Written Direct Testimony of Stephanie Nagata

My name is Stephanie Nagata. I am the Director of the Office of Mauna Kea Management ("**OMKM**"). I have served in this capacity since 2012. Prior to that, I served as the Interim Director for four years after serving as Associate Director beginning when OMKM was established in August 2000.

Mauna Kea Science Reserve

In 1968, the Mauna Kea Science Reserve ("**MKSR**") (TMK No. (3) 4-4-015: 009) was leased by the Department of Land and Natural Resources ("**DLNR**") to the University of Hawai'i ("**UH**" or "**University**") under General Lease No. S-4191, which terminates on December 31, 2033. Under General Lease No. S-4191, the MKSR is to be used as a "scientific complex" and as a "scientific reserve." Essentially, the leased land, known as the MKSR, covers all land above the 12,000 foot elevation (except for certain portions that lie within the Mauna Kea Ice Age Natural Area Reserve ("**NAR**")). The entire MKSR is designated a Resource subzone under the State of Hawai'i Conservation District rules and, as such, uses on the land are subject to the Conservation District rules (Hawai'i Administrative Rules ("**HAR**") Title 13, Chapter 5) and permit conditions. In addition, uses on the land are subject to the Board of Regent's approved MKSR Master Plan ("**Master Plan**") (Exhibit A-48) and the Board of Land and Natural Resources ("**BLNR**") approved Mauna Kea Comprehensive Management Plan ("**CMP**") and sub-plans (Exhibits A-9 through A-13).[1] As State land, the MKSR is administered by DLNR, as directed by the BLNR.

In 1983, the University adopted the MKSR Complex Development Plan ("**CDP**"). The CDP, which (except for its management plan) was not a BLNR-approved document, was the

[1] In addition to the documents discussed herein, other documents related to the development of the CMP and CDUA include Exhibits A-14, A-15, A23 through A27, A-47, A60, A67, A-73 through A-75, A-92 through A-95, A-98 through A-102, and A-111.

University's plan for describing astronomy development in the MKSR up to the year 2000. In 2000, the University replaced the CDP through the adoption of the Master Plan.

New Management

The adoption of the Master Plan (Exhibit A-48) by the University Board of Regents ("**BOR**") in June 2000 marked a critical milestone in the management of Mauna Kea. The purpose of the Master Plan was to serve as a policy and planning guide for the University, and its goal was balanced stewardship of the University's managed lands. Meetings and public hearings spanning a period of nearly two years went into the formulation of the Master Plan, which establishes management guidelines for the UH-managed areas on Mauna Kea. The process reflected the community's deeply rooted concerns over the use of Mauna Kea, including respect for Hawaiian cultural practices, protection of environmentally sensitive habitat, recreational use of the mountain, as well as astronomy research.

The purpose of the Master Plan is to guide the University in preserving and protecting the natural, cultural, educational/scientific, and recreational resources of Mauna Kea; preserving and protecting the cultural and natural landscape; preserving and managing the cultural resources for future generations; defining areas for the use of cultural, natural and recreational resources; protecting the right to exercise traditional cultural practices; allowing for sustainable, integrated planning and management; and protecting and enhancing astronomy research.

A major feature of the Master Plan is the establishment of a new on-island community-based management entity that advises the Chancellor of the University of Hawai'i at Hilo ("**UH Hilo**"), who is responsible for overseeing the management of the University's managed lands on Mauna Kea. It is composed of the OMKM, the Mauna Kea Management Board ("**MKMB**"), and the Native Hawaiian advisory council, Kahu Kū Mauna. The members of the MKMB and

Kahu Kū Mauna are volunteers who live on the island of Hawai‘i and who serve in these capacities out of their strong desire to see that the lands under the University's responsibility are properly managed.

The management entity's role and responsibilities include implementing the 2000 Master Plan and the CMP; developing and implementing management policies; reviewing project proposals; and overseeing day-to-day management of public activities, commercial tours, filming, research, and outside-the-dome observatory activities within the managed areas. In addition, the MKMB, with input from Kahu Kū Mauna, makes recommendations to the UH Hilo Chancellor to approve or disapprove major projects presented to them by OMKM, such as the Thirty Meter Telescope ("**TMT**").

Comprehensive Management Plan

To carry out its stewardship responsibilities more effectively, OMKM began developing an integrated approach to management in the Summer of 2005. The concept was to first develop two separate management plans, one addressing cultural resources and the other focusing on natural resources, and then to use those two plans as the foundation for developing the CMP. Accordingly, the University undertook preparation of the Cultural Resources Management Plan (Exhibit A-11) and Natural Resources Management Plan (Exhibit A-10).

