WILLIAM W. PATY, CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES



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STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES

> P. O. BOX 621 HONOLULU, HAWAII 96809

REF: OCEA: SKK

OCT 22 1991

FILE NO.: HA-4/18/91-2462 180-Day Exp. Date: 10/15/91 DOC. NO.: 1866E

Dr. Donald N. B. Hall Director Institute for Astronomy University of Hawaii 2680 Woodlawn Drive Honolulu, Hawaii 96822

Dear Dr. Hall:

SUBJECT: Conservation District Use Application for Use of a 5-Acre Site within the Mauna Kea Science Reserve for the Japan National Large Telescope (JNLT), Appurtenant Structures and Associated Infrastructure; Temporary Accessory Use of a Portion of the "Skiers' Parking Lot" for a Concrete Batching Plant and Expansion of Facilities at Hale Pohaku at Mauna Kea, Hamakua, Hawaii

We are pleased to inform you that your Conservation District Use Application for the subject astronomy related facilities was approved on September 27, 1991 subject to the following conditions:

- The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, Administrative Rules, as amended;
- That the Board approved a construction right-of-entry for the subject project elements;
- 3. The applicant shall comply with all applicable Department of Health Administrative Rules;

AQUACULTURE DEVELOPMENT PROGRAM AQUATIC RESOURCES CONSERVATION AND ENVIRONMENTAL AFFAIRS CONSERVATION AND RESOURCES ENFORCEMENT CONVEYANCES FORESTRY AND WILDLIFE HISTORIC PRESERVATION PROGRAM LAND MANAGEMENT STATE PARKS Mr. D. Hall

1 2

- 4. Before proceeding with any work authorized by the Board, the applicant shall submit four (4) copies of the grading and construction plans and specifications to the Chairperson or his authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three (3) of the copies will be returned to the applicant. Plan approval by the Chairperson does not infer approval required of other agencies. Compliance with Condition 1 remains the responsibility of the applicant;
- 5. Any work or construction to be done on the land shall be initiated within two (2) years of the approval of such use, and all work and construction must be completed within seven (7) years of the approval of such use;
- 6. That in issuing this permit, the Department and Board has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;
- 7. That all representation relative to mitigation set forth in the accepted Environmental Impact Statement and the Mauna Kea Science Reserve Complex Development (Management) Plan for this proposed use are hereby incorporated as conditions of this approval;
- 8. That the applicant shall establish a batching plant at the identified alternative site location.
- 9. That the applicant will install a removable barrier preventing vehicular access to the area known as the "skiers' parking lot", part of which lies within the Natural Area Reserve Systems (NARS). The applicant will consult with NARS to develop a recommendation regarding the rehabilitation and future use of the "skiers parking lot". The applicant will implement the recommendation, subject to Board approval.
- 10. That the applicant shall be held responsible for the removal of all litter from the project and surrounding areas generated from the construction and maintenance of the project;

Mr. D. Hall

- 11. That failure to comply with any of these conditions shall render this Conservation District Land Use application null and void; and
- 12. Other terms and conditions as prescribed by the Chairperson.

Please acknowledge receipt of this permit with the above noted conditions in the space provided below. Please sign two copies. Retain one and return the other to the department within thirty (30) days.

Should you have questions on any of these conditions, please feel free to contact our Office of Conservation and Environmental Affairs staff at 548-7837.

Very truly yours,

A.

WILLIAM W. PATY

Receipt acknowledged:

Signature Appl

Date

cc: Hawaii Board Member Hawaii District Land Agent County of Hawaii Planning Dept. DOH/OHA/OSP JOHN WAIHEE



WILLIAM W. PATY, CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES

> DEPUTIES Keith W. Ahue Manabu Tagomori Dan T. Kochi

STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621 HONOLULU, HAWAII 96609 AQUACULTURE DEVELOPMENT PROGRAM AQUATIC RESOURCES CONSERVATION AND ENVIRONMENTAL AFFAIRS CONSERVATION AND RESOURCES ENFORCEMENT CONVEYANCES FORESTRY AND WILDLIFE LAND MANAGEMENT STATE PARKS WATER AND LAND DEVELOPMENT

FILE NO.: HA-4/18/91-2462 180-Day Exp. Date: 10/15/91 DOC. NO.: 0805E

September 27, 1991

Board of Land and Natural Resources State of Hawaii Honolulu, Hawaii

> Conservation District Use Application for Use of a 5-Acre Site within the Mauna Kea Science Reserve for the Japan National Large Telescope (JNLT), Appurtenant Structures and Associated Infrastructure; Temporary Accessory Use of a Portion of the "Skiers' Parking Lot" for a Concrete Batching Plant and Expansion of Facilities at Hale Pohaku at Mauna Kea, Hamakua, Hawaii

APPLICANT: Institute for Astronomy (IFA) University of Hawaii (UH)

LANDOWNER: State of Hawaii

LOCATION/ Mauna Kea Science Reserve TMKs: 4-4-15: 09 (G.L. No. 4191) 4-4-15: 10 4-4-15: 12

AREA OF PARCEL/ USE: Sci∈nce Reserve - 11,214<u>+</u> acres Hale Pohaku - 19<u>+</u> acres

SUBZONE/S: Protective and Resource

DESCRIPTION OF AREA/CURRENT USE:

The subject area is located at Mauna Kea, Hawaii (Exhibits A and B). The properties are identified as TMKs 4-4-15: 09, 4-4-15: 10 and 4-4-15: 12 (Exhibit C). All the properties are situated within the State Conservation District. The parcels identified as TMKs 4-4-15: 09 and 4-4-15: 12 are within the Resource subzone, while parcel 4-4-15: 10 is situated within the Protective subzone (Exhibit D).

ITEM H-1

As identified by the applicant, there are three components to this land use request. Existing conditions at each site is described:

Mauna Kea Science Reserve

The proposed Japanese National Large Telescope (JNLT) site is presently undeveloped. Currently, ten telescopes are either in operation or under construction within the Mauna Kea Science Reserve (Exhibit E). These include five major optical/infrared telescopes; two smaller (24-inch) telescopes; two millimeter and submillimeter-wavelength telescopes; and the VLBA Antenna Facility below the summit area at the 12,200-foot elevation. All of the telescope facilities are used for basic astronomical research to study objects within our solar system and our own galaxy, and to study other galaxies. There are no military uses. Table I lists the telescopes on Mauna Kea by type and by year operational.

Table I: TELESCOPES ON MAUNA KEA BY YEAR OPERATIONAL

Telescopes

Year Operational

*Under Construction

Summit Ridge

UH 24-inch Telescope #1	1968	
UH 24-inch Telescope #2	1969	
UH 88-inch Telescope	1970	
NASA Infrared Telescope (IRTF)	1979	
Canada-France-Hawaii Telescope (CFHT)	1979	
United Kingdom Infrared Telescope (UKIRT)		
W.M. Keck Observatory (Keck)	1991*	

Millimeter Valley

Caltech Submillimeter Observatory (CSO)	1987				
James Clerk Maxwell Telescope (JCMT)	1987				
12,220-Foot Elevation					
VLBA Antenna Facility (VLBA)	1991*				

The Science Reserve is also used for other scientific research including: medical research on the effects of high altitude on the human body; meteorology; geology; biology; and, botany. Skiing, snowplay, hiking and sightseeing are among the recreational and commercial activities that take place in the area.

- 2 -

Batch Plant

Recently, the site was used for a concrete batching plant during the construction of the Keck Telescope and Mauna Kea Access Road improvements. The area is used for public parking during winter months when there is snow.

