

SPECIAL PERMIT APPLICATION

EXHIBIT 17 -
BLACKBURN'S SPHINX MOTHS SURVEYS

**Blackburn's Sphinx Moth Surveys Conducted for West
Hawaii Concrete's Waikoloa Quarry, South Kohala
District, Island of Hawai'i**

Prepared by:

Reginald E. David
Rana Biological Consulting
P.O. Box 1371
Kailua-Kona, Hawai'i 96745

&

Eric B. Guinther
AECOS Consultants
45-309 Akimala Pl.
Kāne'ohe, Hawai'i 96744

Prepared for:
Jennifer A. Lim, Esq. Carlsmith Ball LLP

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Introduction

West Hawaii Concrete is seeking to extend their special use quarry permit at their active Waikoloa Quarry site, identified as TMK No. (3) 6-8-001:066. The quarry occupies approximately 219.990-acre portion of the 243.794-acre, the remaining roughly 24-acres which is not part of the quarry site consists of the entrance road and the immediate entrance to the quarry site proper. The property is owned by WQJ2008 Investment LLC and the Ukumehame Quarry Company LP. West Hawaii Concrete has been operating the quarry since 1995.

As part of the due diligence efforts undertaken prior to West Hawaii Concretes' application to extend their special use permit lease we were asked to conduct a survey of tree tobacco (*Nicotiana glauca*) and the endemic endangered Blackburn's sphinx moth (*Manduca blackburnii*) activity on an approximately 60-acre portion of their 220-acre quarry site as tree tobacco has now become common over fairly large parts of the quarry site. An initial site visit was conducted on May 5, and extensive fieldwork was done on June 11, 2015.

General Site and Project Description

Habitat within the quarry site is highly degraded, as one would expect of an active quarry site where approximately the top five feet of material has been removed from approximately 90-95 percent of the 220-acre quarry site to provide general fill for the Kohala Coast development projects. Prior to that activity the site likely looked like that depicted in Figure 1, which was taken along the quarry access road, but outside of the quarry site.

The habitat remaining within areas that is not bare rock is dominated by fountain grass (*Cenchrus setaceus*). Large portions of the site are bare rock or piles of crushed rock (Figure 2). Currently there is also a small green-waste facility operated by Puna Certified Nursery, Inc. located on the northern central boundary of the property.

As mentioned in the introduction West Hawaii Concrete will be seeking approval from the Leeward Planning Commission and later from the State Land Use Commission to extend the life of the Special Permit, and expand the permitted uses from the currently permitted concrete quarrying to include green waste processing/composting, cement concrete recycling and asphalt concrete recycling.

