

economic, and educational benefits" of the ATST Telescope, the expected "advancement of scientific knowledge" and the opportunity to "foster a better understanding of the relationships between native Hawaiian culture and science"), even if those factors are not specifically set forth in HAR § 13-5- 30(c) *Id.*

119. With respect to HAR § 13-5-30(c)(5) ("The proposed land use, including buildings, structures, and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels"), the Court held that under this criterion, the BLNR may focus its analysis on the permitted land use within the context of a specific area within a Conservation District designated for similar uses (*i.e.*, the Court concluded that the BLNR's interpretation of its own rule as limiting its consideration only to the "locality" of the telescope site and the HO area as the "surrounding area" was not clearly erroneous because the telescope would be located in a small subsection of the HO site, which is a clearly defined, specialized area set aside for astronomical purposes, is the only site within Haleakalā used for that purpose, and the BLNR was not required to consider the broader "surrounding area" of Haleakalā National Park). *Id.* at 406-07, 382 P.3d at 218- 19.
120. With respect to HAR § 13-5-30(c)(6) ("The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable"), the Court held that even though the BLNR may conclude that a project, standing alone, does not "enhance the natural beauty or open space characteristics" of a specific site, the BLNR may properly consider whether the project is similar to existing facilities (and thus will preserve the existing physical and environmental aspects of the land), and the BLNR may also properly consider the project's mitigation commitments in determining whether the proposed land use meets this criteria.

X. DISCUSSION AND CONCLUSIONS

A. THE TMT PROJECT SATISFIES THE EIGHT CRITERIA OF HAR § 13- 5-30(C)

121. HAR § 13-5-30(c) states that "[i]n evaluating the merits of a proposed land use, the department or board shall apply the following criteria," and enumerates the list of eight criteria quoted above.
122. As set forth herein, the TMT Project satisfies the eight criteria for a BLNR-approved CDUP under HAR § 13-5-30(c). WDT White at 13; Ex. A-31; (White) Tr. 10/20/16 at 218:3- 28:5; (White) Tr. 10/24/16 at 24:17-23.
123. Many of the Petitioners, Opposing Intervenors, and their witnesses claimed during their testimonies that the TMT Project does not comply with the eight criteria in HAR § 13-5-30. However, in offering their respective testimonies, the Petitioners, Opposing Intervenors, and their witnesses repeatedly admitted that they did not even consider or read the Hawai'i Supreme Court's recent decision in *Kilakila 'o Haleakalā v. Board of Land and Natural Resources*, 138 Hawai'i 383, 382 P.3d 195 (2016), which extensively

discussed several of the same eight criteria. *See* (Prof. Fujikane) Tr. 1/11/17 at 84:25-85:15; Tr. 1/19/17 at 129:2-11 (Dr. Abad); Tr. 1/25/17 at 147:18-24 (Prof. Mills); (Flores) Tr. 1/30/17 at 229:3-6 (Flores); Tr. 1/31/17 at 135:7-10 (Ward); Tr. 2/22/17 at 132:20-133:8 (Ho); Tr. 2/28/17 at 263:15-20 (Trask); Tr. 3/1/17 at 202:22-25 (Camara). While Frankel, who testified on behalf of KAHEA in this proceeding, represented the appellant in the *Kilakila* case, he testified on cross examination that he did not consider *Kilakila* in offering his testimony in this proceeding because it did not involve the public trust doctrine, which his testimony in this proceeding was limited to. Tr. 1/11/17 at 49:9-17.

124. Based upon the findings of fact and conclusions of law contained herein, the TMT Project is consistent with the eight criteria of HAR § 13-5-30(c), and UH Hilo has proven by a preponderance of the evidence that it meets the requirements for the granting of the CDUP for the TMT Project.

i. The TMT Project Satisfies the First Criterion

125. The first criterion, set forth in HAR § 13-5-30(c)(1), states: "The proposed land use is consistent with the purpose of the conservation district[.]"
126. The purpose of the Conservation District is "to conserve, protect and preserve the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety and welfare." HRS § 183C-1.
127. The purpose of the Conservation District rules is "to regulate land-use in the conservation district for the purpose of conserving, protecting, and preserving 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." HAR § 13-5-1.
128. Therefore, the issue under the first criterion is whether the proposed land use will be appropriately managed and used to protect, preserve and promote the long-term sustainability of important natural resources, public health, safety and welfare.
129. The 11,288-acre MKSR is within the Conservation District, and the proposed TMT Project is within the MKSR's 525-acre Astronomy Precinct, which currently houses eight optical and/or infrared observatories, and three submillimeter observatories.
130. The proposed use within the already-developed Astronomy Precinct is consistent with the purpose of the Conservation District to conserve, protect, preserve and promote the long-term sustainability of the surrounding areas within the MKSR.
131. In addition, the TMT Project provides for "appropriate management and use" that promotes the long-term sustainability of resources and the public health, safety, and welfare within the Conservation District.
132. As noted in the findings of fact above and in these conclusions, the TMT Project will promote the health, safety and welfare of the public through the advancement of scientific

study, providing educational benefits in the form of telescope viewing time for the University students and researchers, advancing STEM educational opportunities for Hawai'i residents through the community benefits package, and other measures.

133. The TMT Project will be subject to management through the BLNR-approved CMP and sub-plans, TMT Management Plan, which complies with Ex. 3 of Section 13-5 of the Hawai'i Administrative Rules, and the BLNR-imposed conditions to the CDUP, as well as the University's internal Master Plan. The TMT Project is consistent with the foregoing plans, and this comprehensive management framework appropriately addresses cultural and natural resources, public access, and the ultimate decommissioning of the Project and restoration of its site.
134. By following the applicable provisions of the various relevant plans, sub-plans, and permit conditions, UH Hilo and the TIO will conserve, protect, and preserve the important natural and cultural resources of the State, will promote the long-term sustainability of those resources, and will promote the health, safety, and welfare of the public.
135. By following the applicable provisions of the various relevant plans, sub-plans, and permit conditions, the TMT Project will comply with the Conservation District rules and applicable laws and regulations.
136. The characteristics that make Mauna Kea uniquely suitable for astronomy (including its altitude, stable atmospheric clarity and absence of light pollution), which make it arguably the single best location in the northern hemisphere to conduct astronomical research, are also "important natural resources of the State" that must be appropriately managed and used to "promote their long-term sustainability and the public health, safety, and welfare."
137. Given the TMT Project's design, mitigation efforts, planned financial contributions to the management of MKSR, and consistency with the objectives and provisions of the applicable plans, the TMT Project will conserve, protect and promote these unique and important astronomical natural resources of the State.
138. For all of these reasons, and for the reasons set forth in the findings of fact above, the TMT Project is therefore consistent with the broad purposes of the Conservation District, in satisfaction of HAR § 13-5-30(c)(1). *See Kilakila*, 138 Hawai'i at 408, 382 P.3d at 220.

ii. The TMT Project Satisfies the Second Criterion

139. The second criterion, set forth in HAR § 13-5-30(c)(2), states: "The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur[.]"
140. The TMT Project is consistent with the objectives of the subzone of the land on which the use will occur, in satisfaction of HAR § 13-5-30(c)(2).
141. The TMT Project is located in the Resource subzone.

