the pilot production mill.



UH Hilo Agricultural Farm

Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility Draft Environmental Assessment

Figure 1-2

The pilot production mill would manufacture small and large scale aquatic (fish, shrimp) and terrestrial (beef, dairy, swine, and poultry) animal feeds for government and privately funded nutrition and feeds processing research. Testing of regional by-products in feed formulation for sustainable agriculture and aquaculture would be the pilot production mill's focus. This pilot production milling operation would seek to emulate commercial manufacturing conditions rather than laboratory-like conditions.

Once construction is complete, the Feeds Facility would operate on a reduced schedule, however, a full-time operator would be at the facility for equipment maintenance and research support services. As production-scale processing tests are scheduled, researchers from Makapu'u would travel to Hilo to conduct the manufacturing process for the trial. Operations of the pilot production mill would build up with increased frequencies of production runs and trials, requiring the amount of on-site staff to increase accordingly. Once fully operational, the Feeds Facility would be staffed with three full-time permanent staff and two or more student assistants from UH Hilo. Table1-2 provides a breakdown of the operations and general production rates, showing that the initial two years of operations would be pre-dominantly training, gradually shifting to more production-oriented activities as the feed mill becomes more operational and research matures. Daily hours of operation would be consistent with operations at the UH Hilo Farm Laboratory.

Table 1-2: Feed Mill Days of Operation and Production Rates

	Days per Year						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Output**	**Feed Type**
Laboratory Mill	49.0	37.0	37.0	27.0	27.0	2kg/hr	Pellet
Pilot Mill – Aquatic	24.5	47.0	58.5	78.0	84.5	1 ton/hr	Extrude/Pellet
Pilot Mill – Terra	24.5	47.0	58.5	78.0	84.5	2 ton/hr	Mash
Mill Training	98.0	65.0	42.0	13.0	0.0		
Maintenance/Cleaning	52.0	52.0	52.0	52.0	52.0		
Total Days	248.0	248.0	248.0	248.0	248.0		

Source: Oceanic Institute's Feeds Research and Pilot Production Facility Business Plan 2012, Oceanic Institute of Hawai'i Pacific University, May 2012.

1.5.3 Feed Milling Process

Feed is produced as either pellet or mash and is used in the rearing of livestock such as poultry, swine, domesticated pets, and fish. The feed milling process generally involves the following primary operations:

- Raw ingredient receiving, distribution, and storage;
- Grinding;
- Batching and mixing to combine the various ingredients;
- Pelleting and cooling;
- Final product storage; and
- Loadout

Figure 1-3 provides a conceptual floor plan for the facility.

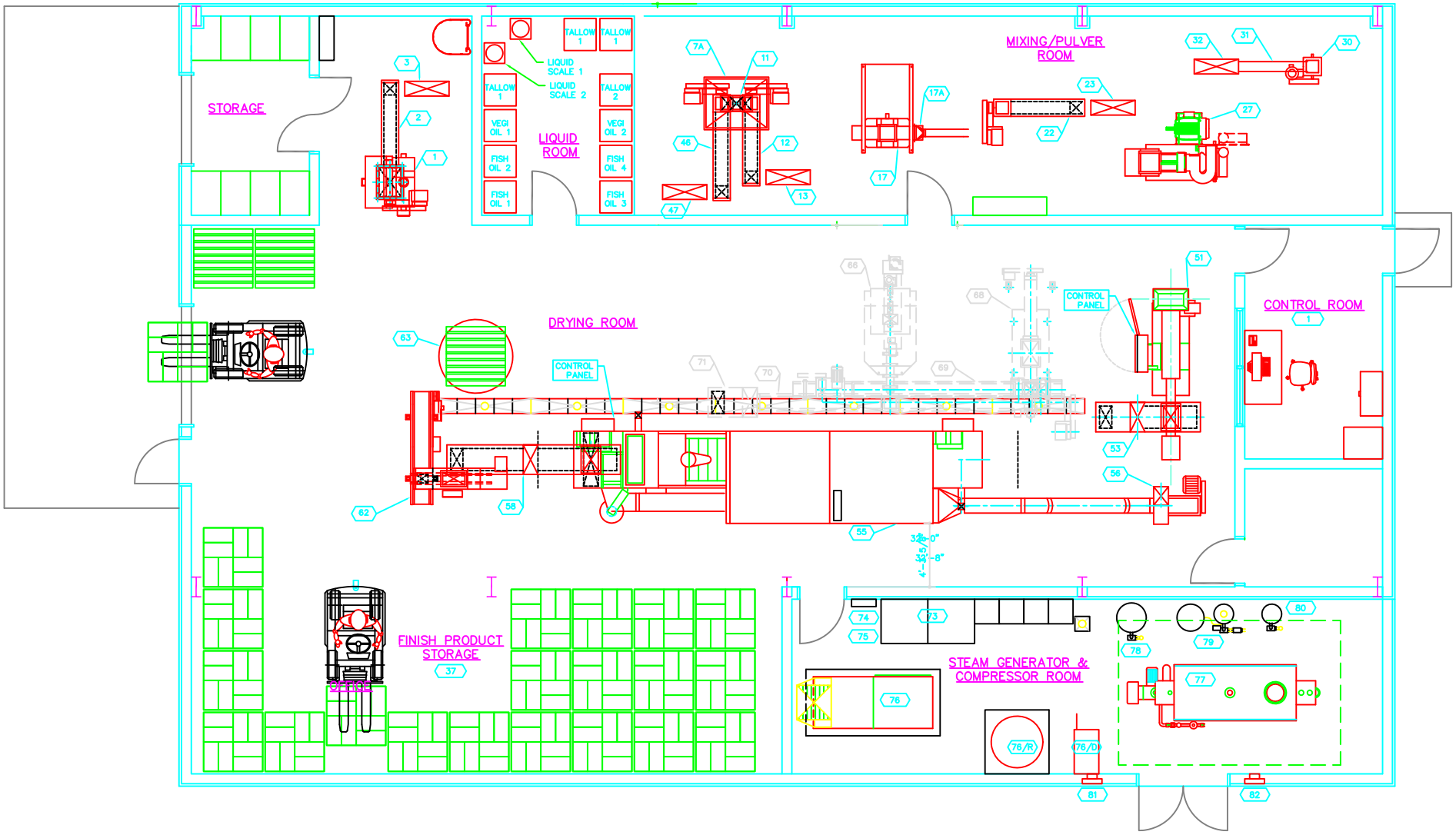
Raw Ingredient Receiving, Storage and Distribution

Raw or process ingredients for feed would be delivered to the feedmill by truck (including hopper-bottom, bulk solids, and liquids trailers). Potential process ingredients would be based on local availability and could include local co-products such as: meat and bone meal; soybean hulls; wheatmill run; molasses; papaya; fisheries by-products; coconut, and possibly pressed cake waste from biofuel manufacturing. A primary objective of the feeds facility is to use local materials and by-products, however, in the event that local ingredients are unavailable to meet the required animal nutrition profiles, imported raw ingredients may be used as supplements. Generally, the amount of raw materials stored is about two week's worth, so the quantity of raw materials on-site will depend on research and production cycles.

Ingredient distribution generally involves transporting feed materials within the facility using various types of equipment such as hoppers, bucket elevators, distributors and gravity flow spouting, as well as conveyor belts which depend on the type of ingredient (liquid, grain, bulk solids), stage of production and production method. Some conveyors are able to meter ingredients as they move from one process to the next.

Grinding

Ingredients are generally ground to reduce the clumps and fragments as well improve the digestibility, mixing properties, pelletability, and density of feed ingredients. Grinding also removes some of the moisture and provides an opportunity for antioxidants to become blended



Note: Plans for illustrative purpose only and may be subject to change.

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Conceptual Equipment Floor Plan

Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility Draft Environmental Assessment

Figure 1-3

into the feed. Various machines may be use to accomplish this process including hammermills, attrition mills, roller mills, cutters and screening or sieves. The most common grinder, the hammermill, is generally equipped with an air system to control for dust, which is avoided to maintain the feed's uniformity and overall integrity.

Batching and Mixing

Once ground to the desired consistency, ingredients are ready for batching and mixing, where much of the "recipe" in feed formulation occurs. Batching systems carefully meter the desired quantities of ingredients and distribute them to the mixer. In the mixing process, liquids and dry ingredients are uniformly combined and diffused in carefully calibrated mixers. Mixing would be performed in a contained unit with fixed baffles, moving augers or paddles. At the conclusion of this process, the mixed feed would be transferred or distributed to allocated storage bins as mash until it is needed for pelleting, bagging, or loadout.

Pelleting and Cooling

A pellet mill aides in the transformation of soft mash into hardened pellets by compressing the feed through holes in a metal die. Dry steam is used in this process to soften and lubricate the feed as it is compressed and extruded, however, some materials such as rice bran, ground cottonseed and palm kernel, as well as ingredients with high fat content do not require the additional moisture. Feed at a room temperature of 77°F can be heated to a temperature of 185-194°F by adding just 4 to 6 percent of moisture from steam. Another 2-3 degrees of temperature is also added from friction as the ingredients pass through the pellet mill. An assemblage of knives at the end of the die casing then cuts the processed/extruded pellets to the desired length.

After extrusion, the hard pellets are cooled to room temperature using a cooler-dryer, which prevents feed spoilage. Pellets are transported on a belt within the enclosed horizontal cooler-dryer as air is fanned through the layer of pellets to cool them. In the process, fine particles and broken pellets are separated or removed by the force of the air and collected in a dust-collecting system. Once the feed has been cooled and screened, it can then be distributed to final product storage and later bagged or bulk loaded.

Final Product Storage and Loadout

The proposed Facility would accommodate warehouse storage space for feed product awaiting transport to end users described in Section 1.5.2. Final product storage and the loadout area

would provide adequate clearance and access platforms so that load out distribution systems and equipment can be maintained.

1.5.4 Estimated Cost and Schedule

OI currently has a 25-year lease with UH Hilo for the 1-acre parcel, which began in 2000, for a nominal fee of $1.00 per year. The Feedmill's estimated total project cost is $4.9 million dollars of which $3.1 million is for construction, and $1.8 million for equipment costs. Funding for construction has been obtained from the U.S. Department of Agriculture , DLNR, HDA, and other private donors. Funding for equipment was obtained through discounts, equipment donations, and funding from the U.S Department of Agriculture.

Final design and permitting is tentatively scheduled to begin in early Spring 2014, and is expected to take approximately six months to complete. Construction of the feeds facility may begin as soon as Fall 2014.

1.6 Alternatives Considered but Rejected

Site selection for the proposed Feeds Facility began with an evaluation of eleven potential sites, which were then narrowed down to five. Table 1-3 provides a listing of sites that were evaluated, and their basis for rejection. An asterisk (*) denotes the five finalist sites, which were scored and evaluated based on the following criteria:

- Landowner enthusiasm;
- Land (rental) costs;
- Availability of infrastructure and ease of development;
- Environmental impacts and permitting concerns;
- Proximity to port for ingredient import and mobility;
- Facilitates joint research opportunities with the University of Hawai'i;
- Attractive location to industry;
- Close to end-product users or evaluators; and
- Ease of management, and operational coordination

Table 1-3: Alternative Sites Considered and Reasons for Rejection

Location	*Reasons for Rejection*
Makapu`u, O`ahu*	• The site is located adjacent to tourist attractions, which would generate significant opposition with a lengthy permitting and public review process given potential odor, noise, dust, and visual impact associated with the proposed facility. • Site is restrictive and could not accommodate on/off-loading trailer-trucks 40-ft in length, nor material storage. • Co-location would not be ideal for other activities on the property that require a biosecure environment.
Waimanalo Research Station, University of Hawai`i, O`ahu*	• Location is adjacent to residences within a community with a history of opposition to industrial noise, dust, and odor. • Master plan identifies this property for forestry research, and would require additional approval from the Dean to secure a lease. • Requires sitework including construction of a private sewerline to the wastewater treatment plant, access road, clearing and grubbing. • Vandalism has also been an issue.
Waiale'e Agricultural Farm, University of Hawai`i, O`ahu	• Distance from port facilities, and OI facilities would make this location difficult to manage, as well as difficult to reach with raw materials. • Trainee housing, and lack of existing classrooms in the immediate facility also detracted from this location, making it difficult to conduct integrated training. • No City wastewater connection available, so wastewater disposal would be through a septic tank and leachfield.
Pomoho Agricultural Farm, University of Hawai`i, O`ahu	• Distance from port facilities, and OI facilities would make this location difficult to manage, as well as difficult to bring in raw materials. • Trainee housing, and lack of existing classrooms in the immediate facility also detracted from this location, making it difficult to conduct integrated training. • Requires extensive sitework including demolition of existing building, new ¾ -mile access road, electrical, and water lines. • Site has a history of vandalism.
Various properties of the Campbell Estate, O`ahu (Campbell Industrial Park, Kapolei Business Park, Kinai (near Barber's Point Harbor))	• High rental costs. • Trainee housing, and lack of existing classrooms in the immediate facility detract from this location, making it difficult to conduct training. • Far from potential end-users. • Surrounding neighbors may object to potential odors and noise. Community has held up construction of sludge reuse facility. • Site is also distant from OI maintenance staff.

Table 1-3 (Continued): Alternative Sites Considered and Reasons for Rejection

Location	*Reasons for Rejection*
Properties of the Damon Estate, O`ahu	• High rental costs. • No classrooms in the vicinity detract from this location, making it difficult to conduct training. • Integrated training with other OI programs would also be difficult due to distance from Makapu'u. • Far from potential end-users of feed products. • Existing metal building would require demolition. • Environment is already congested. • Adjacent businesses are warehousing, industrial shops, and retail businesses, which are incompatible with agricultural processes.
Properties of the Kamehameha Schools/Bishop Estate, O`ahu	• Distance from port facilities would make this location difficult to bring in raw materials. • Distance from OI facilities would make this location difficult to manage. Integrated training with other OI facilities not feasible. • No classrooms in the vicinity detract from this location, making it difficult to conduct training.
Kawaihae Harbor, Kona, Hawai`i	• Unknown cost to lease. • No classrooms in the vicinity detract from this location, making it difficult to conduct training. • Management and coordination would be a challenge because of distance from Makapu'u.
Department of Land and Natural Resources' Feed Lot Area, O`ahu*	• Cost to lease would be relatively high. • Remote location would not facilitate joint research with UH, and would not be attractive to industry. • Community has not been receptive to the now-existing industrial developments.
Department of Transportation lands abutting Ke'ehi Lagoon, O`ahu*	• Lessee would be required to use property for maritime use, otherwise only a year-to-year lease would be possible. • Location is not likely to promote joint research and training opportunities with UH.

During the scoping process to prepare this Draft EA, the PBARC's Hilo facility was also identified as a potential location, however it was rejected from further consideration because the activities for the proposed Feeds Facility would be too industrial in nature to co-locate with the PBARC facility. The potential noise, truck traffic, and odors associated with the industrial processes that would occur at the proposed Feeds Facility would likely disrupt PBARC's research-oriented environment. Furthermore, the research objectives of OI's Feeds Facility are not fully consistent with PBARC's long-term research, which is focused on agricultural crop production, protection, and resolving issues that enhance agricultural production for local and export markets.

The selection of the UH Hilo's Farm Laboratory at Pana'ewa Agricultural Park as the site for the proposed Feeds Facility fully conforms with ongoing and potential future agricultural and aquatic

activities at the farm. Furthermore, it is the aspiration of both UH Hilo and OI, as documented in a Memorandum of Understanding (MOU) (See Appendix C), that the Facility's location would create opportunities for institutional collaboration and cooperation. As described in Section 1.4, the UH Hilo Farm Laboratory location would allow OI to model the facility after Kansas State University's very successful feed mill in which collaboration between the University and the research mill significantly enriches academic curriculum, provides hands-on training, serves as a vehicle for conducting short, intensive extension courses, and facilitates direct interactions with ingredient suppliers, feed producers, and equipment manufacturers.

CHAPTER 2
AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This chapter describes the existing environmental conditions in the study area of the proposed action. It also describes the environmental impacts that may result from constructing the feeds research and pilot production facility (Feeds Facility). When appropriate, regulatory requirements associated with the resource or discipline is provided.

2.1 Natural Environment

2.1.1 Geographic Setting, Topography and Soils

2.1.1.1 Existing Conditions

The UH Hilo Farm Laboratory is on relatively level terrain that has been cleared and graded in the past. Ground elevation at the site varies from a high of 249 feet above mean sea level (msl) to a low of 242 feet msl, gently sloping down toward the north. The rectangular shaped site is covered by moderate vegetation, and enclosed by live electrical wire fencing to prevent the grazing cattle from escaping.

Figure 2-1 shows that the underlying soils at the Feeds Facility are rKFD (Keaukaha extremely rocky muck with 6 to 20 percent slopes) and rPAE (Papai extremely stony muck with 3 to 25 percent slopes). According to the Natural Resources Conservation Service (NRCS), rKFD and rPAE are both very dark brown, thin organic soils that are about 8 inches thick and highly permeable. Both soils typically occur at elevation ranges near sea level to 1,000 feet msl, and receive 90 to 150 inches of rainfall each year. Erosion hazard is considered slight.

Pana'ewa Agricultural Park, including UH Hilo's Farm Lab and the proposed Feeds Facility is designated by the Agricultural Lands of Importance to the State of Hawai'i (ALISH) as "Other Important Agricultural Land". Lands within this category lack qualities that would classify them as "Prime" or "Unique" agricultural land, but are still suitable for agriculture when supplemented and managed with inputs such as fertilizer, drainage improvements, etc. Due to the rockiness of the soil, the project site and its vicinity is well suited for livestock grazing and orchards.

Soils Map

Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility Draft Environmental Assessment

Figure 2-1

2.1.1.2 Potential Impacts

The soil conditions at the project site do not present any unusual or abnormal problems to the design and construction of the proposed action. Construction of the Feeds Facility would not require substantial excavation on the property, and therefore, the site's existing topography would remain the same.

Project impacts would be nominal and less than significant.

2.1.2 Natural Hazards

2.1.2.1 Existing Conditions

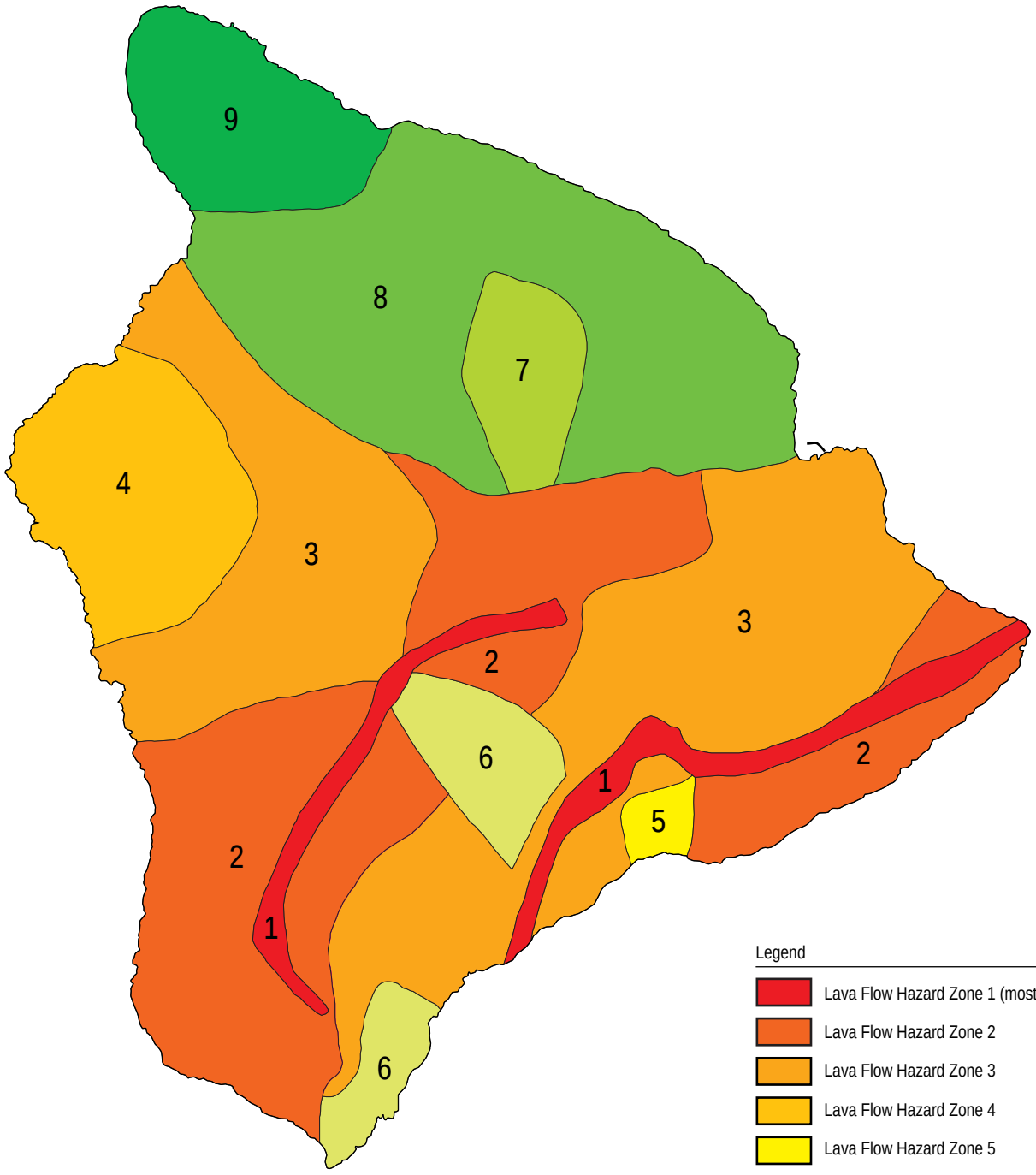
When considering natural hazards that occur on the Island of Hawai'i, volcanic activity is the primary concern. Hazards include lava flows, particle-and-gas clouds, earthquakes, subsidence and tsunamis. The project site is located in a lava flow hazard zone 3, an area of moderate to high risk for lava flow (Mullineaux and Peterson, 1974, rev.1987). Figure 2-2 illustrates the relative risks for lava flow, the proposed project would be located in an area where lava flows from Mauna Loa have historically covered only 15 to 20 percent of the zone. Mauna Loa's most recent eruption in 1984 originated at the summit, and migrated to the northeast rift zone creating flows that reached within 4 miles of Hilo. However, the distance from recently active vents in combination with topography reduces the likelihood of lava flowing into this region.

The project site is located within the Flood Zone X, which is an area outside 500-year floodplain (Hawai'i National Flood Insurance Program), and does not occur in an area that is particularly vulnerable to subsidence or tsunami. Additionally, the project's location is not noted for being any more unusually susceptible to earthquakes than anywhere else on the Island.

2.1.2.2 Potential Impacts

The project does not propose to alter the property's topography, soil characteristics, or other geologic or natural conditions; therefore, there would be no change from existing natural hazard risks such as earthquakes, lava flows, subsidence, flooding, or tsunami.

Project impacts would be nominal and less than significant.



Source:http://pubs.usgs.gov/gip/mauna-loa.html

N

Lava Flow Hazard

Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility Draft Environmental Assessment

Figure 2-2

2.1.3 Surface Water Resources

2.1.3.1 Applicable Regulations

The 1972 Water Pollution Control Act, also known as the Clean Water Act (CWA), provides federal protection for the quality of the nation's waterways. The purpose of the CWA is to stop pollutants from being discharged into waterways, and to maintain water quality for various uses. The CWA requires States to review proposed actions in light of water quality standards if those actions may result in pollutant discharges to "waters of the U.S".

As the counterpart to the CWA, Hawai'i's laws and regulations relating to water quality are contained in Hawai'i Revised Statutes (HRS) Chapter 342D, Water Pollution; Hawai'i Administrative Rules (HAR) Chapter 11-55, Water Pollution Control; and HAR 11-54, Water Quality Standards. The State's rules for Water Quality Standards include a Water Quality Antidegradation Policy that is three-fold, intending to maintain water quality levels that: (1) maintain and protect existing uses; (2) support propagation of fish and shellfish, wildlife and recreation; and (3) maintain existing high quality waters where waters are of exceptional recreational or ecological significance. The remainder of this section discusses the project's potential impact to surface and ground water resources within these regulatory contexts.

2.1.3.2 Existing Conditions

The project would be located within the Kaahakini watershed. There are no streams, rivers, major drainage, ponds, or wetlands within the vicinity of the project.

2.1.3.3 Potential Impacts

Vegetation removal and exposure of soils generally create opportunity for soil erosion and run-off. Given the types of soils found in this location, see Section 2.1.1., soil erodibility is considered slight. Construction would disturb about one acre of land, therefore, an NPDES permit for storm water associated with construction activities would be required. The NPDES permit requires that best management practices (BMPs) be utilized to minimize the potential for storm water quality degradation.

The facility would create additional impervious surfaces that were previously vegetated and facilitated absorption of storm water. Given the porous soil and geologic conditions, the amount of additional impervious surface is not anticipated to create much run-off. If necessary, drywells may be constructed to accommodate any additional run-off or on-site storm water.

Project impacts would be nominal and less than significant.

2.1.4 Biological Resources

2.1.4.1 Applicable Regulations

Section 7 of the Endangered Species Act of 1973 requires federal agencies to consider impacts on endangered or threatened species and critical habitat of such species. For terrestrial species, it requires that federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) about the effects of any major construction activity on a listed species or species proposed as endangered, or those effects which could result in the destruction or adverse modification of designated critical habitat (40 Code of Federal Regulations 402). The State's counterpart law is Chapter 195D, Hawai'i Revised Statutes (HRS), under which species are similarly protected. The remainder of this section discusses the impact to biological resources in this regulatory context.

2.1.4.2 Existing Conditions

The project area has been cleared and graded for agricultural use. It does not provide habitat for any rare or endangered native species (Panaewa Agricultural Product Center Final EA, 1980).

2.1.4.3 Potential Impacts

Since the area has been cleared and is not known for endangered or threatened species, the proposed project would not have an adverse effect on rare or endangered species. Coordination with USFWS and DLNR's Division of Forestry and Wildlife is provided in Chapter 3.

2.1.5 Air Quality

2.1.5.1 Applicable Regulations

The 1977 Clean Air Act (CAA), amended in 1990, provided for the establishment of National Ambient Air Quality Standards (NAAQS) by the U.S. EPA. The State of Hawai'i has also established its own standards. Both federal and State standards have been set to maintain ambient air quality. At the present time, seven parameters are regulated: particulate matter (PM), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and lead (Pb). State of Hawai'i air quality standards are comparable to national standards except those for NO_2 and CO, which are more stringent than the national

standards. Localities in which pollution levels persistently exceed the NAAQS are considered non-attainment areas. National and State Ambient Air Quality Standards are provided in Table 2-1.

Table 2-1: National and State Ambient Air Quality Standards

Pollutant	*Standards*		
	Hawai'i State	**Federal Primary[a] (Health)**	**Federal Secondary[b] (Welfare)**
Carbon Monoxide (CO)			
1 Hour[1]	9 ppm	35 ppm	----
8 Hour[1]	4.4 ppm	9 ppm	----
Nitrogen Dioxide (NO_2)			
Annual (Arithmetic)	0.04 ppm	0.05 ppm	0.05 ppm
PM10[c]			
24 Hour[3]	150 µg/m^3	150 µg/m^3	150 µg/m^3
Annual (Arithmetic)[2]	50 µg/m^3	---	---
PM2.5[d]			
24 Hour[5]	----	35 µg/m^3	35 µg/m^3
Annual (Arithmetic)[4]	----	15 µg/m^3	15 µg/m^3
Ozone (O_3)			
8 Hour[6]	0.08 ppm	0.075 ppm	0.08 ppm
Sulfur Dioxide (SO_2)			
1-Hour	----	0.075 ppm	
3 Hour[1]	0.5 ppm	----	0.5 ppm
24 Hour[1]	0.14 ppm	0.14 ppm	----
Annual (Arithmetic)	0.03 ppm	0.03 ppm	----
Lead (Pb)			
Calendar Quarter	1.5 µg/m^3	0.15 µg/m^3	0.15 µg/m^3
Hydrogen Sulfide (H_2S)			
1 Hour	0.025ppm	----	----

Source: State of Hawai'i, Department of Health, Clean Air Branch – State of Hawai'i Annual Summary 2011, Air Quality Data

Notes: [a]Designated to prevent against adverse effects on public health.
[b]Designated to prevent against adverse effects on public welfare, including protection against visibility, damage to animals, crops, vegetation, and buildings.
[c]Particulate matter 10 microns or less in diameter
[d]Particulate matter 2.5 microns or less in diameter.
(1)Not to be exceeded more than once per year.
(2)Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).
(3)Not to be exceeded more than once per year on average over 3 years.
(4)To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.
(5)To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).
(6)To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

2.1.5.2 Existing Conditions

Air quality throughout the Island of Hawai'i, including the project site, is generally good due to prevalent trade winds and on-shore breezes that help disperse most urban air pollutants. Data collected by HDOH at six monitoring stations located throughout the island indicate that air quality on the Island of Hawai'i meets National and State Ambient Air Quality Standards.

2.1.5.3 Potential Impacts

Most air quality impacts during construction generally consist of fugitive dust generated by construction vehicles operating around the construction site, excavation activities, and stockpiles. The contractor would be required to prevent dust emissions from migrating off the parcel by employing mitigating measures such as minimizing disturbed areas, watering disturbed areas and utilizing dust screens.