<u>Hale_Pohaku</u>

The astronomers' Mid-Level Facilities consist of six buildings: a common building (which contains kitchen and dining facilities, observer preparation rooms, offices, lounge areas, and an exercise-emergency room); a maintenance building which provides space for minor equipment repairs and other repair and maintenance functions; and four dormitories for astronomers, technicians and support staff accommodating a total of 77 people. Expansion of the Mid-Level Facilities was provided for in the Mauna Kea Science Reserve Complex Development Plan (SRCDP).

A 1,200-square-foot Visitor Information Station, at approximately the 9,185-foot elevation, serves both as an interpretive center for disseminating information to the general public about the man-made and natural features of Mauna Kea, and as the control point for managing and monitoring visitors who travel to the upper slopes of the mountain. Restroom facilities are located in this building which has an adjacent parking area for 25 cars (Exhibit G).

A construction camp, consisting of a dormitory with sleeping accommodations for 24 to 29 workers and a separate building for kitchen/dining/recreation, is located directly below the Information Station at the 9,150-foot elevation. A master plan for accommodating up to 140 workers at one time was approved by the BLNR in 1986 (CDUA HA-1819).

An arboretum is located to the east of the Visitor Information Station. The arboretum, which is the responsibility of DLNR, is not part of the 19-acre Hale Pohaku site.

Existing Utilities

Mauna Kea Science Reserve

Potable Water: Water is trucked from Hilo to the Science Reserve in a 5,000-fallon water tanker. Each telescope has its own on-site water storage and distribution system. This service will be expanded to include the on-site water system at the proposed JNLT facility.

Sewage Disposal: Each individual telescope has its own on-site cesspool or septic tank with leaching field. These methods of sewage disposal have been approved by the State Department of Health (DOH).

Solid Waste Disposal: Each telescope facility is responsible for disposal of its own solid waste. Telescope personnel transport the waste from the summit to an appropriate disposal site near their base facilities.

Electrical Power: Commercial electric power to the summit is provided by a 12.47-kV underground power conduit that runs from a substation near Hale Pohaku to the summit area. The system is connected to the Hawaii Electric Light Company (HELCO) power grid. The system will be extended to service the JNLT.

HA-2462

Communications: A fiber-optic cable for high-speed data transmission was installed in conduits running parallel to those for the power line. The cable runs from the summit telescopes to Hale Pohaku. This system will be extended to service the JNLT. Radio transmitters are no longer allowed at individual telescope sites.

<u>Hale Pohaku</u>

Potable Water: Water is trucked from Hilo and stored in two 40,000-gallon tanks located in the maintenance area of the Mid-Level Facilities (Exhibit H). It is distributed throughout the complex via pipelines that are either buried or installed under elevated walkways.

Sewage Disposal: Cesspools are used for wastewater disposal at most of the Hale Pohaku facilities. Sewage from the recently constructed Dormitory D will be disposed of into a septic tank with leaching field. State Health Department approval has been received for each individual wastewater disposal system.

Solid Waste Disposal: Mauna Kea Support Services (MKSS) trucks the solid waste produced at Hale Pohaku to Hilo on a daily basis.

Electrical Power: Commercial electrical power is provided from an overhead 69-kV power line which runs from the Saddle Road to a substation near Hale Pohaku. Distribution throughout the facility is accomplished by buried or otherwise hidden lines.

Communications: Hawaiian Telephone provides standard voice communications from Hale Pohaku to sea level. UH is arranging to provide wide-band data communications by installing a microwave relay station near the Access Road above Hale Pohaku.

Drainage: The area was subject to serious erosion problems in the past. However, drainage improvements were constructed as part of the permanent Mid-Level Facilities. As a result of these improvements, water is diverted to catchment areas and from there it is piped to a natural ponding area below the construction camp.

Existing Access:

<u>Mauna Kea Science Reserve</u>

Access to the upper elevations of Mauna Kea from Hilo or Waimea is via the Saddle Road (Route 200) to Pu'u Huluhulu and from there via a 6-mile-long, 20-foot-wide paved portion of the Mauna Kea Access Road to Hale Pohaku, at the 9,200-foot elevation of the mountain. From there, the Access Road continues 8.3 miles to the summit (Exhibit I). It is paved from the summit down to approximately the 11,800-foot elevation.

Within the summit area, access to the telescope site will be along an existing paved road that branches off from the Mauna Kea Access Road and proceeds north through "millimeter valley" to just beyond the JCMT. From there it connects with an unpaved road which runs up the slope of Pu'u Hau Oki and then around to the Keck Observatory site (Exhibit J). This gravel road, which was constructed initially to facilitate traffic flow while the Mauna Kea Access Road improvements were under construction, also provides emergency access and egress from the summit area during heavy winter storms and provides access for the public to remote ski areas. The road will be paved in order to minimize dust.

<u>Hale Pohaku</u>

Access to the new dormitory will be either by slightly elevated walkway (which will be extended from the existing Building D to meet the new Building E), or from the existing parking lot.

Vegetation and Fauna

Mauna Kea Science Reserve

Vegetation: There is no vegetation on the JNLT site. An inventory of the botanical resources at the summit area was prepared by Smith in 1982. Six species of vascular plants were found during the 1982 survey. Smith also located approximately 25 different lichen species at the summit area. Of these, roughly half were endemic.

Avifauna: The Hawaiian Dark-rumped Petrel or 'Ua'u (<u>Pterodroma</u> <u>phaeopygia sandwichensis</u>) is an endangered endemic subspecies of the Dark-rumped Petrel. No Petrel were found at the 12,200-foot elevation of the Science Reserve during a field survey conducted by M.S. Kjargaard in 1988. The survey was performed at night during the height of the breeding season in May, 1988 and at a period of the lunar cycle where calling is maximized.

Batch Plant

According to CDUA HA-789 which addressed the site, there are no vegetation or fauna present in this disturbed area.

<u>Hale Pohaku</u>

Vegetation: Three botanical studies have been conducted at Hale Pohaku: Gerrish (1979); Char (1985); and Char (1990).

Vegetation in the area consists of scattered clumps of mamane trees (<u>Sophora chrysophylla</u>), from 6 to 18 feet tall. Smaller saplings less than three feet tall are also common. Ground cover consists of a mixture of bunch grass species. Other species found commonly in this vegetation type are ripgut grass, sheep sorrel, hairy cat's-ear, filaree, and two species of mullein. Scattered shrubs of 'aheahea are occasionally found.

Two native mint species, and or ma'ohi'ohi, are found associated with most of the larger mamane clumps. Both were considered candidate endangered species at one time, but in the most recent listing by the U. S. Fish and Wildlife Service (1990) they are no longer being considered for candidate endangered species status. They have proven to be more widespread or abundant than previously believed and are not subject to any identifiable threat at present.

Avifauna: Two endangered bird species are known to occur on the upper slopes of Mauna Kea: the Dark-rumped Petrel (<u>Pterodroma</u> <u>phaeopygia</u>), and the Palila (<u>Loxiodes bailleui</u>). Hale Pohaku is located within the critical habitat of the Palila (Exhibit K).

The Palila has been seen at or near Hale Pohaku with some consistency in recent years, however, neither of the two endangered bird species was seen in the area during a 1990 survey by Kjargaard.

- 5 -

TOPOGRAPHY

Mauna Kea Science Reserve

Elevations in the summit area of the Mauna Kea Science Reserve range from about 13,000 to 13,796 feet. The telescope site is located between the 13,480-foot (4,109 m) and 13,596-foot (4,144 m) elevations of the western summit of Pu'u Hau Oki cinder cone (Exhibit L). The ground surface slopes down to the south and west at inclinations of about 2:1 to 2.5:1 (horizontal:vertical) on the outer edges of the cinder cone. Slopes into the center of the cone to the north are slightly flatter, on the order of 3:1. The western rim of the cinder cone slopes away from the telescope site at about a 10-percent gradient.