142. Under the version of HAR § 13-5-13(a) that was in effect when the CDUA was submitted to the BLNR, "[t]he objective of this [Resource] subzone is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas." The current version of HAR 13-5-13(a) states: "The objective of this subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas."
143. Thus, the Resource subzone expressly contemplates and permits use and development within the subzone, and the TMT Project, as an astronomy facility, is specifically and expressly permitted as an allowed use within the Resource subzone of the Conservation District. HAR § 13-5-24(c) R-3.
144. As noted in the findings of fact above and conclusions herein, although the BLNR has reviewed and considered the physical characteristics of the TMT Project and proposed mitigation measures in connection with its analysis of various criteria, the BLNR notes that for purposes of the criteria in HAR § 13-5-30(c)(1) and (c)(2), these rules do not specify limits as to the size, appearance or other characteristics of an astronomy facility within the subzone.
145. As an astronomy facility, the TMT Project falls under an appropriate use and is consistent with the purposes of the Resource subzone.
146. One of the objectives of the subzone is to develop and promote science through astronomy facilities constructed in the approved geographic areas, including Area E within the Mauna Kea Astronomy Precinct.
147. The TMT Project develops, with proper management, the areas involved in the Project to ensure sustained use of the natural resources of those areas. These include the elevation, clear skies, humidity, minimal light pollution, and stable wind flow.
148. Under the version of HAR § 13-5-24(c) that was in effect when the CDUA was submitted to the BLNR, "Astronomy facilities under an approved management plan" are permitted in the Resource subzone. Astronomy facilities under a management plan approved by the Board are also permitted in the Resource subzone under the current version of the HAR.
149. Under the version of HAR § 13-5-2 that was in effect when the CDUA was submitted to the BLNR, "'Management plan' means a comprehensive plan for carrying out multiple land uses."
150. The CMP, with its sub-plans, is a comprehensive plan for carrying out multiple land uses that had already been approved by the BLNR and was in place when the CDUA for the TMT Project came before the BLNR.
151. The TMT Project, as set forth in the CDUA and supporting documents, is consistent with the provisions of the CMP and sub-plans.
152. Under the amended version of HAR § 13-5-13(a) that is currently in place, "[t]he objective of this [Resource] subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas."

153. The TMT Project ensures, with proper management, the sustainable use of the natural resources of the areas involved in the Project.
154. Under the amended version of HAR § 13-5-24(c) that is currently in place, "Astronomy facilities under a management plan approved simultaneously with the permit" are permitted in the Resource subzone.
155. Under the amended version of HAR § 13-5-2 that is currently in place, "Management plan' means a project or site based plan to protect and conserve natural and cultural resources."
156. The TMT Management Plan, which is a project or site based plan to protect and conserve natural and cultural resources, was appended to the CDUA.
157. The TMT Management Plan is consistent with the CMP and sub-plans, and provides for implementation of all relevant action items and plans of the CMP and sub-plans on a site-specific basis.
158. Petitioner Flores-Case `Ohana's position is that the University is not in compliance with the CMP because it has not been updated. Ex. B.02a at 4; (Flores) Tr. 1/30/17 at 31:16-17. When the BLNR approved the CMP, it only required the University or its designee to submit and present annual reports on the status of the CMP management actions. The BLNR does not require the University to prepare a five-year update, as Mr. Flores argued, but provides that OMKM may do one. Ex. B.02z at § 4.2.2 at 17. This language is permissive, not mandatory. OMKM's position is that a separate five-year review and a five-year amendment is premature because five years is too short a period to fully vet all management actions. If OMKM were to amend the CMP, it would be relatively minor edits, such as the spelling of place names and eliminating redundancies. Moreover, a five-year review is not necessary because OMKM's annual reports are cumulative and reflect everything that was done since the CMP was first implemented. Ex. A-133 at 5-6; Tr. 12/12/16 at 180:8-181:1. Therefore, all information that would have been included in a five-year review was and is incorporated in annual reports, such as OMKM's 2015 annual report. Exhibit A-21; Tr. 12/12/16 at 182:17-184:1.
159. Thus, under both versions of HAR § 13-5-24(c), the requirement of a management plan has been satisfied.
160. Furthermore, the proposed use does not significantly, adversely, or cumulatively impact the natural resources present in the Mauna Kea Summit Region Historic District, alpine stone desert, or other land area designation that encompasses either the breadth or endemic suite of resources present on Mauna Kea. *See* HAR § 13-5-1.
161. To the extent HAR § 13-5-13(a) requires protection of other natural resources within the Resource subzone beyond those proposed to be used, the reliable, probative, substantial, and credible evidence demonstrates that the comprehensive management plans, design elements, and mitigation measures described herein and in the CDUA and supporting documents and evidence provide for the sustainable use and protection of those natural resources.

162. For all these reasons, and for the reasons set forth in the findings of fact above, the proposed land use is consistent with the objectives of the subzone of the land on which the use will occur.

iii. The TMT Project Satisfies the Third Criterion

163. The third criterion, set forth in HAR § 13-5-30(c)(3), states: "The proposed land use complies with provisions and guidelines contained in chapter 205A, HRS, entitled 'Coastal Zone Management', where applicable[.]"
164. The TMT Project complies with provisions and guidelines contained in chapter 205A, HRS, entitled "Coastal Zone Management", in satisfaction of HAR § 13-5-30(c)(3).
165. Under HRS § 205A-1, "'Coastal zone management area' means all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the United States territorial sea."
166. Under HRS § 205A-22, "'Special management area' means the land extending inland from the shoreline as delineated on the maps filed with the authority as of June 8, 1977, or as amended pursuant to section 205A-23."
167. The TMT Project is not in the special management area, and Part II of Chapter 205A, HRS §§ 205A-21 – 205A-33, which applies only to lands within the special management area, does not apply to the TMT Project.
168. Many of Chapter 205A's objectives, such as protection of historic resources, scenic and open space resources, and recreational resources, parallel the objectives of the Conservation District.
169. For the same reasons that the TMT Project is consistent with the purpose of the Conservation District, and given the mitigation measures to reduce and minimize the impacts of the project on surrounding areas as discussed in the findings of fact above and conclusions herein, it is also consistent with the objectives of Chapter 205A.
170. The TMT Project satisfies all of the applicable objectives of Chapter 205A that do not overlap with the Conservation District but are unique to Chapter 205A.
171. Specifically, Chapter 205A describes objectives relating to coastal ecosystems (including the impact of upland areas on coastal ecosystems), which are intended to promote and protect water quality.
172. As noted in the findings of fact above, the TMT Project will have no significant or adverse impact on water resources, including no significant impacts upon Lake Waiau and ground water, and no significant effects upon the surrounding areas through surface water runoff or through wastewater (which will be collected and transported off the summit for treatment and disposal).
173. Therefore, the TMT Project satisfies all of the objectives of Chapter 205A as to water

quality issues.

174. Based on the above findings and applicable law, the proposed land use is consistent with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management," where applicable.

iv. The TMT Project Satisfies the Fourth Criterion

175. The fourth criterion, set forth in HAR § 13-5-30(c)(4), states: "The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community, or region[.]"
176. The TMT Project will not cause substantial adverse impact to existing natural resources within the surrounding area, community, or region, in satisfaction of HAR § 13-5-30(c)(4).
177. Under the version of HAR § 13-5-2 that was in effect when the CDUA was submitted to the BLNR, "Natural resource" is defined as meaning "resources such as plants, aquatic life and wildlife, cultural, historic and archeological sites, and minerals." The amendment added to this definition "recreational" and "geologic" sites, "scenic areas, ecologically significant areas," and "watersheds."
178. By mandating that BLNR consider impacts to the resources that are "existing," within the surrounding area, this criterion requires that a proposed project be assessed within the context of what is already there.
179. The impacts of the TMT Project must therefore be viewed in the context of the Astronomy Precinct, which is within the MKSR that was specifically established by the community and the State for astronomy uses on Mauna Kea, has housed astronomy facilities since the 1960's, and currently has eight optical / infrared observatories, three submillimeter observatories and a radio telescope.
180. In the context of the existing summit area cumulative impacts—and under the assumption that such cumulative impacts will continue—the TMT Project does not create or cause substantial adverse impacts to existing natural resources in the applicable area. The existing uses and resources are already committed to astronomical uses and objectives, and otherwise based upon commitments of the CDUA and University proposals, several facilities will be removed thereby significantly reducing substantial existing adverse impacts on the more sensitive and visible summit ridge areas within the Astronomy Precinct.
181. All of the current astronomy facilities (except the radio telescope), as well as the proposed site of the TMT Project, are within the 525-acre Astronomy Precinct, which is less than five percent of the 11,288 acre MKSR.
182. Under the MKSR Master Plan, astronomy development is further restricted to a defined 150-acre portion within the Astronomy Precinct.