The proposed facility's operations would be within an enclosed steel-framed building, in which feed processing equipment are generally equipped with individual exhaust and air filters as well as containment in order to minimize particulates from potentially compromising the integrity of the feed. Furthermore, air quality from truck traffic, vehicles associated with the feeds facility, and burner exhaust gases from the boiler discharge would not have an adverse impact on air quality. The number of additional vehicles and exhaust gases would be negligible under normal operation conditions.

Odors may be detectable from the facility. The facility would be located adjacent to similar uses such as animal feeding operations and other agricultural uses that would not be aggravated by the condition.

Project impacts would be nominal and less than significant.

2.1.6 Noise

2.1.6.1 Existing Conditions

Ambient noise at the UH Hilo Farm Laboratory is typical of what one would find at any large agricultural operation, which is a mix of wide-open space with large machinery such as tractors that generate high decibels for extended periods of time. As shown in Figure 1-2, the adjacent uses, such as the cattle and goat pastures, and green houses are not considered to be noise-sensitive receptors.

2.1.6.2 Potential Impacts

Construction activities would involve heavy machinery and vehicles that at times may exceed the maximum levels allowed by Community Noise Control regulations for daytime within Class C Zoning Districts (agriculturally zoned areas or similar). A Community Noise Permit would be required, and the Contractor will be required to comply with Community Noise regulations.

Noise generating activities at the facility would include equipment and machinery operations, as described in Section 1.5.2, as well as trucks and other vehicles travelling to and from the facility to deliver ingredients and load feed product. Initial operations would likely involve only a few vehicles per day, especially during non-production cycles.

Noise generated from feedmill operations would likely come from conveyors, dryers, the hammermill, augers, mixers, and other motorized equipment. As shown in Table 2-2, milling machines (85 decibels) are relatively less noisy or intense than a tractor (100 decibels), but noisier than a radio or vacuum cleaner (75 decibels). The equipment would be located within a building, therefore, the equipment noise would affect those inside the building but be reduced for those outside the building.

Noise from feedmill operations would be consistent with the ambient agricultural environment. Best management practices would be followed to minimize noise-producing characteristics including frequent machine inspections and maintenance to make sure that machines and motors are properly balanced; lubricated; and that mufflers are not broken, cracked or missing.

Table 2-2: Noise Intensity Limits

Decibels	*Source of Noise*
140	Pain Threshold
135	Jet Airplane Take-off
120	Chain Saw
100	Tractor; Power Saw
85	Milling Machine
75	Radio; Vacuum Cleaner
60	Normal Conversation
45	Soft Music; Leaves Rustling
40	Whispering
15	Hearing Threshold

Source: North Carolina Department of Labor, Occupational Safety and Health Division, A Guide to Safety and Health in Feed and Grain Mills, 2013.

Project impacts would be nominal and less than significant.

2.1.7 Visual and Aesthetic Resources

2.1.7.1 Existing Conditions

UH Hilo's Farm Laboratory is located inland, such that it does not provide any coastal vistas. The landscape is marked by shade houses, sheds, pastures, livestock pens, agricultural plots, a horse arena, equestrian facility, and other structures in support of farming operations (See Figure 1-2).

2.1.7.2 Potential Impacts

The Feeds Facility would be consistent with the existing agricultural aesthetics, and would not obstruct coastal views as it is located inland. The building would be forty-two feet high which is within the forty-five foot height limit for non-residential agricultural structures (Hawaii County Zoning, Section 25-5-73). Although much of the nearby structures are greenhouses and farm sheds that are much lower in height, the towering trees that serve as buffer for the Pana'ewa Forest also line the project site reducing some visibility of the building from the street.

Project impacts would be nominal and less than significant.

2.2 Social Environment

2.2.1 Land Use

2.2.1.1 Existing Conditions

UH Hilo's Farm Laboratory is a 110-acre agricultural park that is part of the larger 470-acre Pana'ewa Agricultural Park. As an instructional and research farm, students at UH Hilo's Farm Laboratory are fully engaged in the business of agriculture with instruction in cultivating anthuriums, ornamental foliage, hydroponics, floriculture, orchids, forestry, vegetables, sustainable agriculture, livestock production, equine science, beekeeping, tropical fruit and aquaculture (UH Hilo website, http://hilo.hawaii.edu/academics/cafnrm/facilities.php).

The Farm Laboratory is equipped with shade and green houses to cultivate ornamental foliage, anthuriums, floriculture plants, orchids, and hydroponics. Orchards of fruit trees, guava trees, macadamia plants, banana trees, vegetable crops, as well as an arboretum and forestry plot can also be found on the property. As part of the equine program, the farm laboratory is equipped with a horse arena, equestrian area, and horse facility for training horses. In addition to horse facilities, the farm has pens for raising poultry, and swine, as well as pastures for horses, goat, and cattle. Pacific Aquaculture and Coastal Resources Center (PACRC) is

constructing an aquaculture facility in which the focus will be on "quarantine, health management and integrated agriculture-aquaculture farming systems" (UH Hilo website, http://hilo.hawaii.edu/academics/cafnrm/facilities.php).

2.2.1.2 Potential Impacts

The proposed Feeds Facility would enhance the existing land use as a learning environment and as an agricultural facility. By co-locating the Feeds Facility with other agricultural, aquacultural and livestock operations, both the existing uses and the Feeds Facility would benefit from being close to end-product users for feeding trials. End-product users and feed researchers would have open and direct dialogue for feedback on feed formulations, and animal performance. Bi-products from farming operations also provide potential resources for feed ingredients. As a learning or research environment, the Feeds Facility would expand the activities and research that students and faculty can engage in.

The proposed project is consistent with existing land uses and its impacts would be nominal and less than significant.

2.2.2 Social, Cultural and Security Conditions

2.2.2.1 Existing Conditions

The UH Hilo Farm Laboratory is secured by fencing and gates, which are locked during non-business hours. The Farm Manager resides on the property to provide security as well as manage equipment and operations. The Farm Laboratory is used for research and training purposes, therefore outside social or cultural activities are not conducted on the property.

2.2.2.2 Potential Impacts

From start-up of operations, the Feeds Facility would have one operator/mechanic at the facility on a full-time basis to maintain the site. The proposed feeds facility would not interfere with operations and security for the remaining portions of the UH Farm Laboratory. Additional fencing may be required for the safety of grazing cattle, as well as perimeter lighting for the building. Internal access roads, and additional access controls, would be coordinated with UH Hilo's Farm Manager and Real Property Director. Although the feeds facility would generate some truck and vehicle traffic (see Section 2.3.1), the amount is too small to interfere with other farm-related truck and vehicle traffic.

Project impacts would be nominal and less than significant.

2.2.3 Historic and Archaeological Resources

2.2.3.1 Applicable Regulations

Section 106 of the National Historic Preservation Act (NHPA) requires actions that are federally-funded, -authorized, or -implemented take into account the effect of such actions on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (National Register). Such resources are called historic properties.

The Section 106 process involves coordination and consultation with the State Historic Preservation Officer (SHPO), and other agencies and organizations that have an interest in or is mandated to protect historic properties. Since the project involves both federal and State agencies and funding, both federal and State regulations apply to the project. Completion of the federal Section 106 process normally satisfies the requirements of the State process, under HRS Section 6E-8. Chapter 3 provides a record of consultation conducted on behalf of the project in accordance with Section 106.

2.2.3.2 Existing Conditions

The proposed project site was formally converted from forested tracts to pasture when it was cleared for the Pana'ewa Agricultural Park and the UH Hilo Farm Laboratory. Previous environmental studies prepared for these activities indicate that evidence of archaeological, historic or cultural resources are not present within the vicinity of the proposed project[3]. Clearing, grading, and grubbing associated with these activities would have removed any surface features if there were any, therefore, it is highly unlikely that the proposed site contains archaeological or historic resources. The State Historic Preservation Division's Archaeologist for the Island of Hawai'i agreed that no historic properties would be affected by the project and that an archaeological inventory survey is not needed for the proposed project (see Section 3.2.1).

2.2.3.3 Potential Impacts

Construction of the feeds facility is not expected to impact or encounter any archaeological or historic resources, however, the following mitigation policies would be observed:

[3] EIS for Pana'ewa Agricultural Park, Supplemental Statement for UH Hilo Farm Laboratory, August 1980; EA for Renovation of Pana'ewa Research Farm, August 2002; EIS for Pana'ewa Agricultural Park, March 1980.

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, Hawai'i Administrative Rules Title 13, Subtitle 13, Chapter 300 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and SHPD and Police Department will be contacted. The appropriate process would then proceed in conformance with Hawai'i Administrative Rules §13-300 Subchapter 4 "Procedures for Proper Treatment of Burial Sites and Human Skeletal Remains."

2.2.4 Recreational and Public Resources

2.2.4.1 Existing Conditions

As Pana'ewa Agricultural Park is primarily dedicated to agricultural enterprise, there are no recreational facilities within the immediate vicinity of the proposed project.

2.2.4.2 Potential Impacts

The proposed project would not affect recreational or public resources.

2.3 Public Facilities

2.3.1 Roadways and Traffic

2.3.1.1 Existing Conditions

Figure 1-1 shows the existing street network surrounding the UH Hilo Farm Laboratory and the proposed Feeds Facility. Vehicles destined for the Feeds Facility would exit from Mamalahoa Highway onto Mamaki Street, followed by a right turn onto Awa Street, and another right turn onto Pau O Palae Street. The proposed facility is situated on the northern portion of the Farm Lab that is accessed via Pau O Palae Street, which is a local road with no outlet. Very little or no activity occurs at night or on the weekends, as the road is not a major thoroughfare, and is used to access agricultural lots. .

2.3.1.2 Potential Impacts

Vehicular activities associated with the operation of the feeds facility would include employee vehicles, and delivery vehicles. During full-scale operations, as described in Section 1.5.2, as many as 5 or more employee vehicles would access the facility on a daily basis. Delivery

vehicles bringing raw feed materials and picking up finished product would also access the site on a sporadic basis, depending on production cycles. In preparation for full-scale production, there may be as many as 7 delivery vehicles in a week. However, because the majority of the facility's feed trials would occur at the farm laboratory, the facility's proximity to end users minimizes the number of vehicles traversing Pau O Palae Street and regional roads and highways and the number of additional vehicles would be difficult to notice.

Early scoping input from the Hawai'i County Police Department indicated that the Department does not anticipate any significant impact to traffic and/or public safety concerns. Feedback from the State Department of Transportation (DOT) also indicated that given the project's location and nature, DOT did not anticipate that the feeds facility would have any significant adverse impacts to State transportation facilities.

2.3.2 Utilities and Infrastructure

2.3.2.1 Existing Conditions

The project site has access to or is serviced by water, electrical and telephone lines. Wastewater for UH Hilo Farm Laboratory is typically managed with cesspools, however, the project site is located in an area that has been identified by the Hawai‘i Wastewater Advisory Committee as a critical wastewater disposal area. No new cesspools are allowed.

2.3.2.2 Potential Impacts

The utility requirements of the feeds facility would include telephone service, electricity, water, and a sanitary waste treatment and disposal system for domestic and non-domestic wastewater. Telephone and internet service would be required in the office spaces. Potable water would be tapped from an existing 8-inch waterline within Pau O Palae Street, which fronts the project site. Because the existing waterline is not sufficient to meet the 2,000 gallons per minute requirement flow for fire protection, the facility would be equipped with an approved automatic fire sprinkler system in accordance with Section 18.3 of the National Fire Protection Association's (NFPA), NFPA 1, Uniform Code, 2006 edition and Hawai‘i State Fire Code with County Amendments. The electrical requirements and quantities of potable water entering and water leaving the feed facility are not anticipated to be high enough to overtax or overload the capacities of the systems. During final design, estimates for maximum daily water usage prepared by a professional engineer licensed in the State of Hawai'i will be provided to the

Hawai'i County Department of Water Supply to ensure that the existing 2-inch water meter that serves the parcel is adequate to support the water demand.

Since a connection to Hawai'i County's sewer system is not available, domestic and non-domestic wastewater would be handled on-site with a septic tank disposal system designed in accordance with the Hawai'i State Department of Health's (DOH) Administrative Rules, Chapter 11-62 "Wastewater Systems". Unlike cesspools, septic tank disposal systems have a watertight receptacle that receives raw wastewater and discharges a settled, partially treated effluent in which grit, solids, oil, grease, fat and floatables have been removed before discharging to a leachfield for final treatment (HAR Chapter 11-62). In contrast, a cesspool is an unlined excavation or pit in the ground designed to retain the organic matter and solids, while allowing liquids to percolate through the pits' bottom or sides to gain access to the underground formation (HAR Chapter 11-62). The quality of wastewater effluent from cesspools is considered only slightly better than the quality of raw wastewater, posing a greater risk to the surrounding environment than a septic disposal system would. For this reason large capacity cesspools have been banned by the U.S. Environmental Protection Agency, and Critical Wastewater Disposal Areas (CWDA) have been identified to limit the number of cesspools within areas of particular concern.

An individual wastewater system permit, which is administered by DOH would be required for the septic tank disposal system. While there may be some non-domestic wastewater handled by the system, much of the water would be considered domestic because the milling process does not typically generate a lot of wastewater. A septic tank disposal system is anticipated to be sufficient to handle both the quality and quantity of water for disposal. The main source of non-domestic wastewater would be from equipment wash-down, which is limited to the extruder on an infrequent basis. Best management practices of sweeping before wash-down would prevent solids from entering the septic disposal or individual wastewater system. DOH shall be consulted during the project's final design to determine whether an underground injection control (UIC) well and permit would also be required.

For solid waste, in the world of animal nutrition and feed production, it is important to note the distinction that waste is generally considered something that has fallen out of the production cycle that cannot be used for any other purpose, and not intended for re-use, recovery, or recycling. For example solid waste generated by the facility, such as test batches that do not meet the desired or intended nutritional profiles would be evaluated for suitability as swine feed,

since swine are noted for their ability to eat just about anything. Given the industry approach to solid waste management, in which very little is discarded, operations are not expected to generate large or significant quantities of solid waste.

2.4 Secondary and Cumulative Impacts

The Council of Environmental Quality (CEQ) defines secondary impacts as those effects that are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8). These types of effects are also called indirect impacts. In contrast, cumulative impacts are results of the incremental consequences that an action has over time. Cumulative effects are sometimes more difficult to recognize because they are less defined and viewed within the context of past actions and reasonably foreseeable future actions (40 CFR 1508.7). Such an analysis is intended to identify those impacts that may not be immediately significant, but over time could lead to greater environmental change.

The proposed facility would not be expected to cause secondary impacts because its development would not affect the land use decisions of landowners controlling adjacent and nearby properties nor would it impede agricultural practices or require other entities to commit to other actions at or near the proposed site. At this time there are no other planned projects within the UH Hilo Farm Laboratory and the proposed facility does not require other facilities to be built or developed. The proposed project would ideally become an integrated part of the Farm Lab, providing test feeds for research feed lots and aquaculture ponds that already exist independently. Feed produced by the facility would not be intended for increasing or expansion of commercial livestock herds. Therefore the facility would not create additional indirect environmental impacts from expanded livestock operations.

During early scoping for the proposed project the concern for using genetically modified organism (GMO) crops was identified because of the potential to create secondary impacts in the form of spreading genetically engineered plants or "weeds" to other agricultural lots. Within this context, weeds would be GMO crops that may have been inadvertently spread by pollen and seeds, infiltrating into organically grown crops. Since one of the facility's staple local crops, papaya, only exists as a GMO crop on the island of Hawai'i, the feeds facility would involve production of feed from such sources. It is also important to note that about 90% of the traditional feed ingredients such as corn, soy beans, and canola are GMO crops, therefore excluding genetically engineered ingredients from the feeds facility operations with absolute certainty would be virtually impossible.

At this time the entire list of food crops in which GMO varieties exist are: corn, soybeans, cotton (for oil), canola, squash, alfalfa, and papaya. While there are versions of tomatoes, potatoes, and rice that have been approved by government regulators, these GMO crops and seeds are not commercially available. Of these GMO commercially available crops only papaya is commercially grown on the island of Hawai'i. Other crops, such as corn, may be grown in house gardens around the island of Hawai‘i.

The risk for establishing genetically engineered weeds amongst local organic crops is further lowered since the raw feed ingredients are typically in the form of byproducts that are no longer viable for germination. Seed corn would not be used at the facility, so would not be able to establish itself. Furthermore, as feed is produced, the manufacturing process (i.e. hammermill pulverization) reduces the risk of any inadvertent establishment to almost non-existent.

Therefore, the risk of a mutant seed inadvertently establishing itself among organic crops is very small. Since one cannot reasonably foresee development of other varieties of GMO crops, good manufacturing practices would be used to manage potential future risks.

Finally, the proposed feeds facility would have the cumulative effect of strengthening Hawai'i's agriculture. As a research and pilot production facility, it would demonstrate the industry potential for manufacturing animal feeds locally, support Hawai‘i's achievement of food security and self-reliance; promote a culture of reducing waste; and assist in diversifying Hawai'i's agricultural base.

2.5 Consistency with Government Plans, Policies, and Controls

2.5.1 State of Hawai‘i Plans and Controls

2.5.1.1 Hawai‘i State Plan

The *Hawai‘i State Plan* (June 1991), as codified in HRS Chapter 226, serves as a guide for the future long-range development of the State. It consists of comprehensive goals, objectives and policies for determining priorities and allocating resources. The State Plan promotes the growth and diversification of the State's economy, the protection of the physical environment, the provision of public facilities, and the promotion of and assistance to socio-cultural advancement.

The proposed action would support the following State Plan's objectives for agriculture (HRS§226-7):

Objective #2: Growth and development of diversified agriculture throughout the State.

Objective #3: An agriculture industry that continues to constitute a dynamic and essential component of Hawai'i's strategic, economic, and social well-being.

The proposed action would support the following State Plan's policies for agriculture (HRS§226-7):

Policy #8: Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.

Policy #12: Expand Hawai'i's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, food crops, aquaculture, and other potential enterprises.

Policy #13: Promote economically competitive activities that increase Hawai'i's agricultural self-sufficiency.

2.5.1.2 Hawai'i State Land Use Controls

The State Land Use Commission (SLUC), under the authority granted in HRS Chapter 205, regulates land use through classification of State lands into four districts: Urban, Agriculture, Conservation and Rural. The intent of the land classification is to accommodate growth and development while retaining the natural and agricultural resources of the State. Each district has specific land use objectives and development constraints. The proposed feeds facility is in the State Agricultural area, in which buildings and uses including mills, storage and processing facilities are permitted (HRS§205-4.5(10)).

2.5.2 County of Hawai'i Plans and Controls

2.5.2.1 General Plan

The *Hawai'i County General Plan* (2005, as amended) is a statement of comprehensive long-range development for the island of Hawai'i, and includes policies to meet these objectives.

The proposed action would address the *General Plan* objective of meeting "where economic development and improvement shall be in balance with physical, social, and cultural

environments of the island of Hawai'i" (§2.2 (b)) by providing a means to use local agricultural byproducts that would typically have gone to landfills as waste and converting it to feed local livestock and aquaculture. The feeds facility would serve as that critical link in the biofuel and agricultural lifecycle, which has the potential to improve the balance between economic and agricultural development and environmental sustainability.

The proposed feeds facility would be consistent with the following policies within the *General Plan* (§2.3):

(b) Encourage the expansion of the research and development industry by working with and supporting the University of Hawai'i at Hilo and West Hawai'i, the Natural Energy Laboratory at Hawai'i Authority and other agencies' programs that support sustainable economic development in the County of Hawai'i.

(e) Encourage the sustainable development of the fishing industry, various forms of aquaculture, and other fresh and sea water-based activities.

(f) Support all levels of educational, employment and training opportunities and institutions.

(i) Continue to encourage the research, development and implementation of advanced technologies and processes.

(k) Continue to encourage development and utilization of by-products from alternate energy conversion projects.

2.5.2.2 County of Hawai'i Zoning

The County of Hawai'i Planning Department regulates land use on the island of Hawai'i in accordance with zoning ordinances, as specified in official zoning maps, and chapter 25 of the Hawai'i County Code (HCC). Zoning maps and the HCC are used to encourage orderly development in accordance with adopted land use policies, such as the *General Plan* and development plans or sustainable community plans, and to promote and protect public health, safety, and welfare.

The proposed project site is zoned A-3a (Agricultural District with a minimum building site of 3 acres). According to the HCC (Section 25-5-72 (a)(17)), the proposed feeds facility may be considered a "public use and/or structure" that is needed for agricultural practices. Public uses, structures, and buildings are permitted in any district given that the Director has issued a plan

approval for the use (Section 25-4-11(c). An application for development plan review would be submitted to the Planning Department for the Director's approval.

2.5.2.3 Special Management Area

The Hawai‘i Coastal Zone Management program designated the areas along the shoreline for "special controls on developments to avoid permanent losses of valuable resources and the foreclosure of management options, and to ensure that adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided." [HRS Section §205A-21] To accomplish these objectives, HRS Chapter 205A established the Special Management Area (SMA), and authorized the counties to develop and administer permitting systems to control development within the SMA. The SMA is a regulated zone extending inland from the shoreline to a landward boundary delineated by the counties. The County of Hawai‘i's Planning Department administers the SMA use permit program for Hawai‘i County. Since the proposed feeds facility is located beyond the SMA boundaries, it would not be subject to permitting under the SMA program.

2.6 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses are those that will occur during the lifetime of the project, while long-term productivity is in reference to the timeframe beyond the completion of the life cycle of the project.

The facility will occupy approximately 1 acre of land. The use of the land for feed mill purposes will be in compliance with existing land use policies; when the facility reached the end of its life cycle, the land will be available for other beneficial uses in the future and remain consistent with the land use policies. The proposed project will not result in a substantial adverse effect to the long-term productivity of the environment because the project will not be sited in an area considered to be exceptional or unique with respect to natural and cultural resources. The use of water, electricity, and roadways will result in a slight increase in demand in the short-term, but the long-term productivity and capability of these resources will not be inhibited by the project.

Short-term, the project will provide opportunities for research that demonstrates the industry potential for manufacturing animal feeds locally, support Hawai‘i's achievement of food security and self-reliance; promote a culture of reducing waste; and assist in diversifying and strengthening Hawai'i's agricultural base.

The short-term use of resources by the Project represents a benefit to the community, and will not result in a substantial adverse impact to the long-term productivity of any resources.

2.7 Irreversible and Irretrievable Commitments of Resources

The proposed project will require the commitment of natural, physical, and human resources to plan, design, and develop; to construct and operate. A commitment of resources is irreversible when primary or secondary impacts limit the future options for a resource; an irretrievable commitment refers to the use or consumption of resources that are neither renewable nor recoverable for future use.

The project will result in some commitments of such resources. The electrical power that will be used by the project will be supplied through renewable and fossil-fuel power generation by HELCO. Building materials will be used for the project facilities; some of those materials could ultimately be recycled for reuse in the future, those that are not will be expended. Solid waste generated by the project will occupy space at a landfill. The human labor required during construction, and operation will be expended and unable to be recovered. However, none of these resources are considered to be in short supply, and the commitment of them to the Project will not have an adverse effect on the continued availability of these resources.

The materials utilized to produce the feeds at the facility do not represent a direct irretrievable commitment of resources because those resources will be utilized to feed animals. Raw materials used in feed production would seek to re-direct items that are typically discarded in landfills. Kukui nut, algae, papaya, coconut, press cake from bio-fuel production, as well as slaughterhouse and seafood processing wastes are among the current possibilities for research and manufacturing feed. Feed produced by the facility would then be used to nourish animals that are part of existing teaching and research efforts.

2.8 Required Approvals and Permits

Table 2-3 lists approvals and permits that may be required for the proposed Project. Much of the approvals and permits are ongoing, but will be finalized prior to completion of the environmental review process. Other permits and approvals would be obtained during final design.

Table 2-3: Permits and Approvals

Agency	Permit or Approval	Current Status
NIFA	Section 106 of the National Historic Preservation Act	Consultation complete (Appendix A).
Department of Land and Natural Resources (DLNR), Historic Preservation Division (SHPD)	HRS Chapter 6E-8 Review	Consultation complete (Appendix A).
U.S. Fish and Wildlife Service (USFWS)	Section 7 of the Endangered Species Act	Informal consultation complete (Appendix A).
Department of Business, Economic Development, and Tourism (DBEDT); Office of Planning	Hawai'i Coastal Zone Management Program Consistency concurrence	Coordinated with DBEDT and Determined Not Applicable (Appendix A).
Department of Health (HDOH), Clean Water Branch (CWB)	National Pollutant Discharge Elimination System (NPDES) Permit for storm water discharges relating to construction activities	On-going
HDOH, Indoor Air and Radiological Branch	Community Noise Control Permit	On-going
HDOH, Clean Air Branch	Air Pollution Control Permit	On-going
County of Hawai'I Department of Public Works	Grading and Grubbing	On-going
County of Hawai'i Planning Department	Development Plan Review/Approval	On-going

2.9 Unavoidable Adverse Impacts

Probable long-term unavoidable and adverse impacts related to Project operation include the following:

- Visual impacts due to the building's height would be unavoidable, however, as discussed in Section 2.1.7, the building would be within the County's height limits for agricultural structures, and the large trees lining the road would mitigate the view of the building from the street.
- Odor is a nuisance that is typically associated with the raw materials used in feed production, however, the scent is consistent with other farming operations such as cattle feeding that occur at UH Hilo's Farm Lab and may not be discernible from these and other farming activities. Best management practices would be employed to control for odor-causing sources.

- As described in Section 2.1.6, the milling process is noisy. However, the noise is stationary and would be consistent with the other agricultural operations occurring nearby.

CHAPTER 3
COMMENTS AND COORDINATION

This chapter summarizes the public and agency consultation and coordination activities for the Oceanic Institute of Hawai'i Pacific University's Feeds Research and Pilot Production Facility Project that have been conducted to date. Project scoping and coordination activities included correspondence with government agencies, environmental organizations, landowners and other interested parties.

3.1 Early Consultation

The following agencies and organizations were contacted by letter (see Appendix A) and asked if they were aware of any environmental or social issue associated with the proposed action, or if they had any environmental concerns:

- Federal Agencies
  - U.S. Department of Agriculture, Natural Resources Conservation Service
  - U.S. Department of Commerce, National Oceanic and Atmospheric Administration and National Marine Fisheries*
  - U.S. Department of the Interior, Office of Environmental Project Review
  - U.S. Department of Labor, Occupational Safety and Health Administration, Region IX
  - U.S. Environmental Protection Agency (U.S. EPA), Office of Federal Activities
  - U.S. EPA, Pacific Islands Contact Office
  - U.S. EPA, Region IX
- State of Hawai'i Agencies
  - Department of Accounting and General Services*
  - Department of Budget and Finance*
  - Department of Business, Economic Development and Tourism (DBEDT)
  - DBEDT, Office of Planning*
  - Department of Education
  - Department of Hawaiian Homelands
  - Department of Health (DOH), Clean Air Branch*
  - DOH, Clean Water Branch*
  - DOH, Environmental Planning Office*
  - DOH, Indoor and Radiological Health Branch

  - DOH, Solid and Hazardous Waste Section
  - DOH, Wastewater Branch*
  - DOH, Hazard Evaluation and Emergency Response
  - DOH, Office of Environmental Quality Control*
  - Department of Labor and Industrial Relations, Hawai'i Occupational Safety and Health Division*
  - DLNR, Office of Conservation and Coastal Lands Division
  - DLNR, Commission on Water Resource Management
  - DLNR, Division of Forestry and Wildlife*
  - Department of Transportation*
  - University of Hawai'i at Mānoa, Environmental Center
  - University of Hawai'i at Hilo, College of Agriculture Forestry and Natural Resource Management*

- Hawai'i County Agencies
  - Department of Environmental Management*
  - Fire Department*
  - Planning Department*
  - Police Department*
  - Department of Public Works
  - Department of Research and Development
  - Department of Water Supply*

- Elected Officials
  - The Honorable Mayor Billy Kenoi
  - The Honorable Councilman Dennis Onishi, County Council District 3

- Utility Companies
  - Hawaiian Electric Company
  - Hawaiian Telcom
  - Oceanic Time Warner Cable
  - Hawai'i Gas Company

- Community Groups
  - Big Island Association of Nurserymen
  - Hawai'i Agricultural Research Center*

- Hawai'i Export Nursery Association
- Hawai'i Farm Bureau Federation
- Hawai'i Farm Bureau Federation, Hilo Chapter
- Hawai'i Farmer's Union United*
- Hawai'i Island Burial Council
- Kahea: The Hawaiian Environmental Alliance
- Sierra Club

An asterisk appears next to those entities that responded to the letter, and copies of their response letters are provided in the Appendix.

3.2 Regulatory Consultation and Coordination

Since the project must comply with certain federal and State environmental laws and regulations, the following coordination and consultation activities were conducted. See Appendix A for records of written correspondence and communications referenced in the discussion below.