Batch Plant

The proposed batch plant site is flat.

<u>Hale Pohaku</u>

The average slope in the vicinity of the new dormitory is about 12 percent. Slopes at the construction camp site vary from about 5 to 12 percent.

EXISTING COVENANTS, EASEMENTS, RESTRICTIONS

Mauna Kea Science Reserve

As described in General Lease S-4191 between UH and the BLNR (DLNR, 1968).

Batch Plant Site

A portion of the batch plant site is located within the Mauna Kea Ice Age Natural Area Reserve. The Keanakakoi Adze Quarry, an ancient Hawaiian Historic Place, is located within the Reserve. The quarry site is listed on the National Register of Historic Places. It will not be affected by the proposed project.

However, a special use permit from the Natural Area Reserve System Commission will be applied for at a later date.

<u>Hale Pohaku</u>

The BLNR approved the UH lease request for a site of approximately 21 acres at the Hale Pohaku Mid-Level Facilities under agenda item F-14 at its meeting of February 28, 1986. This action was confirmed in a letter from the BLNR chairperson to the UH Vice-President for Finance and Operations, dated May 22, 1986. Subsequently, by letter dated April 9, 1987, the County of Hawaii approved the subdivision of a 19.261-acre site (T.M.K. 4-4-15: 12, Figure 7). Shortly thereafter, the Survey Division of the Department of Accounting and General Services (DAGS) forwarded the survey map and metes and bounds description to DLNR Land Management Division for preparation of the State lease document. It is the understanding of UH that this lease is still in process.

- 6 -

PROPOSED USE:

The National Astronomical Observatory of Japan (NAOJ), Japan's national research institute for astronomy, located in Mitaka, Tokyo, has asked UH IFA for permission to locate the Japan National Large Telescope (JNLT) within the summit area of the Mauna Kea Science Reserve. The proposed 8-meter optical/infrared telescope will be the largest single-mirror telescope in the world. It will be unique among large telescopes because it will have a single, unusually large and very thin primary mirror (Exhibits M and N). This will be the first time the Japanese government will construct a major installation outside its own country and the first international scientific collaboration of its kind for Japan.

In the early 1980s, Japanese optical and infrared astronomers began to look at sites for an optical-infrared telescope to be built outside Japan, where observing conditions are better than potential Japanese sites. Mauna Kea was the final selection for both scientific and operational reasons. From the scientific perspective, the opportunity for collaboration with UH and other scientists on Mauna Kea, and the previously proven superb qualities of the site for astronomical observations made the site highly desirable. From an operational standpoint, Mauna Kea is easily accessible from Japan; Hawaii holds promising possibilities for good local technical support staff; the U. S. political and social climate is stable; and the members of the local community have been cooperative with representatives of the JNLT in preliminary discussions about the proposed project.

The JNLT will make great scientific advances over existing smaller telescopes because it will have technical characteristics (full angular resolution, more sensitive imaging, a large field of view, increasingly sophisticated detectors, etc.) that will provide astronomers with a unique opportunity to discover the times and places where galaxies were born; map as-yet-undiscovered galaxies and intergalactic clouds; study distant exploding stars; learn the properties of quasars; discover more about the structure, movement, chemistry and physics of star-forming regions and planet-forming regions at various stages in their development; and understand the physics and chemistry of astronomical objects.

The JNLT will also provide critical support for U. S. and Japanese space astronomy missions, since it can be use very effectively to identify the characteristics of the astronomical sources that are discovered during space missions. These newly discovered objects are extending the horizon of astronomy, opening up new areas to be researched, and increasing the pressure on observing time with large optical-infrared telescopes. The JNLT will have the large light-collecting capacity and the sensitivity that is essential for follow-up optical observations, and it will also be optimized for an infrared wavelength range which will complement the wavelengths that are observed with space telescopes.

The Japan/UH collaboration will also lead to collaborations on Mauna Kea with astronomers at other telescopes operating there -particularly the James Clerk Maxwell Telescope (JCMT) and the W.M. Keck Observatory (Keck) -- where two or more telescopes will observe the same object using a relatively new technique in these wavelengths called interferometry, with the goal being to resolve fine internal structures of astrophysical objects.

- 7 -

<u>8-METER TELESCOPE: Description</u>

Telescope Site: NAOJ intends to sublease a 5-acre site from the UH. The proposed site is located in SRCDP Siting Area I (Exhibit O), between the 13,480-foot (4,109 m) and 13,596-foot (4,144 m) elevations of the western summit of Pu'u Hau Oki cinder cone.

The telescope building will occupy a circular level pad about 230 feet in diameter at an elevation of 13,580 feet. A control building, parking for ten vehicles, a transformer building and a sewage disposal facility will also be located on site. A preliminary site plan has been developed (Exhibit P).

Telescope Dome and Appurtenant Structures: The telescope facility will consist of a 148-foot-diameter (45 m) telescope building with a cylindrical dome which will rise from ground level at the 13,580-foot (4139 m) elevation to a height of approximately 164 feet (50 m). The telescope will be mounted about 88 feet above the floor of the building. In addition to the telescope, the dome enclosure will have space for necessary machinery and ventilation and it will also have an observing floor.

A two-story 15,500-square-foot control building with half-basement will be connected to the telescope building by a covered pathway constructed about 13 feet below ground level. A buried 5-foot-diameter steel corrugated heat exhaust duct and outlet will extend north of the control building, venting at an elevation of approximately 13,510 feet (Exhibit Q).

Roads: The gravel "detour" road, which was constructed initially to facilitate traffic flow while the Mauna Kea Access Road improvements were under construction, will be the primary access within the summit the JNLT site. The road, which also provides emergency access and egress from the summit area during heavy winter storms and provides access to remote ski areas, will be paved to minimize dust.

An 800-foot-long paved spur road, with 10-foot travelway, will be constructed to run southward to the telescope site from a point on the aforementioned gravel road at about the 13,500-foot-elevation. An unimproved existing 4-wheel drive road, which runs to the JNLT site from the Keck Telescope, will serve primarily as a utility corridor and will not be paved.

Infrastructure and Utilities: Domestic water will be trucked from Hilo and stored in a 5,000-gallon storage tank to be located under the control building. Wastewater, consisting primarily of human washing and waste, will be disposed of by means of a septic tank with leaching field which will be located northwest of the control building.

Commercial power will be supplied from the existing 12.47-KV commercial Hawaiian Electric Light Co. (HELCO) underground system. Power usage is estimated at 2,000 KWH per day. On site service will be provided via a 600-KVA transformer located outside the control building (Exhibit R).

HA-2462

- 8 -

A stand-by generator of approximately 100 kVA will be mounted on a concrete pad to be located on the ground level of the control building. It will be used during interruptions of HELCO power to close the dome and to keep sensitive instruments cold. A 1,000-gallon diesel fuel storage tank will be placed underground near the parking lot.

Five commercial telephone lines will be required for voice and data transmission. In addition, UH will make available a fiber-optic network for high-speed data communications. The service will be provided to the JNLT (and the other telescopes on Mauna Kea) with the flexibility to transmit data gathered at the telescopes to their base support facilities and to locations elsewhere around the world.