183. It is undisputed that without the TMT Project, the cumulative effects of astronomical development and other uses in the summit area of Mauna Kea have previously resulted in impacts that are substantial, significant and adverse.
184. The TMT Observatory will not tip the balance of any existing impact from a level that is currently less than significant to a significant level. Tr. 10/25/16 at 181:6-10.
185. Petitioners and Opposing Intervenors have argued repeatedly that because UH Hilo acknowledges that the summit area of Mauna Kea has already sustained significant and adverse impacts, it "admits" the TMT Project will itself have substantial adverse impacts. Petitioners and Opposing Intervenors misconstrue UH Hilo's position. The UH Hilo has never made such an admission, and, as set forth in these findings of fact and conclusions of law, the TMT Project will not cause substantial adverse impacts.
186. By arguing that the summit area of Mauna Kea has suffered "unlawful" significant and adverse impacts in the past, Petitioners and Opposing Intervenors also imply that no project can be undertaken in that area without first *reducing* the *existing* cumulative impacts to a level that is less than significant and adverse. Petitioners' and Opposing Intervenors' arguments are legally unsupported.
187. In other jurisdictions, where projects have been proposed for locations that were already substantially impacted by previous development, courts have assessed the proposed new projects on their own merits, found impacts not to be significant, and approved the projects without first requiring the existing impacts in the surrounding area to be reduced to a less-than-substantial level. *See, e.g., Geer v. Fed. Highway Admin.*, 975 F. Supp. 47, 73-74 (D. Mass. 1997) ("although there were noise and visual impacts those impacts were not substantial given the urban context of the project and the existing impacts under a no-build option").
188. Moreover, the Hawai'i Supreme Court recognizes the difference between developed and undeveloped land, and acknowledges the treatment of resources (specifically including cultural resources) varies depending upon whether land is developed or undeveloped. *See, e.g., Kalipi*, 66 Haw. at 8-9, 656 P.2d at 749-50.
189. Specifically, HAR § 13-5-30(c)(4) does not require an analysis of whether (and how) *existing* cumulative impacts should be mitigated. Rather, the proper analysis is whether, viewed within the context of such existing cumulative impacts – and under the assumption that such cumulative impacts will continue – a new proposed land use will cause substantial adverse impacts to existing natural resources in the applicable area. *See Kilakila*, 138 Hawai'i at 402-05, 382 P.3d at 214-17.
190. The plain language of the criterion itself directs BLNR to consider whether the "proposed land use" itself – *not* other existing uses and/or conditions – will cause "substantial adverse impact to *existing* natural resources within the surrounding area, community, or region[.]" HAR § 13-5-30(c)(4).
191. The reliable, probative, substantial, and credible evidence, specifically including but not limited to the testimonies of White, Hayes, Nees, Dr. Smith, Nance, Dr. Sanders, and

- Rechtman, and applicable exhibits, demonstrates that the TMT Project will not cause substantial adverse impact to existing plants, aquatic life and wildlife, cultural, historic, and archaeological sites, minerals, recreational sites, geologic sites, scenic areas, ecologically significant areas, and watersheds.
192. Petitioners and Opposing Intervenors did not offer reliable, probative, substantial, and credible evidence, whether from witnesses or exhibits, that would support the conclusion that the TMT Project would cause substantial adverse impact to existing plants, aquatic life and wildlife, cultural, historic, and archaeological sites, minerals, recreational sites, geologic sites, scenic areas, ecologically significant areas, or watersheds.
 193. The surrounding pāhoehoe lava rock upon which the structure will be constructed is a common lava foundation feature for the surrounding areas upon which existing astronomy facilities have been constructed.
 194. Under HAR § 13-5-30(c)(4), BLNR may properly consider that the level of impacts on natural resources of a proposed land use would be substantially the same even in the absence of the project.
 195. The level of impacts on natural resources within the Astronomy Precinct of the MKSR would be substantially the same even in the absence of the TMT Project within the Astronomy Precinct of the MKSR.
 196. The incremental nature of a project's impacts, standing alone, cannot endlessly justify development within an existing developed area (*See Kilakila*, 138 Hawai'i at 404-05, 382 P.3d at 216-17); however, the TMT Project, given the specific findings of fact herein, and based on the weight of the reliable, probative and substantial evidence, will not cause substantial adverse impact to existing natural resources within the surrounding area, community, or region. HAR § 13-5-30(c)(4).
 197. In some situations, incremental changes add up to a qualitative difference and create a tipping point. A small increase in temperature can cause coral bleaching. *Center for Biological Diversity v. NHTSA*, 508 F.3d 508 (9th Cir. 2007.) Small increases in the number of cars can push traffic to an unacceptable level of service. *Dept. of Land Conservation & Development v. Klamath Cty.*, LUBA 2001-029 (Or. LUBA 2001.)
 198. Mauna Kea is unlike these examples. TMT opponents who emphasize Mauna Kea's cultural and religious significance and natural beauty basically contend that a large building such as the TMT would detract from the spiritual and aesthetic experience of the mountain in its natural state. This perspective envisions Mauna Kea as a natural landscape, free of large buildings. But the summit of Mauna Kea ceased to be a natural landscape over forty years ago, when the first large observatory, the 80' high UH 2.2 meter telescope, was completed in 1970. The 125' high CFHT followed in 1979, the 100' high JCMT in 1987, the 111' high Keck I and II observatories were completed in 1992 and 1996, respectively, and the 151' Gemini and 141' Subaru observatories were completed in 1999. (Dates of completion from Ex. A-3/R-3, vol. 1, p. 3-151; dome heights from *Id.*, p. 3-81.) Large observatories have been a major visual element on the

summit for decades. A 13th observatory – the 7th over 100' in height – would not change that. This is exactly like *Kilakila*, where the "level of impacts on natural resources would be substantially the same even in the absence" of the new observatory. *Id.* at 405.