3.2.1 Section 106 of the National Historic Preservation Act and Chapter 6E of the Hawai'i Revised Statutes

The National Historic Preservation Act (NHPA) requires that actions that are federally funded, authorized, or implemented take into account the effect of such actions on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Such resources are called historic properties. The Section 106 process involves coordination and consultation with the State Historic Preservation Officer (SHPO), and other agencies and organizations that have an interest in or are mandated to protect historic properties. In addition, the Advisory Council on Historic Preservation (ACHP) is afforded the opportunity to comment on actions that may potentially affect historic properties. At the State level, Section 6E-8 of the Hawai'i Revised Statutes (HRS) places similar responsibilities on projects involving State funding. Because the project involves both federal and State funding, both regulations apply. Completion of the Section 106 process normally satisfies the requirements of HRS Section 6E-8. The following coordination activities were conducted on behalf of the Project (See Appendix A)

- DLNR State Historic Preservation Division (SHPD)

1. July 11, 2013 letter from the U.S. Department of Agriculture, National Institute of Food and Agriculture (USDA NIFA) to the State Historic Preservation Officer (SHPO) delegating authority to Oceanic Institute of Hawai'i Pacific University (OI) and its consultant, Parsons Brinckerhoff (PB), to conduct Section 106 consultation activities on its behalf.
2. July 18, 2013 letter from PB to the SHPD initiating Section 106 Consultation which includes – an overview of the Undertaking or Proposed Project; a Proposed Area of Potential Effect; a discussion of the Historical, Cultural and Archaeological Background; a discussion of the Identified Potential Historic Resources; a Consultation Overview; and discussion of whether an Archaeological Inventory Survey is required.
3. September 5, 2013 letter from SHPD to PB indicating that based on the parcel's history of industrial and agricultural uses as well as prior reviews, SHPD concurs with the determination that no historic properties will be affected by this project. An archaeological inventory survey is not needed prior to additional ground disturbance or construction on this parcel.

- Other agencies and organizations
  - Office of Hawaiian Affairs (OHA): July 18, 2013 letter from PB to the OHA providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
  - Association of Hawaiian Civic Clubs: July 18, 2013 letter from PB to the Association of Hawaiian Civic Clubs providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
  - Association of Hawaiians for Homestead Lands: July 18, 2013 letter from PB to the Association of Hawaiians for Homestead Lands providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
  - Au Puni O Hawai'i: July 18, 2013 letter from PB to the Au Puni O Hawai'i providing information about the proposed Project and requesting information on historic and

cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.

- Council for Native Hawaiian Advancement: July 18, 2013 letter from PB to the Native Hawaiian Advancement providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- George K. Cypher ʻOhana: July 18, 2013 letter from PB to the George K. Cypher ʻOhana providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Hawaiʻi Maoli: July 18, 2013 letter from PB to Hawaiʻi Maoli providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Hawaiian Civic Club of Hilo: July 18, 2013 letter from PB to the Hawaiian Civic Club of Hilo providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Hui Hoʻoniho: July 18, 2013 letter from PB to Hui Hoʻoniho providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Hui Mālama I Na Kūpuna O Hawaiʻi Nei: July 18, 2013 letter from PB to Hui Mālama I Na Kūpuna O Hawaiʻi Nei providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Hui Kākoʻo ʻĀina Hoʻopulapula: July 18, 2013 letter from PB to Hui Kākoʻo ʻĀina Hoʻopulapula providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Kamehameha Schools:

i. July 18, 2013 letter from PB to Kamehameha Schools providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.

ii. August 5, 2013 e-mail from Kamehameha Schools to PB respectfully declining an invitation to participate in consultation.

- Kanu o ka ʻĀina Learning ʻOhana: July 18, 2013 letter from PB to Kanu o ka ʻĀina Learning ʻOhana providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Makuʻu Farmers Association: July 18, 2013 letter from PB to the Makuʻu Farmers Association providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Piihonua Hawaiian Homestead Community Association: July 18, 2013 letter from PB to the Piihonua Hawaiian Homestead Community Association providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Royal Hawaiian Academy of Traditional Arts: July 18, 2013 letter from PB to the Royal Hawaiian Academy of Traditional Arts providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- The Imua Group: July 18, 2013 letter from PB to the Imua Group providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.
- Historic Hawaiʻi Foundation: July 18, 2013 letter from PB to the Historic Hawaiʻi Foundation providing information about the proposed Project and requesting information on historic and cultural sites or contact information for any person or organization that is knowledgeable about the proposed project area.

3.2.2 Section 7 of the Endangered Species Act and Chapter 195D of the Hawai'i Revised Statutes

Section 7 of the Endangered Species Act (ESA) requires that federally-funded actions not jeopardize any species listed as threatened or endangered, or adversely modify designated critical habitat. HRS Chapter 195D, the State counterpart law to the ESA, requires evaluation of the potential impact of State-funded projects on threatened and endangered species.

The following consultation and coordination activities were conducted with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7:

- July 11, 2013 letter from USDA NIFA to USFWS initiating informal consultation, and requesting information on critical habitat and threatened or endangered species occurring in the vicinity of the proposed Project.
- E-mail from USFWS to USDA NIFA indicating that there are no Listed Species or Critical Habitat concerns at the construction site.

The following consultation was conducted with the State of Hawai'i Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW):

- August 5, 2013 early consultation letter from PB to DLNR providing project information and requesting information to identify potential issues.
- August 15, 2013 from letter from DLNR DOFAW to PB indicating that DOFAW has no comments to offer at this time since the project does not appear to impact DOFAW land or resources.

3.2.3 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) requires that federal agencies identify and consider the adverse effects of their actions on the preservation of farmland. The following consultation and coordination activities were conducted on behalf of the Project (see Appendix A).

- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)
  - August 5, 2013 early consultation letter from PB to NRCS providing project information and requesting information to identify potential issues.
  - August 30, 2013 e-mail from PB to NRCS requesting clarification on whether a Farmland Conversion Impact Rating would be required in compliance with the FPPA.

- September 3, 2013 e-mail and September 27, 2013 letter from NRCS to PB indicating that because feeding with feeds from the proposed facility would be done as an integral part of the farm, the facility would fall into the category of an On-Farm Structure for Farm Operations and would not trigger FPPA documentation requirements.

CHAPTER 4
ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT

In accordance with the Hawai‘i Revised Statutes (HRS) Chapter 343 HRS and Hawai‘i Administrative Rules (HAR), Sections 11-200-9 and 11-200-11.2, the University of Hawai'i at Hilo (UH Hilo), as the approving agency, anticipates rendering a Finding of No Significant Impact (AFONSI) for the proposed action. This assessment is based on an evaluation of project impacts in relation to the "Significance Criteria" specified in HAR 11-200-12(b). The Significance Criteria appear below in italics, followed by a discussion of the project in relation to the specific criterion. The nature of the project's potential impacts is discussed in detail in Chapter Two.

Involves an irrevocable commitment to loss or destruction of any natural or cultural resource – The area that would be affected by construction of the proposed feeds facility does not contain important natural or cultural resources (see Sections 2.2.2 and 2.2.3).

Curtails the beneficial uses of the environment –the proposed feeds facility would be constructed on land that has been set aside for agricultural use. Operation of the feeds facility would support the surrounding agriculture instead of being considered a detriment to the beneficial uses of the environment.

Conflicts with the State's long-term environmental policies or goals and guidelines expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders - The proposed feeds facility is consistent with the environmental goals and objectives of the State of Hawai‘i (see Section 2.5.1.1).

Substantially affects the economic welfare, social welfare and social practices of the community or State – Construction and operation of the feeds facility would not adversely affect the economic or social well-being of the community or State because it would encourage development of local agricultural enterprise by demonstrating the possibilities for locally produced feeds, promote Hawai'i's self-sufficiency in animal nutrition, as well as capture and divert waste that would typically go to landfills.

Substantially affects public health – Similar to any agriculture or food processing facility, good production practices must be adhered to in order to maintain the optimal nutritional quality of the feed and prevent food safety hazards from occurring. The feeds facility would

follow industry-accepted Good Agricultural Practices, and Good Manufacturing Practices to minimize the risk of food safety hazards caused by pests, chemical, physical or microbiological contaminants, etc. during production from affecting public health further along the food chain. It should be noted that the feed produced by the facility would be primarily used to nourish research livestock and aquaculture rather than for commercial use.

Involves substantial secondary impacts, such as population changes or effects on public facilities - The proposed facility would not be expected to cause secondary impacts because its development would not affect the land use decisions of landowners controlling adjacent and nearby properties nor would it impede agricultural practices or require other entities to commit to other actions at or near the proposed site (see Section 2.4).

Involves substantial degradation of environmental quality - The proposed feeds facility would not affect environmental quality. The project site is not located in an environmentally sensitive area.

Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions – The proposed feeds facility would have individual functional utility. It is important to note that the proposed action would be limited to a research and pilot scale production mill with the intent of demonstrating the possibilities for a local commercial production mill. However, the research and pilot scale production mill does not necessitate or require commitment of a commercial mill, since the research and production facility would yield invaluable research capabilities and information in and of itself.

Substantially affects a rare, threatened or endangered species, or its habitat – The UH Hilo Farm Laboratory and the project site does not contain rare, threatened or endangered plant or animal species (see Section 2.1.4).

Detrimentally affects air or water quality or ambient noise levels – Noise from operating machinery such as pulverizers, coolers, and dryers would be heard outside the facility (See Section 2.1.6). Odors would also be detectable (See Section 2.1.7). However, these nuisances would be consistent and commensurate with other farming and livestock feeding operations occurring nearby within Pana'ewa Agricultural Park and the UH Hilo Farm Laboratory. The proposed project would increase impervious surface and the potential for stormwater runoff. However, there are no bodies of water nearby to affect water quality, and

if necessary, drywells would be installed as drainage to retain storm water run-off on-site (See Section 2.1.4)

Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters - The proposed project is not located in an area that is particularly vulnerable to flooding, tsunami, subsidence, fresh or coastal waters, or other environmentally sensitive areas (see Section 2.1.3).

Substantially affects scenic vistas and viewplanes identified in county or state plans or studies – The feeds facility would not affect scenic vistas or important viewsheds. It would be located inland within an area designated for agriculture and similar activities (see Section 2.1.7).

Requires substantial energy consumption – operations rely on electricity to power machinery, however they are not anticipated to overtax the system. Gas-powered vehicles would be used to transport raw materials and finished product to, from and within the facility. However, the facility has been strategically located near end-users, and energy consumption of these vehicles would not be excessive or substantial.

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CHAPTER 5
REFERENCES

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U.S. Department of Agriculture. Economic Research Service Website <http://www.ers.usda.gov/data-products>

U.S. Geological Survey Website <http://pubs.usgs.gov/gip/hazards/maps.html>

University of Hawai'i at Hilo, College of Agriculture, Forestry and Natural Resource Management Website <http://hilo.hawaii.edu/academics/cafnrm>

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Appendix A
Agency and Stakeholder Letters and Responses

Early Consultation and Pre-Assessment Scoping Coordination

Some NMFS feedback re the proposed Feeds Research and Pilot Production Facility at Hilo

an email sent by Rachel Adams on 12 Sep 13 at 10:38am

From: Adams, Rachel
To: "feedmill@projectsolvemail.com" <feedmill@projectsolvemail.com>

From:#Gdqlhooh#Md|hzdughqh0#QRDD#Diiloldwh#^pdlowr=gdqlhooh1md|hzdughqhCqrdd1jry`#
Sent:#Iulgd|/#Vhswhpehu#39/#5346#5=3<#SP
To:#Kd|hv/#Mdphv#+Krqroxox,
Cc: Jhu|1GdylvCqrdd1jry
Subject:#Vrph#QPIV#ihhgedfn#uh#wkh#sursrvhg#Ihhgv#Uhvhdufk#dqg#Slorw#Surgxfwlrq#Idflolw|#dw#Klor

Aloha Jim,

I have, on behalf of the Habitat Conservation Division of NOAA Fisheries Pacific Islands Regional Office (NMFS), reviewed your letter requesting early comments for the preparation of an environmental assessment document for the proposed construction of a Feeds Research and Pilot Production Facility at the Panaewa Agricultural Park in Hilo, Hawaii.

Currently our understanding is that the US Department of Agriculture, partially funding the project, is the *Federal action agency* hence responsible for NEPA compliance also any required federal consultations. (Please correct us if we are wrong).

While we do not have any specific recommendations at this early stage beyond incorporation of general Low Impact Development measures in project facility design, please familiarize yourself with the requirements of the Essential Fish Habitat (EFH) consultation pursuant to the *EFH provision §305(b) of the Magnuson Stevens Fishery Conservation and Management Act (MSA;16 U.S.C. 1855(b))*. If it is deemed that there may be adverse effect to EFH from the project, include the EFH consultation in your process and analysis as appropriate. Attached is a fact sheet on EFH, also feel free to visit our website: http://www.fpir.noaagov/HCD/hcd_efh.html

Thank you for the opportunity to comment; don't hesitate to contact me with any comments/questions.

Danielle

-- Danielle Jayewardene Ph.D. Coral Reef Ecologist/EFH coordinator Habitat Conservation Division NOAA Fisheries, Pacific Islands Regional Office 1601 Kapiolani Blvd, Suite 1110 Honolulu, HI 96814 Ph 808-944 2162

Comments

Attachments

NOAA FISHERIES
Pacific Islands Regional Office

Essential Fish Habitat and Consultation





What is Essential Fish Habitat (EFH)?

EFH is defined as those waters and substrate necessary for federally managed species to spawn, breed, feed, and/or grow to maturity. It is the legal tool that National Marine Fisheries Service (NMFS) uses to manage marine habitat to ensure that the federally managed species identified by the fishery management councils have a healthy future.

Why has EFH been designated?

Species require healthy habitat to survive and reproduce. In 1996, the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855(b)) was amended to establish a new requirement to identify and describe EFH to protect, conserve and enhance EFH for the benefit of the fisheries.

Where has EFH been designated?

EFH has been designated, as per the table below, for all the federally managed species referred to as the Management Unit Species (MUS) in our Pacific Islands Region. EFH is described in detail in the Western Pacific Fishery Management Council's Fishery Ecosystem Plans, available on the Council's website (www.wpcouncil.org).

What is a Habitat Area of Particular Concern (HAPC)?

HAPC are subsets of EFH that merit special attention because they meet at least one of the following 4 criteria:

1) provide important ecological function;
2) are sensitive to environmental degradation;
3) include a habitat type that is/will be stressed by development;
4) include a habitat type that is rare.

HAPC are afforded the same regulatory protection as EFH and do not exclude activities from occurring in the area, such as fishing, diving, swimming or surfing.

Management Unit Species (Groups)	EFH for eggs and larvae	EFH for juveniles and adults
Bottomfish	Water column down to 400 meters depth from shoreline out to the 200-mile U.S. Exclusive Economic Zone (EEZ) boundary	Water column and all bottom from shoreline down to 400m depth
Seamount Groundfish	Water column down to 200 meters depth of all EEZ waters bounded by 29°–35° N and 171° E–179° W	Water column and bottom from 200 meters to 600 meters depth, bounded by 29°–35° N and 171° E –179° W
Pelagics	Water column down to 200 meters depth from shoreline out to EEZ boundary	Water column down to 1000 meters depth from shoreline out to EEZ boundary
Precious Corals	Known precious coral beds in the Hawaiian Islands located at: Keahole point, between Milolii and South Point, the Auau Channel, Makapuu, Kaena point, the southern border of Kauai, Wespac bed, Brooks bank bed, and 180 Fathom Bank	
Coral Reef Ecosystem	Water column and all bottom down to 100 meters depth from shoreline out to EEZ boundary	
Crustaceans	Lobsters/crab: Water column down to 150 meters depth from shoreline out to EEZ boundary Deepwater shrimp: The outer reef slopes between 300-700 meters depth	Lobsters/crab: Bottom from shoreline down to 100 meters depth Deepwater shrimp: Outer reef slopes between 550-700 meters depth

EFH Consultation

Who should consult with NMFS on EFH?

Federal agencies which fund, permit or undertake activities that may adversely affect EFH are required to consult with NMFS regarding the potential effects of their actions on EFH and to respond to NMFS conservation recommendations.

What is an "adverse effect" to EFH?

An "adverse effect" to EFH is anything that reduces the quantity and/or quality of EFH. It may include a wide variety of impacts such as:

- direct impacts (e.g., contamination or physical disruption);
- indirect impacts (e.g., loss of prey, reduction in species' fecundity); or
- site-specific/habitat wide impacts, including individual, cumulative or synergistic consequences of actions.

What is an EFH Assessment?

An EFH Assessment is a document that evaluates the effects of a proposed action on EFH. It should include:

1) a description of the proposed action;
2) an analysis of individual and cumulative effects of the action on EFH, the managed species, and associated species such as major prey species, including affected life history stages;
3) the action agency's view regarding effects on EFH; and
4) a discussion of proposed mitigation, if applicable.

The EFH assessment can be provided to NMFS within an existing environmental document (e.g. Environmental Assessment or Environmental Impact Statement) or as a standalone document. The level of detail in the EFH Assessment should be commensurate with the level of impact to EFH.

What are EFH Conservation Recommendations?

NMFS provides EFH Conservation Recommendations to a Federal action agency for its action that may adversely affect EFH. These recommendations are intended to help an action agency avoid and minimize impact to EFH and, when there is unavoidable impact, offset this impact.

EFH consultations steps:

1. The action agency provides notification of the action to NMFS.
2. The action agency submits an EFH Assessment to NMFS.
3. NMFS reviews the EFH Assessment.
4. NMFS provides EFH Conservation Recommendations to the action agency.
5. The action agency responds to NMFS.

Checklist

If you answer "yes" to any of these questions, your agency is required to consult with NMFS regarding the potential effects of your actions on EFH.

- ☐ Is your Federal agency **funding** an activity that may adversely affect EFH?
- ☐ Is your Federal agency **permitting** an activity that may adversely affect EFH?
- ☐ Is your Federal agency **undertaking** an activity that may adversely affect EFH?

For more information:

Contact NOAA NMFS Pacific Islands Regional Office EFH Coordinator, Danielle Jayewardene at Danielle.Jayewardene@noaa.gov, or visit our website at: www.fpir.noaa.gov/HCD/hcd_efh.html

NOAA Fisheries | Pacific Islands Regional Office
www.fpir.noaa.gov

Version 1.0

NEIL ABERCROMBIE
GOVERNOR

Dean H. Seki
Comptroller

Maria E. Zielinski
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

SEP 12 2013

(P)1200.3

RECEIVED
SEP 16 2013
PARSONS BRINCKERHOFF
HONOLULU, HAWAII

Mr. Jim Hayes
Parsons Brinckerhoff
American Savings Bank Tower
1001 Bishop Street, Suite 2400
Honolulu, HI 96813

Dear Mr. Hayes:

Subject: Oceanic Institute Feeds Research and Pilot Production Facility
Panaewa Agricultural Park, Hilo, Island of Hawaii, State of Hawaii
Federal Project No. 95-33673-2656
Chapter 343 of the Hawaii Revised Statutes and National Environmental Policy Act, Environmental Scoping

This is in response to your letter, dated August 5, 2013 regarding the subject project. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If there are any questions, please call me at 586-0400, or your staff may call Mr. David DePonte of the Public Works Division at 586-0492.

Sincerely,

DEAN H. SEKI
Comptroller

c: Mr. Jerry Watanabe, DAGS-Hawaii District

NEIL ABERCROMBIE
GOVERNOR

KALBERT K. YOUNG
DIRECTOR

LUIS P. SALAVERIA
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
P.O. BOX 150
HONOLULU, HAWAII 96810-0150

EMPLOYEES' RETIREMENT SYSTEM
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND
OFFICE OF THE PUBLIC DEFENDER
PUBLIC UTILITIES COMMISSION

ADMINISTRATIVE AND RESEARCH OFFICE
BUDGET, PROGRAM PLANNING AND
MANAGEMENT DIVISION
FINANCIAL ADMINISTRATION DIVISION
OFFICE OF FEDERAL AWARDS MANAGEMENT

August 15, 2013

RECEIVED
AUG 22 2013
PARSONS BRINCKERHOFF
HONOLULU, HAWAII

Mr. James T. Hayes, Sr. Supervising Planner
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawaiii 96813

Dear Mr. Hayes:

This is to acknowledge receipt of your letter dated August 5, 2013, soliciting comments on the Oceanic Institute Feeds Research and Pilot Production Facility, Pana'ewa Agricultural Park, Hilo, Island of Hawai'I, State of Hawai'i, Federal Project No. 95-33673-2656, Chapter 343, HRS, and National Environmental Policy Act, Environmental Scoping.

We have no comments at this time.

Sincerely,

KALBERT K. YOUNG
Director of Finance

No. 1 Capitol District Building, 250 S. Hotel Street, Honolulu, Hawaii 96813

OFFICE OF PLANNING
STATE OF HAWAII

NEIL ABERCROMBIE
GOVERNOR

JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http:/planning.hawaii.gov/

Ref. No. P-14077

August 12, 2013

RECEIVED
AUG 14 2013
PARSONS BRINCKERHOFF
HONOLULU, HAWAII

Mr. James T. Hayes
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Hayes:

Subject: Environmental Assessment Scoping for Oceanic Institute Feeds Research and Pilot Production Facility at Panaewa Agricultural Park, Hilo, Hawaii

This responds to your request for comments regarding the construction of a "Feeds Research and Pilot Production Facility" at the Panaewa Agricultural Park in Hilo, Hawaii, by Oceanic Institute with the assistance of federal funds from the U.S. Department of Agriculture (USDA). The information that was provided is insufficient to determine the applicability of Coastal Zone Management (CZM) Act federal consistency review requirements, because the USDA grant program was not identified. The only USDA grant program that is subject to CZM federal consistency review is No. 10.760 "Water and Waste Disposal Systems for Rural Communities." If the source of federal funding for this project is from 10.760, then CZM federal consistency review is required. Any other source of USDA funding does not require CZM federal consistency review.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Jesse K. Souki
Director

c: Planning Department, County of Hawaii

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

13-796A CAB

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SEP 24 2013
PARSONS BRINCKERHOFF
HONOLULU, HAWAII

September 19, 2013

Mr. James T. Hayes
Sr. Supervising Planner
Parsons Brinckerhoff
American Savings Bank Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Hayes:

SUBJECT: **Comments on Proposed Oceanic Institute Feeds Research and Pilot Production Facility, Panaewa Agricultural Park, Hilo, Hawaii**

The project should address the potential dust and odor nuisance concerns. The activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust and §11-59-4 on Ambient Air Quality Standards on hydrogen sulfide during construction and daily operations. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential dust and odor nuisance problems.

We encourage the contractor to implement a dust control plan, which does not require approval by the Department of Health, to comply with the fugitive dust regulations. Dust control measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing dust from shoulders and access roads;
e) Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling dust from debris being hauled away from the project site. Also, controlling dust from daily operations of material being processed, stockpiled, and hauled to and from the facility.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

NOLAN S. HIRAI, P.E.
Manager, Clean Air Branch

BC:rg

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

08069PST.13

RECEIVED
AUG 30 2013
PARSONS BRINCKERHOFF
HONOLULU, HAWAII

August 29, 2013

Mr. James Hayes
Senior Supervising Planner
Parsons Brinckerhoff
American Savings Bank Tower
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

Dear Mr. Hayes:

SUBJECT: Oceanic Institute Feeds Research and Pilot Production Facility
Pana'ewa Agricultural Park Project, Hilo, Island of Hawaii, Hawaii
Federal Project No. 95-33673-2656
Chapter 343 of the Hawaii Revised Statutes (HRS) and National Environmental Policy Act, Environmental Scoping

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated August 5, 2013, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/cwb-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of

the discharge. To request NPDES permit coverage, you must submit the CWB Individual NPDES Form through the e-Permitting Portal and the hard copy certification statement with $1,000 filing fee. Please open the e-Permitting Portal website at: https://eha-cloud.doh.hawaii.gov/epermit/View/home.aspx. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the "CWB Individual NPDES Form." Follow the instructions to complete and submit this form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommend that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

ST:jst

c: DOH-EPO [via email only]

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

13-155
Pana`ewa Ag Park

August 14, 2013

Mr. James T. Hayes
Parsons Brinckerhoff
American Savings Bank Tower
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

Dear Mr. Hayes:

SUBJECT: **Oceanic Institute Feeds Research and Pilot Production Facility**
Pana`ewa Agricultural Park, Hilo, Island of Hawai`i, State of Hawai`i
Federal Project No. 95-33673-2656
Chapter 343 of the Hawaii Revised Statutes (HRS) and National Environmental Policy Act, Environmental Scoping

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter dated August 5, 2013. Thank you for allowing us to review and comment on the subject document. The document was routed to the Department of Health's Clean Water, Sanitation, and Wastewater Branches as well as the District Health Office on the island of Hawaii. They will provide specific comments to you if necessary. EPO recommends that you review the Standard Comments found on our website: http://health.hawaii.gov/epo/home/landuse-planning-review-program/. You are required to adhere to all Standard Comments specifically applicable to this application.

EPO suggests that you examine the many sources available on strategies to support the sustainable design of communities, including the:

- U.S. Environmental Protection Agency's report, "Creating Equitable, Health and Sustainable Communities: Strategies for Advancing Smart Grants, Environmental Justice, and Equitable Development" (Feb. 2013), http://www.epa.gov/smartgrowth/pdf/equitable-dev/equitable-development-report-508-011713b.pdf;
- U.S. Environmental Protection Agency's sustainability programs: www.epa.gov/sustainability;
- U.S. Green Building Council's LEED program: www.new.usgbc.org/leed; and
- World Health Organization, www.who.int/hia.

The DOH encourages everyone to apply these sustainability strategies and principles early in the planning and review of projects. We also request that for future projects you consider conducting a Health Impact Assessment (HIA). More information is available at www.cdc.gov/healthyplaces/hia.htm. We request you share all of this information with others to increase community awareness on sustainable, innovative, inspirational, and healthy community design.

We wish to receive notice of the environmental assessment's availability when it is completed. We request a written response confirming receipt of this letter and any other letters you receive from DOH in regards to this submission. You may mail your response to: 919 Ala Moana Blvd., Ste. 312, Honolulu, Hawaii 96814. However, we would prefer an email submission to epo@doh.hawaii.gov. We anticipate that our letter(s) and your response(s) will be included in the final document. If you have any questions, please contact me at (808) 586-4337.

Mahalo,

Laura Leialoha Phillips McIntyre, AICP
Manager, Environmental Planning Office

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

LUD – 3 2 2 056 056-ID1397
OI Panaewa Ag Park

August 13, 2013

RECEIVED
AUG 19 2013
PARSONS BRINCKERHOFF
HONOLULU, HAWAII

Mr. James Hayes
Senior Supervising Planner
Parsons Brinckerhoff
American Savings Banks Tower
1001 Bishop Street Suite 2400
Honolulu, Hawaii 96813

Dear Mr. Hayes:

Subject: Oceanic Institute Feeds Research and Pilot Production Facility
Pana`ewa Agricultural Park, Hilo, Island of Hawaii, State of Hawaii
Federal Project No. 95-33673-2656, Chapter 343 of the Hawaii Revised Statutes (HRS) and National Environmental Policy Act, Environmental Scoping
(UH Hilo Ag Land 3551 Kanoelehua Ave, Hilo, HI 96720 TMK (3) 2-2-056: 056)

Thank you for allowing us the opportunity to review the above subject project overview which requests comments on the proposed Oceanic Institute Feeds Research and Pilot Production Facility Pana`ewa agricultural Park. We have the following information and comments on the above subject project.

The subject project is located in the critical wastewater disposal area as determined by the Hawaii Wastewater Advisory Committee. No new cesspools are allowed in the subject area. Please note that a cesspool card is on file at the Wastewater Branch for the property dated, March 30, 1989.

We do recommend the project connect to the County sewer system to handle the treatment and disposal of wastewater generated at the site. However, if a County sewer system is not available, we have no objections as long as the domestic wastewater and non-domestic wastewater generated by the project is handled by wastewater systems that comply with HAR, Chapter 11-62. Please be informed that the use of the office trailer as part of the permanent operations for the subject project shall require the design and construction of a wastewater system in accordance with applicable provisions of the Department of Health's Administrative Rules (HAR), Chapter 11-62, "Wastewater Systems."

If large volumes of non-domestic wastewater are expected to be generated as part of the operations of the subject project, the Underground Injection Control Program of the Safe Drinking Water Branch, DOH should be consulted for the disposal of this wastewater utilizing injection wells.

We are unable to offer additional comments at this time because both the domestic and non-domestic wastewater treatment and disposal have not been addressed in the document. Information

about the project will be required to be submitted to our office before we will be able to determine what type of wastewater treatment system will be allowed if a sewer connection to a private or County sewer system is not available for the project.

We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please contact Mr. Mark Tomomitsu, Supervisor of the Planning & Design Section of the Wastewater Branch at phone (808) 586-4294 or fax (808) 586-4300.