The underground power and communications lines will be extended approximately 300 feet south from their present terminus at handhole 23, just past the Keck Telescope site, to proposed handhole 24 at the JNLT site and from there along the southern rim and then down the slope of the cinder cone, completing the loop at handhole 26 near the JCMT (Exhibit R). All conduits will be installed in accordance with HELCO and Hawaiian Telephone specifications.

Construction Facilities

Concrete Batching Area: Although most of the concrete used in construction will be transported from Hilo by truck as dry mix and mixed with water at the site, on the occasions when three or more large continuous pours are required, a temporary concrete batching plant will be needed. The "skiers' parking lot," located at the 12,700-foot elevation, was designated for that purposed in the SRCDP and has been used as a temporary batch plant during construction of most of the major telescopes atop Mauna Kea.

During these large "pours", aggregate and sacks of cement will be hauled to the proposed batching plant site. The concrete will be mixed there and then transferred in ready-mix trucks to the telescope site. Batching activities will not be undertaken during the winter months, when weather and ground conditions and recreational activities preclude such operations.

No permanent facilities will be constructed at the batching area. After this phase of the construction process is completed, all equipment will be removed and the site restored to its original condition. All equipment utilized in mixing will have self-contained power (gasoline and diesel).

Field Office: A temporary construction field office trailer will be brought to the JNLT site for use by supervisory personnel. It will be removed at the end of the construction period.

Construction Phases

Construction and installation of the telescope is divided into the following phases:

Phase I: Site Preparation and Spur Road -- July 1992 to March 1993

- 9 -

HA-2462

Phase	II:	Construction of the Telescope Building and Control Building April 1993 to March 1995
Phase	III:	Installation of the Rotating Dome January 1994 to March 1996
Phase	IVA:	Installation of the Telescope April 1996 to March 1997
Phase	IVB:	Adjustment of the Telescope April 1997 to March

Construction Activities

1999

Phases I & II: Site preparation and building construction activities include:

- Vertical excavation of approximately 16 feet off of the cinder cone and removal of about 10,900 cubic yards of material to provide a building pad at an elevation of 13,580 feet;
- Excavation for a pathway between the control building and the telescope, a heat exhaust duct, the spur road, structural foundations, utility trenches, wastewater disposal system and fuel storage;
- Placement of excavated material along the outer edges of the telescope pad, along the access road, and in the control building area;
- Excavation of a conduit trench down the southern slope of the cinder cone to extend the underground power and communications conduits from the JNLT site to handhole 26 near the JCMT;
- Grading and filling to provide a level area for construction of the telescope building and control building; grading and filling of the spur road; grading and leveling of the parking areas and other on site excavations when installation is completed;
- Drilling to a depth of 75 feet below ground level for 10-foot-long piers on 65-foot-long piles; excavation and drilling for dome footings; and pouring about 4,400 cubic yards of concrete for piles, piers, footings, other foundations and the pathway between the telescope and the control building. This would involve transferring 550 truck loads of concrete mix from the batch plant at the 12,700-foot elevation to the telescope site; and,
- Paving all vehicular travelways, including the spur road and the gravel access road, and walkways with asphaltic concrete. Runoff from paved surfaces will be directed to lined channels which will conduct the water to collection basins and/or dry wells. This will allow runoff to percolate into the subsurface and thereby prevent surface erosion.

- 10 -

Excavation for the conduit trench down the slope south of the JNLT site may need to be done by hand to minimize ground disturbance. The trench will be backfilled by excavated material to match the adjacent surfaces. Erosion of the backfill on the slope is expected to be minor if concentrated surface drainage is diverted from it.

Recommendations in a recent soils investigation report by Harding-Lawson Associated indicate that fill slopes will not be steeper than 1.5:1 and will be benched into the existing slopes on the cinder cone for stability. There will be no permanent cut slopes.

Phases III and IVA: The rotating cylindrical dome will be fabricated outside Hawaii and assembled on the JNLT site. The dome sections will be transported to the site on flat-bed trucks. Since the mechanical structure that supports the telescope will be large (approximately 300 tons), it will also be transported in sections and assembled on site. It is estimated that about 150 heavy truck and 50 flat bed trailer trips will be required to transport the dome segments and telescope components from the harbors at Hilo and Kawaihae to the JNLT site. All trips of heavy trucks will be scheduled during off-peak hours so as not to interfere with normal traffic flow in Hilo or along the Saddle Road.

Hoisting equipment, such as a large mobile crane, air compressors, welding machines, forklifts and flat-bed trucks will be required. Skilled workers, such as riggers, welders and painters will be needed on site to put the dome in place. After it is established on the building, other skilled workers will work inside the dome to finish the installation. Skilled laborers such as riggers, welders, electricians, and painters will also be needed to install the telescope and its support structure (the "mount"). After the telescope is installed in the building, mechanical and electrical engineers and technicians will complete the installation. As many of these workers as available will be local hires.

Phase IVB: Astronomers, electrical and mechanical engineers, and electronics and mechanical technicians will spend two years adjusting the telescope to assure that it meets the specifications laid down in the design. All of this work will take place inside the buildings.

Construction Costs

Construction costs for the telescope facility are estimated at \$200 million dollars (in 1990 dollars), of which \$36 million will be spent on site preparation and construction on the summit. The telescope is estimated at \$164 million.

<u>Operations</u>

Economics and Employment: The JNLT will be maintained and operated by the NAOJ through its Hawaii headquarters in Hilo. In its normal operating mode, it will have a staff of about 50 people, of whom about half will be locally hired and the other half dispatched from Japan. Operating costs are estimated at \$10 million per year (in 1990 dollars), with about 40 percent of this (\$4 million) being spent in Hawaii annually.

- 11 -

A crew of five will work at the telescope during the day. In addition, three support staff and two night assistants will need accommodations at Hale Pohaku in order to support the astronomers on the summit. Normal observations will be made between sunset and sunrise, except for rare times when infrared observations are made during the daylight hours. From three to six astronomers (depending upon the nature of the observing program) will be present at the telescope each evening.

During periods when new instruments are being commissioned, or the mirrors are being realuminized (about once a year), or a special effort is required for unforeseen problems, additional engineering and technical staff will be required at the summit.

The JNLT will be connected via data communication line with its base support facilities at Hilo, and later with the headquarters in Japan. Remote operations will minimize the number of people at Hale Pohaku and the summit.

Infrastructure and Utilities: Water usage at the JNLT telescope will be less than 120 gallons per day. It will be trucked from Hilo in conjunction with deliveries to other telescope facilities and stored on site. The current number of tanker trips (four times per week) should be adequate to service the JNLT. The additional amount of water needed to supply JNLT will not affect the County of Hawaii water supply.

About 120 gallons per day of wastewater, consisting primarily of human washing and waste, will be disposed of by means of a septic tank with leaching field.

Power usage is estimated at 2,000 kWh per day and there is sufficient capacity in the existing commercial electrical power system to accommodate the JNLT. In addition, the underground power and communications lines will be extended along the souther rime of Pu'u Hau Oki and then down the slope to handhole 26 near the JCMT. Completion of this loop will insure uninterrupted power and communications to the telescopes should a problem occur in the conduits.

Visual Impact: A geometric visibility analysis of the proposed JNLT was undertaken. The results, indicate that the JNLT will not be seen from Hilo. It will be seen, however, from some areas of North Kona and South Kohala, including the town of Waimea, and from Mauna Loa and portions of the Puna District.

FACILITIES AT HALE POHAKU

<u>Dormitory</u>

Phasing: Dormitory construction is expected to commence in April 1997, with occupancy expected in March 1998. This will insure that the building is available for use by JNLT scientists, engineers and technicians during the telescope commissioning period, after first-light.