199. The record lacks any evidence, reason, or coherent argument that the TMT is significantly more offensive from an aesthetic or spiritual standpoint than the other large observatories. In some ways it should be considered less offensive: it is not on the summit ridge, and it incorporates more environmental safeguards.
200. The record also lacks any evidence, reason, or coherent argument that the TMT, added to the previous observatories, will create a tipping point where impacts become significant.
201. Each of the twelve observatories now on Mauna Kea received a CDUP, Ex. A-7 at p. 7, a public process that included the opportunity for contested case hearings, *see Stop H-3 Ass'n v. DOT, supra*, and for judicial review. None of these twelve permits were judicially challenged; the first judicial challenge was to the Keck "Outrigger" project in 2004. Ex. A-9 at p. 3-8. The BLNR approved the CDUP for the SMA project in November 1994 after receiving "no objections". Ex. A-155, p. 3. The validity of the prior twelve CDUP decisions, and the specific reasoning that went into them, are not at issue in this proceeding; the time for any judicial action expired decades ago. The administrative rules specifically allow the continuation of existing permitted uses. HAR §§ 13-5-22(a)(P-8), -23(a), -24(a), -25(a). Today's decisions, and our options, are shaped by decisions made in the past.
202. The reliable, probative, substantial, and credible evidence demonstrates that the TMT Project will not cause substantial adverse impacts to cultural, historical, and archaeological sites.
203. Under the definition of "Natural resource" in HAR § 13-5-2, cultural, historical, and archaeological "sites" are "natural resources"; but cultural *practices* are not necessarily.
204. In accordance with the express language of the Conservation District Rules, cultural practices are not "natural resources" and so are not required to be considered in an analysis of HAR § 13-5-30(c)(4). (The effect on cultural practices is analyzed elsewhere.)
205. In any case, while the presence of the TMT Project in the Astronomy Precinct will introduce a new element in the Northern Plateau for certain cultural practitioners and may affect the setting in which certain contemporary practices occur, given the findings above, the reliable, probative, substantial, and credible evidence demonstrates that the TMT Project will not cause substantial adverse impacts to cultural practices established prior to 2015.
206. No existing critical habitat, natural resources, or customary and traditional native Hawaiian practice can be considered endangered or substantially impacted in the specified area for the TMT Project site.
207. There is no credible proof that any historic feature, traditional practice, or viewplane will

- be substantially or adversely impacted by construction at the proposed TMT Project site.
208. The Hawai'i Supreme Court has instructed that in assessing a proposed land use under HAR § 13-5-30(c)(4), mitigation measures for a project may be considered even if "mitigation" is not expressly stated in the rule. *See Morimoto*, 107 Hawai'i at 302-04, 113 P.3d at 178-80; *see also Kilakila*, 138 Hawai'i at 402-04, 382 P.3d at 214-16 (finding it appropriate to consider mitigation measures as part of the assessment of impacts under this criterion).
 209. Petitioners and Opposing Intervenors, many of whom conceded during cross-examination that they had not reviewed *Kilakila*, claimed in this proceeding that the proposed mitigation measures for the TMT Project could not be considered in connection with HAR § 13-5-30(c)(4) because those mitigation measures, in their view, do not specifically address the environmental and cultural impacts of the project. *See e.g.* Petitioners' Collective Prehearing Statement at 4.
 210. While the TMT Project's location in the Northern Plateau section of Area E will introduce a new visual element in that area for certain individual practitioners which may affect the setting in which certain practices occur; the reliable, probative, substantial, and credible evidence demonstrates that the TMT Project itself and otherwise in conjunction with its mitigation efforts, will not cause substantial adverse impact to recognized historic traditional and cultural practices.
 211. Petitioners' and Opposing Intervenors' argument is factually and legally incorrect.
 212. As noted in the findings of fact above, numerous proposed mitigation measures for the TMT Project are specifically designed to address the environmental and cultural impacts of the TMT Project, including, but not limited to:
 - a. The site selection and physical design of the project itself and related infrastructure to mitigate its visual, cultural and environmental impact;
 - b. The TMT Access Way design;
 - c. Implementing a cultural and natural resources training program;
 - d. Developing educational exhibits;
 - e. Restoring of Pu'u Poli'ahu;
 - f. Providing a sense of place within the TMT facilities;
 - g. Providing financial contributions to support cultural programs;
 - h. Implementing specific cultural and community outreach efforts;
 - i. Implementing cultural observance days;

- j. Continuing consultation with the State Historic Preservation Division and Kahu Kū Mauna Council regarding the protocols for the relocation of the modern shrine at the 13N site;
 - k. Implementing arthropod monitoring;
 - l. Working with OMKM to develop and implement a wēkiu bug habitat restoration study;
 - m. Developing and implementing an invasive species prevention and control program; and
 - n. Continuing consultations with cultural practitioners.
213. Moreover, under *Morimoto*, the Hawai‘i Supreme Court held that all mitigation measures set forth in an EIS (regardless of whether direct or indirect) must be made part of the conditions of the CDUP. *See Morimoto*, 107 Hawai‘i at 303-04, 113 P.3d at 179-80.
214. *Morimoto* suggests that where mitigation measures have been accepted as part of a final EIS, those mitigation measures – which are required to be made conditions of the CDUP – may also satisfy HAR § 13-5-30(c)(4). But more importantly, *Morimoto* clearly holds that *all* mitigation measures may be considered.
215. As noted above, the unchallenged FEIS for the TMT Project identifies an abundance of mitigation measures, both direct and indirect, that are aimed at ameliorating potential impacts on the environment and cultural practices. Taking into account the many measures proposed to mitigate the Project’s potential impacts on the environment and cultural practices confirms that the TMT Project will not cause substantial adverse impact to these areas.
216. In addition, under *Kilakila*, the Hearing Officer may take into consideration the scientific, economic and educational benefits of the TMT Project in determining that the project meets the criteria of HAR § 13-5-30(c)(4). *See Kilakila*, 138 Hawai‘i at 405-06, 382 P.3d at 217-18 (noting that consideration of relevant scientific, economic and educational benefits of project does not conflict with the BLNR’s duty to protect natural and cultural resources through "appropriate management and use to promote their long-term sustainability and the public health, safety and welfare").
217. As noted in the findings of fact above and herein, the scientific and educational benefits of the TMT Project are material, substantial, and highly unique.
218. Based upon the testimony of Dr. Stone and other evidence, the TMT Project is designed to be a world-class telescope that will provide a much more advanced and powerful ground-based observatory than currently exists anywhere on Earth. The TMT Project is designed to investigate and answer some of the most fundamental questions regarding our universe, including studies relating to the formation of stars and galaxies shortly after the Big Bang and how the universe evolved to its present form.

219. Further, TIO has committed to a substantial community benefits package that has provided over \$2.5 million to date for grants and scholarships for STEM education to benefit Hawai'i students, and TIO has committed to providing \$1 million annually for this program.
220. TIO will also pay sublease rent to the University (the first telescope developer to do so on Mauna Kea), and these funds will be used for the management of Mauna Kea through the Mauna Kea Special Management Fund, administered by OMKM.
221. For these and all other reasons noted in the findings above, the TMT Project will substantially improve the interests of the surrounding area, community, region, and public welfare by advancing public higher education in the State, ensuring that the University remains a premier institution for astronomy research throughout the world, and will bring other significant educational, economic and scientific benefits to Hawai'i and its residents.
222. The reliable, probative, substantial, and credible evidence demonstrates that, through the comprehensive management schemes and the thoughtful design elements and mitigation measures described above and in the CDUA and supporting documents and evidence, the sustainable use of those TMT Project area natural resources will be appropriately protected and ensured.
223. Accordingly, the TMT Project satisfies the fourth criterion, HAR § 13-5-30(c)(4).

v. The TMT Project Satisfies the Fifth Criterion

224. The fifth criterion, set forth in HAR § 13-5-30(c)(5), states: "The proposed land use, including buildings, structures, and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels[.]"
225. The TMT Project, including buildings, structures, and facilities, is an astronomical facility that is compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels, in satisfaction of HAR § 13-5-30(c)(5).
226. The appropriate locality to be considered is the summit area of Mauna Kea within the MKSR, and more specifically, the Astronomy Precinct of the MKSR. The Astronomy Precinct is similar to the HO site used as the appropriate locality in *Kilakila*, 138 Hawai'i at 406-07, 382 P.3d at 218-19. Like the HO site, the Astronomy Precinct is the specific area planned for astronomical facilities, on which such facilities had historically been placed. Although the Astronomy Precinct is larger than the HO site, the existing observatories on Mauna Kea are also much larger and more spread out than those on Haleakalā.
227. The MKSR and adjacent Natural Area Reserve could also be considered as the locality. Petitioners and Opposing Intervenors have repeatedly emphasized the importance of the mountain as a whole. The MKSR contains the entire area leased to the UH and set aside

by Executive Order specifically for astronomical facilities and related buffers. The Natural Area Reserve contains the remaining high elevation areas on Mauna Kea.