Sincerely,

SINA PRUDER, P.E., CHIEF
Wastewater Branch

LM/MST:lmj

Attachments: Existing Cesspool Information Form

c: Ms. Laura McIntyre, DOH-Environmental Planning Office
Ms. Amy Cook, DOH-WWB's Hilo Staff

STATE OF HAWAII
DEPARTMENT OF HEALTH

SANITATION BRANCH
ENVIRONMENTAL PROTECTION AND HEALTH
SERVICES DIVISION

CESSPOOL SURVEY

Property Owner University of Hawaii Address Panaewa Ag. Station (Aquaculture Bldg)

Tax Map Key 2-2-56-56 Lot No. 3551 Kanoelehua Ave Hilo

Island Hi City Hilo District HC3 96720

Builder or Contractor R. Otani Intended For Restrooms

Primary ✓ Secondary Other

Distance From Building 10' Boundary >9' Stream, Well, Body of Water, Etc. ∅

Diameter (Clear) Ft. 6' Depth-Ft. 10' Capacity (Gal.) ~ 2115

No. Ft. Down to Water Table ∅ Ground Slope slight

Soil Profile (Starting from Surface) 12 1/2' rock + loose rock

Type of Wall or Curb Mortar rock + Natural Reinforced Concrete Cover ground cover on visual

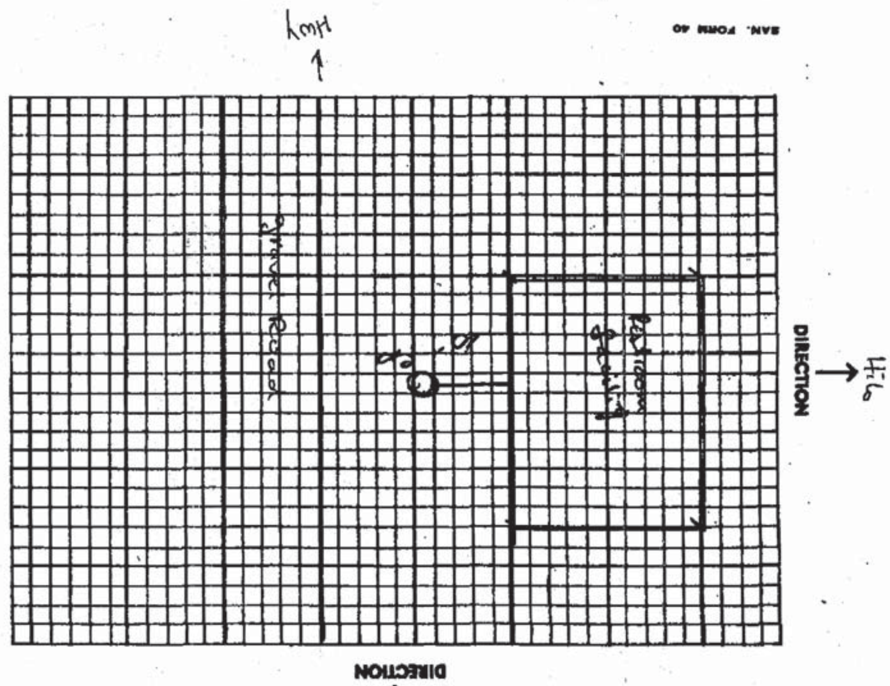
Distance from Finished Ground to Top of Cover (Ft.) —

Date Certificate Issued

Date Approved 3/30/89 19 [signature]

Sanitarian

SAN. FORM 40



REMARKS

Restroom for Aquaculture farm.

NEIL ABERCROMBIE
GOVERNOR OF HAWAI'I

GENEVIEVE SALMONSON
INTERIM DIRECTOR

STATE OF HAWAI'I
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET, SUITE 702
HONOLULU, HAWAI'I 96813

In reply, please refer to:
File:

August 9, 2013

James Hayes, Sr. Supervising Planner
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813

Subject: Oceanic Institute Feeds Research and Pilot Production Facility
Pana`ewa Agriculture Park, Hilo, Island of Hawai`i, State of Hawai`i
Federal Project No. 95-33673-2656
Chapter 343 of the Hawai`i Revised Statutes (HRS) and
National Environmental Policy Act, Environmental Scoping

Dear Mr. Hayes,

We are in receipt of your pre-consultation request. At this time, we have one comment that you address the traffic impact that this project may create.

We will reserve further comments for the draft environmental assessment. If you have any question, please feel free to contact the office at 586-4185.

Sincerely,

Genevieve Salmonson
Interim Director
Office of Environmental Quality Control
235 S. Beretania St., Suite 702
Honolulu, HI 96813

NEIL ABERCROMBIE
GOVERNOR

DWIGHT TAKAMINE
DIRECTOR

AUDREY HIDANO
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
HAWAII OCCUPATIONAL SAFETY AND HEALTH DIVISION
830 PUNCHBOWL STREET, ROOM 423
HONOLULU, HAWAII 96813
http://labor.hawaii.gov/hiosh
Phone: (808) 586-9116 / Fax (808) 586-9104
Email: dlir.hiosh@hawaii.gov

September 23, 2013

Mr. James T. Hayes
Senior Supervising Planner
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Hayes:

Thank you for offering us the opportunity to comment on the proposed construction of a Feeds Research and Pilot Production Facility at the Pana`ewa Agricultural Park in Hilo, Hawaii.

On August 13, 2013, in a phone conversation with one of our staff, Ms. Ceronda Enocencio, you stated that you wanted to know if the Hawaii Occupational Safety and Health Division required any permits, reviews, or had any concerns regarding the referenced project.

Since the material you provided to us was general, consisting of a typed 15 line summary and a dimensionless 8 1/2" x 11" street map of the surrounding area, all we can say is that the following Occupational Safety and Health and Boiler and Elevator standards may be applicable during the construction phase of the project:

- Title 12, Subtitle 8, Part 3, Construction Standards
- Title 29, Part 1926 of the Code of Federal Regulations
- Title 12, Subtitle 8, Part 10, Boiler & Pressure Vessel
- Title 12, Subtitle 8, Part 11, Elevators & Related Systems

You can find these standards on our website at http://labor.hawaii.gov/hiosh/standards/.

Please feel free to contact me by telephone at 586-9116, if you have any questions.

Sincerely,

DIANTHA M. GOO
Administrator

HIOSH

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

August 15, 2013

James T. Hayes, Sr. Supervising Planner
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813

Subject: Oceanic Institute Feeds Research and Pilot Production Facility
Pana'ewa Agricultural Park, Hilo, Island of Hawai'i, State of Hawai'i
Federal Project No. 95-33673-2656
Chapter 343 of the Hawaii Revised Statutes (HRS) and National Environmental Policy Act, Environmental Scoping

Dear Mr. Hayes:

We would have no comments at this time. Based on the information provided, it does not appear to impact the Division of Forestry and Wildlife lands or resources.

Please feel free to contact Lisa Hadway, Hawaii Branch Manager, at (808) 974-4221, if you have any more questions.

Sincerely,

fo Roger H. Imoto, Administrator
Division of Forestry and Wildlife

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
JADE T. BUTAY
FORD N. FUCHIGAMI
RANDY GRUNE
JADINE URASAKI

IN REPLY REFER TO:

STP 8.1286

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

August 22, 2013

Mr. James T. Hayes
Senior Supervising Planner
Parsons Brinckerhoff
American Savings Bank Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Hayes:

Subject: Feeds Research and Pilot Production Facility
Chapter 343 of the Hawaii Revised Statutes and
National Environmental Policy Act, Environmental Scoping
TMK: (3) 2-2-056:056 (por)

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project. DOT understands the Oceanic Institute is proposing the construction of a Feeds Research and Pilot Production Facility at the Panaewa Agricultural Park. Access to the project will be from Pauopalae Street.

Given the project's location and nature, DOT does not anticipate any significant adverse impacts to the State transportation facilities.

DOT appreciates the opportunity to provide comments. If there are any other questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7977.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Director of Transportation

projectsolve²

OI Feeds Research Pilot Production Facility at the UH Hilo Ag Farm in Panaewa

an email sent by Rachel Adams on 4 Sep 13 at 12:42pm

From: Adams, Rachel
To: "feedmill@projectsolvemail.com" <feedmill@projectsolvemail.com>

From:#Euxfh#P dwkhz v#^p dlow=ep dwkhz vC kdz dll1hgx`#
Sent:#Wxhvgd|/#Vhswhp ehu#36/#5346#7=75#SP
To:#Kd|hv/#Mdp hv#+Krqroxx,
Cc:#Kduu|#\dgd>#Ulfkdug#Vkruw>#P duvkd#Rvklur
Subject:#RL#Ihhgv#Uhvhdufk#Slorw#Surgxfwlrq#Idflolw|#dw#wkh#XK#Klor#Dj#Idup#lq#Sdqdhz d

Aloha Mr. Hayes,

Thank you for your letter of inquiry dated 5 August. This is to inform you that the College of Agriculture, Forestry, and Natural Resource Management at UH Hilo has no concerns with the construction of the OI Feeds Research and Pilot Production Facility at the UH Hilo Agricultural Farm in Panaewa. With respect to access to the facility we suggest that an electronic gate be installed in consultation with the farm manager and Mr. Harry Yada, UH Hilo Real Property Director.

Regards,

Bruce W. Mathews
Interim Dean, CAFNRM
Univ. of Hawaii at Hilo
200 W. Kawili Street
Hilo, HI 96720-4091

(808) 974-7393 (office)
(808) 974-7674 (fax)
(808) 217-7393 (cell)

Comments

William P. Kenoi
Mayor

BJ Leithead Todd
Director

County of Hawaiʻi
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street • Hilo, Hawai`i 96720
(808) 961-8083 · Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_envmng.htm

August 12, 2013

Mr. James T. Hayes
Senior Supervising Planner
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813

RE: Oceanic Institute Feeds Research and Pilot Production Facility
Panaʻewa Agricultural Park, Hilo, Island of Hawai`i, State of Hawai`i
Federal Project No. 95-33673-2656
Chapter 343 of the Hawai`i Revised Statutes (HRS) and National Environmental Policy Act, Environmental Scoping

Dear Mr. Hayes

We have no comments to offer on the subject project.

Thank you for allowing us to review and comment.

Sincerely,

BJ Leithead Todd
DIRECTOR

William P. Kenoi
Mayor

Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Room 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

August 19, 2013

Mr. James T. Hayes
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawai'i 96813

SUBJECT: OCEANIC INSTITUTE FEEDS RESEARCH AND PILOT PRODUCTION FACILITY
PANA'EWA AGRICULTURAL PARK, HILO, ISLAND OF HAWAI'I, STATE OF HAWAI'I

In regards to the above-mentioned Environmental Assessment, the following shall be in accordance:

NFPA 1, UNIFORM FIRE CODE, 2006 EDITION
Note: NFPA 1, Hawai'i State Fire Code with County amendments. County amendments are identified with a preceding "C~" of the reference code.

Chapter 18 Fire Department Access and Water Supply

18.1 General. Fire department access and water supplies shall comply with this chapter.

For occupancies of an especially hazardous nature, or where special hazards exist in addition to the normal hazard of the occupancy, or where access for fire apparatus is unduly difficult, or areas where there is an inadequate fire flow, or inadequate fire hydrant spacing, and the AHJ may require additional safeguards including, but not limited to, additional fire appliance units, more than one type of appliance, or special systems suitable for the protection of the hazard involved.

18.1.1 Plans.

18.1.1.1 Fire Apparatus Access. Plans for fire apparatus access roads shall be submitted to the fire department for review and approval prior to construction.

18.1.1.2 Fire Hydrant Systems. Plans and specifications for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

C~ 18.1.1.2.1 Fire Hydrant use and Restrictions. No unauthorized person shall use or operate any Fire hydrant unless such person first secures permission or a permit from the owner or representative of the department, or company that owns or governs that water supply or system. Exception: Fire Department personnel conducting firefighting operations, hydrant testing, and/or maintenance, and the flushing and acceptance of hydrants witnessed by Fire Prevention Bureau personnel.

18.2 Fire Department Access.

18.2.1 Fire department access and fire department access roads shall be provided and maintained in accordance with Section 18.2.

18.2.2* Access to Structures or Areas.

18.2.2.1 Access Box(es). The AHJ shall have the authority to require an access box(es) to be installed in an accessible location where access to or within a structure or area is difficult because of security.

18.2.2.2 Access to Gated Subdivisions or Developments. The AHJ shall have the authority to require fire department access be provided to gated subdivisions or developments through the use of an approved device or system.

18.2.2.3 Access Maintenance. The owner or occupant of a structure or area, with required fire department access as specified in 18.2.2.1 or 18.2.2.2, shall notify the AHJ when the access is modified in a manner that could prevent fire department access.

18.2.3 Fire Department Access Roads. (*may be referred as FDAR)

18.2.3.1 Required Access.

18.2.3.1.1 Approved fire department access roads shall be provided for every facility, building, or portion of a building hereafter constructed or relocated.

18.2.3.1.2 Fire Department access roads shall consist of roadways, fire lanes, parking lots lanes, or a combination thereof.

18.2.3.1.3* When not more than two one- and two-family dwellings or private garages, carports, sheds, agricultural buildings, and detached buildings or structures 400ft^2 (37 m^2) or less are present, the requirements of 18.2.3.1 through 18.2.3.2.1 shall be permitted to be modified by the AHJ.

18.2.3.1.4 When fire department access roads cannot be installed due to location on property, topography, waterways, nonnegotiable grades, or other similar conditions, the AHJ shall be authorized to require additional fire protection features.

18.2.3.2 Access to Building.

18.2.3.2.1 A fire department access road shall extend to within in 50 ft (15 m) of at least one exterior door that can be opened from the outside that provides access to the interior of the building. Exception: 1 and 2 single-family dwellings.

18.2.3.2.1.1 When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.1 shall be permitted to be increased to 300 feet.

18.2.3.2.2 Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 ft (46 m) from fire department access roads as measured by an approved route around the exterior of the building or facility.

18.2.3.2.2.1 When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.2 shall be permitted to be increased to 450 ft (137 m).

18.2.3.3 Multiple Access Roads. More than one fire department access road shall be provided when it is determined by the AHJ that access by a single road could be impaired by vehicle congestion, condition of terrain, climatic conditions, or other factors that could limit access.

18.2.3.4 Specifications.

18.2.3.4.1 Dimensions.

C~ 18.2.3.4.1.1 FDAR shall have an unobstructed width of not less than 20ft with an approved turn around area if the FDAR exceeds 150 feet. **Exception:** FDAR for one and two family dwellings shall have an unobstructed width of not less than 15 feet, with an area of not less than 20 feet wide within 150 feet of the structure being protected. An approved turn around area shall be provided if the FDAR exceeds 250 feet.

C~ 18.2.3.4.1.2 FDAR shall have an unobstructed vertical clearance of not less then 13ft 6 in.

C~ 18.2.3.4.1.2.1 Vertical clearances may be increased or reduced by the AHJ, provided such increase or reduction does not impair access by the fire apparatus, and approved signs are installed and maintained indicating such approved changes.

18.2.3.4.1.2.2 Vertical clearances shall be increased when vertical clearances or widths are not adequate to accommodate fire apparatus.

C~ 18.2.3.4.2 Surface. Fire department access roads and bridges shall be designed and maintained to support the imposed loads (25 Tons) of the fire apparatus. Such FDAR and shall be comprised of an all-weather driving surface.

18.2.3.4.3 Turning Radius.

C~ 18.2.3.4.3.1 Fire department access roads shall have a minimum inside turning radius of 30 feet, and a minimum outside turning radius of 60 feet.

18.2.3.4.3.2 Turns in fire department access road shall maintain the minimum road width.

18.2.3.4.4 Dead Ends. Dead-end fire department access roads in excess of 150 ft (46 m) in length shall be provided with approved provisions for the fire apparatus to turn around.

18.2.3.4.5 Bridges.

18.2.3.4.5.1 When a bridge is required to be used as part of a fire department access road, it shall be constructed and maintained in accordance with county requirements.

18.2.3.4.5.2 The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus.

18.2.3.4.5.3 Vehicle load limits shall be posted at both entrances to bridges where required by the AHJ.

18.2.3.4.6 Grade.

C~ 18.2.3.4.6.1 The maximum gradient of a Fire department access road shall not exceed 12 percent for unpaved surfaces and 15 percent for paved surfaces. In areas of the FDAR where a Fire apparatus would connect to a Fire hydrant or Fire Department Connection, the maximum gradient of such area(s) shall not exceed 10 percent.

18.2.3.4.6.2* The angle of approach and departure for any means of fire department access road shall not exceed 1 ft drop in 20 ft (0.3 m drop in 6 m) or the design limitations of the fire apparatus of the fire department, and shall be subject to approval by the AHJ.

18.2.3.4.6.3 Fire department access roads connecting to roadways shall be provided with curb cuts extending at least 2 ft (0.61 m) beyond each edge of the fire lane.

18.2.3.4.7 Traffic Calming Devices. The design and use of traffic calming devices shall be approved the AHJ.

18.2.3.5 Marking of Fire Apparatus Access Road.

18.2.3.5.1 Where required by the AHJ, approved signs or other approved notices shall be provided and maintained to identify fire department access roads or to prohibit the obstruction thereof of both.

18.2.3.5.2 A marked fire apparatus access road shall also be known as a fire lane.

18.2.4* Obstruction and Control of Fire Department Access Road.

18.2.4.1 General.

18.2.4.1.1 The required width of a fire department access road shall not be obstructed in any manner, including by the parking of vehicles.

18.2.4.1.2 Minimum required widths and clearances established under 18.2.3.4 shall be maintained at all times.

18.2.4.1.3* Facilities and structures shall be maintained in a manner that does not impair or impede accessibility for fire department operations.

18.2.4.1.4 Entrances to fire departments access roads that have been closed with gates and barriers in accordance with 18.2.4.2.1 shall not be obstructed by parked vehicles.

18.2.4.2 Closure of Accessways.

18.2.4.2.1 The AHJ shall be authorized to require the installation and maintenance of gates or other approved barricades across roads, trails, or other accessways not including public streets, alleys, or highways.

18.2.4.2.2 Where required, gates and barricades shall be secured in an approved manner.

18.2.4.2.3 Roads, trails, and other accessways that have been closed and obstructed in the manner prescribed by 18.2.4.2.1 shall not be trespassed upon or used unless authorized by the owner and the AHJ.

18.2.4.2.4 Public officers acting within their scope of duty shall be permitted to access restricted property identified in 18.2.4.2.1.

18.2.4.2.5 Locks, gates, doors, barricades, chains, enclosures, signs, tags, or seals that have been installed by the fire department or by its order or under its control shall not be removed, unlocked, destroyed, tampered with, or otherwise vandalized in any manner.

18.3 Water Supplies and Fire Hydrants

18.3.1* A water supply approved by the county, capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45 720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ. For on-site fire hydrant requirements see section 18.3.3.
EXCEPTIONS:

1. When facilities or buildings, or portions thereof, are completely protected with an approved automatic fire sprinkler system the provisions of section 18.3.1 may be modified by the AHJ.
2. When water supply requirements cannot be installed due to topography or other conditions, the AHJ may require additional fire protection as specified in section 18.3.2 as amended in the code.
3. When there are not more than two dwellings, or two private garage, carports, sheds and agricultural. Occupancies, the requirements of section 18.3.1 may be modified by AHJ.

18.3.2* Where no adequate or reliable water distribution system exists, approved reservoirs, pressure tanks, elevated tanks, fire department tanker shuttles, or other approved systems capable of providing the required fire flow shall be permitted.

18.3.3* The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be provided on a fire apparatus access road on the site of the premises or both, in accordance with the appropriate county water requirements.

18.3.4 Fire Hydrants and connections to other approved water supplies shall be accessible to the fire department.

18.3.5 Private water supply systems shall be tested and maintained in accordance with NFPA 25 or county requirements as determined by the AHJ.

18.3.6 Where required by the AHJ, fire hydrants subject to vehicular damage shall be protected unless located within a public right of way.

18.3.7 The AHJ shall be notified whenever any fire hydrant is placed out of service or returned to service. Owners of private property required to have hydrants shall maintain hydrant records of approval, testing, and maintenance, in accordance with the respective county water requirements. Records shall be made available for review by the AHJ upon request.

C~ 18.3.8 Minimum water supply for buildings that do not meet the minimum County water standards:

Buildings up to 2000 square feet, shall have a minimum of 3,000 gallons of water available for Firefighting.

Buildings 2001- 3000 square feet, shall have a minimum of 6,000 gallons of water available for Firefighting.

Buildings, 3001- 6000 square feet, shall have a minimum of 12,000 gallons of water available for Firefighting.

Buildings, greater than 6000 square feet, shall meet the minimum County water and fire flow requirements.

Multiple story buildings shall multiply the square feet by the amount of stories when determining the minimum water supply.

Commercial buildings requiring a minimum fire flow of 2000gpm per the Department of Water standards shall double the minimum water supply reserved for firefighting.

Fire Department Connections (FDC) to alternative water supplies shall comply with 18.3.8 (1)-(6) of *this code.*

NOTE: In that water catchment systems are being used as a means of water supply for firefighting, such systems shall meet the following requirements:

(1) In that a single water tank is used for both domestic and firefighting water, the water for domestic use shall not be capable of being drawn from the water reserved for firefighting;

(2) Minimum pipe diameter sizes from the water supply to the Fire Department Connection (FDC) shall be as follows:
   (a) 4" for C900 PVC pipe;
   (b) 4" for C906 PE pipe;
   (c) 3" for ductile Iron;
   (d) 3' for galvanized steel.

(3) The Fire Department Connection (FDC) shall:
   (a) be made of galvanized steel;
   (b) have a gated valve with 2-1/2 inch, National Standard Thread male fitting and cap;
   (c) be located between 8 ft and 16 ft from the Fire department access. The location shall be approved by the AHJ;
   (d) not be located less than 24 inches, and no higher than 36 inches from finish grade, as measured from the center of the FDC orifice;
   (e) be secure and capable of withstanding drafting operations. Engineered stamped plans may be required;
   (f) not be located more than 150 feet of the most remote part, but not less than 20 feet, of the structure being protected;
   (g) also comply with section 13.1.3 and 18.2.3.4.6.1 of *this code;*

(4) Commercial buildings requiring a fire flow of 2000gpm shall be provided with a second FDC. Each FDC shall be independent of each other, with each FDC being capable of flowing 500gpm by engineered design standards. The second FDC shall be located in an area approved by the AHJ with the idea of multiple Fire apparatus' conducting drafting operations at once, in mind.

(5) Inspection and maintenance shall be in accordance to NFPA 25.

(6) The owner or lessee of the property shall be responsible for maintaining the water level, quality, and appurtenances of the system.

EXCEPTIONS TO SECTION 18.3.8:

(1) Agricultural buildings, storage sheds, and shade houses with no combustible or equipment storage.

(2) Buildings less than 800 square feet in size that meets the minimum Fire Department Access Road requirements.

(3) For one and two family dwellings, agricultural buildings, storage sheds, and detached garages 800 to 2000 square feet in size, and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 1000 feet.

(4) For one and two family dwellings, agricultural buildings, and storage sheds

greater than 2000square feet, but less than 3000 square feet and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 500 feet.

(5) For buildings with an approved automatic sprinkler system, the minimum water supply required may be modified.

If there are any questions regarding these requirements, please contact the Fire Prevention Bureau at (808) 932-2912.

DARREN J. ROSARIO
Fire Chief

GA/lc

William P. Kenoi
Mayor

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

County of Hawai'i
PLANNING DEPARTMENT

Duane Kanuha
Director

Bobby Command
Deputy Director

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

September 3, 2013

Mr. James T. Hayes,
Senior Supervising Planner
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813

Dear Mr. Hayes:

Subject: **Environmental Assessment Scoping**
Oceanic Institute Feeds Research and Pilot Production Facility
at Pana'ewa Agricultural Park
Tax Map Key: (3) 2-2-056:056, South Hilo, Hawai'i

Oceanic Institute is proposing the construction of a Feeds Research and Pilot Production Facility at the Pana'ewa Agricultural Park. The proposed facility would support the testing and evaluation of feed production in Hawai'i's aquatic and terrestrial agriculture industries on a commercial-scale.

In response to your request for comments, we have the following to offer on the proposed project:

1. Tax Map Key: The tax map key number for the 110.20 acre parcel is (3) 2-2-056:056.

2. State Land Use designation: Agricultural

3. General Plan Land Use Pattern Allocation Guide Map designation: Important Agricultural Land

4. County Zoning: Agricultural - 3 acres (A-3a)

   According to Hawai'i County Code Section 25-5-72(a)(17), permitted uses include *"Public uses and structures which are necessary for agricultural practices"*. Section 25-4-11(c) states that "*Public uses, structures and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use*".

5. The parcel is not located within the County's Special Management Area.

We appreciate the opportunity to provide comments for the environmental assessment. If you have questions, please feel free to contact Esther Imamura of our office at (808) 961-8139.

Sincerely,

for DUANE KANUHA
Planning Director

ETI:cs
P:\wpwin60\ETI\EAdraftPre-consul

William P. Kenoi
Mayor

Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawai`i
POLICE DEPARTMENT
349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

August 14, 2013

Mr. James T. Hayes
Sr. Supervising Planner
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, Hawai'i 96813
(808) 531-7904

Dear Mr. Hayes:

SUBJECT: OCEANIC INSTITUTE FEEDS RESEARCH AND PILOT PRODUCTION FACILITY; PANA'EWA AGRICULTURAL PARK, HILO, HAWAI'I
FEDERAL PROJECT NO. 95-33673-2656
CHAPTER 343 OF THE HAWAII REVISED STATUTES (HRS) AND NATIONAL ENVIRONMENTAL POLICY ACT, ENVIRONMENTAL SCOPING

Staff, upon reviewing the provided documents, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

If there are any questions, please contact Captain Richard Sherlock, Commander of the South Hilo District, at (808) 961-2214.

Sincerely,

HENRY J. TAVARES, JR.
ASSISTANT POLICE CHIEF
AREA I OPERATIONS BUREAU

RS:lli
130543

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

September 5, 2013

Mr. James T. Hayes
Senior Supervising Planner
Parsons Brinkerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813

PRE-ENVIRONMENTAL ASSESSMENT CONSULTATION
OCEANIC INSTITUTE FEEDS RESEARCH AND PILOT PRODUCTION FACILITY
TAX MAP KEY 2-2-056:056

We have reviewed your letter regarding the proposed facility and have the following comments.

Water is available from an existing 8-inch waterline within Pau O Palae Street fronting the subject parcel. There is an existing 2-inch meter serving the subject parcel.

The Department will request estimated maximum daily water usage calculations, prepared by a professional engineer licensed in the State of Hawai'i, for review and approval. After review of the calculations, the Department will determine if the existing meter serving the parcel is adequate to support the additional water demand or if a larger or additional meter will be required. Should the water demand for the proposed improvements exceed the original water allocation for the parcel; additional facilities charges may also be required.

Any meter(s) serving the subject parcel shall have a reduced pressure type backflow prevention assembly installed within five (5) feet of the meter on private property before water service can be activated.

Please be informed that the facility would require that there be 2,000 gallons per minute available at the site for fire protection. The existing 8-inch waterline within Pau O Palae Street is inadequate to provide the required fire flow per the Department's Water System Standards for school use applications. The Fire Department should be contacted to determine any other fire protection requirements or alternatives.

Should there be any questions, you may contact Mr. Lawrence Beck of our Water Resources and Planning Branch at 961-8070, extension 260.

Sincerely yours,

Quirino Antonio, Jr., P.E.
Manager-Chief Engineer

LB:dfg

. . .Water, Our Most Precious Resource . . . Ka Wai A Kāne . . .

projectsolve²

federal project No. 95-33673-2656

an email sent by Rachel Adams on 8 Aug 13 at 2:14pm

From: Adams, Rachel
To: "feedmill@projectsolvemail.com" <feedmill@projectsolvemail.com>

-----Original Message-----
From: Stephanie Whalen [mailto:swhalen@harc-hspa.com]
Sent: Thursday, August 08, 2013 1:50 PM
To: Hayes, James (Honolulu)
Cc: cpinick@harc-hspa.com
Subject: federal project No. 95-33673-2656

Dear Mr. Hayes,
I understand there are many reasons for locating a new facility in a specific spot; however I would like to point out that the USDA-ARS-Pacific Basin for Agricultural Research Center is located at 64 Nowelo St in Hilo 96720 approximately 5 miles from the proposed location at Pana'ewa Agricultural Park. Here research is being done in feedstock:
Objective:
The goal of this agreement is to carry out a collaborative research effort among PBARC, The College of Agriculture, Forestry and Natural Resource Management (CAFNRM) at the University of Hawaii at Hilo (UHH), and the College of Tropical Agriculture and Human Resources (CTAHR) at the University of Hawaii at Manoa (UHM) that addresses important agriculture problems in Hawaii. The specific problem to address is determined through consultation and agreement among the agriculture college deans of CAFNRM and CTAHR and the director of PBARC. The main objective of this SCA is to evaluate the usefulness of regionally grown feedstock for aquaculture and livestock.

It would seem reasonable to put the pilot production facility on the same site where the research is being done.

Last time I was on that site there seem to be plenty of room for a production facility next to PBARC. Hawaii is a small place with limited research capacity which could be improved by having like activities in close proximity to improve communication among all those involved in the development of a new endeavor.

The infrastructure resources should be able to be reduced somewhat by the fact that the PBARC site has these resources already at its site. There could be consolidation of administration space and restroom sharing.

In this day and age especially for agricultural, efficiency and consolidation where possible should be given considerable priority considering the difficulty in obtaining funding not only for capital but for annual operating concerns.

I appreciate this opportunity to provide comments.