Location and Design: A new dormitory (Building E) will be constructed on a 35 by 115-foot site at the 9,245-foot-elevation, near the recently completed Building D dormitory (Exhibit H). The site is located within the area identified for dormitory expansion in the SRCDP (Exhibit F).

HA-2462

- 12 -

The dormitory will have a maximum of 32 single occupancy rooms, each with a closet and bathroom. About twelve rooms will be used by JNLT astronomers and technical personnel; the remaining rooms will be allocated to other telescope personnel. The dormitory building will be two stories high and similar in style to the existing buildings. It will be designed to follow the contours of the site and integrate visually with the surrounding environment. No new common area buildings will be constructed.

Access, Infrastructure and Services: Access to the new dormitory will be either by slightly elevated walkway (which will be extended from the existing Building D to meet the new Building E), or from the parking lot area.

Electrical power is provided by connection to the 69-kV HELCO power supply. The existing electrical system will be extended to service the new dormitory structure. Power and communications conduits and potable and not water lines will be installed under elevated walkways.

Water consumption for a fully-occupied 32-room dormitory is estimated at 1,600 gallons per day. This demand cannot be accommodated by the existing water storage capacity at Hale Pohaku and a new 40,000-gallon tank will be constructed in the area designated for that purpose in the SRCDP.

A new septic tank with leaching field will be constructed for wastewater disposal. The Department of Health will be consulted to insure that the method of sewage disposal meets its requirements. A sewer line will be constructed from the new dormitory to the septic tank.

Operating and maintenance services at the Mid-Level Facilities are provided by Mauna Kea Support Services (MKSS); the costs are shared with the existing astronomy users.

Construction Workers' Housing

Phases: At the peak, about 32 construction workers could be needed at the JNLT site at one time. These workers would require housing at Hale Pohaku during the time they are working on the mountain.

Because there will not be space in the existing construction camp at the time the JNLT workers will need housing, NAOJ will construct four 8-person sleeping cabins (Exhibit S) as described in the Construction Camp Master Plan (Exhibit G). The cabins will be built in two phases -- two in 1992 and two in 1993. The first two cabins were included in the Phase I Development, and were approved for construction in CDUA HA-1819.

Location and Design: The cabins will be sited to nestle among the existing trees; as nearly as possible, they will be located in the areas designated on the Master Plan. The one-story buildings will be raised off the ground on wood posts and constructed on pier-type foundations to minimize marring of the terrain. The exteriors of the buildings will blend into the surrounding environment and not detract from the existing buildings at Hale Pohaku.

- 13 -

Access, Infrastructure and Services: Access to the construction camp facilities will be on foot from the parking area. All buildings will be connected by walkways of crushed cinder or gravel confined within suitable curbing material.

The 32 construction workers will require about 1,600 gallons of water per day and disposal of an almost equal amount of wastewater. The existing water lines and electrical conduits will be extended to the new cabins in covered trenches. A new septic tank with leach field will be constructed with a capacity to serve all four cabins.

Construction Activities

The following actions will be taken in the construction of the dormitory, construction camp cabins and associated infrastructure:

- Removal of vegetation and surface rocks, causing the displacement of the fine soil material, during site preparation;
- Grading and/or excavation for concrete footings; septic tanks; extension of utility line through the mid-level and trenching for utility lines to the construction camp; trenching for extension of sewer lines to septic tanks to be located near the new dormitory and at the construction camp site; and, construction of drainage pipes to dry wells;
- Excavation for ¹a new 40,000-gallon water tank in the maintenance area of the Mid-Level Facilities;

Disturbance of the ground surface under and around the buildings would be minimal, since the buildings will be constructed on pier-type foundations. No new paved surfaces will be constructed, so additional erosion protection measures will not be necessary.

Runoff from building roofs would flow into roof gutters and be piped to seepage pits, swales, or catch basins as appropriate to minimize on-site soil erosion.

No mamane trees will be removed as a result of dormitory construction. Expansion of the construction camp will require the removal of only a few clumps of mamane, however, removal of mature trees will be avoided.

<u>Timeframe</u>

Due to the extended construction proposals, the applicant request a seven year timeframe to complete construction, with project commencement by July 1992 and completion by March 1999.

SUMMARY OF COMMENTS:

This application was referred to the following agencies for review and comment: the State of Hawaii, Department of Health, Department of Transportation, Office of State Planning, Office of Hawaiian Affairs, the Department of Land and Natural Resources Divisions of Aquatic Resources, Forestry and Wildlife, State Parks, Historic Preservation Program, Conservation and Resources Enforcement, Land Management, Water Resource Management, and the Natural Area Reserves System, and the County of Hawaii, Department of Planning. Comments received include:

- 14 -

State of Hawaii

Department of Health

We have reviewed the material on the subject project submitted by your office and have the following comments to offer:

Safe Drinking Water

Department of Health Administrative Rules, Chapter 11-20, "Potable Water Systems", Section 11-20-30 requires that new or substantially modified distribution systems for public water systems be approved by the Director. Such approval depends upon the submission of plans and specifications for the project prior to construction and the demonstrations that the new or modified portions of the system are capable of delivering potable water in compliance with all maximum contaminant levels as set forth in Chapter 20. Therefore, please arrange to submit plans and specification to the Department of Health as soon as practicable.

Wastewater

It has been determined that the subject project is located within the non-critical wastewater disposal area, as determined by the Hawaii County Wastewater Advisory Committee. In addition, there are no sewers currently available in the area. The wastewater treatment and disposal concept presented in the plan, septic tank and leaching field, is acceptable. We do reserve the right to review the detailed wastewater plans for conformance to applicable rules in Chapter 11-62.

Department of Transportation

The proposed project will not impact our State highway facilities.

Office of State Planning

We have reviewed the subject application and have no objections if the proposed uses are consistent with the Mauna Kea Science Reserve Complex Development Plan (SRCDP) and/or SRCDP amendments.

Department of Land and Natural Resources

The <u>Division of Aquatic Resources</u> had no comments on the proposed project.

Division of Forestry and Wildlife

We offer the following comments regarding the subject proposal:

- 1. <u>Page 12, Figure 9, Construction Camp Master Plan</u>, shows a "rerouted jeep trail." This route provides recreational access to eastern Mauna Kea. Any detours must accommodate traffic in a direct, safe, and unhindered fashion.
- 2. <u>Page 24, Hale Pohaku, Avifauna</u>. As stated, Hale Pohaku is located within the Palila critical habitat. The use of pesticides should be minimized and carefully controlled to prevent possible damage to the native flora and fauna.

- 3. <u>Page 29, Batch Plant Site</u>. The batch plant should not be located within the Mauna Kea Ice Age Natural Area Reserve as it is not compatible with the intent of the Reserve. The batch plant should be situated so it will be completely within the Mauna Kea Science Reserve.
- 4. <u>Page 36, Re: Stand-by Generator</u>. It is stated that a 1,000-gallon diesel fuel storage tank will be placed underground. A buried storage tank could potentially leak its entire contents undetected. The fuel storage tank should remain above ground to facilitate quick detection of possible leaks.

Division of Land Management

On page A-26 of the subject CDUA the applicant requests Board approval for a right-of-entry to construct improvements on the sites noted, permission to occupy the dormitory, permission to operate the telescope as well as setting time constraints for the completion of construction.

Review and recommendation for Board approval regarding these items is part of Land Management's scope of responsibility. Therefore, we request that OCEA delete this from the CDUA and direct the applicant to apply for the necessary documentation from the Board through Land Management.

The Division of State Parks has no comments on the proposed project.

