CONSERVATION DISTRICT USE APPLICATION (CDUA)
All permit applications shall be prepared pursuant to HAR 13-5-31

File No.:
Acceptance Date: 180-Day Expiration Date:
Assigned Planner:

for DLNR Use

PROJECT NAME  CSO Decommissioning Project
Conservation District Subzone: Resource
Identified Land Use: P-8 Structures and Land Uses, Existing; Demolition and removal
(Identified Land Uses are found in Hawai‘i Administrative Rules (HAR) §13-5-22 through §13-5-25)
Project Address: n/a

Tax Map Key(s): (3)4-4-015:009 (por.)
Ahuupua’a: Ka‘ohe
County: Hawai‘i
District: Hāmākua
Proposed Commencement Date: 6/1/2022
Island: Hawai‘i
Proposed Completion Date: 12/31/2022
Estimated Project Cost: $4,034,040

TYPE OF PERMIT SOUGHT  ☑ Board Permit  ☐ Departmental Permit

ATTACHMENTS
$ 2,500 Application Fee. 2.5% of project cost for Board Permits, but no less than $250, up to a maximum of $2500; $250 for Departmental Permits (ref §13-5-32 through 34).
$ 250 Public Hearing Fee ($250 plus publication costs; ref §13-5-40)
☐ 20 copies of CDUA (5 hard + 15 hard or digital copies)
☐ Draft / Final Environmental Assessment (EA) or Draft / Final Environmental Impact Statement (EIS)
☐ or Statement of Exemption
☐ State Historic Preservation Division HRS 6E Submittal Form
dlnr.hawaii.gov/shpd/review-compliance/forms
☐ Management Plan or Comprehensive Management Plan (ref §13-5-39) if required
☐ Special Management Area Determination (ref Hawai‘i Revised Statutes 205A)
☐ Shoreline Certification (ref §13-5-31(a)(8)) if land use is subject to coastal hazards.
☐ Kuleana documentation (ref §13-5-31(f)) if applying for a non-conforming kuleana use.
☐ Boundary Determination (ref §13-5-17) if land use lies within 50 feet of a subzone boundary.
REQUIRED SIGNATURES

Applicant
Name: California Institute of Technology (Caltech)
Title; Agency: California Submillimeter Observatory
Mailing Address: Mail Code 206-31; California Institute of Technology
1200 E. California Blvd., Pasadena, CA 91125
Contact Person & Title: David Tirrell, Provost
Phone: (626) 395-6336
Email: provostoffice@caltech.edu
Interest in Property: Sublease holder
Signature: ___________________________ Date: 6/24/2021
Signed by an authorized officer if for a Corporation, Partnership, Agency or Organization

Landowner (UH holds general lease S-4191 for the subject TMK; if different than the applicant)
Name: Bonnie D. Irwin
Title; Agency: Chancellor; University of Hawai‘i at Hilo
Mailing Address: 200 Kawili Street
Hilo, Hawaii, 96720-4091
Phone: (808) 932-7348
Email: bdirwin@hawaii.edu
Signature: ___________________________ Date: 6/30/2021
For State and public lands, the State of Hawai‘i or government entity with management control over the parcel shall sign as landowner.

Agent or Consultant
Agency: Planning Solutions, Inc.
Contact Person & Title: Jim Hayes
Mailing Address: 711 Kapiolani Boulevard, Suite 950
Honolulu, Hawaii 96813
Phone: (808) 550-4559
Email: jim@psi-hi.com
Signature: ___________________________ Date: 6/9/2021

For DLNR Managed Lands

State of Hawai‘i
Chairperson, Board of Land and Natural Resources
State of Hawai‘i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai‘i 96809-0621
Signature: ___________________________ Date: ___________
PROPOSED USE

Total size/area of proposed use (indicate in acres or sq. ft.): 1.3 acres

Please provide a detailed description of the proposed land use(s) in its entirety. Information should describe what the proposed use is; the need and purpose for the proposed use; the size of the proposed use (provide dimensions and quantities of materials); and how the work for the proposed use will be done (methodology). If there are multiple components to a project, please answer the above for each component. Also include information regarding secondary improvements including, but not limited to, grading and grubbing, placement of accessory equipment, installation of utilities, roads, driveways, fences, landscaping, etc.