Aloha

Comments

Hawaii Farmers Union
United to Grow Family Agriculture

KFUU
Hawaii Farmers Union United
Kauai - Oahu - Molokai - Maui - Hawaii
KONA CHAPTER

September 8, 2013

Hawaii Farmers Union United
Kona Chapter
78-6980 Kaluna St, #102
Kailua-Kona HI, 96740-2822
(808) 238-5285

BY MAIL & E-MAIL
Parsons Brinckerhoff
ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813

ATTN: James T. Hayes, Sr. Supervising Planner

RE: Environmental Scoping Oceanic Institute Feeds Project (Fed. Proj. No. 95-33673-2656)

Aloha Mr. Hayes:

The Kona Chapter of the Hawaii Farmers Union United appreciates this opportunity to participate in the environmental scoping of the Oceanic Institute Feeds Research and Pilot Production Facility. Your August 5 letter, which we received on or about August 9, does not describe the project in any great detail. We are left to speculate on what might be its actual environmental consequences; therefore our scoping comments cast a rather broad net. These are the issues that come to mind:

(1) Effect of Traffic: The Environmental Assessment should take into account the number of employees and the types, numbers and frequency of vehicles that might be accessing the site to deliver raw materials and carry away finished products and solid waste or for other purposes and the effect this traffic might have on adjoining roads, private property, communities and public facilities.

(2) Noise: What noise will the heavy equipment used to manufacture the feed generate and what effect will that have on surrounding property, communities, public and private facilities?

(3) Water & Waste Water: What volume of water and wastewater will be consumed and produced in the manufacturing process? What are the water sources and volumes required for the project? How and where will wastewater be disposed of and what effects will that have on existing wastewater treatment facilities and surrounding property?

(4) Raw Materials: What raw materials will be required to produce the feed? Will they be locally acquired or imported? Will any of the raw materials be derived from GMO crops? If so will there be increased use of herbicides to produce those crops and what effects will that have on surrounding property, communities and public and private facilities? If any raw materials are to be derived from GMO crops, what steps will be taken to insure that the chemicals and pollen associated with GMO crops are properly regulated so that they do not contaminate organic farms, increase the levels of toxic chemicals in the environment or lead to production of "super weeds."

(5) Finished Feed Products: What will be done with the finished feed products? Will they also be tested as a part of this project and if so on what and where? If finished products are to be tested on terrestrial or aquatic animals will there be base line and scientifically controlled and conducted tests of the effect of the feed on those animals including their suitability for human consumption? If the finished products are to be fed to animals without such testing, what is the justification for that and the environmental risks and how will they be assessed?

(6) Solid Waste. What solid waste will be produced in the manufacturing process such as organic matter left over from the raw products used to produce the feed? How will it be disposed of and where and what effect will that have on the environment? Will any such solid waste be recycled and if so how and for what purposes? What effect will any recycled solid waste have on the environment?

(7) Feed Lots and Aquatic Farms. Will the finished feed products be consumed in enclosed terrestrial or aquatic facilities? Will the volume of animal waste from these facilities be increased? What effects will that have on the environment?

Again, thank you for the opportunity to participate in the scoping process and we look forward to the conclusions of the environmental assessment and participating in any further environmental impact statements the project may require.

Very Truly Yours,
HAWAII FARMERS UNION UNITED-
KONA CHAPTER

David S. Case

David S. Case, President

e-cc: Kona Chapter Board
Vincent Mina, HFUU President

Section 106 of the National Historic Preservation Act and Chapter 6e of the Hawai'i Revised Statutes Coordination

USDA United States Department of Agriculture National Institute of Food and Agriculture

July 11, 2013

Mr. William J. Aila Jr.
State Historic Preservation Officer and Chairperson
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Suite 555
Kapolei, Hawai'i 96707

Subject: National Historic Preservation Act (NHPA), Section 106 Consultation
Oceanic Institute Feeds Research and Pilot Production Facility
Pana'ewa Agricultural Park, Hilo, Hawai'i
Federal Project No. 95-33673-2656
Tax Map Key: 3-2-002-056:056

Dear Mr. Aila:

The United States Department of Agriculture (USDA) intends to provide funds for the construction of Oceanic Institute's (OI) Feeds Research and Pilot Production Facility (Facility) at the Pana'ewa Agricultural Park in Hilo, Hawai'i. The Pana'ewa Agricultural Park is administered by the State of Hawai'i Department of Agriculture. As the first of its kind within the U.S. Pacific Region, the proposed Facility would support the testing and evaluation of feed production for Hawai'i's aquatic and terrestrial agriculture industries on a commercial-scale. The USDA would like to inform the State Historic Preservation Division (SHPD) that it is working cooperatively with the OI to advance the subject Project.

Pursuant to Section 106 of the NHPA and 36 CFR Section 800.2(a), the USDA authorizes the OI and its consultant Parsons Brinckerhoff (PB) to conduct NHPA Section 106 consultations with the SHPD, Native Hawaiian organizations (NHOs), and other consulting parties. However, the USDA remains responsible for all findings and determinations charged to the agency during the Section 106 process.

The proposed Project is located in the Hilo District on the Island of Hawai'i (Figure 1). The planned Project and Facility includes the following:

- A Research and Pilot Production building in which process-testing would occur. The steel-framed structure would consist of a feeds processing area; electric utility room, feeds/ingredient storage rooms, and support areas. Building design and size would be based on accommodating the heavy equipment and processes. Machinery such as a pellet mill, hammermill, extruder, mixer, compressor, steam generator, industrial coolers, and fat coater would be housed within this enclosed building.
- A separate office trailer for office space and restrooms.

- Temporary containers for process ingredient storage.
- Exterior utilities such as a short access road from the Highway/Agricultural farm gate to the Facility, parking with off-loading and truck turn-arounds, fresh water supply lines, electric and telephone lines, sanitary waste treatment and disposal system, wastewater (non-sanitary) disposal system, security fencing, and perimeter lighting would also be installed.

The proposed project is located within the Pana'ewa Agricultural Park on a 1-acre lot that has been highly disturbed by agricultural activity. Previous environmental studies[1] indicate no known historical or archaeological sites exist within the project area.

An Environmental Assessment discussing the Project and disclosing potential associated impacts will be prepared for compliance with both HRS Chapter 343 and the National Environmental Policy Act (NEPA).

In agreement with the OI and PB, all official letters to the consulting parties shall be transmitted under PB letterhead. Determination letters will be transmitted under USDA letterhead. The PB project manager for the subject project is Dexter Eji and can be contacted by phone at 566-2241, or by e-mail at eji@pbworld.com. Please contact him for additional information.

Should you have any questions, please do not hesitate to contact us at (202) 401-6802 or 202-401-4320. Thank you for your assistance.

Sincerely yours,

Adriene Woodin
Branch Chief AMD

Gary Jensen
National Program Leader IFPS

Enclosure: Project Location

cc: Jim Hayes (PB)
Randy Honke (OI)

[1] Pana'ewa Agricultural Park Revised EIS, Hawai'i Department of Land and Natural Resources (March 1980), Pana'ewa Agricultural Product Center Final EA, Hawai'i Department of Agriculture (May 1990); Renovations at Pana'ewa Research Farm TMK:62-2-056:056 Final EA/FONSI, U.H. Hilo (August 2002)

PARSONS
BRINCKERHOFF

ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813
Main: +1-808-531-7094
Fax: +1-808-528-2368

www.pbworld.com

July 18, 2013

Mr. William J. Aila Jr.
State Historic Preservation Officer and Chairperson
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Suite 555
Kapolei, Hawai'i 96707

Attention: Ms. Pua Alaokalani Aiu, Ph.D.
State Historic Preservation Division Administrator

Subject: **National Historic Preservation Act (NHPA), Section 106 Consultation**
Hawai'i Revised Statues, Chapter 6E
Oceanic Institute Feeds Research and Pilot Production Facility
Pana'ewa Agricultural Park
Ahupua'a of Waiākea, District (Moku) of Hilo, Island (Mokupuni) of Hawai'i, State of Hawai'i
Federal Project No. 95-33673-2656
Tax Map Key: 3-2-002-056:056

Dear Mr. Aila:

The Oceanic Institute (OI) is proposing the construction of a Feeds Research and Pilot Production Facility (Facility) at the Pana'ewa Agricultural Park in Hilo, Hawai'i. OI has employed Parsons Brinckerhoff (PB) to assist in planning the proposed facility. As the first of its kind within the U.S. Pacific Region, the proposed facility would support the testing and evaluation of feed production for Hawai'i's aquatic and terrestrial agriculture industries on a commercial-scale. The Pana'ewa Agricultural Park is administered by the Hawai'i Department of Agriculture, and federal funds from the United States Department of Food and Agriculture (USDA) would be involved in bringing the facility to fruition. Due to federal participation, the proposed project constitutes an undertaking under Section 106 of the NHPA as amended, and the Advisory Council on Historic Preservation's Regulations (Title 36 of the Code of Federal Regulations (CFR) Part 800), as revised. This letter is to initiate Section 106 consultation with the State Historic Preservation Division (SHPD) in accordance with 36 CFR Section 800.3.

An Environmental Assessment discussing the proposed project and disclosing potential associated impacts will be prepared for compliance with both HRS Chapter 343 and the National Environmental Policy Act (NEPA).

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Overview of the Undertaking

The proposed project is located in Hilo District on the Island of Hawai'i (see enclosed map). The proposed project or facility includes the following:

- A Research and Pilot Production building in which process-testing would occur. The steel-framed structure would consist of a feeds processing area; electric utility room, feeds/ingredient storage rooms, and support areas. Building design and size would be based on accommodating the heavy equipment and processes. Machinery such as a pellet mill, hammermill, extruder, mixer, compressor, steam generator, industrial coolers, and fat coater would be housed within this enclosed building.
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Proposed Area of Potential Effect

The proposed project is located on a 1-acre lot within the University of Hawai'i, Hilo's Farm Laboratory portion of the Pana'ewa Agricultural Park. The undertaking's proposed area of potential effect (APE), as shown in the enclosed map, consists of the 1-acre lot for the project site, as well as the adjacent road's right-of-way for utility connections and the short access road proposed from either the Highway or Agricultural farm gate to the facility.

Historical, Cultural, and Archaeological Background

Environmental studies (see references below) provide detailed information in regard to the historical, cultural, and archaeological background for the proposed APE. The proposed facility would be situated in the ahupua'a of Waiākea within a zone that has been categorized as a traditionally "Upland Agricultural Zone", according to Holly McEldowney's 1979 "Archaeological and Historical Literature Search and Research Design" in which McEldowney indentified zones of early-historic land use (McEldowney 1979:64, in Hammatt et al. 2002: 17). Studies indicate that in pre-contact history, there was some permanent habitation in this region, however the majority of the habitation was temporary and scattered, possibly over-flow from intensive coastal occupations. Over time, this forested area was cleared to "open parkland".

The rich resources of Waiākea distinguished it as an important location to Hawai'i's chiefs. Chiefly residences have been documented within the region as early as ca.1550 (Kelly, Nakamura, Barrere, 1981, in Hammatt et al. 2002: 17). After conquering the island,

Kamehameha I retained Waiākea, and later gave the ili kupono of Pi'opi 'o with its associated fishponds, which is located between Hilo Bay and Wailoa River, to Queen Ka'ahumanu, his favorite wife.

Until around 1840, land use remained mainly subsistence within the region. The sandalwood trade, the arrival of whalers, and the establishment of American Board of Commissioners for Foreign Missions station in Hilo during this time, marked a shift towards a market-based economy. However, much of the activity and settlement, including agricultural production, was focused in the coastal zones.

In the late 1840's to mid 1850's, during the "Great Mahele", when land became privatized in Hawai'i, almost the entire Waiākea ahupua'a was retained as Crown Lands. Twenty-six Land Commission Awards (LCAs) were granted, of which twenty-four were in the coastal zone and two were in the upland agricultural zone, all of which were outside the project area. For this reason, very little historical documentation is found regarding land use for the proposed project site. However, interior land use at this time generally progressed towards cattle ranching and timber harvesting for Hilo's development as a "whaling town".

Development of the Waiākea Sugar Mill on leased Crown lands around the 1860s became the dominant land use from the coast to the lower rain forest. Commercial sugar cane activities infused an immigrant labor force and a new railroad transportation system into the landscape. By the 1920's the Waiākea Mill Company had about 7,000 acres in sugarcane production. Areas considered too rocky for sugar production were used for pasture land in support of Hilo's several dairies, while other large remaining tracts of forest were set aside for preservation to serve as a "watershed" for the sugar industry. The site of the proposed project was former Waiākea pasture land. Other agricultural crops from the lands "sweeping up cloudwards" from Hilo included kalo, melons, pineapples, and banana groves (Bird 1964: 38, in Hammatt et al. 2002; 20).

Plantation life dominated the region through the early 1900's. In 1948, the Waiākea Mill Company was liquidated, however, canec production, a cane by-product had taken over and remained in operation until 1966. After statehood (1959), and with the closing of these production centers, tourism became the next economic focus. The Hilo Bay frontage is now home to several hotels, and the large tracts of former Waiākea homestead and sugar cane lots were converted to housing and sub-divisions, adjacent to agricultural uses.

Identified Potential Historic Resources

Previous environmental studies indicate no known historical or archaeological sites within the proposed APE. . The proposed APE has been highly disturbed by agricultural activity. Grading and grubbing in construction of the Pana'ewa Agricultural Park would have removed any existing surface archaeological features from the site.

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Consultation Overview

Native Hawaiian organizations (NHOs) and Native Hawaiian descendants with ancestral lineal or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area are asked to provide a response within 30 days of notification. Section 106 consultation letters have also been sent to the following organizations and individuals:

- Office of Hawaiian Affairs (OHA)
- Association of Hawaiian Civic Clubs
- Association of Hawaiians for Homestead Lands
- Au Puni O Hawai'i
- Council for Native Hawaiian Advancement
- George K. Cypher 'Ohana
- Hawai'i Maoli
- Hawaiian Civic Club of Hilo
- Hui Ho'oniho
- Hui Mālama I Na Kūpuna O Hawai'i Nei
- Hui Kāko'o 'Āina Ho'opulapula
- Kamehameha Schools
- Kanu o ka 'Āina Learning 'Ohana
- Maku'u Farmers Association
- Piihonua Hawaiian Homestead Community Association
- Royal Hawaiian Academy of Traditional Arts
- The I Mua Group
- Historic Hawai'i Foundation

The invitations sent to these groups include an overview of the undertaking, a summary of the proposed area of potential effect, an overview of potential historic resources, and a request for a response if they would like to become consulting parties.

Mitigation Policies

Mitigation measures during the construction of the proposed undertaking would be implemented to avoid and minimize potential impacts to archaeological, cultural, and historic resources. The following mitigation measures will be implemented, at a minimum:

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, Hawai'i Administrative Rules Title 13, Subtitle 13, Chapter 300 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and SHPD and Police Department will be contacted. The appropriate process would then proceed in conformance with Hawai'i Administrative Rules §13-300 Subchapter 4 "Procedures for Proper Treatment of Burial Sites and Human Skeletal Remains."

As Section 106 consultation progresses additional mitigation measures may be identified and added to this list.

Oceanic Institute and the USDA will prevent the disturbance or taking of any historic property or resource to the extent possible by instituting these mitigation measures and enforcing their implementation by contractors.

HRS Chapter 6E Considerations

The first question in the HRS Chapter 6E process is whether an Archaeological Inventory Survey (AIS) is required for the project?

We believe an AIS is not warranted for the proposed project. We reached this conclusion based on the following factors:

- The APE is a highly disturbed area used for grazing and farming for many years or is an existing roadway.
- Previous studies in the Pana'ewa Agricultural Park have not encountered archaeological resources.

Request for Response

We welcome any comments you might have on the proposed undertaking. We are particularly interested in any information you may have on the historic and cultural sites that have been recorded in the area or any other historic or cultural sites about which you may have knowledge. In addition, if you are acquainted with any person or organization that is knowledgeable about the proposed project area, or any descendants with ancestral lineal or cultural ties to or cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information. Please also inform us if you (a) have any disagreement with the proposed APE, or (b) feel an AIS is required for the project.

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We would appreciate a written response within 30 days from date of receipt, to Jim Hayes via email at hayesja@pbworld.com, or by US Postal Service to 1001 Bishop Street, American Savings Bank Tower, Suite 2400, Honolulu, Hawai'i, 96813.

Please feel free to contact me by telephone at (808) 566-2239, if you have any questions. We look forward to working with you on this needed undertaking.

Sincerely yours,

James T. Hayes
Sr. Supervising Planner

Enclosure: Proposed Area of Potential Effect

cc: Gary Jensen, Adriene Woodin (USDA)
Ken Kakesako (Hawai'i Department of Agriculture)
Randy Honke (OI)

REFERENCES:

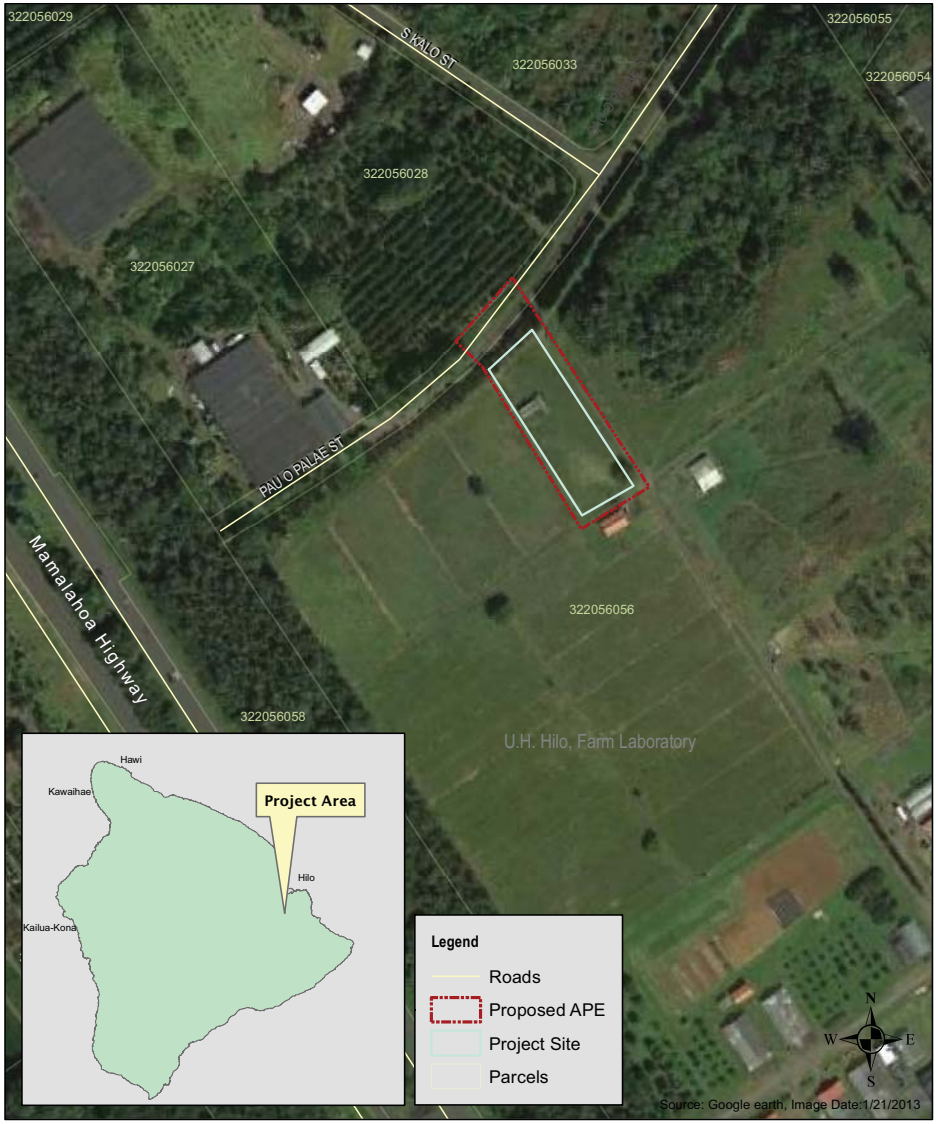
Awa & Associates, LLC. And Gerald Park Urban Planner. *Renovation of Pana'ewa Research Farm Final EA/FONSI*, for the University of Hawai'i, Hilo, August 2002.

Hallett H. Hammatt, Ph.D., Mary Perzinski, and Ka'ohulani McGuire. *A Cultural Impact Assessment for Renovations at University of Hawai'i at Hilo, Pana'ewa Research Farm, Waiākea Ahupua'a, District of South Hilo, Island of Hawai'i (TMK 2-2-56:Por.56)* 2002.

Hilo Engineering, Inc. *Pana'ewa Agricultural Park Revised EIS, Hawai'i Department of Land and Natural Resources*, for the Hawai'i Department of Land and Natural Resources, March 1980.

Hilo Engineering, Inc. *Pana'ewa Agricultural Product Center Final EA*, for the Hawai'i Department of Agriculture, May 1990.

Oceanic Institute Proposed Feeds Research and Pilot Production Facility
Panaewa Agricultural Park, Hilo, Hawai`i
Proposed Area of Potential Effect



NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

601 Kamokila Boulevard, Suite 555
Kapolei, HI 96806

September 5, 2013

Jim Hayes
Parsons Brinckerhoff
American Savings Tower
101 Bishop Street Suite 2400
Honolulu, HI 96713

LOG NO: 2012.4468
DOC NO: 1308SN19
Archaeology

Dear Mr. Hayes:

SUBJECT: **National Historic Preservation Act Section 106 Consultation –**
Oceanic Institute Feeds Research and Pilot Production Facility, Pana'ewa Agricultural Park
Waiākea Ahupua'a, South Hilo District, Island of Hawai'i
TMK: (3) 2-2-056:056

Thank you for the opportunity to review this undertaking that was received by our office on July 22, 2013. According to your letter, this project will receive federal assistance in the form of federal funds from the US Department of Food and Agriculture. The purpose of this project is to finance the construction of the Oceanic Institute's Feeds Research and Pilot Production Facility at the Pana'ewa Agricultural Park. As a federal undertaking, this project is subject to review under Section 106 of the National Historic Preservation Act.

According to your request and attached documentation, the area of potential effect (APE) for this undertaking is a 1-acre lot within the UH-Hilo's Farm Laboratory portion of the Pana'ewa Agricultural Park, an adjacent right-of-way for utility connections and a short access road. SHPD concurs with your APE designation. No archaeological inventory survey has been conducted for TMK (3) 2-2-056:056 and no known historic properties have been identified. Our records indicate that this parcel has undergone several reviews that have resulted in no historic properties affected, based on the parcel's history of industrial and agricultural uses. We have received no new information since our prior reviews, and concur with the determination that no historic properties will be affected by this project. We believe that an archaeological inventory survey is not necessary prior to additional ground disturbance or construction on this parcel.

Please contact Sean Nāleimaile at (808) 933-7651 or Sean.P.Naleimaile@Hawaii.gov to make an appointment for an inspection or if you have any questions or concerns regarding this letter.

Aloha,

Theresa K. Donham
Archaeology Branch Chief

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ASB Tower, Suite 2400
1001 Bishop Street
Honolulu, HI 96813
Main: +1-808-531-7094
Fax: +1-808-528-2368

www.pbworld.com

July 18, 2013

See Recipient List

Subject: **National Historic Preservation Act (NHPA), Section 106 Consultation**
Oceanic Institute Feeds Research and Pilot Production Facility
Pana'ewa Agricultural Park
Ahupua'a of Waiākea, District (Moku) of Hilo, Island (Mokupuni) of Hawai'i, State of Hawai'i
Tax Map Key: 3-2-002-056:056

Dear Ms. Mallow:

The Oceanic Institute (OI) is proposing the construction of a Feeds Research and Pilot Production Facility (Facility) at the Pana'ewa Agricultural Park in Hilo, Hawai'i. As the first of its kind within the U.S. Pacific Region, the proposed facility would support the testing and evaluation of feed production for Hawai'i's aquatic and terrestrial agriculture industries on a commercial-scale. The Pana'ewa Agricultural Park is administered by the Hawai'i Department of Agriculture, and federal funds from the United States Department of Food and Agriculture (USDA) would be involved in bringing the facility to fruition. Due to federal funding participation, the proposed project constitutes an undertaking under Section 106 of the NHPA as amended, and the Advisory Council on Historic Preservation's Regulations (Title 36 of the *Code of Federal Regulations* (CFR) Part 800), as revised. The USDA has authorized OI and its consultant, Parsons Brinckerhoff (PB) to act on behalf of the USDA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

An Environmental Assessment discussing the proposed project and disclosing potential associated impacts will be prepared for compliance with both HRS Chapter 343 and the National Environmental Policy Act (NEPA).

Overview of the Undertaking

The proposed project is located in Hilo District on the Island of Hawai'i (see enclosed map). The proposed project or facility includes the following:

- A Research and Pilot Production building in which process-testing would occur. The steel-framed structure would consist of a feeds processing area; electric utility room, feeds/ingredient storage rooms, and support areas. Building design and size would be based on accommodating the heavy equipment and processes. Machinery such as a pellet mill, hammermill, extruder, mixer, compressor, steam generator, industrial coolers, and fat coater would be housed within this enclosed building.
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Proposed Area of Potential Effect

The proposed project is located on a 1-acre lot within the University of Hawai'i, Hilo's Farm Laboratory portion of the Pana'ewa Agricultural Park. The undertaking's proposed area of potential effect (APE), as shown in the enclosed map, consists of the 1-acre lot for the project site, as well as the adjacent road's right-of-way for utility connections and the short access road proposed from either the Highway or Agricultural farm gate to the facility.

Historical, Cultural, and Archaeological Background

Environmental studies (see references below) provide detailed information in regard to the historical, cultural, and archaeological background for the proposed APE. The proposed facility would be situated in the ahupua'a of Waiākea within a zone that has been categorized as a traditionally "Upland Agricultural Zone", according to Holly McEldowney's 1979 "Archaeological and Historical Literature Search and Research Design" in which McEldowney indentified zones of early-historic land use (McEldowney 1979:64, in Hammatt et al. 2002: 17). Studies indicate that in pre-contact history, there was some permanent habitation in this region, however the majority of the habitation was temporary and scattered, possibly over-flow from intensive coastal occupations. Over time, this forested area was cleared to "open parkland".

The rich resources of Waiākea distinguished it as an important location to Hawai'i's chiefs. Chiefly residences have been documented within the region as early as ca.1550 (Kelly, Nakamura, Barrere, 1981, in Hammatt et al. 2002: 17). After conquering the island, Kamehameha I retained Waiākea, and later gave the ili kupono of Pi'opi'o with its associated fishponds, which is located between Hilo Bay and Wailoa River, to Queen Ka'ahumanu, his favorite wife.

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In the late 1840's to mid 1850's, during the "Great Mahele", when land became privatized in Hawai'i, almost the entire Waiākea ahupua'a was retained as Crown Lands. Twenty-six Land Commission Awards (LCAs) were granted, of which twenty-four were in the coastal zone and two were in the upland agricultural zone, all of which were outside the project area. For this reason, very little historical documentation is found regarding land use for the proposed project site. However, interior land use at this time generally progressed towards cattle ranching and timber harvesting for Hilo's development as a "whaling town".

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Plantation life dominated the region through the early 1900's. In 1948, the Waiākea Mill Company was liquidated, however, canec production, a cane by-product had taken over and remained in operation until 1966. After statehood (1959), and with the closing of these production centers, tourism became the next economic focus. The Hilo Bay frontage is now home to several hotels, and the large tracts of former Waiākea homestead and sugar cane lots were converted to housing and sub-divisions, adjacent to agricultural uses.

Identified Potential Historic Resources

Previous environmental studies indicate no known historical or archaeological sites within the proposed APE. . The proposed APE has been highly disturbed by agricultural activity. Grading and grubbing in construction of the Pana'ewa Agricultural Park would have removed any existing surface archaeological features from the site.

Consultation Overview

Native Hawaiian Organizations and Native Hawaiian descendants with ancestral lineal or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the

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proposed project area are asked to provide a response within 30 days of notification. Section 106 consultation letters have been sent to other organizations or individuals that might attach significance to this area and invite them to participate in the process.

Mitigation Policies

Mitigation measures during the construction of the proposed undertaking would be implemented to avoid and minimize potential impacts to archaeological, cultural, and historic resources. The following mitigation measures will be implemented, at a minimum:

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, Hawai'i Administrative Rules Title 13, Subtitle 13, Chapter 300 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and SHPD and Police Department will be contacted. The appropriate process would then proceed in conformance with Hawai'i Administrative Rules §13-300 Subchapter 4 "Procedures for Proper Treatment of Burial Sites and Human Skeletal Remains."

As Section 106 consultation progresses additional mitigation measures may be identified and added to this list.

Oceanic Institute and the USDA will prevent the disturbance or taking of any historic property or resource to the extent possible by instituting these mitigation measures and enforcing their implementation by contractors.

Request for Response

We welcome any comments you might have on the proposed undertaking. We are particularly interested in any information you may have on the historic and cultural sites that have been recorded in the area or any other historic or cultural sites about which you may have knowledge. In addition, if you are acquainted with any person or organization that is knowledgeable about the proposed project area, or any descendants with ancestral lineal or cultural ties to or cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information.

We would appreciate a written response within 30 days from date of receipt, to Jim Hayes via email at hayesja@pbworld.com, or by US Postal Service to 1001 Bishop Street, American Savings Bank Tower, Suite 2400, Honolulu, Hawai'i, 96813.