228. It would not be appropriate to use a smaller unit than the Astronomy Precinct as the locality, or one that does not include the summit ridge. Petitioners and Opposing Intervenor have emphasized the importance of considering the whole mountain. The summit ridge is the dominant geographical feature in the area, culturally significant, and the existing observatories are major features in the locality.
229. Astronomy facilities in the locality of the TMT Project are an expressly permitted use under HAR § 13-5-24.
230. As noted above, the TMT Project will be located on an approximately five acre site within the Astronomy Precinct of the MKSR, which is a clearly defined, highly specialized area set aside specifically for astronomical facilities, and was first leased to the University in 1968 for this purpose.
231. The proposed location of the TMT Project is in relatively close proximity to the eleven other previously developed facilities for astronomy within the Astronomy Precinct, which is the only area now designated for astronomical facilities on Mauna Kea.
232. From most vantage points within the Astronomy Precinct where the TMT Project will be visible, other astronomy facilities are already visible.
233. The TMT Project will not be visible from the culturally sensitive areas of the summit of Kūkahau‘ula, Lake Waiau, Pu‘u Līlīnoe, and Pu‘u Wēkiu.
234. As discussed extensively in the findings of fact, supra, the TMT site is perhaps the best site in the world for the construction of this telescope. The proposed land use, is, therefore, "appropriate to the physical conditions and capabilities" of the specific parcel or parcels.
235. For all these reasons, and for the reasons set forth in the findings of fact above, the proposed land use, including buildings, structures, and facilities, is compatible with the locality and surrounding areas, and appropriate to the physical conditions and capabilities of the specific parcel or parcels. Thus, the TMT Project satisfies the fifth criterion, HAR § 13-5-30(c)(5).

vi. The TMT Project Satisfies the Sixth Criterion

236. The sixth criterion, set forth in HAR § 13-5-30(c)(6), states: "The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable[.]"
237. The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon by the TMT Project, in satisfaction of HAR § 13-5-30(c)(6).

238. The relevant land area to be considered in connection with this criterion can be considered to be the Astronomy Precinct or the MKSR. In addition, natural beauty and open space should be analyzed from the point of view of people who will experience them. This means, in this case, from distant populated areas or by visitors to the summit
239. It would make no sense to analyze whether a project negatively affected natural beauty or open space by considering "the land" affected as only the project area or its immediate vicinity. Construction of any significant building will reduce the "open space" aspects of its immediate vicinity. The BLNR, having reviewed and approved twelve separate CDUP's for observatories on Mauna Kea, see Ex. A-7 at p. 7, was clearly aware that astronomical facilities, as expressly allowed under the rules with a CDUP, could be very large structures, and were not normally hidden underground. The rules also expressly allow, with a CDUP, such structures as wind turbines, hydroelectric power plants, and geothermal power facilities, which are also often very large. H.A.R. §13-5-22(a). Such renewable energy facilities are allowed even in the Protective Subzone. *Id.*
240. It would be wrong to arbitrarily select a much smaller area as the unit of analysis for the sixth criterion such as the immediate vicinity of the project site, as discussed in the findings of fact, *supra*.
241. The Astronomy Precinct is analogous to the HO site chosen as the unit of analysis in *Kilakila*: the specific area planned for astronomical facilities, on which such facilities had already been built.
242. By its terms, the sixth criterion requires the consideration of the "existing" aspects. In analyzing open space and natural beauty for the TMT Project, this necessarily means including the existing observatories.
243. Criterion Six does not mean that every possible viewplane in the land area being considered must remain free of structures. Every building, unless hidden underground, will affect some viewplane.
244. The BLNR's interpretation of its own rules is generally entitled to deference unless plainly erroneous or inconsistent with the underlying legislative purpose. *Kilakila*, 138 Hawai'i at 396, 382 P.3d at 208 (citing *Panado v. Bd. of Trs., Emps.' Ret. Sys.*, 134 Hawai'i 1, 11, 332 P.3d 144, 154 (2014)).
245. The BLNR's interpretation and approach to this issue is consistent with other jurisdictions, which, like the BLNR, recognize that the significance of a project's visual impacts must be assessed in light of the context where it occurs. *See, e.g., Bowman v. City of Berkeley*, 122 Cal. App. 4th 572, 589, 18 Cal. Rptr. 3d 814, 828 (2004) ("To conclude that replacement of a virgin hillside with a housing project constitutes a significant visual impact says little about the environmental significance of the appearance of a building in an area that is already highly developed."); *Geer*, 975 F. Supp. at 73-74 (project would have some visual impacts in river basin, but impacts were not significant given existing context, where "substantial" visual impacts were already present).

246. As Petitioners and Opposing Intervenors have repeatedly emphasized, the visual landscape in the summit area of Mauna Kea has already been substantially altered and impacted, and it will remain so with or without the TMT Project. The TMT Project, and its visual impacts, must be assessed in that context. Adding the TMT to the existing physical context will not result in a substantial adverse impact.
247. The BLNR may approve a proposed land use despite some environmental impacts to the Conservation District, provided that the project incorporates appropriate measures and conditions to mitigate the project's adverse impacts. *See Morimoto*, 107 Hawai'i at 305-06, 113 P.3d at 181-82; *Stop H-3 Ass'n*, 68 Haw. at 157-62, 706 P.2d at 449-52.
248. Hawai'i law requires the "mitigation" of impacts; it does not require that impacts be eliminated altogether. *See Morimoto*, 107 Hawai'i at 305-06, 113 P.3d at 181-82 (finding that BLNR appropriately considered the effect of mitigation measures designed to "diminish" – not eliminate altogether – "the impact of the project upon the Palila").
249. Specifically regarding visual impacts, "mitigation" is understood to require reducing adverse impacts, not eliminating them. *See, e.g., Las Virgenes Homeowners Fed'n, Inc. v. Cnty. of Los Angeles*, 177 Cal. App. 3d 300, 308-09, 223 Cal. Rptr. 18, 25 (1986) (where Environmental Impact Report for mixed-use development project discussed numerous mitigation measures and project was conditioned on reducing project's size and using design, landscaping, and contouring to reduce adverse visual impact, mitigation measures were found to "exceed those required by law").
250. Courts have construed regulatory language similar to that contained in HAR § 13-5-30(c)(6) to require "minimization of visibility and impacts," not elimination of visual impacts altogether. *See McCallister v. Calif. Coastal Comm'n*, 169 Cal. App. 4th 912, 955, 887 Cal. Rptr. 3d 365, 398 (2009) (where county land use plan required that siting of structures "shall not detract from natural beauty of the undeveloped skylines, ridgelines, and the shoreline," court found that regulations "require that visibility and visual impacts be minimized" to the extent reasonably feasible, but did not require reduction of visibility to the point of elimination). The BLNR could have imposed an "invisibility-if-feasible standard" if it had desired; the fact that it did not do so suggests that it intended to require reasonable minimization, not elimination, of visual impacts. *See Id.*
251. Through significant mitigation measures discussed above, including the location of the telescope, reduction of the dome to the smallest size physically possible, the finishing of the dome and supporting structure to reduce the visibility of the structures, and other measures, the visual impacts for the TMT Project have been reduced to the greatest extent feasible.
252. The removal of three telescopes from the summit ridge, and the restoration of the abandoned Poliahu road, will also help to mitigate visual effects of the TMT Project.
253. Moreover, the design of the TMT Project is consistent with (and in many aspects, improves upon) the design of the other existing telescopes within the Astronomy Precinct, which also includes various support buildings, roads and other facilities.