Attach any and all associated plans such as a location map, site plan, floor plan, elevations, and landscaping plans drawn to scale (ref §13-5-31).

The California Institute of Technology (Caltech) subleases a small portion (0.75 ac.) of TMK No. 4-4-015:009, which is known as the Mauna Kea Science Reserve (MKSR), near the summit of Maunakea in Ka‘ohe ahupua‘a, Hāmākua District, on the Island of Hawai‘i. The Caltech Submillimeter Observatory (CSO) is located on the subleased area. The CSO is a 10.4-meter (34 ft.) diameter telescope that was engaged in astronomical observations from 1986 until it ceased operation on September 8, 2015. Caltech tendered its Notice of Intent (NOI) to decommission the CSO to the University of Hawai‘i’s (UH’s) Office of Mauna Kea Management (OMKM, now known as the Center for Maunakea Stewardship or CMS) on November 8, 2015. The location of the CSO is shown in Figure 1-1 and a site plan of the CSO is provided in Figure 1-2 of the Draft Environmental Assessment for the CSO Decommissioning Project (DEA), which is incorporated here as Attachment 1. The "CSO Site," which is 1.3 acres, includes the sublease area and other minor adjacent areas that were disturbed during the original construction or will be disturbed during the proposed decommissioning of the CSO (Figure 1.2 of the DEA).

OMKM (now transitioning to CMS) manages the MKSR according to the terms of the Board of Land and Natural Resources (BLNR)-approved Comprehensive Management Plan (CMP). One component of the CMP is the Decommissioning Plan for the Mauna Kea Observatories (DP). The DP provides the framework for observatories on Maunakea, to ensure that the DLNR as landowner, the UH as Lessee and permittee, and the observatories as sublessees all have clear expectations of the observatory decommissioning process and can plan accordingly. Caltech is now proposing to decommission the CSO, per the terms of its Site Decommissioning Plan for the Caltech Submillimeter Observatory (SDP). The SDP was prepared pursuant to the DP and describes the two primary components of decommissioning: (a) deconstruction and removal of improvements within the CSO Site; and (b) restoration of the CSO Site, as closely as practicable, to its pre-construction condition. The decommissioning process is described in greater detail in Chapter 2 of the DEA (see Attachment 1), and the SDP is incorporated as Appendix A of the DEA.

The purpose of the CSO Decommissioning project is to enable Caltech to conclude its use of the site and surrender its sublease while satisfying its obligations, via Sublease H09176 and other agreements, to UH and the State of Hawai‘i, as related to the CSO through permitting and implementing the complete removal of all improvements on the CSO Site and full restoration of the site (i.e., the Preferred Alternative; see DEA, Chapter 2). The sublease offers four options for termination or expiration of the sublease: (1) sale to UH; (2) surrender with concurrence of UH, (3) sale to a third party acceptable to UH; or (4) removal of all property and restoration of the site to even grade at the expense of Caltech. Consistent with the sublease’s fourth option, the DP, and its own NOI and SDP, Caltech has stated its intent (and Preferred Alternative of the DEA; see Attachment 1) to completely remove all structures on the CSO Site and fully restore the CSO Site.
The Preferred Alternative consists of: (a) BLNR awarding Caltech a Conservation District Use Permit (CDUP) for the decommissioning of the CSO as described in Chapter 2 of the DEA (see Attachment 1); and (b) Caltech then implementing the decommissioning of the CSO. The CSO Decommissioning Project would be conducted according to the methodology described in the SDP (see Attachment 1, Appendix A) and summarized as follows:

1. Removal of all aboveground and underground CSO components within the CSO Site including, but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid.