PARSONS BRINCKERHOFF

Please feel free to contact me by telephone at (808) 566-2239, if you have any questions. We look forward to working with you on this needed undertaking.

Sincerely yours,

James T. Hayes
Sr. Supervising Planner

Enclosure: Proposed Area of Potential Effect

cc: Gary Jensen (USDA)
Adriene Woodin (USDA)
Randy Honke (OI)

REFERENCES:

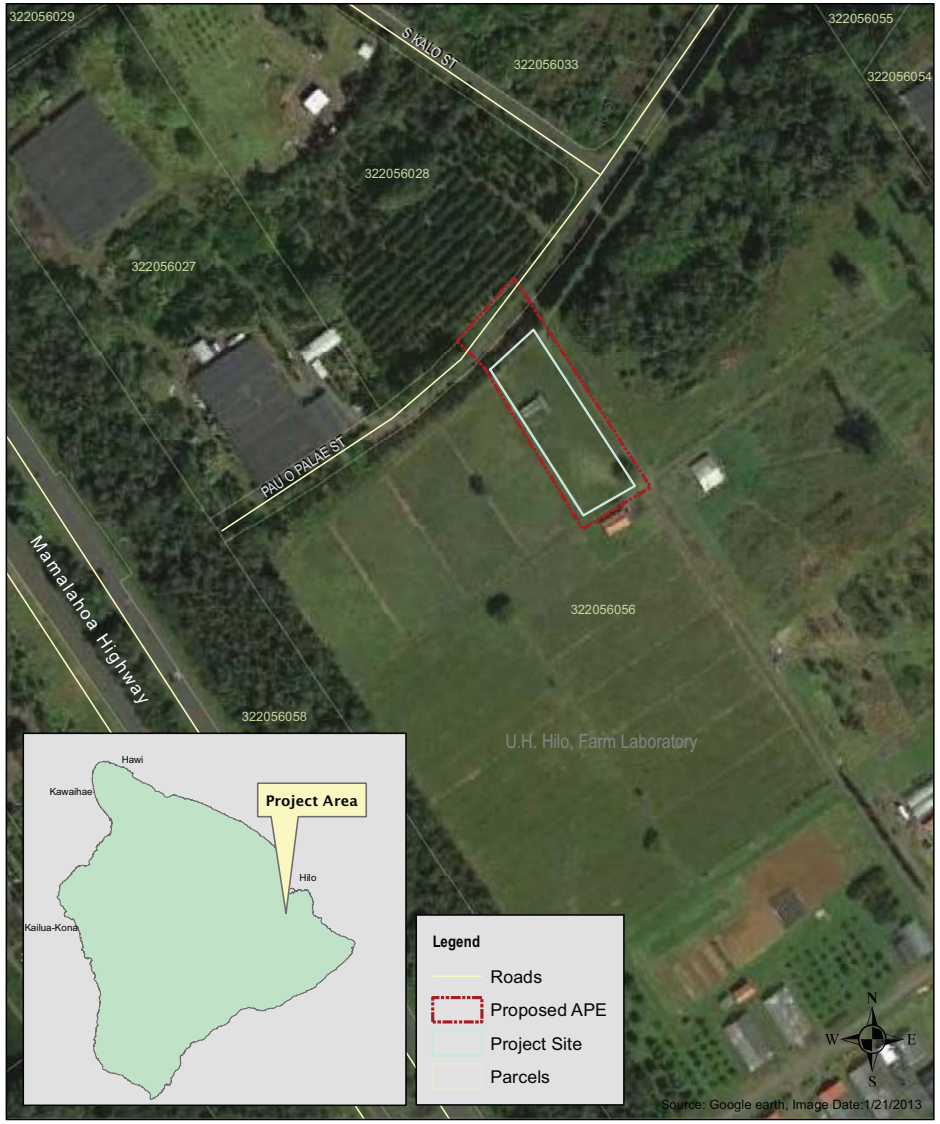
Awa & Associates, LLC. And Gerald Park Urban Planner. *Renovation of Pana'ewa Research Farm Final EA/FONSI*, for the University of Hawai'i, Hilo, August 2002.

Hallett H. Hammatt, Ph.D., Mary Perzinski, and Ka'ohulani McGuire. *A Cultural Impact Assessment for Renovations at University of Hawai'i at Hilo, Pana'ewa Research Farm, Waiākea Ahupua'a, District of South Hilo, Island of Hawai'i (TMK 2-2-56:Por.56)* 2002.

Hilo Engineering, Inc. *Pana'ewa Agricultural Park Revised EIS, Hawai'i Department of Land and Natural Resources*, for the Hawai'i Department of Land and Natural Resources, March 1980.

Hilo Engineering, Inc. *Pana'ewa Agricultural Product Center Final EA*, for the Hawai'i Department of Agriculture, May 1990.

Oceanic Institute Proposed Feeds Research and Pilot Production Facility
Panaewa Agricultural Park, Hilo, Hawai`i
Proposed Area of Potential Effect



Oceanic Institute Proposed Feeds Research and Pilot Production Facility
Section 106 of the National Historic Preservation Act
Coordination Letter List of Recipients

Office of Hawaiian Affairs (OHA)

Association of Hawaiian Civic Clubs

Association of Hawaiians for Homestead Lands

Au Puni O Hawai‘i

Council for Native Hawaiian Advancement

George K. Cypher ‘Ohana

Hawai‘i Maoli

Hawaiian Civic Club of Hilo

Hui Ho‘oniho

Hui Mālama I Na Kūpuna O Hawai‘i Nei

Hui Kāko‘o ‘Āina Ho‘opulapula

Kamehameha Schools

Kanu o ka ‘Āina Learning ‘Ohana

Maku‘u Farmers Association

Piihonua Hawaiian Homestead Community Association

Royal Hawaiian Academy of Traditional Arts

The I Mua Group

Historic Hawai‘i Foundation

From: Pi'ilani Hanohano [pihanoha@ksbe.edu]
Sent: Monday, August 05, 2013 8:50 AM
To: Hayes, James (Honolulu)
Subject: NHPA, SEC. 106 - Oceanic Institute Feeds Research and Pilot Production Facility Pana`ewa Agricultural Park

Aloha,

On behalf of Kamehameha Schools, mahalo nui loa for the invitation to comment on the Oceanic Institute Feeds Research and Pilot Production Facility Pana`ewa Agricultural Park . While we certainly appreciate this opportunity, at this time we will be respectfully declining this invitation due to our lack of expertise as pertains to this particular site. If we can assist in other ways, please do not hesitate to call me at 808-523-6368 or contact me via email at pihanoha@ksbe.edu.

Me ka ha`aha`a,

Pi`ilani Hanohano

Pi`ilani Hanohano
Government Relations Coordinator
Community Relations & Communications Group

TEL: 523-6368
FAX: 523-6365

Section 7 of the Endangered Species Act and Chapter 195D of the Hawai'i Revised Statutes Coordination

USDA United States Department of Agriculture | National Institute of Food and Agriculture

July 11, 2013

Mr. Loyal Mehrhoff
U.S. Fish and Wildlife Office
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawai'i 96850

Subject: Endangered Species Act, Section 7, Informal Consultation
Oceanic Institute Feeds Research and Pilot Production Facility
Pana'ewa Agricultural Park, Hilo, Hawai'i

Dear Mr. Mehrhoff:

The Oceanic Institute (OI) is proposing to construct and operate a Feeds Research and Pilot Production Facility (Facility) at the Pana'ewa Agricultural Park in Hilo, Hawai'i. The Pana'ewa Agricultural Park is administered by the State of Hawai'i Department of Agriculture. As the first of its kind within the U.S. Pacific Region, the proposed facility would support the testing and evaluation of feed production for Hawai'i's aquatic and terrestrial agriculture industries on a commercial-scale. Partial funding for the project will be provided by the U.S. Department of Agriculture (USDA).

Project Overview

The proposed Project is located in the Hilo District on the Island of Hawai'i (Figure 1). The planned Project and Facility includes the following:

- A Research and Pilot Production building in which process-testing would occur. The steel-framed structure would consist of a feeds processing area; electric utility room, feeds/ingredient storage rooms, and support areas. Building design and size would be based on accommodating the heavy equipment and processes. Machinery such as a pellet mill, hammermill, extruder, mixer, compressor, steam generator, industrial coolers, and fat coater would be housed within this enclosed building.
- A separate office trailer for office space and restrooms.
- Temporary containers for process ingredient storage.
- Exterior utilities such as a short access road from the Highway/Agricultural farm gate to the Facility, parking with off-loading and truck turn-arounds, fresh water supply lines, electric and telephone lines, sanitary waste treatment and disposal system, wastewater (non-sanitary) disposal system, security fencing, and perimeter lighting would also be installed.

As shown in Figure 1 and the photograph attached as Figure 2, the Project is located within the Pana'ewa Agricultural Park on a 1-acre lot that has been highly disturbed by agricultural activity. Previous fauna surveys and environmental studies[1] indicate that habitat for rare and endangered species are not known to exist in this area. Exotic species previously frequented the area; however, much of those occurrences have lessened as lots for the agricultural park were cleared.

An Environmental Assessment discussing the proposed project and disclosing potential associated impacts will be prepared for compliance with both HRS Chapter 343 and the National Environmental Policy Act (NEPA).

Species and Habitat Information Request

We are writing to request any pertinent information concerning threatened and endangered species and/or designated critical habitat in the project area. We also request that your office share with us any specific or general concerns you may have regarding the proposed project.

Please feel free to contact us by telephone at (202) 401-6802 or 202-401-4320, if you have any questions. We look forward to working with you on this needed facility.

Sincerely yours,

Adriene Woodin
Branch Chief AMD

Gary Jensen
National Program Leader IFPS

Attachments:
Figure 1 – Project Location Map
Figure 2 – Photograph, Proposed Facility Site

cc: Jim Hayes (PB)
Randy Honke (OI)
Ken Kakesako (Hawai'i Department of Agriculture)

[1] Panaewa Agricultural Park Revised EIS, Hawaii Department of Land and Natural Resources (March 1980), Panaewa Agricultural Product Center Final EA, Hawaii Department of Agriculture (May 1990)

Farmland Protection Policy Act Coordination

projectsolve2

FW: Farmland Protection Policy Act (FPPA) Questions and Oceanic Institute's Proposed Feeds Facility

an email sent by Rachel Adams on 12 Sep 13 at 12:33pm

From: Adams, Rachel
To: "feedmill@projectsolvemail.com" <feedmill@projectsolvemail.com>

From: #Dgdp v/#Udfkho#
Sent: #Iulgd|/#Dxjxvw#63/#5346#45=87#SP
To: #*f|qwkld1vwlhvC kl1xvgd1jry*
Cc: #Kd|hv/#Mdp hv##+Krqroxox,>#Hml/#Gh{whu
Subject: #Idup odqg#Surwhfwlrq#Srdf|#Dfw#+ISSD,#Txhvwlrqv#dqg#R fhdqlf#Lqvwlwxwh*v#Sursrvhg#Ihhgv# Idflolw|

Hi Cynthia,

I found your contact information on NRCS' contact list for local FPPA coordination, and was hoping you could assist us in clarifying whether a Farmland Conversion Impact Rating would be required for the subject project.

We are working on a project proposed by the Oceanic Institute that would construct a facility to test-pilot production of feeds for aquaculture and livestock. The proposed project involves a federal grant from the USDA. The site is about an acre, and located within UH Hilo's Farm Laboratory at the Panaewa Agricultural Park in Hilo. I have attached a map for your information. The feeds facility is being sited in this location in the anticipation that it would be an integral part of the Farm Laboratory that would allow for feeding trials, etc.

According to the USDA soil mapping, the project would *not* be on "prime" or "unique" farmland. However, it falls within the category of "other important agricultural lands" for Agricultural Lands of Importance to the State of Hawaii (ALISH). We were wondering whether feed production or feeds research would be considered a "non-agricultural" or "non-farm" use, triggering the requirement for a farmland conversion impact assessment. Could a feeds research or production facility be considered an "on-farm structure for farm operations"? Your advisement on whether compliance with the FPPA is triggered by the proposed project would be greatly appreciated.

Thanks,

Rachel Adams
Lead Planner
Parsons Brinckerhoff
1001 Bishop St.
American Savings Bank Tower, Suite 2400
Honolulu, HI 96813
808-566-2257 (office)

adamsra@pbworld.com

www.pbworld.com

According to the USDA soil mapping, the project would *not* be on "prime" or "unique" farmland. However, it falls within the category of "other important agricultural lands" for Agricultural Lands of Importance to the State of Hawaii (ALISH). We were wondering whether feed production or feeds research would be considered a "non-agricultural" or "non-farm" use, triggering the requirement for a farmland conversion impact assessment. Could a feeds research or production facility be considered an "on-farm structure for farm operations"? Your advisement on whether compliance with the FPPA is triggered by the proposed project would be greatly appreciated.

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American Savings Bank Tower, Suite 2400
Honolulu, HI 96813
808-566-2257 (office)

adamsra@pbworld.com

www.pbworld.com

Comments

projectsolve²

FW: Farmland Protection Policy Act (FPPA) Questions and Oceanic Institute's Proposed Feeds Facility (2)

an email sent by Rachel Adams on 12 Sep 13 at 12:33pm

From: Adams, Rachel
To: "feedmill@projectsolvemail.com" <feedmill@projectsolvemail.com>

From: #Vwlohv/#F|qwkld#0#QUFV/#Krqroxox/#KL#^p dlowr=f|qwkld1vwlohvC kl1xvgd1jry`#
Sent: #Wxhvgd|/#Vhswhp ehu#36/#5346#43=83#DP
To: #Dgdp v/#Udfkho
Subject: #UH=#Idup odqg#Surwhfwlrq#Srolf|#Dfw#+ISSD,#Txhvwlrqv#dqg#Rfhdqlf#Lqvwlwxwh*v#Sursrvhg# Ihhgv#Idflolw|

Hello Rachel – Since there will be feeding done on the farm as part of its operations and the facility makes the feed for this activity, I believe that the facility would indeed fall into the category of On-Farm Structure for Farm Operations and would not trigger the FPPA documentation. We are much more concerned when land is converted to non-agrarian development than the when land on a farm is developed for better farming operation. If you need a formal letter, I can provide one of these for you, to cover requirements - CAS

Cynthia A. Stiles, PhD.
Assistant State Soil Scientist – Pacific Islands Area
USDA-NRCS, Rm 4-118
300 Ala Moana Blvd
Honolulu, HI 96850
(808)541-2600 ext 129
Cynthia.stiles@hi.usda.gov

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From: #Dgdp v/#Udfkho#^p dlowr=Dgdp vUdC sez ruog1frp `#
Sent: #Iulgd|/#Dxjxvw#63/#5346#45=87#SP
To: #Vwlohv/#F|qwkld#0#QUFV/#Krqroxox/#KL
Cc: #Kd|hv/#Mdp hv#+Krqroxox,>#Hml/#Gh{whu
Subject: #Idup odqg#Surwhfwlrq#Srolf|#Dfw#+ISSD,#Txhvwlrqv#dqg#Rfhdqlf#Lqvwlwxwh*v#Sursrvhg#Ihhgv# Idflolw|

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Thanks,

Rachel Adams
Lead Planner
Parsons Brinckerhoff
1001 Bishop St.
American Savings Bank Tower, Suite 2400
Honolulu, HI 96813
808-566-2257 (office)

adamsra@pbworld.com

www.pbworld.com

Comments

United States Department of Agriculture

Natural Resources Conservation Service
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850
808-541-2600

September 27, 2013

Parsons Brinckerhoff
1001 Bishop Street, Ste. 2400
Honolulu, HI 96813
Attn: Ms. Rachel Adams

Subject: Consultation on FPPA requirements for Oceanic Institute Feed Research Production Facility – Hilo, HI.

Thank you for your query on USDA-NRCS Farmland Conversion Impact Rating requirements for the proposed Oceanic Institute feed research and production facility on UH-Hilo Farm Laboratory land, County of Hawaii. We acknowledge that the land upon which the improvements will be located is designated as "Other Important Agriculture Lands" within the State of Hawaii ALISH statue, as you have described in your communications. Based on documentation of the activities that are planned for the parcel – construction of a facility which supports agricultural activities – and its location within a developed area, we deem that no further actions are necessary (please refer to provided narrative below from the Federal Register with regards to FPPA application).

> **Sec. 3 [7 USC 658] Applicability and exemptions.**
> (a) Section 1540(b) of the Act, 7 U.S.C. 4201(b), states that the purpose of the Act is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. Conversion of farmland to nonagricultural uses does not include the construction of on-farm structures necessary for farm operations.

From our agency perspective, "farmland" does not include land already in or committed to urban development. This means that if the parcel is within a larger area (40 acres) that has a density of 30 structures, it is identified within an "urbanized area" and activities on that parcel are not subject to the Farmland Protection Policy Act.

If you have any questions concerning the soil resources or this letter, please contact Cynthia A. Stiles, Assistant State Soil Scientist, (808) 541-2600 ext. 129, or e-mail Cynthia.stiles@hi.usda.gov.

Sincerely,

Cynthia A. Stiles, Ph.D.

cc: Tony Rolfes, Assistant Director for Soil Science and Natural Resource Assessments, USDA-NRCS, Honolulu, HI

Helping People Help the Land

Appendix B
Oceanic Institute of Hawai'i Pacific University's Feed Mill Business Plan

Oceanic Institute's Feeds Research and Pilot Production Facility

Business Plan 2012

The Oceanic Institute
Makapu`u Point
41-202 Kalaniana'ole Highway
Waimanalo, Hawai`i 96795

May 2012

Table of Contents

1. Project Overview

Hawai`i's agriculture industry plays a critical role in the food security and safety of our state. With over 80% of our agricultural products imported and only an 11-day emergency food supply, our community can ill afford to lose the infrastructure required to support its food needs in times of shortage, crisis, or increased cost, and must focus on increasing the local supply to provide choice, quality, and freshness. However, the very existence of the agriculture industry in Hawai`i is being threatened by rising fuel, feed, and fertilizer prices. Unless innovative solutions are sought and emphasis placed on sustainability, Hawai`i will become totally dependent upon imports of unknown quality and outside market forces in supplying the food needs of its people.

Feed is the single largest cost of any animal agriculture operation and all feed in Hawai`i is imported. High feed costs have directly caused the demise of the local broiler industry, and now threaten the established egg layer, swine, dairy, and beef cattle sectors, as well as the rapidly-growing aquaculture industry in Hawai`i. Rising ingredient prices and demand for scarce supplies have led to the evaluation and development of alternative ingredients worldwide, especially in aquaculture, where fishmeal and fish oil are in increasingly short supply.

This project proposes the construction and operation of a research and demonstration Feeds Research and Pilot Production Facility with commercial-scale processing capabilities to assist research and development of alternative, local feed ingredients for the aquaculture and other animal agriculture industries in Hawai`i. Diversified agriculture is one of Hawai`i's bright spots, providing alternative food choices for our community and potential feed ingredients. A budding biofuels industry also yields promising co-products from algae, kukui nut, coconut, and others that can be developed for feed as well as fertilizer and improve the economic outlook for biofuels production. There are also substantial amounts of slaughterhouse and seafood processing waste currently being discarded in overburdened landfills which could be economically converted into feed ingredients or fertilizer. A critical mass of ingredients and programs now exist that promise hope to all agricultural sectors in Hawai`i and ultimately, the overall food security, safety, and sustainability of our state. No similar facility exists in the U.S. Pacific region which targets the use of tropical ingredients, and no similar facility exists in the U.S. for research on aquaculture ingredient and feeds development. The proposed Feeds Research and Pilot Production Facility will be unique in the nation and launch Hawai`i as a leader and model for our U.S. affiliated and other island communities, and other isolated regions in the country.

The proposed project has already has been sited in Hilo, Hawai`i with land leased for its construction, and all construction funds appropriated and encumbered. This plan describes the facility to be built and its purpose, and outlines the costs of operation and generation of operational funds. A total $4.9 M in construction funds and equipment are in-hand through a combination of federal, state, and other support. Operational funds will come from a combination of targeted public and private research, research feed sales, industry rental time, and private partnerships. Opportunities for education and outreach are also included that would position Hawai`i as a center for feeds processing research and training for the entire Pacific region. Construction of the Feeds Research and Pilot Production Facility has the support of the Hawai`i congressional delegation, the state of Hawai`i DOA and DLNR, UH Hilo, and the Hawai`i animal agriculture and aquaculture industries.

Key project objectives are to:

- Enable Oceanic Institute (OI) to become a leader in aquatic nutrition and feeds production research
- Offer large-scale defined test feeds for genetic and nutritional research programs
- Provide research feed products and technical assistance to support research farm growout trials with shrimp and finfish that simulate commercial production conditions
- Expand product development research, equipment evaluations, and testing
- Demonstrate, promote, and display U.S. feed milling technology, goods, and services to the countries of the Pacific Basin and beyond
- Assist in market development and increasing the demand for American feed commodities, manufacturing equipment, computer software, and other products related to aquatic feeds production
- Offer short courses in nutrition and feed processing systems in cooperation with universities, private research organizations, and commercial companies

Current Status:

The project is currently in the initial design phase. The total project cost is $4.941 million. This includes $1.7 million in a federal construction grant, $1.75 million in equipment purchases, donations, and discounts, and $1.37 million in required match (Table 1). The matching funds for the project will be made up of a $0.804 million Grant-in-Aid from the state of Hawai`i Department of Land and Natural Resources (secured through 2013), a $0.45 million State Department of Agriculture appropriation pending from Hawai`i state SB 2695 SD2 HD1, a $0.110 million pending from redirection of Molokai hatchery matching funds*, and OI matching funds currently estimated at $11,000. At least a portion of the OI matching funds and any deficit in the matching funds pending will be made up through a $0.900 million donation from Palace Entertainment which names the feed mill as one recipient of at least a portion of the funds. Construction of the facility itself is estimated at $3.09 million. OI currently leases a 1-acre parcel from the University of Hawai`i in Hilo within its agricultural farm for a nominal fee of $1.00 per year for 25 years. Most of the equipment is already located on our job site at Panaewa Agricultural Park in Hilo, Hawai`i, and is ready for installation. Architectural, mechanical, structural, and electrical drawings are currently in progress. Both the design of the building and implementation of the permit process need to be completed.

In addition to its research function, the Feeds Research and Pilot Production Facility was designed to generate exposure for U.S. equipment, products, and technology to the Asia Pacific region. U.S. manufacturers have provided extensive discounts on, or donations of, processing equipment. In return, their equipment will be exhibited in the Feeds Research and Pilot Production Facility and used for demonstrations and training seminars with feed producers of the Asia-Pacific region.

The Oceanic Institute has distinguished itself as a center for testing larval, growout, and broodstock feeds for tropical marine species. The Institute has become an international resource center for feed evaluation, processing technology development and testing, and information regarding the use of wheat, soybean, and fishmeal products in aquaculture feeds. In recognition of its ability to help U.S. agriculture, OI has a permanent seat on the Aquaculture

Committee of the American Feed Industry Association. There is no comparable resource in either the U.S. or Pacific Rim countries for marine aquaculture nutrition research or aquaculture feed processing.

The aquaculture industry in Pacific Rim countries is currently growing at an annual rate of approximately 25%. U.S. shrimp imports alone from the Asia-Pacific region exceed $3 billion. U.S. feed producers and equipment manufacturers are very interested in access to this market. In this context, Hawai`i's geographic location in the Pacific provides an ideal communication link between international time zones. Business or research operations in Hawai`i can converse with associates on the mainland U.S. and Asia in the same day.

Table 1. Funding obtained for construction of the Feeds Research and Pilot Production Facility

Construction Costs			Subtotal
	U.S. Department of Agriculture, CSREES (Construction)	$1,719,000	
	State of Hawai`i (1999) (Matching Funds)	$ 804,000	
	State of Hawai`i (2012) (Matching Funds – pending)	$ 450,000	
	Redirected Molokai Matching Funds*(pending)	$ 110,000	
	Oceanic Institute**(Matching Funds)	$ 11,000	
	Oceanic Institute**(Non-Matching Funds)	$ 100,000	
			$3,194,000
Equipment Costs	U.S. Department of Agriculture, ARS (Equipment	$1,027,494	
	Equipment Donations	$ 572,794	
	Equipment discounts received	$ 147,349	
			$1,747,637
Project Grand Total	**TOTAL**	**$4,941,637**	

***These funds will be made up from a donation to the Hilo feed mill and OI by Palace Entertainment of $900,000.

2. Project Description

2.1 Introduction.

The aquatic / terrestrial Feeds Research and Pilot Production Facility will be the only facility in the U.S. Pacific Region capable of supporting feed formulation testing and evaluation on a commercially significant scale. It will be a pilot, research, and demonstration feed processing and production facility which will permit feed production research to be carried out using U.S.

equipment and ingredients. Also important, it will have the capability to produce experimental feeds in quantities sufficient for commercial verification—a capacity not presently available in any other facility. In addition, the facility will serve as an international training facility with students from throughout the world, to allow the showcasing of the latest U.S. equipment and technologies. The Feeds Research and Pilot Production Facility will also allow the design and verification of novel specialty feeds, an area identified by commercial feed companies as being of economic importance in the future. Moreover, as planning has progressed, interest in the proposed project has spread beyond aquaculture itself to potentially encompass related fields such as biomedicine applications.

Strategically, the Feeds Research and Pilot Production Facility will enable the Oceanic Institute to pursue the following ambitious and far reaching goals over the next ten years with regard to development of the Aquatic Feed and Nutrition Program:

- Become a world leader in performing aquaculture feeds production research, product development, equipment evaluation and testing, and training of industry representatives in aquaculture feeds production processes.
- Develop research feeds in cooperation with allied research and development programs at the Institute that effectively and efficiently meet all animal nutritional requirements and research objectives.
- Offer large-scale defined test feeds for genetic and nutritional improvement research programs, pharmaceutical testing for commercial viability and efficacy, equipment testing, and efficiency of different manufacturing processes.
- Provide research feed products and technical assistance to support large-scale research farm growout trials with shrimp and finfish that simulate commercial production conditions.
- Partner with other aquaculture research programs and support their need for research feed products in the Pacific Basin area.
- Demonstrate, promote, and display U.S. feed milling technology, goods, and services—such as those developed by members of the American Feed Industry Association (AFIA)—to the countries of the Pacific Basin.
- Assist in market development and increasing the demand for American feed commodities, manufacturing equipment, computer software, and other products that support aquatic feeds production.
- Initiate an international training program that offers short courses in aquaculture feed processing technology by working in cooperation with universities, private research organizations, and commercial companies. A Memorandum of Understanding is already in place with University of Hawai`i at Hilo (UH-Hilo) for educational activities with terrestrial animals. OI would like to develop a similar partnership with Hawai`i Pacific University (HPU) for aquatic animals.
- Expand the international training program to include short courses in livestock (swine, poultry, dairy, and beef) processing technology, targeting the countries of the Pacific Basin.
- Transfer feed mill processing technologies to the commercial sector once they are proven effective and commercially viable.

2.2 Need for OI's Feeds Research and Pilot Production Facility

2.2.1 Existing Facilities. The Oceanic Institute is located on a narrow coastline approximately 56 acres in area, between the steep cliff of the Koolau mountains and Kalaniana'ole Highway at Makapu`u Point on the Island of O`ahu. Research and training are conducted in several of the 25+ separate buildings, ponds, tanks, and laboratories that constitute the existing campus.

The facilities of the Aquatic Feed and Nutrition Program presently consists of two categories of buildings—feed production laboratories and feeds testing laboratories.

- ***OI Feed Production Laboratories***. Four separate buildings house the production facilities. The first building, occupying 1,030 square feet, consists of two offices, two air-conditioned dry feed ingredient storage rooms, three dry feed processing laboratories with two sinks and a large 3-door freezer, and a small boiler room. Among the equipment contained in this building are:
    - *CPM* C-5 laboratory pellet mill with a triple pass steam conditioner;
    - *Accurate* dry material feeder, model 600;
    - *Parker* 3-hp steam boiler;
    - *Despatch* forced air drying oven with an 18' x 3' chain drive drying belt;
    - *Theco* drying oven model 18;
    - *Davis*, 200-lb horizontal ribbon mixers;
    - *Colton*, 50-lb ribbon mixer;
    - *Hobart* D-300 mixer;
    - Pellet durability tester;
    - *Rotap* sieve shaker;
    - Japanese pellet crumbler;
    - 400 lb/hr meat grinder;
    - *Hobart* 4288 meat grinder;
    - *Yale*, 200 lb floor scale;
    - *NCI*, 40 kg table scale;
    - *Ohaus* GT 4800 micro ingredient scale;
    - *Amprobe* voltage and amp tester;
    - *Udy* mill;
    - *Denver* IR200 moisture tester;
    - *YSI* 2700 for starch cook; and an
    - *Aqua Lab* CX2 for water activity tests.

The second feeds production facility, called the O`ahu Feed Mill, is two separate buildings, one section of which has 1,000 square feet of floor space. The O`ahu Feed mill contains:

- *Wenger* model X-20 cooking extruder;
- *Wenger* model 360 steam dryer;
- *Denver* IR200 moisture tester
- HVH conveyor; and a
- Clever Brooks 100hp, 150 psig steam boiler.