The CMP includes a summary of the description of the resources within the managed areas of Mauna Kea, identification of uses and activities, threats to the resources, and management actions to mitigate threats and to protect the resources. It is an integrated planning guide for adaptive resource management that is designed to ensure the protection of Mauna Kea's unique cultural, natural, recreational, educational, and scientific resources. The CMP was submitted and approved by the BLNR on April 9, 2009 with the condition that the University

submit four additional plans (sub-plans) for approval. Exhibit A-50.

The four sub-plans include the previously developed Cultural Resources Management Plan and Natural Resources Management Plan. Exhibits A-11 and A-10. The remaining two plans are the Public Access Plan and the Decommissioning Plan. Exhibits A-12 and A-13. The Decommissioning Plan establishes a process for the eventual removal of observatories and site restoration. It describes the requirements that an observatory must meet regarding their summit facilities to be released from its sublease agreement with the University. It also describes the steps involved in the decommissioning process and establishes requirements to ensure that funding will be available to carry out decommissioning activities. In addition, the Decommissioning Plan discusses the future of astronomy on Mauna Kea, including the University's expectation that by the end of the current lease there will be fewer telescopes than exist today. Exhibit A-13, at 30-34. The Public Access Plan provides a set of principles and policies to guide OMKM in the development of administrative rules relating to public and commercial activities in the managed areas. The recommended policies are based, in large part, on data collected by the OMKM rangers, information from interviews with community members, and guidance obtained during round table discussions with members of the various constituencies interested in and involved with Mauna Kea. The four sub-plans were approved by BLNR on March 25, 2010. Exhibit A-60. Collectively, the CMP and the four sub-plans are referred to as the CMP.

University Management Areas

The lands that are managed by the University include the MKSR, the Hale Pōhaku mid-level facilities, and the Summit Access Road between Hale Pōhaku and the MKSR (including 400 yards on either side of the road excluding the NAR). The MKSR is comprised of 11,288

acres, which is subdivided into a 10,763-acre cultural and natural preserve and a 525-acre Astronomy Precinct.

Pursuant to the Master Plan, development in the MKSR is limited to the Astronomy Precinct. By delineating an Astronomy Precinct, development will be consolidated to ensure a close grouping of astronomy facilities, utilize existing roads and support infrastructure, thereby minimizing the potential for impacts on the resources in the summit region. The Astronomy Precinct boundaries were determined based on: avoidance of archaeological sites; retaining open views to the west of Kūkahauʻula; and preserving the open natural areas to the east of the summit ridge.

In May 2015, the Governor proposed that 10,000 acres of the MKSR be returned to DLNR. OMKM is working with the DLNR and the community on how best to implement the proposed return of land. An Environmental Impact Statement ("**EIS**") for the new master lease for the current UH-managed lands on Mauna Kea is currently being developed, with one alternative considering the impacts of the Governor's ideas. The EIS will review potential impacts of UH managing different dimensions of the MKSR including the current configuration of 11,288 acres as well as a smaller MKSR (less the 10,000 acres) parcel. The EIS will include an evaluation of the potential impacts of UH's management under a new maximum 65 year lease as well as a reduced lease term. In addition, a current project, EnVision Maunakea, a forum for community discussion on the future of Mauna Kea, was recently launched. EnVision Maunakea will be seeking input from the community of their vision and solutions regarding the future of Mauna Kea. Both of these processes, the master lease EIS and EnVision Maunakea, will help inform policy makers when making decisions regarding the future for the Mauna Kea.

Astronomy Development Under the Master Plan

The Master Plan identifies the types of astronomy development that are allowed within the Astronomy Precinct on Mauna Kea. These include the redevelopment or expansion of existing observatory facilities or sites, and a next generation large telescope such as the TMT. Although the Master Plan also cites the development of a new conventional infrared optical telescope and an optical infrared interferometer array, these two types of development are no longer being considered. Exhibit A-13 at 29 - 34. Under the Master Plan, new facilities proposed within the Astronomy Precinct should be designed to avoid disturbing existing habitat and archaeological sites, to limit the extent of additional visual impacts, to implement design measures to blend with the landscape, and to minimize development of new infrastructure by locating near existing roads and utilities. Exhibit A-48 at IX-20.

Major Project Review Process

Another major component of the Master Plan is the project design and approval process. For the first time since the inception of astronomy development on Mauna Kea, the University has defined a multi-phased process for not only providing input and reviewing proposed design concepts, but also for approving observatory development. A key feature of this process is the community's participation. All proposed observatory facility development must undergo a major project review process.