2. Restoration of the CSO Site, to include: (a) removing fill placed on the lava flow during construction; (b) filling cavities where excavation occurred (e.g., for the cesspool) with a portion of the fill placed on the lava flow during construction of the CSO, which is native to Maunakea; and (c) place fine ash and small rocks that had been screened from the fill material removed on the native lava flow. Items (a) and (b) would return the topography to its pre-construction condition to the greatest extent possible and item (c) would leave a visual appearance consistent with the original condition and restore habitat for native arthropod fauna to the greatest extent possible.

3. Caltech would provide funds to UH to support future decommissioning of infrastructures whose use is shared by other Maunakea astronomical facilities, and which cannot be removed until all uses that they serve have been decommissioned.

4. Caltech would fund site restoration effectiveness monitoring of the former CSO Site for a period of three years to characterize the effectiveness of restoration efforts.

The DEA (see Attachment 1) provides photographs showing the pre- and post-construction condition of the CSO Site (Figures 2-10 and 1-3, respectively), drawings of the facilities present on the site (Figure 1-2), and its relationship to the surrounding area (Figures 1-1 and 1-3).
**EXISTING CONDITIONS**

Please describe the following, and attach maps, site plans, topo maps, colored photos, and biological or archaeological surveys as appropriate:

Existing access to site:

Access to the CSO Site is via Mauna Kea Access Road off of Daniel K. Inouye Highway, State Route 200, known locally as Saddle Road.

Existing buildings/structures:

Existing aboveground structures present on the CSO Site include: (a) the observatory building; (b) outbuilding; (c) water pump shed; and (d) electrical equipment cabinets for generator and transformer. For a detailed description of existing structures on the CSO Site, see Attachment 1, DEA, Section 2.1.1.

Existing utilities (electrical, communication, gas, drainage, water & wastewater):

The CSO Site has electrical and communications service provided by underground conduit entering the sublease area off of Mauna Kea Access Road. Water was trucked to the site and stored in the underground water tank. Wastewater was handled by an underground cesspool. There is also an extensive copper electrical ground grid. For a detailed description of existing structures on the CSO Site, see Attachment 1, DEA, Section 2.1.1.

Physiography (geology, topography, & soils):

The principal rock type on the summit area of Maunakea is Hawaiite, which commonly forms clinkery a’a lava flows or cindercones up to 600 feet high, with ejecta up to 10 feet in size. These Hawaiites range from non-vesicular and dense to extremely vesicular and less dense. The surfaces of lava are frequently striated, which signify overriding glacial movement, and inter-stratified with glacial debris, characterized by loose rock fragments. These, in turn, are interlayered with cinder, ash and other volcanic pyroclastic materials.

Based on available photographs and interviews with UH researchers, the CSO Site is interpreted to originally be an a’a lava flow which vented in the vicinity of the site and flowed primarily northwest with one lobe extending to the south. However, the flow surface has been subject to subsequent glaciation and the original flow paths of the lava are obscured.

The origin of the fill material used on the CSO Site was not documented at the time of construction. Caltech worked with Intera, Inc. to sample and analyze the fill present on the site. The Intera assessment indicate that the fill is consistent with the most recently erupted lavas, the Laupāhoehoe Series, that cover the summit of Maunakea. It is believed that much or all of the CSO Site fill was sourced from an excavation in a Laupāhoehoe Series lava flow during widening of the main Mauna Kea Access Road and possibly tephra from one of the nearby Laupāhoehoe Series cinder cones.

For a detailed discussion of the area's geology, topography, and soils see Attachment 1, DEA, Section 4.5.

Hydrology (surface water, groundwater, coastal waters, & wetlands):

The regional groundwater body below the summit of Maunakea is probably a dike-impounded high-
level aquifer. It is “probable” because there is no direct confirmation of high-level water from drilling. The only surface water in the summit area is Lake Waiau, which is roughly 4,000 feet to the south of the CSO Site. The Pōhakuloa and Waikahalulu Gulches are the most highly developed gulches on the upper mountain slopes. Over three miles south of the CSO Site there are three known springs near Pōhakuloa gulf: the Hopukani, Waihū, and Lilo Springs (collectively “Pōhakuloa Springs”). The CSO Site is miles from any coastal waters or wetlands.