254. The size, dimensions and dome structure were conceived to minimize the structure's impacts and to enhance the natural beauty of the surrounding areas to the extent feasible.
255. Fluids such as gas, water, and wastewater will be contained in above ground and underground tanks to minimize any possible contamination of the surface and subsurface areas.
256. The structural design considered ways to minimize visual impacts and to optimize viewpoints around the facility.
257. Given this context, and the many mitigation measures incorporated into the TMT Project specifically designed to minimize its visual impacts to the extent feasible, the sixth criterion is satisfied.
258. Petitioners and Opposing Intervenors, however, propose to read this criterion to literally require that the TMT Project "improve on the natural beauty or open space of the Northern Plateau." *See e.g.* Petitioners' Collective Prehearing Statement at 5.
259. Although Petitioners and Opposing Intervenors claim that this literal reading "would not meet with absurd results," Petitioners and Opposing Intervenors are incorrect. Applying Petitioners' and Opposing Intervenors' interpretation would lead to an absurd result – an absolute exclusion of any construction of astronomy facilities that are an explicitly permissible use in the Resource subzone.
260. If HAR § 13-5-30(c)(6) is read the way Petitioners and Opposing Intervenors suggest, no telescope could ever have been built on Mauna Kea. Indeed, following this proposed interpretation to its logical conclusion, nothing could ever be, or have been, permissibly built on any Conservation District land anywhere in the State of Hawai'i.
261. HAR § 13-5-30(c)(6) cannot be read that way. If it were, HAR § 13-5-24(c)(4), which expressly allows "Astronomy facilities" in the Resource subzone, would be rendered meaningless.
262. In addition, HAR § 13-5-30(c)(6) must be read in the context of all subzones, including the objectives of each subzone (and the permitted uses in each subzone).
263. The Conservation District is not homogenous; rather, the Conservation District is comprised of four distinct subzones: Protective, Limited, Resource and General.
264. Petitioners and Opposing Intervenors incorrectly interpret the rules as though the entire Conservation District on Mauna Kea is in the Protective subzone, the most restrictive of the subzones.
265. Under rules of statutory interpretation, courts are required to avoid rendering any provision redundant or superfluous. *See Aluminum Shake Roofing, Inc. v. Hirayasu*, 110 Hawai'i 248, 253, 131 P.3d 1230, 1235 (2006); *Okada Trucking Co. v. Bd. of Water Supply*, 101 Hawai'i 68, 77, 62 P.3d 631, 640 (App. 2002) ("We will not construe a statute so that it is rendered meaningless."). Moreover, courts "may depart from a plain

reading of a statute where a literal interpretation would lead to absurd and/or unjust results." *See, e.g., Morgan v. Planning Dep't, Cnty. of Kaua'i*, 104 Hawai'i 173, 185, 86 P.3d 982, 994 (2004) (citing *Iddings v. Mee-Lee*, 82 Hawai'i 1, 15, 919 P.2d 263, 277 (1996)) (finding that the Legislature could not have intended that the Planning Commission would need to file lawsuit each time a special management area use permit needs modification, so, despite the plain language of HRS § 205A-29, the statute had to be interpreted to avoid that "absurd result").

266. Finally, *Kilakila* confirms that HAR § 13-5-30(c)(6) should be interpreted and applied in the context of Astronomy Precinct and the MKSR and in light of the mitigation measures proposed in connection with the TMT Project. *See Kilakila*, 138 Hawai'i at 407, 382 P.3d at 219 (affirming BLNR's findings and conclusions that the solar telescope project met the sixth criterion because the project "will be consistent with and will preserve the existing physical and environmental aspects of the land (the Haleakalā High Altitude Observatory site, which housed other existing observatories), and further noting that BLNR properly considered the numerous mitigation commitments for the project with respect to this criterion).
267. Therefore, HAR § 13-5-30(c)(6) can only make sense by interpreting it as requiring that the TMT Project, and specifically its visual impacts, be assessed in the manner set forth above, in the context of its surrounding environment – including the uses and development that has already occurred.
268. For all these reasons, and for the reasons set forth in the findings of fact above, the proposed land use is consistent with existing uses and preserves or improves upon the existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, and therefore satisfies the sixth criterion.

vii. The TMT Project Satisfies the Seventh Criterion

269. The seventh criterion, set forth in HAR § 13-5-30(c)(7), states: "Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district[.]"
270. The TMT Project will not utilize subdivision of land to increase the intensity of land uses in the Conservation District, in satisfaction of HAR § 13-5-30(c)(7).
271. The TMT CDUA does not ask for a subdivision. As explained more fully below, the seventh criterion refers only to the few circumstances where a landowner can apply for a CDUP to subdivide conservation land. In those cases, the seventh criterion provides that the subdivision must not be used to increase the intensity of land use.
272. Understanding the seventh criterion requires an explanation of the differences between subdivision controls in a typical land use regulatory system versus Hawai'i's conservation district, and an explanation of how subdivisions are handled under the conservation district rules.
273. In the typical land use regulatory system, the zoning allows certain development by right, for example, single-family homes in a residential zone, subject only to ministerial

approvals like building permits. See, for example, R.O.H. §21-3.70-1(a)(permitted uses in single-family district). To ensure the orderly development of land zoned for particular uses when it is then divided for sale into individual lots, with separate owners, the subdivision code specifies minimum requirements for infrastructure like water, roads, sewers, and drainage, minimum lot sizes, road frontage requirements, and the like. See, for example, R.O.H. §22-3.1 (purpose of the subdivision code). Subdivisions are also important because they create new building sites.

274. By contrast, in Hawai‘i’s conservation district, almost all development requires a site-specific permit. See HAR Chap. 13-5, Subchapter 3. The permit itself specifies the infrastructure requirements for the proposed project. For example, the TMT CDUP addresses the width of the access road, how water will be supplied, and how drainage and wastewater will be handled. The conservation district rules do not contain a subdivision code because the issues are dealt with in permits on a case-by-case basis. Thus, case law regarding subdivisions in the typical land use context is of limited relevance in the conservation district.
275. Under the conservation district rules, subdivision is allowed in only three very limited circumstances, described in HAR § 13-5-22(b)(P-10), and applied to the other subzones by HAR §§ 13-5-23(a), -24(a), and -25(a):
 - (C-1) Consolidation and resubdivision into an equal number of lots that does not result in increased density.
 - (C-2) Consolidation of property into a lesser number of legal lots of record currently existing and approved, which furthers the objectives of the subzone.
 - (D-1) Subdivision of property into two or more legal lots of record that serves a public purpose and is consistent with the objectives of the subzone.
276. The rules allow only one house per lot of record, HAR § 13-5-41(b). They do not allow houses in the Protective Subzone (except for kuleana properties). They allow houses only under certain circumstances in the Limited Subzone, HAR § 13-5-23(c)(L-3), but allow them in the Resource and General Subzones, HAR §§ 13-5-24(c)(R-7), and -25(a).
277. The seventh criterion prevents landowners from manipulating the subdivision process to increase the number of houses that can be built. For example, if a landowner has two adjacent lots, one entirely in the Protective Subzone, and the other entirely in the Resource Subzone, there is a potential for only one house. If the landowner were allowed to consolidate and resubdivide so that part of each resulting lot was in the Resource Subzone, there would be, potentially, two house sites. Because this would "increase the intensity of land use", the seventh criterion could be invoked to deny the consolidation and resubdivision, or to put restrictive conditions on it. The seventh criterion could also be invoked in reviewing a "public purpose" subdivision applied for under HAR § 13-5-22(b)(P-10)(D-1). The seventh criterion applies only in these extremely restricted circumstances.
278. The rules do not limit the number of astronomical facilities that can be built on a single

parcel, or limit the number of other facilities that potentially can be built on a single parcel, except for houses. So, for example, although the Mauna Kea Science Reserve is a single parcel, Ex. A-7, p.1, more than twelve separate CDUP's have been issued for observatories and related infrastructure. *Id.* at p. 7. Each new application must be reviewed for its potential effects. The requirement of a CDUP is the control against overbuilding. The number of potential building sites is not controlled by subdivision rules, except for houses.

