

## Written Direct Testimony of Sara Collins

### **I. Education, Experience, and Qualifications**

I am Sara Collins, Senior Archaeologist at Pacific Consulting Services, Inc. (“PCSI”), where I have worked since 2005. I received a B.A. degree (Anthropology major) from Lawrence University in 1976, and a M.A. (1977) and Ph.D. (1992) in Anthropology from the University of Toronto. I worked as an archaeologist and osteologist at the Bernice Pauahi Bishop Museum from 1980 until 1985; I held positions there as a field crew member, project director, and laboratory director. I worked as a physical anthropologist for the U.S. Army Central Identification Laboratory from 1985 until 1992 where I conducted laboratory analyses and also directed crash and gravesite excavations in Southeast Asia and the South Pacific. From 1992 to 1994, I was the sole proprietor of a consulting firm providing osteological services. From 1994 to early 2005, I worked at the State Historic Preservation Division (“SHPD”) of the Department of Land and Natural Resources (“DLNR”), where I served first as the Moloka‘i and O‘ahu Archaeologist and then as Branch Chief of Archaeology.

Since 2005, I have been employed as a Senior Archaeologist with PCSI, a company that provides cultural resource management (“CRM”) services in archaeology and related areas. In addition to the foregoing positions, I have also taught a graduate class in Historic Preservation (Anthropology 645) at the University of Hawai‘i at Mānoa several times in the last 10 years. I am a qualified archaeologist who meets the standards of the Secretary of the Interior at 36 CFR Part 61, and the requirements of the State of Hawai‘i at Hawai‘i Administrative Rules (“HAR”) 13-281-3. I am also a qualified physical anthropologist who meets the requirements of the State of Hawai‘i at HAR 13-281-8. A copy of my curriculum vitae is provided as Exhibit A-45 in this proceeding.

## II. Cultural Resources

### A. Documentation of Cultural Resources

Since 2005, PCSI has conducted archaeological inventory surveys (“AIS”) on and adjacent to Mauna Kea Science Reserve (“MKS”), the lands leased to the University of Hawai‘i by the State. Final reports for the following areas have been completed and approved by the SHPD:

McCoy, Patrick C., Richard Nees & Stephan D. Clark. 2010. *FINAL REPORT. Archaeological Inventory Survey of the Astronomy Precinct In the Mauna Kea Science Reserve Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i TMK: (3) 4-4-015: 09 (por.).* (Exhibit A-55).

McCoy, Patrick C., Richard Nees & Melanie Mintmeier. February 2010. *FINAL REPORT. Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor, Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i.* (Exhibit A-56).

McCoy, Patrick C. & Richard Nees. August 2010. *FINAL REPORT. Archaeological Inventory Survey of the Mauna Kea Science Reserve, Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i, TMK: (3)4-4-015:009 (por.).* (Appendix I to the TMT Final Environmental Impact Statement (“EIS”), Exhibit A-5, Appendix I).

McCoy, Patrick C. & Richard C. Nees. August 2013. *FINAL REPORT. Archaeological Inventory Survey of the Mauna Kea Ice Age Natural Area Reserve Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i.* (Exhibit A-122).

In addition to the above reports, PCSI also prepared a Cultural Resources Management Plan (“CRMP”) to be implemented by the Office of Mauna Kea Management (“OMKM”) for lands under the University’s jurisdiction:

McCoy, Patrick C., Sara Collins, Stephan D. Clark & Valerie Park. 2009. *A Cultural Resource Management Plan for the University of Hawai‘i Management Areas on Mauna Kea, Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i. TMK: (3) 4-4-012, 015. A Sub-Plan for the Mauna Kea Comprehensive Management Plan.* (Exhibit A-11).

The Board of Land and Natural Resources (“BLNR”) accepted the CRMP in 2010 as a Sub-Plan to the Comprehensive Management Plan (“CMP”) for Mauna Kea. Exhibit A-9. The

CRMP provides recommendations for the management of historic properties and cultural resources documented on the lands under the University's control.

B. Cultural Resources Within the Project Area

With regard to the Thirty Meter Telescope ("TMT") Observatory Project, the TMT Observatory site, the Access Way, and the Batch Plant Staging Area are all within the Mauna Kea Summit Region Historic District – Statewide Inventory of Historic Places ("SIHP") No. 50-10-23-26869 – as previously defined in the SHPD's Mauna Kea Historic Preservation Plan Management Components (SHPD 2000). (Appendix F to the Mauna Kea Master Plan, Exhibit A-48). The District includes a concentration of significant historic properties that are linked through their setting, historic use, traditional associations, and ongoing cultural practices. The properties include shrines, adze quarry complexes and workshops, burials, stone markers/memorials, temporary shelters, historic campsites, traditional cultural properties ("TCPs"), a historic trail, and sites of unknown function. All of these types of historic sites are contributing properties to the Historic District. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 1: pp 8-1 – 8-2). The Historic District has been determined by the SHPD to be significant under all five criteria (A, B, C, D and E), as defined in HAR § 13-275-6.