The University's major project review and approval process involves the integration of four processes: (1) Master Plan design review; (2) State (and, if applicable, federal) Environmental Impact Statement; (3) UH project review and approval; and (4) DLNR permitting. To help in the review process, MKMB developed a flowchart that illustrates the integration of the four processes. Exhibit A-52. This flowchart was later approved by the BOR on February 18, 2010, and then by BLNR on March 25, 2010. Exhibit A-58 and Exhibit A-60.

These four processes are described below.

Master Plan Design Review

This is a multi-phased University review process that provides an opportunity for community input and review of the overall design of a proposed observatory facility. The purpose of the Master Plan design and project review process is to ensure that a project: conforms to the Master Plan's goals and objectives (which are described above); is consistent with the Master Plan's design guidelines; relates harmoniously with the summit environment; promotes resource conservation; and does not contribute significantly to cumulative impact. Participants in this process include representatives from the MKMB, Kahu Kū Mauna, the University's Institute for Astronomy, the project developer, and volunteer community experts.

The process involves four phases of review. In Phase I, the proposer is given an orientation of the Master Plan's goal and objectives, overview of the design review process, and design guidelines. The schematics or conceptual drawings of the proposed project's design are reviewed in Phase II (Schematic Design). The MKMB as a whole reviews the outcome of Phase II, and if it has no objections, the process is allowed to move to Phase III (Design Development). Phase III involves the review of detailed drawings including, for example, site plans, floor plans, and elevation plans. Again, the MKMB as a whole reviews the design outcome of Phase III. If there are no objections, the developer can move to Phase IV (Construction Documents Review) and begin preparing its construction drawings. Exhibit A-48 at XI-10 - 12.

The Master Plan design guidelines are used in the development of the overall design of a proposed observatory facility. The purpose of the design guidelines is to direct development in a manner that integrates the facility into the summit environment. The design guidelines include:

Facility siting	Site should avoid cultural and natural resources; minimize visual impacts; locate facility close to existing roads and utility lines.
Scale, heights and widths	Guidelines regarding the design of the telescope facilities to ensure that the facilities, as much as possible, blend with the surrounding landscape, including minimizing visual impacts and using materials that blend with the natural landscape.
Color, roof (dome), and surface textures and materials	Appropriate coloring and materials should be applied to help blend in with the surrounding environment.
Parking, roadway and utility development	Follow existing road and utility corridors in order to minimize roadway development in the MKSR.
Walls and signage	Walls should try to blend into the environment. Signs should be small and unobtrusive.

Environmental Impact Statement

This sequence involves review and approval of an EIS prepared under HRS Chapter 343 (and, if applicable, the National Environmental Protection Act, or "**NEPA**"). It begins with the public scoping process followed by OMKM's review of the Draft EIS, a public comment period, responses to comments received, and preparation of a Final EIS ("**FEIS**"). The MKMB reviews the FEIS and makes a recommendation to the appropriate University office or to the Governor on whether to approve/accept the FEIS.

UH Project Review and Approval

Following the submittal of the FEIS, the MKMB, with input from Kahu Kū Mauna, reviews and recommends approval or disapproval of a project to the UH Hilo Chancellor, who in turn makes a recommendation to the UH President and BOR. The BOR makes the decision whether or not to proceed with the project.

Department of Land and Natural Resources Permitting

Following approval by the BOR, a Conservation District Use Application ("**CDUA**")

is prepared for review by the MKMB. The MKMB then provides a recommendation on the appropriate University agency to submit the CDUA to DLNR.

The Siting of the Proposed TMT Project

As described in the Master Plan, a site within the Astronomy Precinct identified as "Area E" was recommended as the location for a next generation large telescope (such as the TMT). Exhibit A-68 and Exhibit A-48 at IX-25, Figure IX-15/16. This site was chosen for a variety of reasons. Locating the TMT in Area E would situate the observatory at a significant distance from historical and cultural sites including Kūkahauʻula and Lake Waiau, minimize its visibility, reduce wind shear forces, and minimize the potential to obscure the views of existing observatories. The proposed location will take advantage of the northerly extension of the summit ridge and ensure that the TMT facility will not be visible from Hilo. By contrast, due to the large scale of the TMT, the need for major earthwork, and the visibility of a large te lescope enclosure, it would not be appropriate to place it on the summit ridge. In addition, telescope engineers believe wind forces acting on the structure would be severe and problematic if it were located on the ridge. Exhibits A-48 at IX-37 - 39 and A-69.