279. The University of Hawai'i's subleasing individual observatories to separate operators creates none of the infrastructural problems, or problems with coordination among multiple owners, that a typical subdivision regulation is intended to prevent. The land is still owned by the State of Hawai'i, and leased by the University of Hawai'i. The state, through the BLNR, must review any proposed sublease and consent to its terms. The CDUP's dictate how the land will be developed, including infrastructure. The sublessees are bound by the terms of the CDUP's to the same extent as the UH.
280. It has been the consistent practice of the BLNR that the Mauna Kea subleases are not subdivisions and do not require separate CDUP's. Compare Ex. A-9 at p. 6-1 (subleases) with Ex. A-7 at p. 7 (list of CDUP's). The BLNR, of course, has consented to all of these subleases.
281. Petitioners and Opposing Intervenors argue that because the subleases facilitate the financing and management of the various observatory sites, they "increase the intensity of land uses."
282. Given that they are trying to stop the TMT Project, it is natural that Petitioners and Opposing Intervenors interpret the seventh criterion in this way. It makes no sense, however, to interpret the seventh criterion as if it were intended to inhibit the development of projects by making them more difficult to finance or manage. The other seven criteria all deal with the physical, environmental, and cultural impacts of a project. If a project (other than an actual subdivision) complies with the other seven criteria, and other applicable legal requirements, the permit should be granted; the government has no legitimate interest in making them harder to finance or manage.
283. The CDUP allows the increase in intensity of land use, not the sublease or any subdivision. The sublease creates no additional development rights beyond the CDUP. It is immaterial whether the landowner develops the project or has a sublessee or sublessees develop it. Land use regulations focus on the use, not who carries out the use. *Gangemi v. Zoning Bd. Of Appeals of Town of Fairfield*, 54 Conn. App. 559, 736 A.2d 167 (1999). To the extent that the BLNR may be concerned about the quality of the sublessee or compensation to the state where a sublease involves public land, those issues can be dealt with in the consent to sublease.
284. Many of the uses allowed with permits in the conservation district rules, such as telecommunications antennas, are obviously ones where (1) the use will occupy only a small portion of a lot, (2) the landowner and operator of the use will be different, and (3) the operator will want some documented site control, whether by lease, sublease,

easement, or license. To construe such arrangements as a "subdivision" requiring a separate CDUP when the project has already been found to meet all other environmental requirements would be a waste of time and effort, and to say that the rules prohibit such arrangements if the operator facilitates the development of the site is absurd. In addition, if such arrangements are subdivisions, in many cases, they could not even be allowed because the only subdivisions which can create additional lots are those that serve a "public purpose", which is narrowly defined in the rules. See HAR § 13-5-22(b)(P-10).

285. For these reasons, the BLNR does not construe arrangements such as the Mauna Kea subleases, or other arrangements where a landowner having a CDUP for a specific site transfers site control (not fee ownership) to a separate operator, as subdivisions under its rules. To the extent that there is any ambiguity in the rules, they should be interpreted according to their intent. *IBEW, Local 1357 v. Hawaiian Telephone Co.*, 68 Haw. 316, 323, 713 P.2d 943, 951 (1986). It is clearly the intent of the seventh criterion and the concept of subdivisions in the rules to regulate the use of subdivisions so that they are not used to directly create further development rights, not to regulate who operates facilities already allowed by CDUP's.
286. Petitioners and Opposing Intervenors raise the issue of "illegal subdivision." An "illegal subdivision" can more properly be termed an "illegal attempted subdivision" because the purported subdivision and any conveyances would simply be nullities. *Whitlow v. Jennings*, 40 Haw. 523, 532 (1940.) If an "owner" of a "lot" purportedly created by a subdivision of land in the conservation district, not approved by DLNR or BLNR, applied for a CDUP to build a house on that "lot", DLNR staff would see that the property was not a lot of record, and that the owner could not show good title, *see* HAR § 13-5-31(b) and refuse to process the application. HAR § 13-5-31(c). The seventh criterion would never be applied because no application could be processed. This further illustrates the basic point that the seventh criterion comes into play only when someone has actually applied for a subdivision.
287. Petitioners and Opposing Intervenors contend that the TMT Project does not satisfy HAR § 13-5-30(c)(7) because, in their view, the proposed sublease of land to TIO (and, indeed, each sublease for an existing observatory facility) "further separated areas of land use within the University's Astronomy Precinct resulting in the illegal subdivision of these lands."
288. Petitioners and Opposing Intervenors, however, offer no credible authority to support their position that a sublease within MKSR legally constitutes a "division of a parcel of land into more than one parcel" within the meaning of HAR § 13-5-30(c)(7).
289. The Master Plan identified specific and discrete sites for future development on Mauna Kea, including an appropriate site for a Next Generation Large Telescope (Area E). Ex. A-001 at 1-6.
290. The sublease of a parcel within the Astronomy Precinct of the MKSR that was previously planned and specifically identified as an appropriate location for a Next Generation Large Telescope, such as the TMT Project, does not constitute a division of a parcel into more

than one parcel for the purpose of increasing the intensity of land use within the conservation district as contemplated by HAR § 13-5-30(c)(7).

291. Moreover, as noted above, UH Hilo has not requested, and has not been granted, any subdivision of land for purposes of the TMT Project, and, in any event, the conservation district is not subject to county land use laws. HRS § 205-5; HRS Chapter 183C; HRS § 46-4(c).
292. Thus, construing every sublease within the conservation district as creating a subdivided parcel subject to the county subdivision code would be contrary to HAR § 13-5-30(c)(7) and HRS § 205-5, and subject every such sublease to county ordinances designed to regulate residential developments and lead to absurd results.
293. Accordingly, for these reasons and all reasons stated herein, the Petitioners' and Opposing Intervenors' arguments relating to the effect of the sublease for the TMT Project is rejected. *See, e.g., Morgan*, 104 Hawai'i at 185, 86 P.3d at 994.
294. Petitioners and Opposing Intervenors further contend that the "subdivision is illegal" because the State Land Use Commission did not create the Astronomy Precinct or separate project parcels. *See, e.g.* Petitioners' Collective PHS at 6.
295. Petitioners' and Opposing Intervenors' argument, however, is misplaced and illogical, because the Land Use Commission's authority does not extend to establishing or approving areas such as the MKSR or the Astronomy Precinct – it is undisputed that the BLNR has the authority to manage Conservation District lands, including subdividing lands in the Conservation District into more than one parcel. *See* HRS Chapter 183C.
296. In addition, the Astronomy Precinct is an area identified and described by the MKSR Master Plan as a management and planning designation to reduce the area within the MKSR available for astronomy development.
297. Thus, the clear intent of the designation of the Astronomy Precinct was not to divide the MKSR into more than one parcel in order to intensify the use of the MKSR, but rather to identify an area within the MKSR for planning and management of astronomical facilities.
298. Moreover, Petitioners' and Opposing Intervenors' proposed interpretation would mean nothing could ever be built in a Conservation District, because adding anything would always increase, in some measure, the intensity of land use. That interpretation would lead to an absurd result, and is rejected. *See, e.g., Morgan*, 104 Hawai'i at 185, 86 P.3d at 994.
299. For all these reasons, and for the reasons set forth in the findings of fact above, the proposed land use will not utilize subdivision of land to increase the intensity of land uses in the Conservation District, and therefore satisfies the seventh criterion, HAR § 13-5-30(c)(7).