Historic Preservation Division

(Memorandum of September 12, 1991)

Before commenting on the particular projects covered by this CDUA application, we wish to reiterate our long standing belief that we should be reviewing these projects within the context of a comprehensive management plan for the historic sites in the entire UH management area instead of reviewing the potential effects of each project separately. The cumulative of effects of increased use of the summit area and improved access goes way beyond that which can be assessed at any individual construction site. The historic sites which are or could be effected are clearly of national and statewide significance (including numerous shrines around the summit plateau, burials on cinder cones, and outlier quarry stations and shrines related to the Mauna Kea adze quarry, the largest prehistoric quarry in the world) and often they are small and easily damaged. An overall management plan is vitally needed to properly protect these historic sites and allow timely development of astronomical use of the mountain. We feel that some agreement should be reached on these concerns before another telescope or other major improvements are planned or submitted to our office for review.

The major components of this application, the JNLT telescope, use of a temporary batch plant and expansion of dormitory facilities at Hale Pohaku, are reviewed separately below:

Japan National Large Telescope and Associated Improvements

We believe that construction and use of the Japan National Large Telescope as well as the associated infrastructure will have "no

effect," directly, on historic sites. We have reviewed the archaeological inventory survey report (Appendix B - Archaeological <u>Reconnaissance for Summit and Mid-Level Facilities for the Proposed</u> <u>Japan National Large Telescope, Maunakea, Hawaii</u>, Robbins and Hammatt, November 1990). We concur that the archaeological inventory survey conducted at the proposed telescope site adequately demonstrates that there are no historic sites in areas which would be disturbed by construction activities. This includes paving the existing road, which would provide access to the telescope. We note, however, that the application mentions over 40 sites found in past surveys of nearby areas (p. 29) which were given a state site number of 50-10-23-10228. As a public disclosure document, the application should state that these 40 plus sites have been identified as prehistoric shrines and have been determined eligible for the National and State Register of Historic Places under multiple criteria including cultural significance to the native Hawaiian people.

Use of Parking Lot for Temporary Batch Plant

We agree that use of this area for a batch plant will have "no effect" on historic sites. The area has already been severely modified and has been used for this purpose in the past. We ask that two conditions he placed on the use of this area, however. First, all activities should be strictly confined to the "parking lot" as should all fluid run-off or potentially wind blown debris. Second, the barrier that surrounds the lot should be improved, particularly along the northeastern edge of the lot and the access road which leads to the lot. During a recent field inspection, we noted that four-wheel drive vehicles headed for Lake Waiau were able to pass the bargier constructed around the lot at the point where the access road to the lot crosses the old summit road and underground utility lines. This could be blocked by large boulders, which appear to be an effective barrier around the rest of the lot, or by extending the guard railings from the main road to the parking lot. Blockage is needed to protect inadvertent damage to the large Mauna Kea Adze Quarry, which is a National Historic Landmark.

Construction of 32-Room Dormitory, Water Storage Tank and Construction Worker Cabins at Hale Pohaku

We feel that the archaeological survey and inspection conducted by Robbins and Hammatt (Appendix B) was sufficient to identify all historic sites in areas to be disturbed by construction activities and those that were identified by past inventory surveys in the surrounding area. We concur that construction of these facilities will have "not effect," directly on historic sites. The two additional features found, an oval and a square enclosure, appear to be of recent construction and we agree they are not significant.

To ensure that the increased use of Hale Pohaku has "no adverse effect" on lithic scatters and shrines in the immediately surrounding areas, we agree that a mitigation plan is needed. We feel, however, that the plan should focus on preservation measures and that data recovery is not necessary at this time. Excavation and analysis of these sites require a specialized approach which is beyond the scope of the current mitigation needs. The preservation plan should emphasize measures to create long-term buffer zones that block or discourage access to or through the identified historic sites. If should also address that problem of erosion and

- 17 -

the formation gullies, particularly those caused by run-off from paved areas. During a recent field inspection of the area, we noted that run-off from the Visitors Information Parking Lot was cutting a gully which could, eventually, have an adverse effect on Lithic Scatter No. 2. We ask that drainage catchments be designed to more slowly dissipate run-off from heavy downpours. This would include any under construction and a reevaluation of existing drainage pipes.

(Memorandum of September 13, 1991)

This memo follows up our memo of September 12, 1991. It provides specific conditions to cover contingencies for the impacts of the Japan National Large Telescope, the Temporary Batch Plant, and the Hale Pohaku additions. We believe that these undertakings will have "no adverse effect" to significant historic sites if conditions 1-3 are attached. [Note: The plan called for in Condition 3 is intended to be a very simple, protective action. See our September 12, 1991, memo.]

The last condition addresses our greater concern for developments on the mountain. A number of historic sites of national and statewide significance are on the mountain. The Mauna Kea Adze Quarry is a National Historic Landmark. It is the largest prehistoric quarry in the world. Parts of it are within the NARS area, parts of it extend outside. Small shrines ring the edge of the summit plateau, apparently unrelated to quarrying activity - an extremely unique pattern, and certainly eligible to the National Register of Historic Places as a set of sites, and clearly meritting protection and interpretation. Burials are present on some of the cinder cones, and are extremely sensitive culturally. Additionally, a different type of quarrying activity (one for sinkers) occurred around Pu'u Kalepeamoa, at Hale Pohaku, and has small associated sites and shrines. These sites need proper treatment, and with development for astronomical purposes accelerating on the mountain, it is critical that an overall management plan be in place, so these sites can be protected (and it some cases interpreted) in a compatible fashion with the development. And, we wish to emphasize that we see no problem with the development and that we believe that it can be compatible with proper planning.

Roughly five years ago the University of Hawaii opposed placing the summit shrines on the National Register of Historic Places on a technical processing ground, viewing this placement as a potential impediment to obtaining federal grants for telescope construction. At that time, we worked out an agreement that an overall management plan would be developed and implemented prior to extensive development - as this would achieve our goals of proper treatment. In meetings last year with the University of Hawaii Institute for Astronomy people, they still indicated that this would be done, with funds placed in their next increment of funding. We do believe that this commitment will be carried out. However, it would be desirable to obtain a written commitment with schedules, as a precaution.

Given the plans for rapid expansion of astronomical research, such a written commitment and the execution of a management plan is even more critical. Such a commitment is also likely needed as a step in complying with the National Historic Preservation Act, which must be complied with whenever federal funding (e.g., NSF) or action is involved (e.g., approval of foreign use of the mountain

- 18 -

by some U.S. agency). As part of such compliance, potential impacts to significant historic sites in the area (including indirect impacts to sites immediately outside the project areas) are to be addressed. Currently, the wider concerns are not being addressed in environmental assessments. We believe that a commitment and execution of a management plan would resolve such compliance concerns.

- 1. All activities at the Batch Plant Location shall be confined to the parking lot, as should all fluid run-off or potentially windblown debris, in order to avoid damage to the Mauna Kea Adze Quarry sites.
- 2. The barrier around the Batch Plan shall be upgraded to prevent unauthorized vehicles from passing beyond into the NARS and Mauna Kea Adze Quarry sites.
- 3. Within 6 months, the applicant must develop and execute a detailed historic sites preservation plan to protect the significant historic sites in the immediate vicinity of Hale Pohaku from increasing erosion and traffic in the area. This plan must be approved by the State's Historic Preservation Division prior to its implementation, and that office must also verify in writing that it has been successfully completed.
- 4. Within 5 months, the applicant must develop a scope of work for a historic preservation management plan in their Mauna Kea jurisdiction, as a step towards adequate treatment (preservation and possibly archaeological data recovery) of the significant historic sites on the mountain - particularly the prehistoric shrines encircling the summit plateau, burials on cinder cones, the sites of the Mauna Kea Adze Quarry, and the sites of the outlier sinker quarry near Puu Kalepeamoa. This scope of work must be approved by the State's Historic Preservation. Division. This scope will contain a schedule for when the plan will be developed and when it will be executed.