For a detailed discussion of the area’s hydrology, see Attachment 1, DEA, Section 4.6.

Flora & fauna (indicate if rare or endangered plants and/or animals are present):

The CSO Site is within the Alpine Stone Desert ecosystem. A survey of the CSO Site noted the sparse nature of lichens and vegetation. Eleven clumps of lichens were observed. Species observed included: (a) Granite-speck rim lichen (Lecanora polytropa); (b) ʻiwaʻiwa (Asplenium adiantum-nigrum); and (c) pili uka (Trisetum glomeratum). The most abundant vascular plant in and near the survey site was the endemic grass pili uka. Most pili uka clumps were growing on topographically disturbed areas and one individual was found growing in a driveway pavement crack. Several individual ʻiwaʻiwa ferns were found in the CSO Site between the east-to-south sublease boundary and the dirt road, none were found within the subleased area. No other plant species were recorded.

Two endangered birds, ʻuaʻu (Pterodroma sandwichensis or Hawaiian Petrel) and ʻakēʻakē (Oceanodroma castro or Band-rumped Storm Petrel), may utilize the alpine shrublands and grasslands ecosystem lower on Maunakea, but there have been no recorded detections of birds or burrows in the vicinity of the CSO Site. The endangered ʻōpeʻapeʻa (Lasiurus cinereus semotus or Hawaiian hoary bat) has not been detected in the vicinity of the CSO site, but may occur at high elevations.

No threatened or endangered species of flora or fauna were observed on the CSO Site during the biological site assessment. For a detailed discussion of the area's biology, see Attachment 1, DEA, Section 4.3. For the complete Biological Site Assessment, see Attachment 1, DEA, Appendix D.

Natural hazards (erosion, flooding, tsunami, seismic, etc.):

The CSO Decommissioning Project will deconstruct and remove the observatory and restore the site to the maximum extent practicable. Because it will not create any new structures or infrastructure, it is not susceptible to natural hazards and will not increase the vulnerability of the island to natural hazards.

For a detailed discussion of potential natural hazards, see Attachment 1, DEA, Section 4.11.

Historic & cultural resources:

There are no specific archaeological or historic features present on the CSO Site but the site is within the Mauna Kea Summit Region Historic District (State Inventory of Historic Places (SIHP) Site No. 50-10-23-26869). The CSO Site is within the viewshed of certain historic and cultural resources that contribute to the historic district. No traditional or customary practices, beliefs, or resources upon which they depend have been identified on the CSO Site.

For a detailed discussion of archaeological, historic, and cultural resources, see Attachment 1, DEA, Sections 4.1 and 4.2.
EVALUATION CRITERIA

The Department or Board will evaluate the merits of a proposed land use based upon the following eight criteria (ref §13-5-30(c))

1. The purpose of the Conservation District is to conserve, protect, and preserve the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. (ref §13-5-1) How is the proposed land use consistent with the purpose of the conservation district?

   The appropriate management within the MKSR is outlined in the BLNR-approved CMP. The purpose of the CSO Decommissioning Project is to completely remove existing structures and fully restore the CSO Site, as closely as possible, to its pre-construction condition, and to do so in a manner that fully complies with the CMP so that natural and cultural resources are protected and preserved.

   For a discussion of how the proposed project would comply with applicable CMP management actions see Attachment 1, DEA, Section 5.2.5.