viii. The TMT Project Satisfies the Eighth Criterion

300. The eighth criterion, set forth in HAR § 13-5-30(c)(8), states: "The proposed land use will not be materially detrimental to the public health, safety, and welfare."
301. The TMT Project will not be materially detrimental to the public health, safety, and welfare, in satisfaction of HAR § 13-5-30(c)(8).
302. The construction and use of astronomy facilities alone do not create material harm to the general health, safety, or welfare of Hawai'i's citizens.
303. The construction of astronomy facilities does not require invoking traditional police power protections to protect the public from the proposed construction activities.
304. Any concern for the well-being of a segment of the general public, including native Hawaiians, can be mitigated through the scientific, educational, and economic benefits to be derived from the Project, in accordance with similar considerations in *Kilakila*.
305. As set forth above, Petitioners and Opposing Intervenors contend that building the TMT Project on Mauna Kea will be harmful to the health of native Hawaiians and others. As stated above, Petitioners' and Opposing Intervenors' position that the TMT Project will be materially detrimental to the public health, safety, and welfare has not been supported by reliable, probative, substantial, or credible evidence, and is far too speculative to be given any significant weight.
306. Although, for example, Dr. Taulii provided opinions as to her research on a causal link between alleged "desecration" to a sacred space and the impact upon cultural identity and health of native Hawaiians, Dr. Taulii did not provide the data on her study in this hearing; she was not aware of any peer review studies that supported her claims of trauma to native Hawaiians as a result of the TMT Project; her own study was still undergoing the independent scrutiny of the peer review process; and she testified to her own bias, as she personally opposes the TMT Project. *See* Tr. 1/24/17 at 37, 48, 132-137
307. Similarly, while Prof. Kaholokua offered testimony regarding the ostensible psychological impacts upon native Hawaiians from the activities on Mauna Kea, he did not do any research directly relating to the TMT Project, did not perform any clinical examinations of opponents of the TMT Project, and he was not aware of studies regarding partitioning the cause of stress allegedly from TMT and Mauna Kea from all other stress-causing factors for native Hawaiians, including poverty, single parenthood, and systemic diseases. Tr. 2/23/17 at 121-23, 143, 164-168, and 175.
308. The public will not be detrimentally impacted, and the alleged psychological impact on certain narrow portions of the general population would be isolated and capable of being mitigated. Surveys referenced during the hearing demonstrated that a majority of residents supported the construction of the TMT Project, notwithstanding the protests of a select few who claim political or other reasons outside of the traditional concepts of public health, safety, and welfare.
309. To the extent that there may be an impact on certain individuals from the TMT Project, the evidence adduced in this hearing is that, as a general historical matter, native

Hawaiian health and welfare has also been impacted by numerous other causes of stress, including poverty, lack of educational opportunities, systemic diseases, single parenthood, family abuse, and other societal displacements. Tr. 2/23/17 at 164-68 (Joseph Keaweaimoku Kaholokula, Ph.D.).

310. Prof. Kaholokula testified that he was not aware of any study with regard to apportioning the cause of alleged stress from the TMT Project on Mauna Kea from the other historic factors affecting native Hawaiian health and welfare, and his opinions were not based on any studies or analyses of the individuals opposing the TMT Project. Tr. 2/23/17 at 175-76 (Joseph Keaweaimoku Kaholokula, Ph.D.)
311. Thus, it would be speculative to conclude, in light of the historical issues affecting native Hawaiian health and welfare in general, and the lack of evidence in this hearing apportioning the cause of the various stressors, that the TMT Project, in and of itself, is detrimental to the health, safety and welfare of the public, including native Hawaiians opposing the TMT Project.
312. Petitioners and Opposing Intervenors have not shown that the Project will be detrimental to the public health, safety, and welfare, much less that it will be materially detrimental.
313. Petitioners and Opposing Intervenors also contend that "public welfare" does not mean job-creation educational benefits or money generation, but instead refers to "aesthetics – preserving Hawai'i's unique natural beauty." That position is legally unsound.
314. Under rules of statutory interpretation, where language is plain and unambiguous, it must be given its "plain and obvious meaning." *Awakuni v. Awana*, 115 Hawai'i 126, 133, 165 P.3d 1027, 1034 (2007) (citation omitted). Courts will attempt to construe the meaning of words in a statute according to their "general or popular use or meaning." HRS § 1- 14. If the words at issue are not defined, "[l]egal and lay dictionaries are extrinsic aids which may be helpful in discerning the meaning of statutory terms." *Olelo: The Corp. for Cmty. Television v. Office of Info. Practices*, 116 Hawai'i 337, 349, 173 P.3d 484, 496 (2007) (citations omitted).
315. Merriam-Webster's online dictionary defines "welfare" as "the state of doing well especially in respect to good fortune, happiness, well-being, or prosperity." www.merriam-webster.com/dictionary/welfare. And the "plain and obvious" meaning of a benefit to "public welfare" is something that is good for the public. Job growth, educational prestige, and advancement of knowledge are plainly benefits to the "public welfare."
316. Furthermore, the Hawai'i Supreme Court has held that consideration of relevant scientific, economic, and educational benefits are proper in the context of a CDUA as such benefits impact long-term sustainability and public welfare. *See Kilakila*, 138 Hawai'i at 405; 382 P.3d at 217.
317. HAR § 13-5-30(c)(8) does not require that a proposed land use be affirmatively beneficial to the public health, safety, and welfare – only that a project not be materially detrimental. Therefore, this criterion is satisfied with or without a finding of affirmative

benefit to public welfare.

318. The reliable, probative, substantial, and credible evidence demonstrates that the TMT Project will inject money into the local economy and will bring with it job growth, educational prestige and opportunities, and significant advancement of knowledge. The Project will benefit the "public welfare."
319. For all these reasons, and for the reasons set forth in the findings of fact above, the proposed land use will not be materially detrimental to the public health, safety, and welfare.
320. In sum, UH Hilo has borne its burden of proving that the TMT Project satisfies all of the criteria set forth in HAR § 13-5-30(c).

B. THE TMT PROJECT SATISFIES THE PUBLIC TRUST DOCTRINE, AND ART. XI, SEC. 7 OF THE STATE CONSTITUTION, AND CUSTOMARY AND TRADITIONAL NATIVE HAWAIIAN RIGHTS ARE APPROPRIATELY PROTECTED

321. In assessing the Project and determining whether the criteria of HAR § 13-5-30(c) have been satisfied, the State must protect the public trust and the customary and traditional rights and practices of native Hawaiians.

i. The Public Trust Doctrine

322. In assessing the legal aspects of the public trust doctrine, the Board has not relied upon any expert testimony.
323. The public trust doctrine has been adopted in Hawai'i as a "fundamental principle of constitutional law." *In re Water Use Permit Applications*, 94 Haw. 97, 132, 9 P.3d 409, 444 (2000) ("*Waiahole*").
324. Separately, Article XI, section 1 of the Hawai'i Constitution provides that public natural resources are held in trust by the state:

"For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawai'i's natural beauty and all natural resources, including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State."

"All public natural resources are held in trust by the State for the benefit of the people."

325. The public trust doctrine arises from the common law. *Id.*, 9 P.3d at 439, n.25. It was first applied in Hawai'i case law to navigable waters. *King vs. Oahu RR & Land Co.*, 11 Haw. 717 (1899), then to the shoreline. *County of Hawai'i v. Sotomura*, 55 Haw. 176,