The third production section of the facility, with 420 feet of floor space, contains:

- *Insta-Pro* extruder model 500 with cutter;
- *Insta Pro* model 750 oil press,
- *Jacobson* pulverizer model 16H with product collector; and a
- Fixed blade hammer mill.

The fourth feeds production laboratory has 120 square feet of space and is used to test the physical quality of the finished feeds. Equipment in this laboratory includes:

- *Van Kel* tablet disintegration system;
- *LabLine* oven, model 3511;
- *Theco* oven, model 17;
- *Mettler* AE50 analytical balance; and
- Two small and one large desiccator.

o ***OI Feeds Testing Laboratories***. There are five separate facilities that constitute the feeds testing facilities, as follows:

< ***Indoor Clean Laboratory (ICL).*** OI operates indoor clean laboratories in separate buildings. The ICL contains 75, 52-liter all glass aquaria. All four laboratories are equipped with air and water flow rate controls, sinks, work tables, and a shrimp holding tank. The water system can provide both fresh and filtered saltwater. A timer system controls the lighting to simulate the natural day/night cycle.

< ***Industry Support Module (ISM).*** The area is equipped with 56 - 1500L fiberglass tanks outside the building on a concrete pad, each with an inside diameter of 1.5 meter and a working depth of 70 cm. There are also 52 -115L heavy plastic oval tanks inside the building. Each tank is provided with a regulated source of air and seawater, a stand pipe to simulate round pond shrimp culture conditions, and a set of four airlift tubes to circulate the water

< ***Digestibility & Attractability Laboratory***. This laboratory is equipped with 24– 675 L digestibility tanks, and 36 - 55L Attractant tanks. Each tank is provided with a regulated source of air and seawater, a stand pipe to simulate round pond shrimp culture conditions, and a set of four airlift tubes to circulate the water

< ***Outdoor Microcosm Laboratory (OML).*** The OML area is equipped with 56 - 1500L fiberglass tanks, each with an inside diameter of 1.5 meter and a working depth of 70 cm. Each tank is provided with a regulated source of air and seawater, a stand pipe to simulate round pond shrimp culture conditions, and a set of four airlift tubes to circulate the water.

< ***Analytical Feeds Quality Control Laboratory in the EMSB***. Four separate rooms are combined into a 1,620 square foot analytical feeds quality control laboratory area. Laboratory equipment includes:

- *Beckman* 6300 HPLC amino acid analyzer;
- *Agilent* 1200 Series HPLC amino acid analyzer;
- *Leco* FP-528 elemental nitrogen analyzer;
- *Varian* GC3800 gas chromatograph - fatty acid & pesticide analyzer;
- *Shimadzu* UV-1800 UV spectrophotometer;
- *Foss NIRsystems* near infrared spectrophotometer;
- *Parr* 6200 calorimeter;
- *Dionex* ASE 200 accelerated solvent extractor;
- *Soxtherm* SOX406 fat extraction unit;
- *Brinkman Kjeldahl* digester and distillation apparatus;
- *Labconco* Freezone 6 Bulk Tray freeze dryer;
- *Turner* AU-10 fluorometer;
- *Mettler-Toledo* pH meter;
- *Eppendorf* 5810R refrigerated centrifuge;
- *Sorval Legend Micro* 17 high speed microcentrifuge;
- *Denver Instruments* Model 360 pH Stat titrator;
- *Brinkman* rotary vacuum evaporator;
- *Brinkman* autoclave;
- *Branson* 5510 & 3200 sonicators
- *Savant* Speedvac concentrator with vacuum pump
- *Precision* heated reciprocating shaker bath
- *Lundberg/Blue* heated water bath;
- *Neslab Thermo Flex* 1400 Refrigerated water circulator;
- *Precision & VWR* drying ovens;
- *Fisher Isotemp* vacuum oven
- *Thermo Thermolyne* muffle furnace;
- *Fisher Isotemp* incubator;
- *Revco & Environmental Systems* -80C freezers (2)
- *Sartorius & Mettler Toledo* analytical balances and top loading balance;
- *Barnstead* MP3 water distiller & *Nanopure* water de-ionizer;
- Chemical fume hoods (4)
- Labware / glassware.

< ***Office Space****:* Administrative office space is provided in the Environmental Marine Science Building (EMSB). The EMSB building houses five offices for three research scientists, two research associates, one research assistant, one research technician and an administrative assistant.

2.2.2 Requirement for New Space: The proposed Feeds Research and Pilot Production Facility will expand the Institute's feed processing and manufacturing capabilities to support changing research and industry needs. Construction of the new facility will result in approximately 8,500 square feet of processing area, compared to the 2,570 square feet that is currently available at the Institute's Makapu`u site. Without facility expansion, the Institute will be unable to effectively support the evolving needs of aquatic nutrition and feed development, or the technology development and training needs of the U.S. feeds industry. The new facility is required if OI is to sustain the growth of its ongoing and highly successful program aimed at the following areas:

- Development of R&D feeds and feed products to satisfy animal requirements for the Oceanic Institute's finfish, marine shrimp, and stock enhancement research programs, as well as aquaculture research being conducted at other institutions.
- Demonstration and display of cutting edge aquaculture feed milling technology and equipment to countries of the Pacific Basin.
- Simulation of new processes, technologies, and feed formulations at the pilot level, to demonstrate their commercial viability.
- Expansion of international training programs and short courses related to aquaculture feed processing technologies, as well as livestock and poultry feed processing technologies.
- Transfer of feed technologies to the commercial sector.

Three staff members currently assigned to the Institute's Makapu`u facilities will physically relocate to conduct research at the Hilo site, and operate the new feeds research facility. Projected staffing of the new facility includes a production research scientist, equipment operator/mechanic, and a research feed quality control technician. Other staffing needs will be filled by temporary, part-time student hires from UH-Hilo.

The new facility will significantly enhance the Institute's aquatic feeds production research potential, as shown in the following table.

Table 2. Feed Milling Capabilities of the (current) O`ahu Mill and (future) Hilo Mill

Processing Capability	Current (O`ahu Mill)	Future (Hilo Mill)
Hammer mill	75 kg/hr	3,000 kg/hr @ 420 microns
Mixer	300 kg/hr @ 20 min mixing time	4,000 kg/hr @ 3 min mixing time
Pellet mill	5–10 kg/hr	1,500–4,000 kg/hr
Meat grinder	1-2 kg/hr	
Dry extruder	200 kg/hr	650–1,250 kg/hr
Wet extruder	100-500 kg/hr	100–500 kg/hr
Dryer	1,500-4,000 kg/hr	1,500–4,000 kg/hr
Fat coater	N/A	2,000 kg/hr @ 6 min coating time

2.2.3 Impact if the Project is delayed: Failure to construct and complete the Feeds Research and Pilot Production Facility in a timely manner will result in reduced effectiveness of ongoing aquatic animal research, as well as added costs. The Institute's current feed processing facilities can barely support the test feed demands of the active research in the indoor and outdoor microcosm laboratories, and delays to this project will adversely affect OI's ability to provide control diets for its research programs. In addition, due to insufficient processing capacity, commercial feeds are currently being used to maintain broodstock and to grow out animals used in genetic selection research. Because commercial feeds are subject to constant change with frequent ingredient substitutions, animal performance is often dramatically and unpredictably affected. Maintaining a defined diet is essential for research validity.

Also important, any further delays will threaten both the federal and state funds. Project construction funds were appropriate in 1995, and USDA-NIFA program officers have indicated the need to begin the project or risk losing the funds. On March 2, 2012 the 1995 funds were reprogrammed into a new grant within NIFA that extends the project end date to December 31, 2015. All federal funds must be expended on or before that time. The commitment of state construction funding of $804,000 will lapse by the end of 2013. The project needs to begin immediately to meet projected deadlines (Table 3).

Table 3. Projected Construction Timeline for the Hilo Feed Mill

Negotiate fees for design	May 2012*
USDA approval of design fees	June 2012*
Restart design process	July 2012*
Complete preliminary (60%) design submittal	October 2012*
Preliminary design review complete	October 2012*
Draft Supplemental Environmental Impact Statement	December 2012*
Pre-Final (90%) design submittal	December 2012*
Pre-Final design review complete	January 2013*
Final design complete	March 2013*
Final Supplemental Environmental Impact Statement	April 2013*
Building Permit review complete	September 2013*
Bidding	November 2013*
Request USDA approval of construction contract	December 2013*

Receive USDA approval of construction contract	January 2014*
Start construction	March 2014*
Complete construction	March 2015*

* Dates assume expedited building permit approval.

Among OI's research programs that will be directly and adversely impacted by project delays are:

- Near coast and deep-water cage research feeds for the marine finfish species tuna, moi and kahala;
- Basal and maintenance control diets for marine finfish species;
- U.S. Marine Shrimp Farming Consortium defined basal control feeds for growout trials;
- Defined control basal diets required for marine shrimp genetic improvement program;
- Development of modified diets to express genetic potential of marine shrimp;
- Large-scale field trials with commercial aqua farmers;
- Large-scale ingredient test trials; and
- Process equipment comparison and testing trials.

Economic impacts of project delays could include the following:

- Added research costs (repeating laboratory scale trials to simulate large scale effects);
- Higher shipping and construction costs;
- Rescheduling costs;
- Equipment storage costs;
- Added costs of equipment rehabilitation and maintenance;
- Increased start-up costs due to added equipment deterioration; and
- Loss of funding.

2.2.4 Impact if the Project is Shut Down: Shutting down the project and disposing of all the assets and notifying all participants involved in the project in a timely and orderly manner will result in added administrative costs estimated at approximately $500,000.

2.3 Plan of Work for Construction

2.3.1 Scope of Construction. The intent of this project is to construct an aquatic feeds mill laboratory complete and fully functional to include all required infrastructures such as access roads, parking areas, and site utilities. Major infrastructure requirements include a short access road from the public highway and an acceptable method of disposing of wastewater generated

during processing and equipment cleaning. The project includes the planning, design, procurement, installation, and testing of specialized feed mill equipment, including:

- *Wenger* X-20 cooking extruder and 360 dryer/cooler;
- *Insta-Pro* model 2500 dry extruder;
- *CPM* series 1112-2 pellet mill with double pass conditioners and post pellet cooker;
- *Bliss Hammer mill* with product filter collector;
- *Forberg* high-mixer;
- *Forberg* high speed fat coater;
- *Abel* micro ingredient bins, liquid scale, and dispenser;
- *Rotex* screens and scalpers;
- *Clever-Brooks* 100 hp boiler;
- *Repete* control board;
- *Ingersoll-Rand* air compressor.

2.3.2 Project Site. The project will be constructed at the Panaewa Agricultural Farm of the University of Hawai`i at Hilo. This research farm lies just outside the city of Hilo on the island of Hawai`i. The 100+ acre agricultural farm site is owned by the State of Hawai`i and is used by the University for a variety of agricultural and aquaculture related research as well as to support its educational programs. In 2000, OI entered into a 25-year lease agreement with the University of Hawai`i at Hilo for a 1-acre parcel site for a final lease term of $1/year. A comprehensive environmental impact statement has been prepared and approved for the operations of the University farm. Locating the aquatic feeds research mill on the farm is expected to be in full conformance with the approved and ongoing agricultural and aquatic research activities. A supplemental EIS to incorporate this project will be prepared as necessary. The site has adequate supplies of water and power, is readily accessible from multiple public highways, and is essentially level.

2.3.3 Facility Concept. The Feeds Research and Pilot Production Facility noted above will be sited on a 1-acre parcel of the Panaewa Agricultural Farm. The facility will consist of a single steel-framed structure complete with utilities, parking area, truck off-loading and turn-around, and a short access road from the public highway. The facility will include:

- Feeds processing area
- Electric utility room
- Feeds/ingredient storage rooms

Exterior facilities will include:

- Short access road from the public highway/agricultural farm gate to the facility
- Parking/off-loading/truck turn-around area
- Fresh water supply lines

- Power, telephone lines
- Sanitary waste treatment and disposal system
- Wastewater (non-sanitary) disposal system
- Security fencing

2.3.4 Planning Completed to Date. Planning for the Feeds Research and Pilot Production Facility was initiated in the early 1990s when the Oceanic Institute developed project criteria and an outline concept using planning and design funds that had been appropriated by the State of Hawai`i. OI also secured substantial industry participation in the project, obtaining several hundred thousand dollars of feed mill equipment donations and discounts, which we believe reflects the importance which industry places on this project. Additionally, the Institute sought and secured a second grant-in-aid for $804,000 from the State of Hawai`i for the construction.

The Institute intends to supplement the State of Hawai`i construction funds with funds which have been appropriated to USDA for the Center for Applied Aquaculture (CAA). The programmatic audit of 1995, and the subsequent 1996 review and update to the CAA concept, concluded that the Feeds Research and Pilot Production Facility was within the scope of the CAA project and was indeed an essential part of it. During discussions between OI and the CSREES staff in May 1997, it was concluded, however, that the project should not be funded under the scope of the FY1988 grant. Subsequently, USDA determined that the project should be constructed under a FY1995 grant using FY1995 appropriations supplemented with FY1994 funds as needed.

After a comprehensive update of the entire CAA concept was conducted by the Institute's new leadership and it was concluded that the Feeds Research and Pilot Production Facility was an essential component of the CAA, a review of suitable sites was conducted. Among the potential sites evaluated were:

(1) Alternate locations at Makapu`u;

(2) Waimanalo Research Station, University of Hawai`i;

(3) Waiale'e Agricultural Farm, University of Hawai`i;

(4) Pomoho Agricultural Farm, University of Hawai`i;

(5) Various properties of the Campbell Estate on O`ahu;

(6) Properties of the Damon Estate on O`ahu;

(7) Properties of the Kamehameha Schools/Bishop Estate on O`ahu;

(8) Kawaihae Harbor in Kona, Hawai`i;

(9) University of Hawai`i at Hilo's Panaewa Agricultural Farm;

(10) Department of Land and Natural Resources' Feed Lot area; and

(11) Department of Transportation lands abutting Ke'ehi Lagoon on the island of O`ahu.

These 11 potential sites were narrowed initially to five, then to the University of Hawai`i at Hilo's Panaewa Agricultural Farm after a final weighting of the following factors:

(1) Landowner enthusiasm for the project;

(2) Land (rental) costs;

(3) Availability of infrastructures and ease of development;

(4) Environmental impacts/permitting concerns;

(5) Proximity to port facilities for the import of ingredients;

(6) Likelihood of facilitating joint research opportunities with the University of Hawai`i;

(7) Attractiveness of the location to industry;

(8) Close to end product users and evaluators; and

(9) Ease of management and operational coordination.

The selection of the Panaewa Agricultural Farm will require some modifications to the preliminary design layouts which were completed in 1994 because a split level building had been considered earlier. The preliminary designs have identified the basic components of the project and the final design will be site specific to the Panaewa locale.

2.3.5 Permitting Requirements. Construction permitting is expected to be routine, although coordination with a number of regulatory agencies will be required. Among the permits that are anticipated are a grading and building permit from the County of Hawai`i, conditional use permits depending on a verification of specific land use limitations, air quality permit from the State Department of Health, individual wastewater system, industrial wastewater discharge permit, and various utility connection permits.

As stated previously, a comprehensive environmental impact statement has been prepared and approved for the Agricultural Farm itself. A supplemental Environmental Impact Statement (EIS) is planned to describe the effects of the addition of this project to the overall facility plan.

2.4 Project's Engineering Elements

The project's main work elements/phases are as follows:

1. Preparation of Contract Documents. Final designs will be prepared by a professional architectural and engineering firm under an existing indefinite delivery order contract with the Oceanic Institute. The firm's selection was previously approved by USDA.

2. Preparation of a supplemental environmental impact statement. Concurrent with the preparation of designs, a supplemental EIS that complies with all National Environmental Policy Act and State of Hawai`i requirements will be prepared by contract. The work will be performed through the existing indefinite delivery order contract with a professional architectural and engineering firm.

3. Permitting. Once preliminary designs and environmental data are collected, the designer will be charged with the preparation of applications for all required permits from the various regulatory agencies of the state and county. OI staff will work closely with the design consultant, regulatory agencies, local community interests, and participate as necessary in all public hearings.

4. Construction of the Feeds Research and Pilot Production Facility. The feeds facility will be constructed by a contractor selected through competitive sealed bid procurement.

5. Operational start-up and training of the feeds facility staff. Non-CAA funds will be used for operational start-up and training of qualified managers and technicians to perform routine day-to-day operational and maintenance activities at the hatchery.

2.5 Construction Budget

Table 4. Feeds Research and Pilot Production Facility Construction Budget.

Item Description	Area (SF)	Cost
Mill Area	2316	
Boiler Room	504	
Grinding Room	784	
Open Separation	560	
Area of Building	**4164**	
Building Cost/SF		$180
Building Cost		$749,520
Infrastructure/Site Work/Mechanical/Electrical Cost		$750,000
Total Building Cost		$1,499,520
Contingency (15%)		$224,928
Total		$1,724,448
Additional Equipment Cost		$350,000
Installation Cost		$600,000
Contingency (10%)		$95,000
Total Equipment		$1,045,000
Construction Total		**$2,769,448**
Design/Permitting Cost		$270,000
Services During Construction		$50,000
Supplemental EIS		$100,000
Total A/E Cost		**$420,000**
Total Construction + A/E Costs		**$3,189,448**
Design Cost Spent to Date		$100,000
Estimate OI needs to cover redesign up to 60% submittal (Maximum amount)		$100,000
Total		**$3,089,448**
Budget		**$3,093,871**

Note: This budget does not include $100,000 in additional redesign cost to be paid with OI unrestricted funds.

3. Aquatic Feed and Nutrition Program Description and Impact

3.1 Aquatic Feed and Nutrition Development Program

Feeds research is critical to the U.S. aquaculture industry from an economic and environmental standpoint, especially as it relates to animal and human health concerns. The total world production of aqua feeds is valued at $1.8 billion, and the potential for the U.S. feeds industry is enormous. The Oceanic Institute envisions itself as a future world center for aquatic nutrition and feed development. The Institute conducts feed formulation and ingredient evaluation trials on a variety of aquatic animals as part of its Aquatic Nutrition and Feeds Development program, which focuses on improving ingredient formulations and developing efficient, supporting processing technologies.

For a number of years, OI has advocated the strong interdependency of the feed, animal, and animal culture system. Recent feeds research results clearly demonstrate that feed formulations must be matched to the specific culture environment. Simultaneously, researchers are concluding that conventional culture systems that rely on flow-through water systems in an open pond environment are highly susceptible to devastating disease outbreaks. In response, the Institute has established a new research program to develop second generation feeds by examining the interaction between the diet and a culture environment characterized by a recirculating water system in a closed, biosecure environment.

In the area of feeds processing, OI has pioneered a number of improvements in aquaculture feed and ingredient analyses. Among these are a practical micro-encapsulating method for nutrients which enables the increased use of plant proteins in shrimp diets and a simplified method for fiber analysis in shrimp feeds. The proposed Feeds Research and Pilot Production Facility will enable the Institute to continue to significantly enhance its capabilities in developing innovative and effective aquatic feed processing technologies. An immediate impact will be to raise the level of feed manufacturing expertise provided to the commercial industry as well as to other researchers.

3.2 Unique Features of the Proposed Aquatic Feeds Research and Pilot Production Facility

The Feeds Research and Pilot Production Facility will be unique in that it will be the only facility in the U.S. capable of supporting aquatic feed formulation testing and evaluation on commercially significant scales. When completed, it will be a state-of-the-art feed processing production facility that will permit feed production research to be carried out using U.S.-designed and U.S.-manufactured equipment on a full spectrum of feed ingredients in multiple variations, and provide comprehensive international-level training.

Modeled after the highly successful feed mill for terrestrial animals at Kansas State University (KSU), OI's Feeds Research and Pilot Production Facility is envisioned to provide the facilities for performing processing research and testing; training and education; producing feeds to support OI's research needs; and supporting the aquatic feeds industry as KSU does for the terrestrial feeds industry. As KSU's experience has shown, a research feed mill working jointly with educators and researchers can significantly enhance academic curriculum, provide hands-on training, serve as a vehicle for conducting short, intensive extension courses, and facilitate direct interactions with ingredient suppliers, feed producers, and equipment manufacturers.

The feeds facility will have the capability to produce experimental aquaculture feeds in quantities sufficient for commercial verification—a capacity not presently available from any other laboratory or facility. In addition to feeds processing technology and feeds formulation testing, the facility will serve as a world-class training facility, drawing trainees from throughout the world, but particularly Asia and the Pacific Basin. These educational forums will expose the latest U.S. equipment and technologies to an international audience.

Also important, the feeds laboratory will permit the design and verification of novelty specialty feeds, an area that has been identified as being of great economic importance to future growth by the commercial feeds industry. Interest in the feeds research facility has spread beyond aquaculture itself to include other fields, including land-based agriculture, biomedicine, and aquaculture training and education. As another benefit, researchers and educators at the University of Hawai`i at Hilo's Animal Science Department will gain on-site scientific resources as well as facility infrastructures to teach animal feed production. Local farmers should also benefit, because OI intends to use selected agricultural by-products in feeds formulation and processing.

The number and variety of cooperative research and training initiatives with other private and public institutions, as well as with USDA, are also planned for expansion. For example, currently we are working closely with USDA and the University of Hawai`i in a program to convert spent wastes from the cull fruit into a yeast protein, and fruit from the irradiation program into an economical and beneficial ingredient to be used in pelleted swine and cattle feeds.

Upon completion of the feeds research facility, OI intends to integrate its capabilities with the academic curriculum of Hawai`i Pacific University and the University of Hawai`i's Manoa and Hilo Animal Science Departments, patterning the teaching and training program after that of the highly successful effort at Kansas State University. The feeds research facility could serve as part of an educational partnership among HPU, the University of Hawai`i, Kansas State University, Texas A&M, and the Oceanic Institute. Students and researchers from KSU (especially those interested in terrestrial feeds for poultry, swine, dairy, and beef cattle) would come to the University of Hawai`i at Hilo to participate as exchange students or guest lecturers and use the feeds research facility in the process. Such a program could be readily expanded to include foreign universities and their students.

3.3 Feeds Research and its Role in the Oceanic Institute's Strategic Goals

The Feeds Research and Pilot Production Facility squarely address the need for a production research facility dedicated to aquaculture and terrestrial feeds. The new facility will allow the Oceanic Institute to focus substantial resources directly on the U.S. aquaculture and terrestrial feed industry's critical need for commercial-scale production testing and training. Because the U.S. aquaculture industry is much smaller than the terrestrial animal industry few, if any,

commercial feeds interests are willing to convert their terrestrial-based research facilities to meet the specialized criteria of aquaculture. Commercial feed companies, despite their keen interest in tapping the large global aquaculture market, are generally not willing to stop production just to prepare small experimental scale batches for aquaculture research. Although the U.S. industry clearly has the world's finest feed technologies in terms of terrestrial animal nutrition, aquatic nutrition and feed development have thus far lagged behind.

Technological constraints exacerbate this situation because commercial-scale processing research cannot be performed satisfactorily on laboratory-scale machinery. Although the theory remains the same, technology and process cannot be scaled-up proportionately or accurately.

The Feeds Research and Pilot Production Facility will provide OI with a unique opportunity to support the aquaculture and terrestrial feed industry through a commercial-scale production facility equipped with milling machines specifically designed for aquaculture feeds. Modeled generally after the highly successful terrestrial pilot scale mill laboratory found at Kansas State University, the Feeds Research and Pilot Production Facility laboratory mill will provide capabilities that no other facility in the U.S. offers. As aquatic feed formulations are developed in traditional research laboratories, the Feeds Research and Pilot Production Facility laboratory mill will evaluate the feasibility of the newly-developed formulations at commercial scales using scientifically rigorous testing criteria. Once the formulation has been demonstrated as to its efficacy and commercial production feasibility, the U.S. feeds industry will be able to add the formulation to their product lines. For example, one anticipated area of major research thrust deals with the formulation of aquatic feeds that substitute plant ingredients for the more traditional (and costly) marine proteins. Once formulations, processing technologies, and optimal equipment needs have been developed, U.S. industry will be able to produce more economical, but equivalent feeds using plant-based ingredients in lieu of expensive, imported fish meals.

4. Management Structure

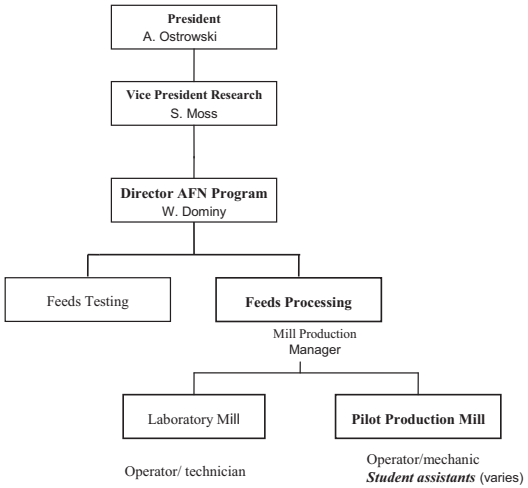
The Oceanic Institute's Feed and Nutrition Development Program will be responsible for managing and operating the facility and for conducting feeds processing research. The program is organized into two separate but inter-related sections: (1) the Feeds Testing Section, and (2) the Feeds Processing Section. The feeds processing section will operate two sets of feed processing equipment—a laboratory mill and the pilot production mill.

The existing laboratory mill will be retained at its present location in Makapu`u, until the Hilo Feeds Research and Pilot Production Facility is operational, and then it will be moved to the Big Island. The mill will produce experimental feeds needed for growth trials to evaluate multiple feed formulations. A relatively small quantity of these specialized aquatic feeds will be produced to support the various experiments conducted within the Indoor Clean Laboratory (ICL), Industry Support Module (ISM) and Outdoor Microcosm Laboratory (OML) at OI's Makapu`u site.

At operational startup, the pilot production mill is expected to operate on a reduced schedule. An operator/mechanic will be assigned full time to the facility to maintain its equipment and to provide research support services. When production-scale processing tests are scheduled, research staff from Makapu`u will travel to Hilo for the duration of the test. As the pilot production mill operations intensify and production runs increase in frequency and number, the number of on-site staff will be correspondingly increased. Once sustained operations are

realized, the pilot production facility is expected to be staffed with three full-time permanent research staff and two or more student assistants from the University of Hawai`i at Hilo.

4.1 Program Organization



4.2 Biographical Information

Four members of the OI staff will play key roles on this project. These are Dr. Anthony Ostrowski, President; Dr. Shawn Moss, Vice President; Dr. Warren G. Dominy, Director of the Aquatic Feeds and Nutrition Department; and Mr. Randy Honke, Project Manager.

4.2.1 Biography of Anthony C. Ostrowski, Ph.D., President. Dr. Ostrowski has over 22 years' experience in research and development at the Oceanic Institute. Between 1990 and 2002 he managed three out of the five major research programs at the Oceanic Institute responsible for multiple USDA and NOAA grants totaling over $14 million. Since 2002, he has been director of a seven-state, multi-institution consortium research program for marine shrimp with an annual budget of $4.0 million. He became Vice President at the Oceanic Institute in 2007 and President in 2009.

Dr. Ostrowski has extensive experience in feeds, hatchery, and growout research for marine food species. He has developed methods for larval rearing, nursery, on and offshore growout,

nutritional requirements, and commercial diet formulations for multiple marine finfish including mahi-mahi (*C. hip Purus*), milkfish (*C. chanos*), crimson snapper *(P. filamentosis*), Pacific threadfin (*P. sexfilis*), greater amberjack (*S. dumerilii*), bluefin trevally (*C. melampygus*), Hawaiian gray snapper (*A. virescens*), and Gulf red snapper (*L. campechanus*), as well as the Pacific white shrimp (*L. vannamei*). He has also conducted hatchery and live feed diet research for the ornamental species, yellow tang, clownfish, and flame angelfish. This work led to the world's first domesticated production of flame angelfish, and breakthroughs in intensive copepod culture.

Dr. Ostrowski' research has led to commercial development of marine aquaculture. His work on the importance of fishmeal quality to diet acceptability in marine species led to the creation of commercial feeds presently used in Hawai`i for the Pacific threadfin and in other areas of the country for other marine species. He was the principal and co-principal investigator on a NOAA/NMFS project titled "Hawai`i Offshore Aquaculture Research Project (HOARP)" to demonstrate the suitability of offshore cage culture in Hawai`i. This project led to the world's first offshore cage farm. He was also project leader on multi-year USDA/CSREES/CTSA grants to develop and transfer growout methods, which established Hawai`i's commercial farming industry for Pacific threadfin.

Dr. Ostrowski has nearly 100 publications and presentations on all aspects of marine aquaculture. He is lead author for "Pacific Threadfin (*Polydactylus sexfilis*) (Moi) Hatchery Manual" which describes hands-on culture techniques for this species. He also authored "Dolphin (mahi-mahi) Culture" in the Encyclopedia of Aquaculture (Wiley Press) published in March 2000. He has one patent pending for novel copepod culture.

Dr. Ostrowski currently serves on the Joint USDA, NOAA, and USFWS National Aquatic Animal Health task force. His is also Board member of the Aquaculture Certification Council, a 501(3) c non-profit organization dedicated to certifying social, environmental and food safety standards at aquaculture facilities throughout the world. He serves on several state and regional proposal review and technical committees. He was Testing Coordinator for the Midwest Feeds Consortium. He has also served on graduate committees as University of Hawai`i adjunct professor.