2. How is the proposed use consistent with the objectives of the subzone of the land on which the land use will occur? (ref §13-5-11 through §13-5-15)

   The CSO Site is located in the Conservation District, Resource Subzone. The purpose of the Resource Subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas. The proposed project is an identified use within the subzone: P-8 Structures and Land Uses, Existing; (B-1) demolition and removal of existing structures. The proposed project will help meet the objectives of the Resource subzone by (a) complying with the CMP as described above, (b) avoid impacts on other uses in the region that benefit from the natural and cultural resources in the subzone, and (c) comply with the goal of sustainable use by eliminating the use of natural resources at this site and restoring the site, as closely as possible, to its preconstruction condition.

3. Describe how the proposed land use complies with the provisions and guidelines contained in chapter 205A, HRS, entitled “Coastal Zone Management” (see 205A objectives on p. 9).

   The CSO Decommissioning Project is not a development and will occur at an elevation exceeding 13,000 feet above sea level. It will not adversely impact coastal resources, uses, or activities and will not prevent or curtail access to any coastal recreational opportunities. Consistent with Hawai’i’s Coastal Zone Management (CZM) program, the public will have an opportunity to review the DEA prepared in support of this application and provide comments. For a detailed discussion of the project’s consistency with the CZM Program, see Attachment 1, DEA, Section 5.2.3.

4. Describe how the proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.

   The CSO Decommissioning Project is limited to the removal of existing structures and restoration of the CSO Site, as closely as possible, to its pre-construction condition. The proposed project will not cause any substantial or significant adverse impacts to existing natural resources on the CSO Site or within the surrounding area. In fact, the proposed project is expected to benefit the natural environment through habitat restoration and the recolonization of the area by native flora and fauna. For a detailed discussion of existing natural resources in the area and potential project related impacts, see Attachment 1, DEA, Chapter 4.
5. Describe how the proposed land use, including buildings, structures and facilities, is compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

The proposed land use does not include the development of any buildings, structure, or facilities. The CSO Decommissioning Project will, to the maximum extent practicable, remove all structures, and restore the CSO Site, as closely as possible, to its pre-construction condition. In doing so, the CSO Site will be restored to a natural appearance, consistent with the locality and surrounding areas, and appropriate to the physical conditions of the Maunakea summit region.

6. Describe how the existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon.

The CSO Decommissioning Project will, to the maximum extent practicable, remove all structures, and restore the CSO Site, as closely as possible, to its pre-construction condition. In doing so, the CSO Site will be restored to a natural and open appearance, consistent with the locality and surrounding areas, and appropriate to the physical conditions of the Maunakea summit region.

7. If applicable, describe how subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.

The proposed action does not involve the subdivision of land.

8. Describe how the proposed land use will not be materially detrimental to the public health, safety and welfare.

Although the proposed project will render the CSO Site less safe, through the restoration of the uneven topography that is natural to the area, it will not be materially detrimental to public health, safety, or welfare because (a) the location is not known to be visited by the public for cultural, recreational, or other purposes; and (b) the site condition will be consistent with the surrounding undisturbed areas.
CULTURAL IMPACTS

Articles IX and XII of the State Constitution, other state laws, and the courts of the State, require government agencies to promote and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups.

Please provide the identity and scope of cultural, historical, and natural resources in which traditional and customary native Hawaiian rights are exercised in the area.

The Cultural Impact Assessment (CIA) prepared for the CSO Decommissioning Project (see Attachment 1, DEA, Section 4.2 and Appendix C) indicates that current-day Hawaiian cultural activities on Maunakea are perceived by the practitioners of those activities to be an exercise in, and extension of traditional and customary practices. The CIA did not identify any practices that are exercised on the CSO Site, but there are a wide variety of practices, beliefs, and resources associated with Maunakea's summit region.

Identify the extent to which those resources, including traditional and customary Native Hawaiian rights, will be affected or impaired by the proposed action.

The conclusion of the CIA prepared for the CSO Decommissioning Project (see Attachment 1, DEA, Section 4.2 and Appendix C) is that the proposed project, in particular its goal of restoring the site to the maximum practicable extent, would have a beneficial effect on Native Hawaiian practices.