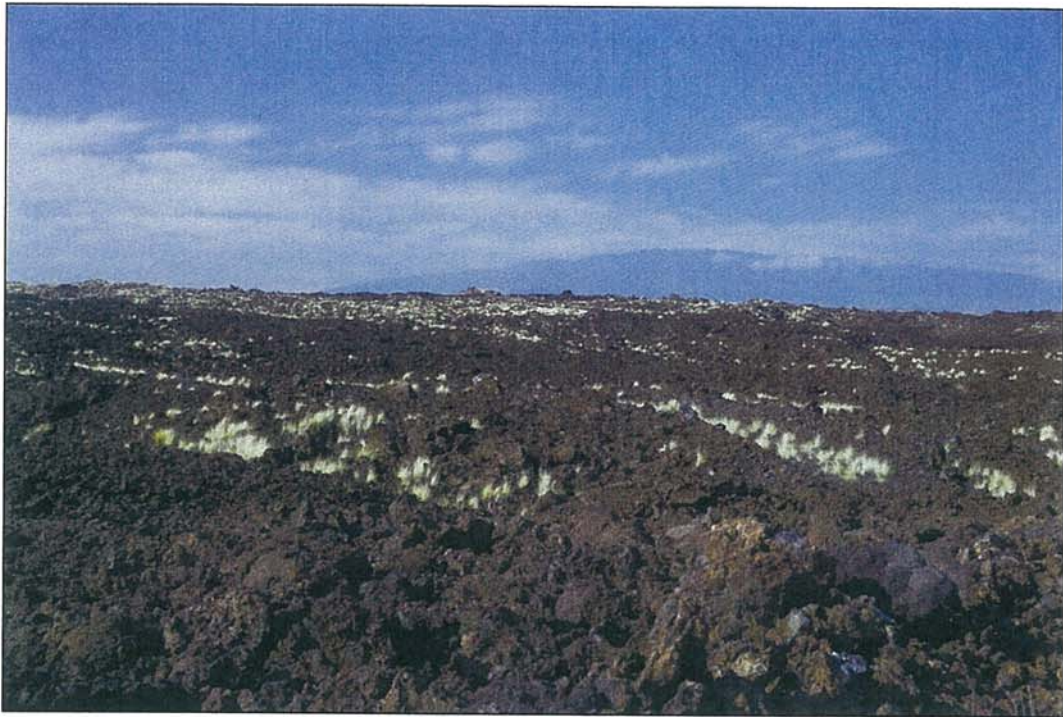


Figure 1 – Typical 'a'a habitat with emergent and sparse fountain grass

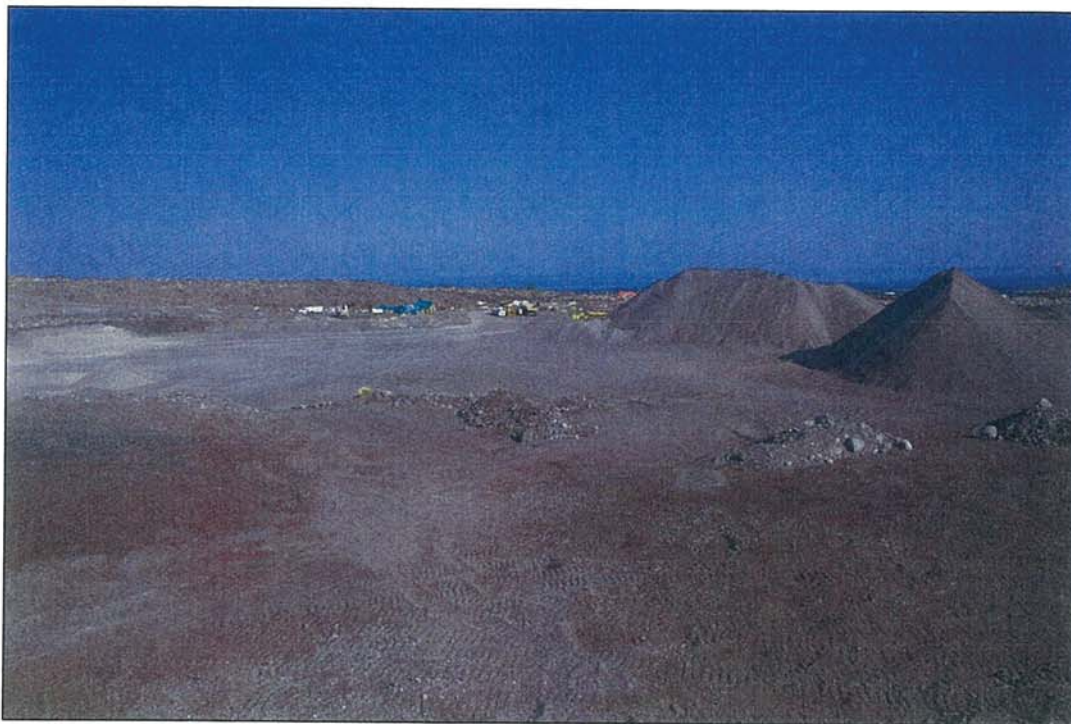


Figure 2 – Main quarry floor with stockpiled material, showing lack of vegetation

Methods

Initial Site Visit

On May 5, 2015 the principal author visited the site with Mr. Mel Macy, West Hawaii Concrete Vice-president to see what areas of the site needed to be surveyed for sign of Blackburn's sphinx moth activity. During that visit Mr. Macy indicated the areas of the property that he anticipated would be quarried or otherwise put into use over the next 3 to 5 years. This area contained approximately 60 acres.

At the time of the visit tree tobacco was observed in many areas, generally outside of the main pit area and sand storage site. A cursory search of a number of plants revealed no signs of any insect browsing of any kind.