The TCPs that are contributing properties to the Mauna Kea Summit Region Historic District include Pu'u Kūkahau'ula, Pu'u Waiiau (which encloses Lake Waiiau), and Pu'u Līlīnoe. Specific information on these historic properties includes the following:

- Pu'u Kūkahau'ula (SIHP No. -21438) encompasses the three *pu'u* that form the highest portion of Mauna Kea's summit, Pu'u Hau'oki, Pu'u Kea, and Pu'u Wekiu, all three of which are recent geographic names for these landmarks. Established by the SHPD in 1999 as TCP, Pu'u Kūkahau'ula bears the name of a legendary figure that appears in Hawaiian traditions and is particularly associated, by name, with legends about Mauna Kea. Kūkahau'ula variously appears as the husband of Līlīnoe, a suitor or husband of Poli'ahu, and as an *'aumakua* of fishermen. Exhibit A-55 (McCoy, Nees & Clark 2010: pp 5-15 – 5-20). The Access Way leading to the TMT Observatory would intersect the northwestern edge of Pu'u Kūkahau'ula for approximately 800 feet.

- SHPD designated Pu‘u Līlīnoe as SIHP No. -21439; at the same time, SHPD designated Lake Waiau and the adjacent Pu‘u Waiau as the Waiau Site (SIHP No. -21440). The Waiau Site is located outside the MKSR to the south and actually lies within the Mauna Kea Ice Age Natural Area Reserve while Pu‘u Līlīnoe is within the MKSR, southeast of Pu‘u Kūkahau‘ula. No portion of the current project area is in or near Pu‘u Līlīnoe or the Waiau Site.

In addition to the foregoing TCPs, Pu‘u Poli‘ahu is a summit cone to the immediate southwest of the Astronomy Precinct. Poli‘ahu is a goddess who plays a prominent role in many Hawaiian traditions pertaining to Mauna Kea. Poli‘ahu was variously associated with a trail, spring, pond, and cave in the earliest available sources, but it wasn’t until the 1890s when W.D. Alexander proposed giving her name to a *pu‘u* in the summit region. Exhibit A-5, Appendix I (McCoy & Nees 2010: p 2-30). No portion of the current project is located on Pu‘u Poli‘ahu.

Several archaeological sites recorded during recent surveys are known to be present in portions of the current project area. The following sites are known to be in the vicinity of the Access Way and TMT Observatory Site:

- SIHP No. -16172 was recorded as a shrine and consisted of a single upright with several support stones. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 2: p 2-7). First recorded in the early 1980s, the site was re-located during subsequent surveys in 1995 and 2005. A Bishop Museum entomologist also reported seeing a crude C-shaped structure and other walls in the vicinity in 1982, however these walls were never observed during the 1995 or 2005 surveys. SIHP No. -16172 is located about 225 feet north of the proposed Observatory site.
- SIHP No. -16167 was recorded as a shrine in 1982 and subsequently documented during surveys conducted in 1995, 1999, and 2007. The site consisted of two uprights placed in a bedrock crack. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 2: pp 2-49 – 2-50). SIHP No. -16167 is located approximately 500 feet east of the proposed Access Road, and about 1,300 feet southeast of the proposed TMT Observatory site.
- SIHP No. -16166 was recorded as a multi-feature shrine with eight, possibly nine, uprights arranged in two groups. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 2: pp 2-46 – 2-48). First recorded in 1982, the shrine underwent further documentation during survey work in 1995, 1999, and 2005. SIHP No. -16166 is approximately 350 feet east of the Access Road and 1,600 feet southeast of the proposed TMT Observatory site.

- SIHP NO. -21449 was believed to be a single terrace constructed of stacked cobbles and small boulders with a surface composed of cobbles, small boulders, and thin flat slabs which were probably brought to the locale by human agency. Test excavations did not yield cultural materials or features and the site's function is unknown. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 2: pp 9-2 – 9-5). SIHP No. -21449 is located approximately 200 feet east of the Access Road and 700 feet south of the proposed TMT Observatory site.