The following is a summary of the criteria for siting the TMT in Area E (Exhibits A-48 at IX 37 - 39 and A-69):

Minimizes impact on existing facilities	Minimizes obscuration impacts on existing facilities.
Minimizes impact of wēkiu bug habitat	Proposed site is not considered good wēkiu bug habitat.
Avoids archaeological sites	Site is outside the 200 feet setback from the cluster of shrines located outside the Astronomy Precinct and other historic properties; site does not contain any known burials.

Minimizes visual impact from significant cultural areas	Site is not visible from Mauna Kea traditional cultural properties, including Lake Waiau and Kūkahauʻula, except from Kūkahauʻulaʼs north ridge (where other observatories are already located).
Minimizes view from Waimea, Honokaʻa, and Hilo	Visibility is limited to the northern side of the island; TMT will be visible to about 14% of the island area, the great majority of which already has views of one or more observatories. Also contributing to reducing the visibility of TMT is locating the observatory at a lower elevation off the summit ridge, reducing the size of the support facility, and coating the dome with a reflective aluminum-like coating.
Locating facility close to existing infrastructure	Disturbance to the natural terrain is minimized by using an existing roadway for access and the installation of utilities.

Summary of the Review and Approval Process for the TMT Project

The TMT project completed the first three of the four review processes described above and is now undergoing the fourth and final review process, DLNR permitting.

Master Plan Design Review Process

The design development process began in October 2008 and was completed in April 2010. Due to the complexity of the project it took several Schematic Design meetings to arrive at a design that satisfied Master Plan and technical requirements. The MKMB reviewed the schematic design on February 25, 2010 and the design development plans on April 21, 2010. Exhibit A-59 at 2 - 4 and Exhibit A-61 at 2 - 3.

Environmental Impact Statement

An EIS for the TMT Project was prepared pursuant to the requirements of Chapter 343, Hawaiʻi Revised Statutes. On April 21, 2010, the MKMB reviewed the TMT FEIS and recommended that the UH Hilo Chancellor approve and sign the FEIS; that occurred on April 26, 2010. The Governor accepted the FEIS on May 19, 2010. Exhibit A-62 at 2 - 6 and Exhibit A-6.

No timely challenges were ever made to the FEIS.

University Review and Approval Process

On May 19, 2010, the MKMB reviewed the project, including TMT's scientific potential, project design, impacts (both positive and negative), and mitigation measures described in the FEIS. The MKMB, with input from Kahu Kū Mauna, recommended to the UH Hilo Chancellor that she submit a recommendation to the University President and the BOR to approve the TMT project. The BOR approved the TMT project on June 28, 2010. Exhibit A-64.

DLNR Permitting Process

Following the approval of the project by the BOR, the University prepared a CDUA for submittal to DLNR. The MKMB reviewed the CDUA and recommended that the UH Hilo Chancellor accept the CDUA and request the University President to designate UH Hilo as the appropriate agency within the University to submit the CDUA to DLNR. Exhibit A-65. The University President accepted this recommendation, and the UH Hilo Chancellor submitted the CDUA to DLNR on September 2, 2010.

The Board of Land and Natural Resources' Ongoing Supervision and Responsibility

The BLNR has jurisdiction over Conservation District lands, regulates and administers land uses in those lands, and retains management control over them — including the University's managed lands on Mauna Kea. The BLNR's jurisdiction also includes control over decisions affecting Native Hawaiian traditional and customary practices. With respect to the managed areas on Mauna Kea, the BLNR has repeatedly exercised its authority and control by approving the CMP, and the UH project review and approval process. As a condition of the BLNR's approval of the CMP, it designated the BOR, the highest authority within the University, with the responsibility of implementing the CMP. Furthermore, the BLNR regularly

oversees the University's management; it requires the University to report annually on the status of implementation of the CMP management actions. Exhibit A-60. The BLNR also retains management authority over Conservation District lands on Mauna Kea through HAR § 13-5, the Conservation District administrative rules. Proposed astronomy development on Conservation District lands on Mauna Kea requires a BLNR-issued permit. Based on this, the BLNR retains ultimate management authority over Conservation District lands on Mauna Kea. Specifically with respect to TMT, this management authority is further reflected in BLNR considering the TMT CDUA, imposing conditions on the grant of a Conservation District Use Permit, directing that this contested case proceeding be held, and retaining responsibility to review and accept, reject, or modify the hearing officer's findings and conclusions herein.

[*Remainder of page intentionally left blank. Signature page follows.*]

DATED: Hilo, Hawai'i, October 11, 2016.

Stephanie Nagata
Director, Office of Mauna Kea Management