What feasible action, if any, could be taken by the Board of Land and Natural Resources in regards to your application to reasonably protect Native Hawai’i rights?

All feasible actions identified by CIA participants (e.g., cultural monitoring) have been incorporated into the proposed action. Because the CSO Decommissioning Project is anticipated to have a beneficial affect, the Board’s timely approval of this CDUA is the most constructive course of action.
OTHER IMPACTS

Does the proposed land use have an effect (positive/negative) on public access to and along the shoreline or along any public trail?

The proposed land use will not have any effect on public access to, or along, the shoreline or any public trail. There are no public trails on the CSO Site, which is many miles from the shoreline.

Does the proposed use have an effect (positive/negative) on beach processes?

The proposed land use will have no interaction with, or effect on, beach processes.

Will the proposed use cause increased sedimentation?

Placement of dust and erosion control barriers at appropriate locations established in a Storm Water Pollution Prevent Plan (SWPPP), which will be a component of the National Pollutant Discharge Elimination System (NPDES) general construction permit, will appropriately manage the potential for increased sedimentation during short-term deconstruction and restoration activities. The return of the CSO Site, as closely as possible, to its pre-construction condition will not generate an unnatural risk for increased sedimentation over the long-term.

Will the proposed use cause any visual impact on any individual or community?

The DEA (see Attachment 1, Section 4.4) discussed the visual and aesthetic resources and the project potential effects on them. The proposed project involves removing existing structures on the CSO Site and restoring it, as closely as possible, to its pre-construction condition. As such, the removal of the existing visual presence will have a beneficial effect on the visual environment.

Please describe any sustainable design elements that will be incorporated into the proposed land use (e.g. the use of efficient ventilation and cooling systems; renewable energy generation; sustainable building materials; permeable paving materials; efficient energy and water systems; efficient waste management systems; etc.).

The CSO Decommissioning Project does not involve the addition of any new structures or infrastructure.

If the project involves landscaping, please describe how the landscaping is appropriate to the Conservation District (e.g. use of indigenous and endemic species; xeriscaping in dry areas; minimizing ground disturbance; maintenance or restoration of the canopy; removal of invasive species; habitat preservation and restoration; etc.)

Landscaping. As the excess fill is removed from the CSO Site, a quantity of approximately five cubic yards of fine ash material and small rocks, consistent with the size and composition of rocks scattered in nearby undisturbed areas, will be segregated using mesh screens and other appropriate methods and stockpiled on-site or at a staging area. Once the excess full material has been removed, the reserved fine ash and small rocks will be layered on top of the summit-native rock to leave a visual appearance consistent with the original condition of the CSO Site. See Attachment 1, DEA, Section 2.1.2.16 for a detailed discussion of finish grading. No plantings will be done.

Invasive Species. Several factors will minimize the potential for invasive species becoming established in the project area as a result of the proposed action. Heavy machinery and equipment brought to the CSO Site will be properly cleaned and inspected per the Maunakea Invasive Species
Management Plan prior to being brought to the summit region. No building materials or aggregate will be transported from lower elevations to the CSO Site on which invasive species could "hitchhike." Workers will be educated regarding habitat sensitivity and methods to reduce the likelihood of invasive species become established, including the daily collection and removal of all food waste. The CSO Site will be monitored monthly for invasive species during deconstruction and restoration activities. In addition, the extreme environmental conditions at the summit are not conducive to establishment of most species not already present. Finally, three years of monitoring following the project's completion will provide ample opportunity to identify and eradicate any colonist species. See Attachment 1, DEA, Section 4.3.3.1 and Appendix I, Section 2.4, for a detailed discussion of invasive species precautions.

Flora and Fauna. It is expected that lichens, mosses, and vascular plants would recolonize the site after it is restored, as has been the case in other disturbed areas in the summit area. Due to extreme environmental conditions, recolonization of the restored site will likely take longer than it would at a lower elevation. Overall, the reduction in hardscape, increase in natural habitat, and recolonization of that habitat by species already established in the area represents an environmental benefit. Arthropod surveys in areas around the summit have recorded the presence of native arthropods in many previously disturbed areas, including around observatory structures, indicating a high likelihood of arthropods recolonizing the site after restoration. See Attachment 1, DEA, Section 4.3.3.1 for a detailed discussion of biological impacts.