Tree Tobacco and Blackburn's Sphinx Moth Survey

Methods used during the course of this survey are the currently accepted standard methodologies for searching tree tobacco for Blackburn's sphinx moths – these protocols were developed by the lead author in concert with the USFWS in 2014 and has been used on several moth surveys in the past two years on Hawaii by both the authors of this report and by biologists with SWCA for a State of Hawaii, Department of Transportation, Highways Division project and a Hawaiian Electric Light Company line replacement project (David and Guinther 2014; SWCA 2014).

The biologists first loaded a shape file of the quarry TMK into a Trimble 6000 Series GNSS unit (GeoXH) and then divided up the survey site between them and proceeded to inspect all of the tree tobacco plants within the survey area (Figure 3). The guidelines for the survey were as follows:

1. Visual search of each tree tobacco plant will be conducted to identify those that show browse marks of a size and scale that are indicative of BSM larvae activity;
2. If significant browsing is identified, the plant will be searched for BSM or other Sphingidae larvae, and an appropriate buffer zone around it demarcated.

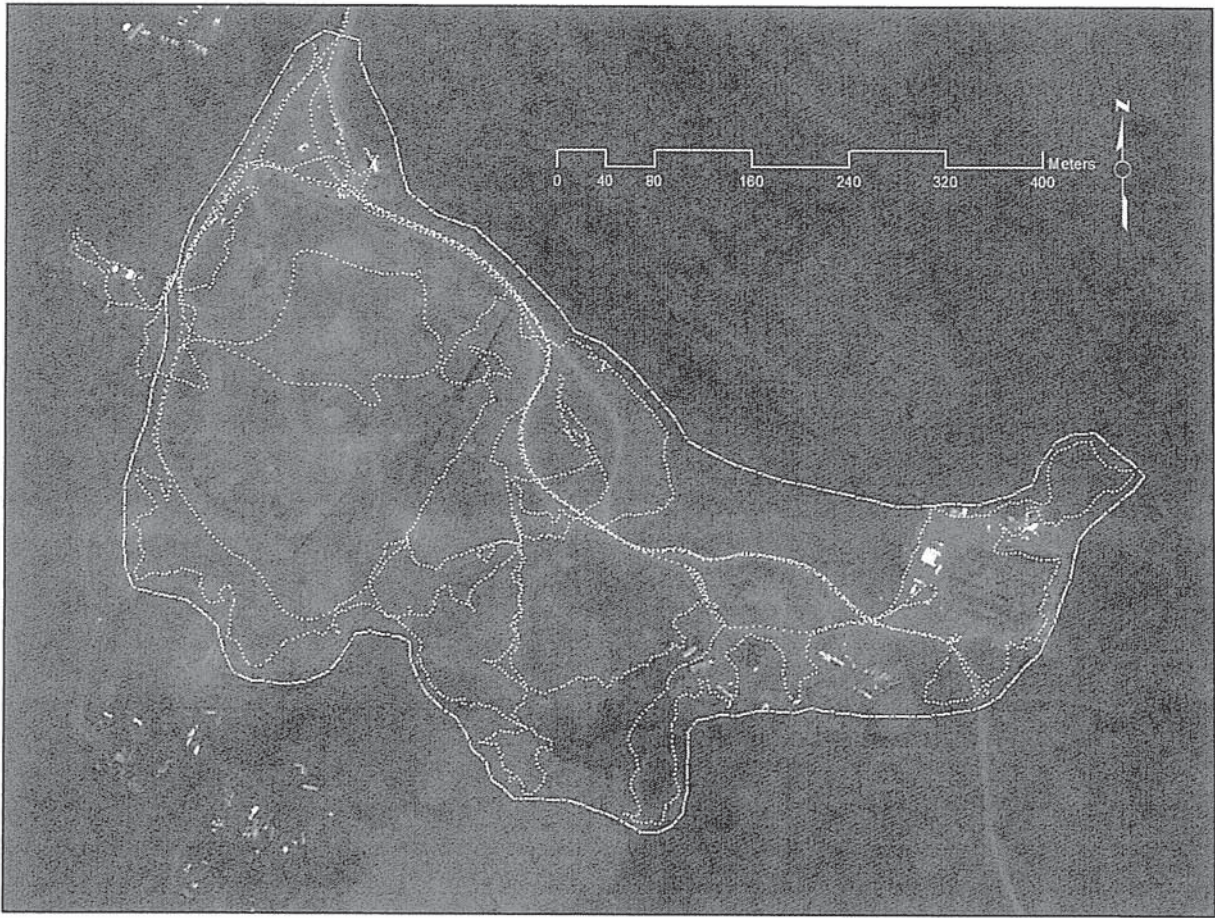


Figure 3 – Yellow outline represents the area that we searched tree tobacco plants and found no evidence of BSM activity. The white dotted lines are the path that one of the biologists took while searching the site.

Results

Tree tobacco is an alien invasive weed that is used in some areas by Blackburn's sphinx moth as an alternate host plant for the egg and larval stages because its natural host plants such as 'aiea (*Nothocestrum breviflorum*) are critically endangered and are exceedingly rare. The quarry site and surrounding area are extremely dry. The diversity of plant species present in the approximately 60-acre portion of the 220-acre site area that we surveys for Blackburn's Sphinx moth was extremely low (Figure 4). Surveys conducted by another team conducting a botanical survey of the entire site, also reported very low diversity and no rare native species (Terry and Hart, 2015).

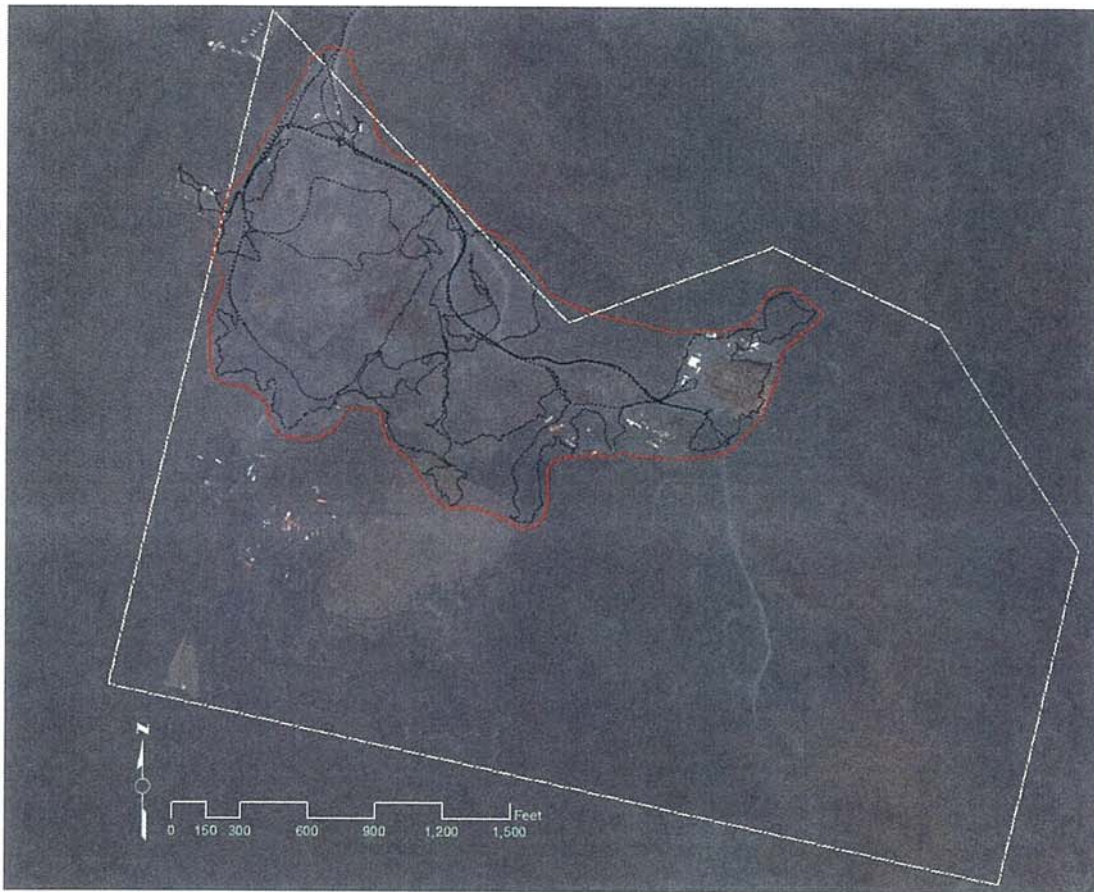


Figure 4 – Red outline represents the area that we searched tree tobacco plants and found no evidence of BSM activity. Dark dotted lines are the paths that one of the two biologists followed. The pale yellow dashed line indicates the boundary of the TMK.

