#119

CERTIFIED MAIL

December 1, 1982

Mr. Stanley Roehrig
P. O. Box 33
Laupahoehoe, Hawaii 96764

Dear Mr. Roehrig:

Variance Application (V82-43)
Variance from Maximum Allowable Height Limits
Tax Map Key 3-6-05:4

After reviewing your application and the information submitted in behalf of it, the Planning Director by this letter hereby certifies the approval of your variance request to allow the construction of a windmill tower with a height of one hundred sixteen and one-half (116'-6") feet in lieu of the maximum allowable height of fifty-five (55) feet for windmills in the Agricultural zoned district in North Hilo, Hawaii.

The approval is based on the following:

1. There are special or unusual circumstances applying to the property which exist to a degree that interferes with the best use or manner of development of the property. Today's energy concious society and world focuses on alternate energy systems such as windplants as viable energy options. This is evidenced by the fact that there are ongoing national and global efforts in becoming less dependent on oil and diversifying the dependence of energy to other resources. The concerted efforts being directed into the fields of solar energy, biomass, wind energy, geothermal and ocean thermal systems, etc. are strong evidence as to the viability and the need for these systems.

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Act 24, SLH 1980, dealing with wind farms shows commercial and private wind farms in the State Land Use "Agricultural" district provided that the facilities/structures are compatible with Agricultural uses and cause minimal adverse impacts on Agricultural lands. In addition, private windplants are permitted wthin the County's "Agriculture" zone as accessory use to the Single Family Dwelling use.

In "A Siting Handbook for Small Wind Energy Conversion Systems by H.L. Wegley, J.V. Ramsdell, U.S. Department of Energy, March 1980", it is stated that:

"The surface over which the wind flows affects wind speed near that surface.

A rough surface will produce more friction than a smooth surface.

The greater the friction the more the wind speed is reduced near the surface. Wind speed increases with height as the effects of surface roughness are overcome. Any curvature along the face of a cliff should also be considered. The curvature of the face channels the winds into the concave portions. Although no estimates are available of how much wind speed is enhanced in these concave areas, they are probably better WECS sites than convey areas because more air may be forced through them. Laboratory and field experiments both indicate that cliffs do enhance the wind speed. Wind speed rapidly increases near the top of the flow separation. This region of shear should be avoided, either by choosing a new site or by raising the windplant so the rotor disc is above the shear zone. Since this turbulent zone continually changes size and shape, it is wise to choose as high a tower as is practical as this will also increase available power."

The makai portion of the property is a cliff which poses approximately 200 feet from the shoreline. Because of this particular land formation in this area, it has been concluded by this wind gauging testing, that the optimum wind for windplant electrical generation is at the 120 foot height level.

All of the above information provides evidence that there are off-site influencing factors in the siting of a windplant system. The uniqueness of the wind resource is the off-site influencing factor relevant to the request for

the additional height. Because of the downwind characteristics, these factors do apply to the subject property as they affect the way that alternatives have to be looked at in terms of establishing a more economical and efficient windplant on the property.

2. That there are no reasonable alternatives in resolving this difficulty. The alternative of denying the Variance is not a reasonable one in that the efficiency of the facility would be further diminished and its utility would be voided. As such, because the requested additional height is needed to ensure or increase the efficiency of the windplant, we have determined that the most reasonable alternative is in granting the Variance. Any other solutions would cause excessive or undue hardships on the petitioner in enhancing the efficiency and utility of the windplant, when a more reasonable solution is available.

3. The approval of the request would be consistent with the County General Plan's "Energy" element and with State and National goals which encourage the development and use of alternate energy sources.

In assessing height variances for windplants, the three basic elements that are evaluated are the visual impact, the physical impact and the specific need for the additional height. The location of the proposed windplant is located approximately 700 feet from the main highway, approximately 400 feet from the makai side, and 80 and 300 feet from the side property lines. The topography of the area gently slopes down from the main highway. The Hawaii Belt Highway at this location is at approximately the 320 foot elevation and the proposed windplant will be erected at approximately the 280 foot elevation.

Because of the topography and vegetation growth in the area, the existing or the proposed windplant will not be visible while traveling in the Waimea direction. However, it will be visible from the highway while traveling in the Hilo direction. The fact that the proposed location will be approximately 40 foot below the main highway elevation, and the approximate 700 foot distance from the highway will minimize the visual impact of the additional 56 plus feet height. The physical impact will also be negligible on the surrounding properties as the character of the area is still rural in nature.

Based on the foregoing, we have determined that the granting of the Variance shall be consistent with the general purpose of the Zoning District, the intent and purpose of the Zoning Code and the General Plan. The analysis of the above issues also has concurred that the granting of the Variance will not be materially detrimental to the public's welfare nor cause any substantial or adverse impact to the area's character or to adjoining properties.

The variance request is approved subject to the following conditions:

1. That the petitioner or authorized representative be responsible for complying with all the stated conditions of approval.

2. That plans and construction of the total structure must be approved by a structural engineer or architect registered in the State of Hawaii.

3. That plans for the windplant be submitted to the Planning Department for Plan Approval within one (1) year from the effective date of approval of the Variance Permit.

4. The petitioner or authorized representative shall be responsible for providing the appropriate safeguards on their system to prevent TV and/or radio interference to the adjoining property owners notified through this Variance Application.

5. That all other applicable rules, regulations and requirements be complied with.

Should the petitioner or authorized representative fail to comply with the above conditions, the Variance shall automatically be deemed void.

If you have any questions on this matter, please feel free to contact us.

Sincerely,

Sidney M. Fuke

SIDNEY M. FUKE
Planning Director

RHY:lgv
cc: Mr. John Crouch