The Batch Plant Staging Area is adjacent to the southwestern boundary of Pu'u Kūkahau'ula (SIHP No. -21438), across the Mauna Kea Access Road. No historic properties are known to be within this area. Prior survey work recorded two shrines in the general region of the Batch Plant Staging Area, both of which are more than 500 feet to the west:

- SIHP No. -16164 is a shrine composed of two upright features. Feature 1 consists of three (possibly five) upright stones that are positioned along the edges of a low rectangular platform; Feature 2 consists of a single upright placed in a bedrock crack, supported by several cobbles. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 2: p 2-41 – 2-43). First recorded in 1997, the site was subsequently visited in 2007 and found unchanged.
- SIHP No. -16165 consists of two single uprights about 1.4 meters apart along a ridge; each upright is supported by cobbles. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 2: pp 2-44 – 2-45). The site was first recorded in 1997 and found unchanged in 2007.

Several features of the Pu'u Kalepeamoia Site Complex (SIHP No. 50-10-23-16244) are in the general vicinity of HELCO's Hale Pōhaku Substation; the following site information is drawn from McCoy & Nees, 2010, Vol. 1: p B-1. Exhibit A-5, Appendix I. Two lithic scatters were designated as SIHP Nos. 50-10-23-10310 and -10311. These sites eventually underwent archaeological data recovery after increased erosion made preservation difficult. The data recovery fieldwork demonstrated the presence of both lithic workshops and manufacturing areas for octopus lure sinkers. In addition to the lithic scatters, two shrines are located across the four-wheel drive access road and to the south about 190 feet away from Hale Pōhaku. SIHP No. -10313 is a shrine with three to five upright stones, and SIHP No. -10315 is a single upright

shrine. The shrines and lithic scatters are over 1,200 feet from the HELCO substation and from the nearest electrical pull box that will be accessed when the conductors in the existing conduits are replaced. None of the actions required to implement the proposed project will affect these historic properties.

Only one known archaeological site is present near HELCO's Hale Pōhaku Substation, where transformer swaps will occur. SIHP No. -10320 (also part of the Pu'u Kalepeamoia Site Complex) is a lithic scatter that lies about 200 feet west of the existing substation. None of the potential TMT activities in this area will be carried out near this site.

In addition to these archaeological sites, the original buildings of Hale Pōhaku – the “stone cabins” – are historic in age. Two rest houses date to the 1930s and were constructed by participants in the Civilian Conservation Corps; one comfort station dates to 1950. Exhibit A-123 (Park & Walden 2010). They are over a thousand feet from the work that would be done within the existing HELCO Hale Pōhaku Substation, and will not be used or otherwise affected by the subject Project.

### **III. Traditional and Customary Practices**

I am familiar with the concept of “traditional and customary practices” through my work as a regulator of archaeological activities at SHPD. The CRMP found that there were a number of different kinds of cultural practices occurring on Mauna Kea. Exhibit A-11, § 4.2.1.1. The Cultural Impact Assessment (“CIA”) for the Master Plan EIS recognized two broad categories, (a) traditional and customary practices and beliefs, and (b) contemporary cultural practices. Exhibit A-67 (PHRI 1999:39). I am aware that traditional and customary practices have been and are still carried out in a number of locations on Mauna Kea. Native Hawaiians have traditionally viewed the summit region, including Pu'u Kukahau'ula, as the realm of the

ancestral *akua* (gods, goddesses, deities) who are believed to take earthly form as the *pu'u*, the waters of Lake Waiau, and other significant features of the mountain's landscape. Exhibit A-5, Appendix I (McCoy & Nees 2010: p 2-20). A number of traditional and customary practices are derived from these beliefs; they have also led to related contemporary cultural practices.