We found no evidence of any insect activity on any of the tree tobacco plants inspected. We surveyed the outlined area depicted in Figures 3 and 4, within the greater quarry site. Tree tobacco condition during this survey was good, with thick green leaves, conducive to usage by Blackburn's sphinx moth (Figure 5). It has been a relatively wet season in the project area; not heavy storms, but rather steady light rain each night that resulted in what can be described as verdant conditions within the greater Waikoloa area.

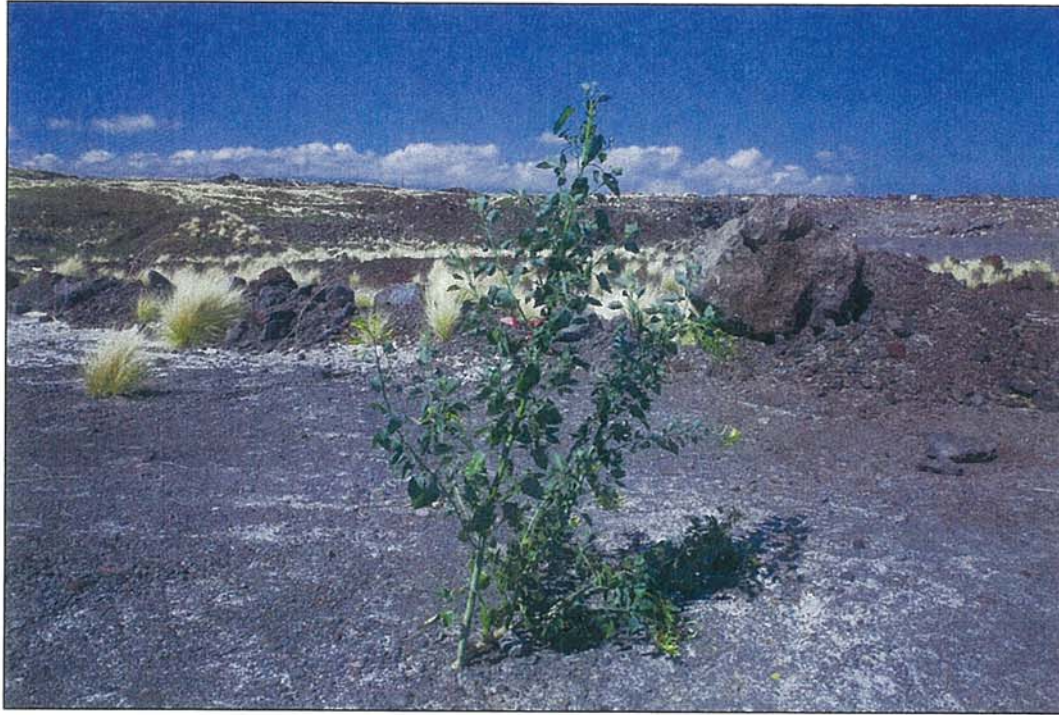


Figure 5 – A typical healthy tree tobacco plant within the quarry site showing sparse fountain grass habitat

Literature cited

David, R.E., and E. B., Guinther. 2014, Blackburn's Sphinx Moth Surveys Conducted for Phase I of the Hawaiian Electric Light 6800 kV Line Replacement Project, South Kohala District, Island of Hawai'i. Prepared for: Power Engineers and Hawaii Electric Light.

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Terry, R. and P. J. Hart 2015. General Botanical Survey and Vertebrate Fauna Assessment, Waikoloa Quarry Waikoloa, South Kohala District, Island of Hawai'i. June 2015. Prepared for: Jennifer A. Lim, Esq. Carlsmith Ball LLP