Dr. Ostrowski received his B.S. degree in Biology at the Pennsylvania State University and his M.S. and Ph.D. degrees in Fisheries and Wildlife at Michigan State University.

4.2.2 Biography of Shaun Moss, Ph.D., Vice President.

Dr. Moss received his doctoral degree in Zoology from the University of Hawai`i in 1993. From 1993-1994, Dr. Moss worked in eastern Indonesia as a Fulbright Scholar documenting the exploitation of living marine resources in the Arafura Sea. He returned to Hawai`i in 1994, where he became an Associate Professor in the Marine Sciences Department at Hawai`i Pacific University. From 1997 - 2009, Dr. Moss served as Director of the Shrimp Department at Oceanic Institute, where he conducted research on a variety of topics related to shrimp aquaculture, including selective breeding and environmentally sustainable growout technologies. Currently, Dr. Moss is Vice President of Research and Development at OI, and he serves as Director of the U.S. Marine Shrimp Farming Program.

<u>A sampling of Dr. Moss' publications:</u>

Doyle, R.W., D.R. Moss, and S.M. Moss. 2006. Shrimp copyright: inbreeding strategies effective against illegal copying of genetically improved shrimp. *Global Aquaculture Advocate*, 9(2):76-79.

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4.2.3 Biography of Warren Dominy, Ph.D., Aquatic Feeds and Nutrition Department Director.

Dr. Dominy received his Bachelor of Arts Degree in Marketing in 1971 and his Master of Science Degree in Animal Sciences (specializing in animal nutrition) in 1983, from the University of Hawai`i. He received his Doctorate in Grain Science (specializing in feed manufacturing technology) from Kansas State University in Manhattan, Kansas, in 1995.

Dr. Dominy has held a variety of responsible positions with the government, private industry, university, and most recently as a research scientist at a non-profit laboratory.

Dr. Dominy started as Research Scientist and Feeds Specialist at OI in 1983. He has been Director of the Aquatic Feeds and Nutrition (AFN) Department since 2006. The AFN Department develops and applies innovative feed and nutrition technologies for the aquaculture and associated industries. It also has a wide spectrum of research and development capabilities such as aquatic nutrition and the development of feeds for aquatic and terrestrial animals with different physical and functional properties. The AFN department also reviews and redesigns commercial aquafeed formulations, processing protocols and quality control methods and aquafeed mill design and operation. The AFN lab provides analytical quality control of feeds and feed ingredients using HPLC and GC techniques.

In his capacity as an aquaculture feed formulation and processing consultant to the American Soybean Association, U.S. Wheat Associates, and to U.S. Agency for International Development (USAID), Dr. Dominy has provided invaluable technical assistance and timely advice to a host of countries including Singapore, Malaysia, Mexico, Philippines, Thailand, Indonesia, Taiwan, People's Republic of China, India, Cambodia, and Egypt. He has also provided similar services to commercial clients in Madagascar and Ecuador.

A sampling of Dr. Dominy' publications:

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4.2.4 Biography of Randy Honke, M.S., P.E., Project Manager.

Mr. Honke received his Bachelor of Science in Mechanical Engineering degree in 1987 from the Massachusetts Institute of Technology, Cambridge, Massachusetts and Master's Degree in Mechanical Engineering with from the University of California, Berkeley, California in 1989. Mr. Honke has been a licensed professional engineer in the State of Hawai`i since 1999. Mr. Honke has also been a licensed professional engineer in the State of California since 1998.

Mr. Honke has extensive design, construction, program, and project management experience. Prior to coming to the Oceanic Institute in 1998, Mr. Honke worked as a Mechanical Engineer at one of Hawai`i's largest consulting engineering firms. Mr. Honke worked primarily on the design of wastewater and water treatment plants. Mr. Honke also has experience in design, operation and maintenance of sugar mills. Mr. Honke was the mill processing engineer at O`ahu Sugar Company. Mr. Honke is a Reserve Squadron Commander and has attained the rank of Major.

Among Mr. Honke's key accomplishments at the Oceanic Institute have been:

1998-2000: Design and Construction Management of the Environmental Marine Science Building, Prototype Aquatic Animal Hatchery, and Industry Support Module, CAA project. This 2.4 million dollar project was funded by USDA and USDOC-Economic Development Administration.

1999-2002: Project Management of the Biosecure Nucleus Breeding Center, CAAMB project. This 2.66 million dollar project was funded by USDA and USDOC-NOAA.

1999-2003: Project Management of the Information, Technology and Training Facility, CAAMB Project. This 1.925 million dollar project was funded by USDOC-EDA.

2001-2003: Project Management of the Saltwater Infrastructure Improvement Booster Pump, CAAMB.

5. Operational Plan

The Oceanic Institute's Aquatic Feed and Nutrition Department will be responsible for managing and operating the Feeds Research and Pilot Production Facility in Hilo. This facility will be organized into two separate feed processing mills, the laboratory scale mill and a pilot scale production mill where small and large scale aquatic and terrestrial animal feeds will be manufactured for government and privately funded nutrition and feeds processing research. A highly skilled feed processing team will be trained to operate both mills to meet the research needs of the academic and the commercial feed, ingredient, and equipment community.

The existing laboratory scale mill and the O`ahu extrusion plant will be retained at its present location at Makapu`u, until the Hilo Feeds Research and Pilot Production Facility is operational, and then both will be moved to the Big island. The laboratory mill will continue to produce small scale experimental aquatic feeds needed for small growth trials to evaluate multiple feed formulations and ingredients. This relatively small laboratory quantity of specialized aquatic

feeds will be produced to support the various government and privately funded grants and contract experiments conducted within the Indoor Clean Laboratory (ICL), Industry Support Module (ISM) and Outdoor Microcosm Laboratory (OML) at OI's Makapu`u site. The O`ahu extrusion plant, like the laboratory mill, will also continue to produce specialized extruded feeds for fish and shrimp as it has provided at the Makapu`u facility.

Promising small laboratory scale feed formulations, novel ingredients and processing techniques that demonstrate superior animal performance can be now scaled up at the Feeds Research and Pilot Production Facility, and a proof of concept can be tested in large commercial scale feeding trials on commercial and/or large scale research farms. The pilot scale production facility in Hilo will also manufacture large scale feeds for terrestrial (beef, dairy, swine, and poultry) as well as aquatic (fish, shrimp) animals, concentrating on testing regional by-products for sustainable aquaculture and agriculture in Hawai`i, as well as in Pacific Basin island communities.

At operational startup, the pilot production mill is expected to operate on a reduced schedule. An operator/mechanic will be assigned full time to the facility to maintain its equipment and to provide research support services. When production-scale processing tests are scheduled, research staff from Makapu`u will travel to Hilo and conduct the manufacturing processing for the duration of the processing trial. As the pilot production mill operations intensify and production runs increase in frequency and number, the number of on-site staff will be correspondingly increased. Once sustained operations are realized, the pilot production facility is expected to be staffed with three full-time permanent staff and two or more student assistants from the University of Hawai`i at Hilo.

Current trends in commercial funded research require that research aquatic feeds be manufactured with equipment and processing parameters that are comparable with the commercial feed manufacturing sector. An academic nutritionist's feed processing equipment at most research institutions usually consists of some kind of forming equipment, such as a meat grinder/mixer. This type of feed manufacturing has been recently discouraged due to the lack of applicability in the real world of animal feed manufacturing. In currently funded research at the AFN department, feed ingredient companies (Monsanto, United Soybean Board, Novus, and Evonik) are requesting and insisting that feeds be processed with commercially applicable equipment with processing conditions comparable with the commercial manufacturing sector.

6. Financial Business Plan

The Feeds Research and Pilot Production Facility will operate and be maintained as a standalone, self-sufficient and economically sustainable research facility. Once the facility has been designed and constructed using federal, state, and private contributions, the operational costs will be supported through reimbursable and contract research, private contributions, and by providing facilities for conducting training and educational courses.

6.1 Direct-Funded Research.

There are no direct funds presently available for future feed research.

6.2 Research Feed Production

Research feeds will be produced to support other ongoing research programs at other commercial institutions, the University of Hawai`i's Manoa and Hilo aquaculture and animal science programs, the Pacific Basin Agricultural Research Center, and with NIFA CTSA programs. These research feeds will be produced on a reimbursable basis. Among the principal users of research feeds are:

(1) University of Hawai`i (Manoa and Hilo) Aquaculture and Animal Sciences Programs

   a. Aquatic feeds for fresh and marine water species (shrimp, fish, mollusks, urchin, etc.)

   b. Terrestrial animal feeds; beef, dairy, swine, poultry, sheep, goats, horses, dogs, cats, birds, zoo feeds, etc.

(2) USDA Pacific Basin Agricultural Research Center (PBARC)

   a. Research feeds for aquaculture (fresh and marine species of fish and shrimp)

   b. Research feeds for terrestrial animals (beef, dairy, swine, poultry, goats, sheep)

(3) USDA National Institute of Food & Agriculture, Center for Tropical & Subtropical Aquaculture (NIFA CTSA)

   a. Research feeds for aquaculture (fresh and marine species of fish and shrimp)

(4) Other research institutions

   a. Texas A&M University

   b. Kansas State University

   c. University of Guam

   d. Hawai`i Institute of Marine Biology

   e. American Samoa Community College

   f. Kagoshima University

Estimated income year 1 to year 5 is $135,000 - $280,000.
These areas are developing quickly where academic researchers and commercial companies are requesting commercial defined ingredients and processing feed technology techniques for use in their research with test animal feeds. The "old" standard lab scale feeds formed with a meat grinder that are commonly used for nutrition research are no longer applicable for the academic and commercial sector.

6.3 Commercial Contracted Feeds Processing Research

The Feeds Research and Pilot Production Facility is also expected to perform proprietary research for commercial corporations through direct contracts or SBIR collaborative government grants in the following areas:

- New feed ingredients from agricultural & biofuel by-products
- New feed product development (abalone, opihi, sea urchin)
- Equipment optimization and efficacy for producing specific feeds
- Processing effects on nutritional value of ingredients
- Pharmaceutical additives for the aquatic feed industry

Note: UH-Hilo has a Pharmacy School and collaboration on aquatic and terrestrial animal feed pharmaceutical additives trials can be developed.

Alternatively, the facility could be leased on a space-available scheduled basis by industry on a short-term basis for conducting proprietary research. Approximately 40 percent of the total available laboratory days are estimated to be used for commercial contracts. Contracts are planned with equipment, ingredient, feed, biofuel and pharmaceutical companies.

(1) Commercial partners participating in OI-sponsored research programs
   a. Diamond Head Seafood Wholesale, Inc. (fish processing by-products)
   b. Kona Blue (Longfin amberjack growout and broodstock feeds development)
   c. Big Island Abalone (abalone growout feeds development)
   d. Pacific Biodiesel, Inc. (new feedstock's from biofuel processing by-products)

(2) Commercial feed and feed ingredient companies
   a. Monsanto / Bunge / Solea / General Atomics
   b. Novus / Degussa-Evonik
   c. Cargill / Land-O-Lakes / Rangen / Zeigler / Burris
   d. U.S. Soybean Board / American Soybean Association
   e. EWOS Innovation
   f. Skretting / Nutreco

Estimated income year 1 to year 5 is $350,000 - $1,000,000.
Current 2012 contract funding levels are at $145,000/year.

6.4 Training and Education

The feeds facility will support several new training initiatives including:

1. Certificate Program with short and intensive extension courses by OI in:
   a. Aquatic nutrition and aquatic feed formulations
   b. Aquatic feed manufacturing and equipment processing parameters
   c. Quality control (nutritional and physical characteristics) on ingredients and finished feeds.
   d. Terrestrial feeds manufacturing (formulations, processing equipment,)

2. Undergraduate-level courses in aquatic nutrition and feeds processing technology conducted as a joint initiative by the Oceanic Institute, HPU, University of Hawai`i Manoa and Hilo, and Kansas State University.

Estimated income year 1 to year 5 is $50,000 - $130,000. Class will be comprised of both private sector trainees and students. Class size of 25 students with hands on field experience will be developed in a 3-day short course.
Training and Education has not been initiated yet.

6.5 Consulting Services

The feeds research facility will allow OI's research staff to expand its nutrition and feeds technology consultant services to include subject matter expertise in formulations, processing technology, plant retrofitting, and planning of new commercial and research plants.

1. Consulting contracts with commercial companies
   a. Biofuel companies in utilization of co-products in aquatic and terrestrial feeds.
   b. In plant design processing and QC training
   c. Co-product utilization in aquatic and terrestrial animal feeds

Estimated income year 1 to year 5 is $20,000 - $60,000. Program is being developed with qualified, experienced personnel.

6.6 Support from the Private Sector.

OI plans to obtain contributions from private foundations, organizations, commercial corporations, and the feed manufacturing industry to offset the costs of novel research projects, laboratory or commercial equipment, and donations or gifts for improved or expanded facilities.

1. Richard Sellers, Vice President and Head of the American Feed Industry Association's (AFIA) Aquaculture Committee, has indicated support by AFIA members that could contribute by paying for time to use the facility for research, demonstrating equipment and aquatic feed processing training.

Estimated income year 1 to year 5 is $140,000 - $320.000.

6.7 Financial Budget

6.7.1 Revenues – spreadsheet
6.7.2 Cost of Operation – spreadsheet
6.7.3 New Funding Scenarios 100%, 50% and 0%
6.7.4 Days of Operation and Estimated Feed Production

6.7.1 Revenues	REVENUES					% INCREASE			
NEW FUNDING:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Government Grants - Aquatic Feeds Development:									
University of Hawaii - Manoa (Usage fee @ $2K/day)	10,000	20,000	24,000	32,000	34,000	100.0%	20.0%	33.3%	6.3%
University of Hawaii - Hilo	10,000	20,000	24,000	32,000	34,000	100.0%	20.0%	33.3%	6.3%
Pacific Basin Agricultural Research Center	10,000	20,000	24,000	32,000	34,000	100.0%	20.0%	33.3%	6.3%
Total Aquatic Feeds Development	30,000	60,000	72,000	96,000	102,000	100.0%	20.0%	33.3%	6.3%
Government Grants - Terrestrial Feeds Development:									
University of Hawaii - Manoa (Usage fee @ $2K/day)	10,000	20,000	24,000	32,000	34,000	100.0%	20.0%	33.3%	6.3%
University of Hawaii - Hilo	10,000	20,000	24,000	32,000	34,000	100.0%	20.0%	33.3%	6.3%
Pacific Basin Agricultural Research Center	10,000	20,000	24,000	32,000	34,000	100.0%	20.0%	33.3%	6.3%
Total Terrestrial Feeds Development	30,000	60,000	72,000	96,000	102,000	100.0%	20.0%	33.3%	6.3%
USDA NIFA CTSA	75,000	75,000	75,000	75,000	75,000	0.0%	0.0%	0.0%	0.0%
Total Government Grants	135,000	195,000	219,000	267,000	279,000	44.4%	12.3%	21.9%	4.5%
Contracts									
SBIR Collaborative Government Contracts	200,000	300,000	350,000	400,000	450,000	0.0%	0.0%	50.0%	35.0%
Collaborative Commercial Contracts (Aqua and Terra)	150,000	250,000	350,000	450,000	550,000	100.0%	50.0%	33.3%	25.0%
Consulting Service (Aqua)	20,000	30,000	40,000	50,000	60,000	100.0%	50.0%	33.3%	25.0%
Training Programs (Aqua and Terra)	50,000	70,000	90,000	110,000	130,000	40.0%	28.6%	22.2%	18.2%
Foundation Support (Aqua and Terra)	140,000	160,000	230,000	250,000	320,000	50.0%	33.3%	25.0%	20.0%
Total Contracts	560,000	810,000	1,060,000	1,260,000	1,510,000	44.6%	30.9%	18.9%	19.8%
Subtotal Grants & Contracts New Funding	695,000	1,005,000	1,279,000	1,527,000	1,789,000	44.6%	27.3%	19.4%	17.2%
TOTAL REVENUES	**695,000**	**1,005,000**	**1,279,000**	**1,527,000**	**1,789,000**	**44.6%**	**27.3%**	**19.4%**	**17.2%**

6.7.2 Cost of Operation	OPERATING EXPENSES ($)						% INCREASE			
	Pre-production Moving & Setup	Year 1	Year 2	Year 3	Year 4	Year 5	Year 2	Year 3	Year 4	Year 5
LABOR:										
Research Scientist (1.0) (S+B)		120,600	124,218	127,945	131,783	135,736	3.0%	3.0%	3.0%	3.0%
Research Assoc (1.0) (S+B)		93,800	96,614	99,512	102,498	105,573	3.0%	3.0%	3.0%	3.0%
Full-time Technicians (1.0) (S+B)		67,000	69,010	71,080	73,213	75,409	3.0%	3.0%	3.0%	3.0%
Part-time Student Help (2.0) (S)		20,800	21,424	22,067	22,729	23,411	3.0%	3.0%	3.0%	3.0%
Overhead (72%)		202,608	208,686	214,947	221,395	228,037	3.0%	3.0%	3.0%	3.0%
TOTAL LABOR		504,808	519,952	535,551	551,617	568,166	3.0%	3.0%	3.0%	3.0%
FIXED COSTS:										
Operating Costs										
Land		1	1	1	1	1	0.0%	0.0%	0.0%	0.0%
Insurance		8,000	8,400	8,820	9,261	9,724	5.0%	5.0%	5.0%	5.0%
Phone/Fax		2,400	2,400	2,880	3,840	4,800	0.0%	20.0%	33.3%	25.0%
Equipment and Supplies		22,500	40,000	65,000	106,667	178,333	77.8%	62.5%	64.1%	67.2%
Travel		7,500	7,500	9,000	12,000	15,000	0.0%	20.0%	33.3%	25.0%
Total Facility Costs		40,401	58,301	85,701	131,769	207,858	44.3%	47.0%	53.8%	57.7%
Moving and Set-up Costs:										
Employee Relocation Costs	15,000						0.0%	0.0%	0.0%	0.0%
Move Feedmill Equipment to Hilo	40,000						0.0%	0.0%	0.0%	0.0%
Equipment Recondition	100,000						0.0%	0.0%	0.0%	0.0%
Total Moving Costs	155,000						0.0%	0.0%	0.0%	0.0%
TOTAL FIXED COSTS	**155,000**	**40,401**	**58,301**	**85,701**	**131,769**	**207,858**	**44.3%**	**47.0%**	**53.8%**	**57.7%**
VARIABLE COSTS:										
Operating Costs: (from detailed expense sheet)										
Propane		9,665	18,192	23,024	30,699	33,542	88.2%	26.6%	33.3%	9.3%
Water		6,000	6,000	7,200	9,600	12,000	0.0%	20.0%	33.3%	25.0%
Electricity		6,049	11,387	14,412	19,215	20,995	88.2%	26.6%	33.3%	9.3%
Gasoline		6,000	6,000	7,200	9,600	12,000	0.0%	20.0%	33.3%	25.0%
Maintenance		4,080	7,680	9,720	12,960	14,160	88.2%	26.6%	33.3%	9.3%
Total Feed Processing		27,714	41,579	51,836	69,114	78,536	0.0%	24.7%	33.3%	13.6%
Ingredients (Contract only!):										
Aqua Pellets $800/ton		60,800	114,240	151,200	201,600	225,120	87.9%	32.4%	33.3%	11.7%
Terrestrial Mash $300/ton		45,600	85,680	113,400	151,200	168,840	87.9%	32.4%	33.3%	11.7%
Shipping Costs for Ingredients		39,900	78,540	103,950	138,600	154,770	96.8%	32.4%	33.3%	11.7%
Shipping Costs-Ingred Emergency Air		5,000	5,000	6,000	8,000	10,000	0.0%	20.0%	33.3%	25.0%
Analysis/Shipping Costs for Ingredients		15,000	16,500	18,150	19,965	21,962	10.0%	10.0%	10.0%	10.0%
Total Ingredients		166,300	299,960	392,700	519,365	580,691	0.0%	30.9%	32.3%	11.8%
TOTAL VARIABLE COSTS		**194,014**	**341,539**	**444,536**	**588,479**	**659,228**	**0.0%**	**30.2%**	**32.4%**	**12.0%**
TOTAL OPERATING EXPENSES	**155,000**	**739,223**	**919,792**	**1,065,788**	**1,271,865**	**1,435,252**	**24.4%**	**15.9%**	**19.3%**	**12.8%**

6.7.3 New Funding Scenarios	SCENARIOS					% INCREASE			
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 2	Year 3	Year 4	Year 5
1) Best Case Scenario (100% of New Funding):									
Estimated Feed Production (In Tons):									
Laboratory Aquatic Feeds	0.86	0.65	0.65	0.48	0.48	-24.5%	0.0%	-27.0%	0.0%
Pilot Aquatic Feeds (100%)	136	256	324	432	472	88.2%	26.6%	33.3%	9.3%
Pilot Terrestrial Feeds (100%)	272	512	648	864	944	88.2%	26.6%	33.3%	9.3%
Total Production (In Tons)	408.86	768.65	972.65	1,296.48	1,416.48	88.0%	26.5%	33.3%	9.3%
Revenues:									
New Grants/Contracts Funding (100%)	695,000	1,005,000	1,279,000	1,527,000	1,789,000	44.6%	27.3%	19.4%	17.2%
Total Revenues	$ 695,000	$ 1,005,000	$ 1,279,000	$ 1,527,000	$ 1,789,000	44.6%	27.3%	19.4%	17.2%
Expenses:									
Labor and Overhead	504,808	519,952	535,551	551,617	568,166	3.0%	3.0%	3.0%	3.0%
Fixed Costs	40,401	58,301	85,701	131,769	207,858	44.3%	47.0%	53.8%	57.7%
Variable Costs (100%)	194,014	341,539	444,536	588,479	659,228	76.0%	30.2%	32.4%	12.0%
Total Expenses	$ 739,223	$ 919,792	$ 1,065,788	$ 1,271,865	$ 1,435,252	24.4%	15.9%	19.3%	12.8%
Net Income (Loss) from Operations	$ (44,223)	$ 85,208	$ 213,212	$ 255,135	$ 353,748	-292.7%	150.2%	19.7%	38.7%
2) Mid Case Scenario (50% of New Funding and 50% of All Production):									
Estimated Feed Production (In Tons):									
Laboratory Aquatic Feeds	0.43	0.33	0.33	0.24	0.24	-24.5%	0.0%	-27.0%	0.0%
Pilot Aquatic Feeds	68.00	128.00	162.00	216.00	236.00	88.2%	26.6%	33.3%	9.3%
Pilot Terrestrial Feeds	136.00	256.00	324.00	432.00	472.00	88.2%	26.6%	33.3%	9.3%
Total Production (In Tons)	204.43	384.33	486.33	648.24	708.24	88.0%	26.5%	33.3%	9.3%
Revenues:									
New Grants/Contracts Funding	347,500	502,500	639,500	763,500	894,500	44.6%	27.3%	19.4%	17.2%
Total Revenues	$ 347,500	$ 502,500	$ 639,500	$ 763,500	$ 894,500	44.6%	27.3%	19.4%	17.2%
Expenses:									
Labor and Overhead	252,404	259,976	267,775	275,809	284,083	3.0%	3.0%	3.0%	3.0%
Fixed Costs	40,401	58,301	85,701	131,769	207,858	44.3%	47.0%	53.8%	57.7%
Variable Costs	97,007	170,769	222,268	294,240	329,614	76.0%	30.2%	32.4%	12.0%
Total Expenses	$ 389,812	$ 489,047	$ 575,744	$ 701,817	$ 821,555	25.5%	17.7%	21.9%	17.1%
Net Income (Loss) from Operations	$ (42,312)	$ 13,453	$ 63,756	$ 61,683	$ 72,945	-131.8%	373.9%	-3.3%	18.3%

6.7.4 Feed Mill Days of Operation and Estimated Feed Production

Total Days of Operation

260 workdays - 12 holidays = 248 work days

Days per year

	year 1	year 2	year 3	year 4	year 5	Output	Feed type
Laboratory mill	49.0	37.0	37.0	27.0	27.0	2 kg/hr	Pellet
Pilot mill - aquatic	24.5	47.0	58.5	78.0	84.5	1.0 ton/hr	Extrude / Pellet
Pilot mill - terra	24.5	47.0	58.5	78.0	84.5	2 ton/hr	Mash
Mill Training	98.0	65.0	42.0	13.0	0.0		
Maintenance / Cleaning	52.0	52.0	52.0	52.0	52.0		
Total Days	248.0	248.0	248.0	248.0	248.0		

Detailed Days of Operation

Days per year

Pilot Aquatic Feeds Breakdown	year 1	year 2	year 3	year 4	year 5	Feed type
UHM	5.0	10	12	16	17	Pelleted
UHH	5.0	10	12	16	17	Pelleted
PBARC	5.0	10	12	16	17	Pelleted
Contracts	9.5	17.0	22.5	30.0	33.5	Pelleted
subtotal Pilot Aquatic days	24.5	47.0	58.5	78.0	84.5	
Pilot Terrestrial Feeds Breakdown						
UHM	5	10	12	16	17	Mash
UHH	5	10	12	16	17	Mash
PBARC	5	10	12	16	17	Mash
Contracts	9.5	17.0	22.5	30.0	33.5	Mash
subtotal Pilot Terrestrial days	24.5	47	58.5	78	84.5	

Experimental - Estimated Feed Production for UHM + UHH + PBARC (50% of output capacity)

Tons per year

	year 1	year 2	year 3	year 4	year 5	Feed type
Pilot Aquatic feeds (experimental)	60	120	144	192	204	Pelleted
Pilot Terrestrial feeds (experimental)	120	240	288	384	408	Mash
Total Experimental Pilot feed production	180	360	432	576	612	

Contracts - Estimated Feed Production

Tons per year

Laboratory Aquatic feeds (contract)	0.86	0.65	0.65	0.48	0.48	Pelleted
Pilot Aquatic feeds (contract)	76	136	180	240	268	Pelleted
Pilot Terrestrial feeds (contract)	152	272	360	480	536	Mash
Total Contract Pilot feed production	228	408	540	720	804	

Appendix C
Memorandum of Understanding between UH Hilo and Oceanic Institute of Hawai'i Pacific University

EXHIBIT C

MEMORANDUM OF UNDERSTANDING

The purpose of this Memorandum of Understanding is to provide a framework for institutional cooperation between the University of Hawai'i at Hilo and the Oceanic Institute. OI is a Hawai'i-based non-profit research corporation who has received grant funding from the U.S. Department of Agriculture and the State of Hawai'i for the construction of an Aquatic Feeds Research and Pilot Production Facility.

This Memorandum of Understanding is entered on the 30TH day of NOV, 1999, by and between the Oceanic Institute ("OI") and the University of Hawai'i at Hilo ("UHH").

1. If space is available at the Aquatic Feeds Research and Pilot Production Facility, OI will, upon request, provide space in which UHH faculty, staff, and students can pursue collaborative research related to feeds processing technology.

2. Upon request, OI will provide support to UHH, on a cost-reimbursable basis, in areas such as feeds formulation, production of aquatic and terrestrial research feeds, equipment evaluation and testing, and processing research, if and as available and on a non-interference basis.

3. OI will seek to provide education, training, and internship opportunities for qualified UHH students at the Aquatic Feeds Research and Pilot Production Facility.

4. As new employment opportunities arise in areas such as research, technical support and/or general support, OI will consider suitably qualified UHH students/graduates for employment on a competitive basis at the Aquatic Feeds Research and Pilot Production Facility.

5. UHH may provide affiliate faculty appointments for OI scientists and researchers assigned to the Aquatic Feeds Research and Pilot Production Facility.

6. OI will, upon request, and subject to availability, provide lecturers from the staff of the Aquatic Feeds Research and Pilot Production Facility to teach appropriate classes in the UHH curriculum.

7. Collaborative research opportunities will be encouraged between OI and UHH faculty. OI and UHH will work together to (a) pursue funding from both government and industry for research, and (b) promote opportunities for sabbatical researchers at both UHH and the Aquatic Feeds Research and Pilot Production Facility.

8. There shall be a committee of senior principles from both UHH and the OI to meet semiannually to encourage cooperation and facilitate the implementation of the provisions of this Memorandum of Understanding.

EXHIBIT C

This Memorandum of Understanding is not binding until approved by the University of Hawai'i Board of Regents.

The Oceanic Institute

By: Thomas E Farewell

Thomas E. Farewell, Ph.D.
President and Chief Executive Officer
The Oceanic Institute

University of Hawai'i at Hilo

By: _____

Chancellor
University of Hawai'i at Hilo

October 25, 1999

The Oceanic Institute (OI) Memorandum of Understanding (MOU) with UH Hilo to construct the Aquatic Feeds Research and Pilot Production Facility on the University Farm was modified. The new MOU is attached with the old MOU that you approved. Please look over the updated MOU, and if you are in agreement, please sign below:

Faculty Member	Agree	Disagree	Date
[signature]	X	___	10/25/99
Erik Cleveland	X	___	10/25/99
[signature]	X	___	10/25/99
[signature]	X	___	10/25/99
[signature]	X	___	10/25/99
[signature]	✓	___	10/25/99
[signature]	✓	___	10/25/99
[signature]	✓	___	10/25/99
[signature]	✓	___	10/25/99
[signature]	✓	___	10/26/99
[signature]	✓	___	10/26/99