1. Traditional shrine construction, pilgrimage, prayer, and offerings: In four seasons of archaeological fieldwork on Mauna Kea, I have personally documented a number of traditional shrines throughout the MKSR, most if not all of which are probably pre-Contact in age. These sites are described in the AIS reports listed above. Although pilgrimage to and prayer or offerings made at these pre-Contact sites cannot be documented archaeologically, it is likely that such practices occurred and were an integral part of the construction of shrines.
2. Modern shrine construction, pilgrimage, prayer, and offerings: The *lele* (altar) erected on Pu'u Wekiu is clear evidence of ongoing religious practices, as is a cluster of modern, apparent shrines in the vicinity of Pu'u Lilinoe, along the Umikoa Trail. Those who are making religious visits, and who may also leave offerings, periodically visit both locales. During my fieldwork with PCSI on Mauna Kea, I have also recorded what appear to be more recent or even modern sites that are called "find spots" in the AIS reports. Some of the "find spots" may also be associated with ongoing religious practices, but their function is ambiguous or unclear in most cases.
3. *Piko* deposition: Several families have traditionally taken the umbilical cords (*piko*) of babies to be placed in Lake Waiau. The antiquity of this practice is not known, but it could be a tradition that extends back into pre-Contact times. Oral history interviews indicate that certain families from Waimea, Kohala, and Kona have connections of this sort with Lake Waiau. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 1: pp 2-42 – 2-44).
4. Scattering of cremation remains: During four seasons of archaeological fieldwork, I have documented traditional burials in a number of locations in the MKSR, primarily on various *pu'u*. None of these burials were cremations. Cremation is not known to be a widely used burial practice in pre-Contact Hawai'i and, according to David Malo, was reserved as an ultimate punishment for those who broke chiefly *kapu* (cited in Exhibit A-5, Appendix I, McCoy & Nees 2010, Vol. 1: p. 2-44). I have seen one cremation burial in the MKSR, and it was probably recent in origin, judging from the condition of the remains; it was not possible to determine ethnicity from the available evidence.
5. Burial blessings: I have not seen direct archaeological evidence of burial blessings in the traditional burials that I have documented during fieldwork, but the obvious care and effort with which the decedents were interred – usually at the summit of a *pu'u* – would suggest ceremonial observances occurred, such as those alluded to in oral history interviews conducted by Kupa Maly (cited in Exhibit A-5, Appendix I, McCoy & Nees 2010, Vol. 1: p 2-44).

6. Collection of snow and water from Lake Waiau: The waters of Lake Waiau are associated with the god Kane and collected for ceremonies and healing purposes among modern cultural practitioners. The time depth of these practices is unknown. Exhibit A-5, Appendix I (McCoy & Nees 2010, Vol. 1: pp 2-46 – 2-47).
7. Compliance with HRS § 6E: Traditional and customary rights in and of themselves are not mandated or regulated through HRS § 6E. The statute does, however, regulate activities that may affect the historic properties on which such practices are centered. In compliance with HRS § 6E and its implementing regulations at HAR 13-276, the AIS reports listed above have made every effort to identify historic properties and any traditional or customary practices associated with them or known to be carried out generally on Mauna Kea in both historic and modern times. In addition, preparation of the CRMP required numerous meetings with stakeholder groups in order to ensure that accurate information and appropriate recommendations were presented in the subsequent plan.

The CMP and the EIS for the TMT project as well as earlier studies commissioned by the OMKM (e.g., Exhibit A-5, Appendix F (Maly & Maly 2005)) have identified ongoing cultural practices involving Mauna Kea with origins in the past. None of those activities is known to be associated with a specific historic property that has been identified in or near the TMT project site aside from those traditional histories and legendary accounts related to Kūkahau'ula TCP and the Mauna Kea Summit Region Historic District.

#### **IV. Protection of Cultural Resources and Mitigation Measures**

It is my opinion that the mitigation measures proposed for the TMT, as more fully outlined in Appendices A (Historic Preservation Mitigation Plan) and C (Historical & Archaeological Site Plan) of the TMT Management Plan (Appendix B of the TMT Conservation District Use Application), will prevent substantial adverse impact to existing and identified historic and cultural resources within the surrounding area, community or region. See Exhibit A-1. Below is a brief description of some of the direct and indirect mitigation measures that will be implemented.