The <u>Division of Water Resource Management</u> has no objections specific to their programs.

Division of Conservation and Resources Enforcement

A field inspection was conducted on May 23, 1991.

The assigned officer noted that there should be a change in the proposed concrete batching plant. He recommended that it be located outside the Natural Area Reserve, alleviating any further disturbance.

Additionally, he was concerned about the existing water runoff problem that is occurring at the Halepohaku Mid Level Facility, noting erosion.

Natural Area Reserves System

(Memorandum of March 1, 1991)

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Please note that the applicant intends to use the "skiers' parking lot' for concrete batching during the construction of the proposed Japan National Large Telescope. The lot is located in the Mauna

- 19 -

Kea Ice Age Natural Area Reserve. The applicant does not acknowledge this in the narrative or in Figure 6, which erroneously shows the lot outside of the Natural Area Reserve.

As with previous applications to use the "skiers' parking lot" for batching during the construction of telescope projects, a special-use permit is required from the Natural Area Reserves System Commission pursuant to HRS Chapter 195 and Administrative Rule 209, Title 13.

A serious concern over past use of the lot for batching is that the batching activity and the related stock piling of sand/gravel have been encroaching beyond the lot area. Attempts to correct this encroachment with the placement of boulders at the lot's perimeter have not been successful.

(Memorandum of May 7, 1991)

Please refer to our March 1, 1991, comments on this project. The application now acknowledges the requirement to obtain a special-use permit from the Natural Area Reserves System Commission before the "skiers' parking lot" can be used for concrete batching. A major condition of granting the permit will be to maintain the boundary of the parking lot by taking measures that will prevent encroachment beyond the boundary caused by material stockpiling and subsequent batching activity. Another important condition will be clean-up and restoring the lot to its prior to batching condition.

County of Hawaii

Planning Department

We concur with the proposed use of the designated 5 acres site for the Japan National Large Telescope (JNLT) within the Mauna Kea Science Reserve.

We have no objections to the re-establishment of the concrete batching plant at the same previous site provided it is returned to its prior natural condition at the end of its use unless other near future construction work is anticipated. Extreme care should be taken that refuse material is not "dumped" or buried on site, nor should machinery be abandoned there.

For the construction camp at Hale Pohaku, strict compliance with the U.S. Fish and Wildlife Service recommendations should be observed. For instance, we note the applicant's statement that "expansion of the construction camp will require the removal of only a few clumps of mamane...." The FWS stated previously, and currently, that mamane" trees that must be removed shall be transplanted....disturbed areas should be replanted...."

During the construction phase of all the developments, extreme care should be taken that solid waste resulting from the construction and operations is properly disposed. There are no rubbish dump sites on the mountain; transfer stations downhill have a limited capacity; there are county solid waste disposal rules to abide by.

Maintenance of the construction workers camp area should be continuous even when the facilities are not in use.

- 20 -

HA-2462

An earlier letter, June 3, 1991 to the UH Institute of Astronomy stated that these projects are outside the county's Special Management Area thus are not subject to SMA review.

Public Hearing Summary

A public hearing on this application was held on June 13, 1991 in Hilo, Hawaii.

Staff presented information pertinent to the application as received at that date.

A Board member inquired about the Mauna Kea Science Reserve Complex Development Plan and its components relative to the proposed project.

Staff identified that the proposed project is consistent with the Board approved development plan.

A Board member asked what the University of Hawaii plans are for the construction worker's housing after they are no longer required. Staff deferred the questions to U.H. representatives.

A Board member was concerned about drainage impacts at the proposed site.

A spokesperson and his assistant at the Institute for Astronomy made a presentation before the Board. He identified that this project is one of three or four which may be forthcoming to the Board in conformance to the complex development plan. He reviewed the advanced technology aspect of the proposed telescope. He clarified that the modified timeframe request is somewhat due to the Japanese government involvement in the project.

A Board member had questions regarding the availability of general public parking for snow play and skiing. The U.H. responded that there are two paved parking lots. Further, that the U.H. is working on other alternatives to the use of the skiers' parking lot as the "batching plant".

A Board member asked how the facility will benefit Hawaii. The U.H. responded that it has a major economic benefit, it allows U.H. researchers and students guaranteed user access and that it is a high-tech non-polluting industry. Further, the facility will require in-part contributions to common infrastructure requirements (i.e. roadway).

The U.H. responded to a Board member's question regarding the long term use of the construction workers camp. The U.H. anticipates heavy use of the construction camp through the year 2000. Its use beyond 2000 will depend on a process which the U.H. expects to begin in two or three years to begin planning for the extension of the Complex Development Plan beyond the year 2000.

ANALYSIS:

Following review and acceptance of the application for processing, the applicant, by letter dated May 1, 1991, was notified that:

- 21 -

- The proposed use is a conditional use within the Protective and Resource subzones of the Conservation District according to <u>Administrative Rules</u>, Title 13, Chapter 2, as amended;
- 2. A public hearing pursuant to Section 183-41, <u>Hawaii</u> <u>Revised Statutes</u> (HRS), as amended, will be required in that portions of the proposed use is situated within the Protective Subzone; and
- 3. In conformance with Title 11, Chapter 200, of the <u>Administrative Rules</u>, the Office of Environmental Quality Control has determined that the proposed projects have been adequately discussed in previously accepted Environmental Impact Statement (letter of January 8, 1991).

The County of Hawaii, Planning Department has affirmed that the project area is situated outside of the Special Management Area and are thus not subject to SMA review.

The objective of the Protective subzone is to protect valuable resources in such designated areas as restricted watersheds; marine, plant or wildlife sanctuaries; significant historic, archaeological, geological, and volcanological features and sites; and other designated unique areas.

The objective of the Resource subzone is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas.

Section 13-2-21(b) (1) relating to standards requires all applications be reviewed in such a manner that the objective of the subzone is given primary consideration.

Staff has been in consultation with various agencies regarding their submitted comments on the proposed project. The UH/IFA has submitted written clarification regarding some of the concern areas (Exhibit I).

Project Amendment:

Of particular concern is the proposed batching plant use of the "skiers' parking lot" within the designated Natural Area Reserve. As an alternative, the UH/IFA proposes the use of approximately two (2) acres of a previously disturbed 7.2-acre site at about the 13,250-foot elevation as a batching plant. This site was used for Board-approved stockriling and rock-crushing activities in connection with the recently completed access road improvements.

Staff believes this alternative site is a preferable location for a batching plant to that currently existing within the Natural Area Reserve.

In this regard, the UH/IFA should be obligated to assess the NARS site in terms of final abandonment, and return it to as a condition acceptable to the Department.

This alternative is further supported by DOFAW, DOCARE and NARS staff, and the Planning Department of the County of Hawaii. At this time, staff is also in consultation with the Division of Land Management on this issue.

- 22 -

Staff has reviewed other concerns expressed by agencies and has incorporated appropriate conditions for Board consideration to manage the development of the proposed project in an acceptable manner. Of particular concern are those comments submitted by the State Historic Preservation Division. Staff finds that suggested conditions are appropriate with the exception of the use of the "skiers' parking lot" (proposed Condition 1) for a batching plant, as staff now supports the UH alternative site.