Please describe Best Management Practices that will be used during construction and implementation of the proposed land use.

Best Management Practices (BMPs) incorporated into the CSO Decommissioning Project are discussed in Attachment 1, DEA, Section 2.1.2.1 and Appendix I, and address applicable CMP management actions. They include, but are not limited to, the following:

1. Require an independent construction monitor who has oversight and authority to insure that all aspects of ground-based work comply with protocols and permit requirements.

2. Require use of Best Management Practice Plan for Construction Practices. This plan will include measures to comply with applicable aspects of the CMP and other guidance, including (a) worker orientation regarding historic, cultural, ecological, and natural resources; (b) invasive species monitoring program; (c) safety and accident prevention; (d) spill prevention and response; (e) materials storage and waste management; (f) erosion and water quality measures; (g) dust and debris management; and (h) coordination with/reporting to CMS. All BMPs will be implemented during both the deconstruction and restoration phases.

3. Develop and follow a rock movement plan. The plan is provided in Attachment 1, DEA, Appendix I, Section 4.0.

4. Require contractors to provide information from construction activities to the Center for Maunakea Stewardship (CMS) for input into CMS information databases.

5. Require on-site monitors (e.g., archeological, cultural, and biological monitors) during deconstruction, as indicated in monitoring plans. Monitoring plans are provided in Attachment 1, DEA, Appendix I, Section 2.4 (biological), and Attachment 1, DEA, Appendix J (archaeological and cultural).

6. Conduct required archaeological monitoring during construction projects per State Historic Preservation Division-approved plan. The Archaeological Monitoring Plan submitted to SHPD for review is provided in Attachment 1, DEA, Appendix J.
7. Provide education regarding the archaeological, historical, and cultural significance of the area, along with education regarding its environment, ecology, and natural resources.

9. Inspect all construction materials.

Please describe the measures that will be taken to mitigate the proposed land use’s environmental and cultural impacts.

Archaeology. Archaeological monitoring per the terms of the Archaeological Monitoring Plan. See Attachment 1, DEA, Section 4.1.5.

Cultural Resources. Independent on-site cultural monitor will be present as specified in the Archaeological Monitoring Plan, which includes a cultural monitoring component. See Attachment 1, DEA, Section 4.2.5 and Appendix J.

Biology. All persons involved with decommissioning activities, including planning, demolition, and site restoration, will participate in a mandatory training about the natural resources on Maunakea. In addition, Caltech will institute measures to: (a) minimize habitat disturbance; (b) avoid introduction of non-native species; (c) manage onsite material storage and disposal; and (d) conduct invasive species monitoring. See Attachment 1, DEA, Section 4.3.4.

Geology, Topography, and Soils. BMPs including: (a) erosion and water quality measures; (b) dust and debris management; and (c) worker orientation regarding historic, cultural, ecological, and natural resources. See Attachment 1, DEA, Section 4.5.4.

Hydrology. Follow HDOH-WB guidance including General Backfilling Scenarios for an Injection-Well Cesspool. See Attachment 1, DEA, Section 4.6.3.

Solid and Hazardous Waste. Implement the Phase II Sampling and Analysis Plan (e.g., sample and analyze material below the CSO foundation and CSO cesspool). Prepare Phase II Environmental Site Assessment assessing whether contaminants (i.e., hydraulic oil) are present in soil beneath the CSO Site and remediate, as necessary. See Attachment 1, DEA, Section 4.7.3.