1. Archaeological Monitoring Plan: As detailed in Appendix A to the TMT Management Plan, an Archaeological Monitoring Plan will be prepared and submitted to SHPD for review and approval.
2. Cultural Monitoring: In accordance with the CMP and with the commitments described in the TMT Final EIS, the TMT Project will hire a cultural resource specialist to work in conjunction with the archaeological monitor at all times and in all places or situations where on-site archaeological monitoring is required.
3. TMT Project Design: The TMT Observatory and Access Way have been designed to minimize their potential impacts on cultural resources. The observatory structure is sited in a portion of the Northern Plateau that is more than 200 feet from known historic properties. In addition, the visual effect of the observatory, including its visual impact from areas of cultural importance such as the summit of Kūkahau‘ula, has been minimized through design steps such as reducing its size, finishing the support building and fixed structure exterior with a lava color, and finishing the dome with a reflective aluminum-like surface similar to that on the Subaru Observatory. Furthermore, the Access Way will be limited to a single-lane road (from a previous design of two lanes) and follows an existing single-lane, 4-wheel drive road that was previously disturbed for access and testing of the 13N site in the 1960s. This proposed design omits the retaining wall that was required for the similar “Option 3” route described in the Draft EIS. The portion of the Access Way within the boundaries of Kūkahau‘ula will be paved to reduce dust. Additionally, the pavement and guardrail will be a reddish color that blends with the surrounding area.
4. Noise: TMT will meet with OMKM and the Kahu Kū Mauna council to identify cultural events that would be sensitive to construction noise in the vicinity of the TMT Observatory site. On up to four days per year, to be identified by Kahu Kū Mauna, the Project will endeavor to reduce construction noise and activities in the vicinity of cultural practices. During the operational phase, TMT Observatory operations will be reduced to minimize daytime activities on up to four days in observance of Native Hawaiian cultural practices.
5. Restoration of Batch Plant and Pu‘u Poli‘ahu: A portion of the Batch Plant Staging Area will be restored to a more natural condition upon completion of TMT construction. TMT will also fund restoration of the closed access road on Pu‘u Poli‘ahu to its natural state.
6. Construction Best Management Practices: Construction best management practices (“BMPs”) will also be implemented to avoid potential disturbance of land beyond the planned limits of disturbance.
7. HELCO Pull-Boxes: Existing HELCO pull-boxes and other utility boxes that are visually distracting or intrusive at the summit and other key locations visible from other portions of Kūkahau‘ula will be camouflaged by treating them so as to blend into the natural environment to the extent feasible.

8. Cultural and Natural Resources Training Program: TMT will implement a Cultural and Natural Resources Training Program that will require all construction managers, contractors, supervisors, construction workers and TMT staff to be trained annually regarding the potential impact to cultural and archaeological resources and the measures to prevent such impact.
9. Community Benefits Package: TMT commits to fund a Community Benefits Package (“CBP”) of \$1 million per year, to be administered via The Hawai‘i Island New Knowledge (“THINK”) Fund Board of Advisors. THINK Fund purposes could include scholarships and mini-grants, educational programs, college awards, educational programs specific to: Hawaiian Culture, astronomy, math, and science, and community outreach activities.
10. Community Outreach: TMT will outreach to the community including consulting with the Kahu Kū Mauna council regularly regarding cultural impact issues. The TMT outreach office will also have an open door policy with the Native Hawaiian community to discuss various issues that may arise. TMT will support, financially and through use of its outreach office, the following measures related to cultural resources:
  - Hosting an annual cultural event or training. Examples of how this measure will be implemented include activities such as a star-gazing program at the annual Makahiki festival, workshops on stone adze-making, and workshops on how to recognize archaeological sites and to determine their importance.
  - The translation of chants and mele and the use of their teachings; the focus will include both (a) translation, and (b) developing programs that can be used in schools to spread what is learned about Hawaiian science and genealogy.
  - The translation of modern astronomy lessons into Hawaiian language for use at Hawaiian language charter schools.
  - Development of exhibits regarding cultural, natural, and historic resources in coordination with OMKM and ‘Imiloa that could be used at the Mauna Kea Visitor Information Station, ‘Imiloa, TMT facilities, or other appropriate locations. Exhibits will include informational materials that explore the connection between Hawaiian culture and astronomy.
11. Ride Sharing: TMT will implement a Ride-Sharing Program to reduce the number of vehicle trips between Hale Pōhaku and the TMT Observatory. This step could further reduce the Project’s impact to the spiritual and sacred quality of Mauna Kea by reducing dust, transient noise, and general movements in the summit region.

The mitigation measures for addressing any effects on cultural practices that have been developed for the TMT are consistent with those stipulated in the CRMP and CMP. In addition to implementation of mitigation measures specific to the TMT, management actions pertaining to historic preservation and cultural resources that are contained in the CMP and the CRMP will

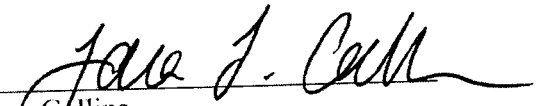
contribute to the protection of these resources.

V. **Compliance with HRS § 6E**

I believe that the AIS fieldwork and related preparation of the CRMP were carried out in accordance with prevailing professional standards. I can further testify that all of the AIS reports and the CRMP have been prepared in compliance with HRS § 6E and its implementing regulations at HAR 13-275 through 13-282. The SHPD and DLNR have reviewed all reports and plans, concurred with their findings and recommendations, and approved them as final.

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

  
Sara Collins  
Senior Archaeologist, Pacific  
Consulting Services, Inc.