Attention has also been given to past Board actions/conditions relative to astronomy facilities on Mauna Kea.

Staff concurs with the applicant's request that due to the extent and complexity of the proposed project, including various subcomponents, a seven (7) year timeframe for the completion of all phases is appropriate. Further, staff concurs with the Division of Land Management that pertinent right-of-entry permission should be obtained via prescribed procedures.

As such, Staff recommends:

RECOMMENDATION:

That the Board approve the subject University of Hawaii, Institute for Astronomy project components, subject to the following conditions:

- 1. The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, <u>Administrative Rules</u>, as amended;
- 2. Since this approval is for use of conservation lands only, the applicant shall obtain appropriate authorization through the Division of Land Management, State Department of Land and Natural Resources for the occupancy of State lands;
- 3. The applicant shall comply with all applicable Department of Health Administrative Rules;
- 4. Before proceeding with any work authorized by the Board, the applicant shall submit four (4) copies of the grading and construction plans and specifications to the Chairperson or his authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three (3) of the copies will be returned to the applicant. Plan approval by the Chairperson does not infer approval required of other agencies. Compliance with Condition 1 remains the responsibility of the applicant;
- 5. Any work or construction to be done on the land shall be initiated within one (1) year of the approval of such use, and all work and construction must be completed within seven (7) years of the approval of such use;

- 23 -

7. That all representation relative to mitigation set forth in the accepted Environmental Impact Statement and the Mauna Kea Science Reserve Complex Development Plan for this proposed use are hereby incorporated as conditions of this approval;

in addition, institute appropriate legal proceedings;

8. That the applicant shall establish a batching plant at the identified alternative site location. The existing site within the Natural Area Reserve shall be assessed and rehabilitated, once abandoned to a condition acceptable to the Department;

- 9. The barrier around the Batch Plan shall be upgraded to prevent unauthorized vehicles from passing beyond into the NARS and Mauna Kea Adze Quarry sites;
- 10. Within 6 months, the applicant must develop and execute a detailed historic sites preservation plan to protect the significant historic sites in the immediate vicinity of Hale Pohaku from increasing erosion and traffic in the area. This plan must be approved by the State's Historic Preservation Division prior to its implementation, and that office must also verify in writing that it has been successfully completed;
- 11. Within 5 months, the applicant must develop a scope of work for a historic preservation management plan in their Mauna Kea jurisdiction, as a step towards adequate treatment (preservation and possibly archaeological data recovery) of the significant historic sites on the mountain - particularly the prehistoric shrines encircling the summit plateau, burials on cinder cones, the sites of the Mauna Kea Adze Quarry, and the sites of the outlier sinker quarry near Puu Kalepeamoa. This scope of work must be approved by the State's Historic Preservation. Division. This scope will contain a schedule for when the plan will be developed and when it will be executed;
- 12. That the applicant shall be held responsible for the removal of all litter from the project and surrounding areas generated from the construction and maintenance of the project;
- 13. That failure to comply with any of these conditions shall render this Conservation District Land Use application null and void; and

- 24 -

14. Other terms and conditions as prescribed by the Chairperson.

Respectfully submitted,

EDWARD E. teven EDWARD E. HENRY Staff Planner

Attachments

Approved for Submittal:

five WILLIAM W. PATY





NORTH



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CDUA NO. <u>HA - 4/18/91 - 2462</u> APPLICANT <u>Institute for Astronomy, U. H.</u> AGENT <u>LIMITED</u> TMK <u>4-4-15: 9, 10, & 12</u>

NORTH



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Figure 9 CONSTRUCTION CAMP MASTER PLAN

EXHIBIT _G CDUA NO. <u>HA - 4/18/91 - 2462</u> Z (111111) RESOURCE APPLICANT Institute for Astronomy, U. H. 127 AGENT_ ທ E TMK <u>4-4-15: 9, 10, & 12</u> GENERAL NORTH



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Figure 16 PALILA CRITICAL HABITAT





Figure 4 MAJOR MAUNA KEA OBSERVATORY TELESCOPES AND JNLT SITE

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		EXHIBIT
NORTH	CDUA NO. <u>HA - 4/18/91 - 2462</u> APPLICANT <u>Institute for Astronomy, U. H.</u> AGENT TMK <u>4-4-15: 9, 10, & 12</u>	



EXHIBIT M





Figure 2 SRCDP: TELESCOPE SITING AREAS





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Figure 11 CONCEPTUAL LAYOUTS OF CONSTRUCTION CAMP CABINS





University of Hawaii at Manoa

Institute for Astronomy 2680 Woodlawn Drive • Honolulu, Hawaii 96822 Telex: 723-8459 • UHAST HR

Office of the Director

August 27, 1991

Mr. William W. Paty, Chairman Board of Land and Natural Resources Kalanimoku Building 1151 Punchbowl Street, Room 131 Honolulu, HI 96813

Dear Mr. Paty:

SUBJECT: CDUA HA-2462 for the Japan National Large Telescope **Response to Comments Received**

Your staff has apprised us of the comments received on the subject CDUA. We wish to respond as follows:

Division of Forestry and Wildlife

Rerouted Jeep Trail

The Construction Camp Master Plan was prepared in 1985. A small section of the jeep trail was rerouted at that time. The new route, as shown on the plan, is more direct and safer than the old route.

Pesticides

No pesticides will be used outside of building areas at the Mid-Level Facilities.

Batching Plant

See response to Natural Area Reserves Program, below

Stand-by Generator

The diesel fuel storage tank will be located in accordance with State and Federal regulations.

Division of Land Management

Right of Entry

In the past, it has been the practice of UH, in cooperation with DLNR, to request right-ofentry at the time of the CDUA. OCEA has coordinated this request with Land Management so that the BLNR could vote on both items at the same time. UH, however, will follow any procedure set forth by the Board that will accomplish this end in a timely manner.

AN EQUAL OPPORTUNITY EMPLOYER

EXHIBIT T | OF 3



RECEIVE

Mr. William W. Paty, Chairman - August 27, 1991 - Page 2

• Time Constraints

Time constraints on commencement and completion of construction are standard provisions in a Conservation District Use Permit. UH believes that modification of these conditions should take place within the CDUA process and that this request should not be deleted from the application.

Natural Area Reserves Program

Batching Plant

As an alternative to the "skiers' parking lot", UH proposes the use of approximately two acres of a previously-disturbed 7.2-acre site, at about the 13,250-foot elevation of the summit area, for a concrete batching plant. (See attached Figure). The 7.2-acre area, originally the site of an 850 kVA generator, was used for approved stockpiling and rock-crushing activities in connection with the recently completed access road improvements. With the Board's approval, UH would use this area for concrete batching in connection with the JNLT.

Should this alternative not be approved, UH will work with the NARS to insure that all conditions for use of the "skiers' parking lot", including the obtaining of a special use permit, are met.

Question from Board at June 13, 1991, Public Hearing

• Visibility

This was addressed in Section II.B.6 (p.45) and Figure 24 of the application. It may be helpful to attach Figure 24 to the staff report.

All conditions on past CDUA's for Hale Pohaku (dorms and construction camp) will be met with the new construction.

Sincerely,

Robert A. McLaren Associate Director

Mauna Kea Division

cc: D. Hall M. Metz RAM/vg

NORTH	CDUA NO. <u>HA - 4/18/91 - 2462</u> APPLICANT <u>Institute for Astronomy, U. H.</u> AGENT TMK <u>4-4-15: 9, 10, & 12</u>	

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MAUNA KEA SUMMIT TELESCOPES AND PROJECT AREAS



NORTH