Traffic. Follow Traffic Management Plan guidance including: (a) temporary signage; (b) changeable message boards; (c) channelizing devices; (d) flaggers and uniformed traffic control officers; (e) barricades; (f) portable barriers; and (g) escort vehicles. Caltech and its contractors will coordinate with CMS and other Maunakea observatories to prevent conflicts between different operations (e.g., TMT construction) which may occur concurrently and to minimize impacts on public access to the summit region. See Attachment 1, DEA, Section 4.8.3.

Noise. Adhere to HAR, Title 11, Chapter 46. Also, total number of vehicle trips for workers will be minimized via ride-sharing and/or vanpooling, when appropriate. See Attachment 1, DEA, Section 4.9.4.

Air Quality. Follow BMPs related to: (a) erosion, (b) dust, (c) debris management; and (d) requiring all vehicles and equipment to be maintained in good working condition. See Attachment 1, DEA, Section 4.10.3.

Natural Hazards. Follow provisions of fire prevention, suppression, and emergency evacuation plan in coordination with HCFD, and adhere to NFPA’s Code 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations. See Attachment 1, DEA, Section 4.11.3.
**Single Family Residential Standards**

Single Family Residences must comply with the standards outlined in HAR Chapter 13-5, Exhibit 4. Please provide preliminary architectural renderings (e.g. building foot print, exterior plan view, elevation drawings; floor plan, etc.) drawn to scale.

**Size of Lot**

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<th>Existing</th>
<th>Proposed</th>
<th>Total</th>
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<tr>
<td>Proposed building footprint</td>
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<td>Paved areas/impermeable surfaces</td>
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<td>Landscaped areas</td>
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<td>Unimproved areas</td>
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**Setbacks**

Front: 
Side: 
Back:

**Shoreline Properties**

Average Lot Depth (ALD): 
Average annual coastal erosion rate:

Minimum shoreline setback based on Exhibit 4:

Actual shoreline setback or proposed structure:

**Maximum Developable Area**

The Maximum Developable Area includes all floor areas under roof, including first, second, and third stories, decks, pools, saunas, garage or carport, and other above ground structures.

Maximum Developable Area based on Exhibit 4:

Actual Developable Area of proposed residence:

Actual height of the proposed building envelope as defined in Exhibit 4:

**Compatibility**

Provide justification for any propose deviation from the established residential standards.

How is the design of the residence compatible with the surrounding area?

If grading is proposed, include a grading plan which provides the amount of cut and fill. Has grading or contouring been kept to a minimum?
CHAPTER 205A – COASTAL ZONE MANAGEMENT

Land uses are required to comply with the provisions and guidelines contained in Chapter 205A, Hawai‘i Revised Statutes (HRS), entitled "Coastal Zone Management," as described below:

- **Recreational resources**: Provide coastal recreational opportunities accessible to the public.

- **Historic resources**: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

- **Scenic and open space resources**: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

- **Coastal ecosystems**: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

- **Economic uses**: Provide public or private facilities and improvements important to the State's economy in suitable locations.

- **Coastal hazards**: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

- **Managing development**: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

- **Public participation**: Stimulate public awareness, education, and participation in coastal management.

- **Beach protection**: Protect beaches for public use and recreation.

- **Marine resources**: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.
CERTIFICATION

I hereby certify that I have read this completed application and that, to the best of my knowledge, the information in this application and all attachments and exhibits is complete and correct. I understand that the failure to provide any requested information or misstatements submitted in support of the application shall be grounds for either refusing to accept this application, for denying the permit, or for suspending or revoking a permit issued on the basis of such misrepresentations, or for seeking of such further relief as may seem proper to the Land Board.

I hereby authorize representatives of the Department of Land and Natural Resources to conduct site inspections on my property. Unless arranged otherwise, these site inspections shall take place between the hours of 8:00 a.m. and 4:30 p.m.

Signature of authorized agent(s) or if no agent, signature of applicant

AUTHORIZATION OF AGENT

I hereby authorize_______ James Hayes _______ to act as my representative and to bind me in all matters concerning this application.

_____________________________
David A. Tirrell, Provost, California Institute of Technology

Signature of applicant(s)